Anno 2013

Università degli Studi di TRIESTE >> Sua-Rd di Struttura: "Scienze della Vita"

B.1.b Gruppi di Ricerca

1. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Gruppo di Ricerca Oncologia molecolare
Descrizione	Vie di segnalazione in oncologia di base e traslazionale Introduction The research program coordinated by Professor Giannino Del is centred in both basic and translational aspects of the molecular biology of the cancer cell. The research interests of Del Sals team are focused on tumor suppressor and oncogenic pathways and on how one can take advantage of them to counteract cancer and stop metastasis. With a combination of molecular, cellular and omics approaches, of bioinformatics and integrative methods, the group studies the role and interconnection of these pathways in physiology and disease. At the centerpiece of Del Sals investigations there are both the p53 tumor suppressor and the mutant p53 oncogenic networks; the Notch pathway; the phosphorylation-dependent isomerization signalling; ncRNAs, epigenetics and chromatin remodelling pathways in physiology and disease. All the activities within this program are organized in various lines of research: Function and dysfunction of TP53 Mutations in the TP53 gene are among the most common alterations found in human cancer cells, and among them missense mutations account for the vast majority of these alterations. While p53 is probably among the best known tumor suppressors, mutant p53 proteins are powerful drivers of cancer initiation and progression. In addition to losing the wt tumor suppressive abilities, p53 missense mutants strongly promote tumor development by driving epithelial-to-mesenchymal transition (EMT), migration, metastasis and increasing chemoresistance (gain of function, GOF). Pivotal for mutant p53 gain of function is the formation of aberrant protein complexes perturbing the activity of the interacting partners, as well as the activation of specific transcriptional programs (Girardini et al., Cancer Cell 2011). The exact magnitude of mutant p53 contribution to cancer progression, however, remains to be characterized. Our team is investigating the different ways by which mutant p53 can subvert cellular processes, regulating, either directly or indirectly, cancer-related gene expression programs, that may include both coding and non-coding genes. There are a multitude of effectors of mutant p53 GOF and key activities within this task is also the characterization and dissection of their contribution in promoting multiple hallmarks of cancer aggressiveness (growth, migration, EMT, metastasis and stemness). In sum, ultimate aim of this line of research is to better understand the molecular drivers of tumour progression, resistance to therapy and spread, in order to identify new targets and/biomarkers within the mutant p53molecular network that can help improving patient care. Cancer metabolism Several studies in the last years pointed out that energy production and nutrient metabolism is profoundly altered in cancer cells. These discoveries raised the exciting idea that cancer metabolism could represent a powerful target for cancer therapy. In solid tumors, cells are often poorly vascularized and need to reprogram their metabolism to supply their high energetic requirement due to the high rate of proliferation. Moreover, the unbalanced signalling of cancer cells can lead to profound changes in the expression and activity of metabolic enzymes with consequent aberrant production of key metabolites. We are focused on the identification of metabolic processes altered during tumorigenesis and on the identification of cross talk between cellular metabolites and oncogenes (such as mutant p53, YAP/TAZ and Notch). By using cell-based High-Content Screening, we identified the mevalonate pathway as an important metabolic regulator of the nuclear activities of two related oncogenes: YAP and TAZ, the nuclear transducers of the Hippo pathway. Through the mevalonate pathway, cells synthesize fundamental biomolecules such as cholesterol, isoprenoids, Heme A, ubiquinon and dolichols. The expression of mevalonate pathway enzymes (e.g. HMG-CoA-Reductase) is frequently altered in tumors, but the mechanisms by which this metabolic pathway operates toward oncogenesis are still poorly understood. Del Sals findings unveiled an unexpected layer of YAP/TAZ control by a metabolite (the mevalonic acid) and demonstrated how cancer cells, by altering cellular metabolism, can drive unscheduled activation of YAP/TAZ transcriptional program thus sustaining proliferation, migration, resistance to apoptosis and stem cell traits appearance. The discovery of the link between the mevalonate pathway and YAP/TAZ opens the unprecedented opportunity to blunt this pro-oncogenic axis with three drugs acting at different steps of this metabolic route: statins, bisphosphonates and GGTI inhibitors. Strikingly, given the fact that two of these drugs (statins and bisphosphonates) are FDA-approved and already used in clinics, alongside of the the study of metabolic processes in cancer, Del Sals team is planning to use the mevalonate pathway inhibitors in clinical trials as anticancer drugs. Insights into cancer and neurodegeneration co-morbidity

	Statistics on the top ten causes of death suggest that certain forms of highly aggressive cancers (namely lung, colon, breast cancer) and neurodegenerative diseases like Alzheimers Disease and others are among the most powerful killers in high income countries (WHO, 2011 release). Interestingly these two classes of disease display an inverse relationship in the way that several epidemiologic studies have pointed out an inverse comorbidity pattern associated with cancer and Alzheimers Disease (AD), Parkinsons Disease (PD), multiple sclerosis, Huntingtons Disease (HD), amyotrophic lateral sclerosis (ALS) and others. The molecular circuitries proposed to be responsible for this inverse relationship are still unknown. Different experimental evidence indicates that common fundamental cellular processes, such as the cell cycle, are subverted in both. In the extent and direction of these deregulations it may rely the inverse relationship inter-occurring between such highly impacting classes of disease. A key molecular player of both neurodegeneration and cancer is the prolyl-isomerase Pin1 (Peptidyl-prolyl cis-trans isomerase NIMA-interacting 1). Pin1 is a key regulator of a multitude of cellular processes. It specifically controls the conformation of key cellular proteins by catalyzing cis-trans isomerisation of Ser/Thr-Pro motifs upon phosphorylation of the Ser/Thr, having profound effects on the modulation of signal transduction. Pin1 is ubiquitously expressed and is required for tissue homeostasis. Alteration of Pin1 levels and activity, or alteration of the phosphorylation status of its direct targets, affects many cellular processes (e.g. oxidative stress, metabolism, survival, drug response, other) that, depending on the cellular context, may lead to age-related pathologies. Some of these processes are under investigation by our team. Indeed, the group already contributed to unveil the effects of Pin1 in tumors, where it is found overexpressed and boosts tumourigenesis through key oncogenic pathways, as Notch and mutant p53. Pin1 levels or activity, however, seem to be curbed in Alzheimer disease and is required for pro-apototic functions of p53 in Huntingtons disease. The highly context dependent activities of Pin1 may be an important key for the interpretation of the observed inverse relationship between neurodegenerative disorders and cancer. A better understanding of these activities will provide knowledge exploitable for the cure of these diseases. The molecular portrait of cancer stem cells Cancer stem cells (CSCs) are proposed to drive tumor initiation and metastatic progression of chemotherapy-resistant tumors. For this reason they are considered core targets to eradicate the roots of malignancy. CSCs may origin from mutations that either occur in normal stem cells or that confer stem cell properties to more differentiated cells by deranged cellular reprogramming. Elucidation of the molecular mechanisms underpinning the attributes of normal and CSCs, i.e. self-renewal, tumorigenicity, and multilineage differentiation capacity, is important in order to develop effective therapeutic strategies. The research team coordinated by Professor Del Sal is dissecting the molecular bases of normal and CSCs of the mammary gland both in cell-based and animal models. Del Sals group already provided contribution to this field identifying the prolyl-isomerase Pin1 as a stem cell factor of the mammary epithelial compartment, both normal and cancerous (Rustighi et al., EMBO Mol Med 2014), whose inhibition elicits breast CSC exhaustion and chemosensitivity. Breast CSC self-renewal, chemoresistance, tumor growth and metastasis formation in vivo rely in fact on this enzyme, that sustains the deregulation of pathways, such as the Notch or mutant p53 ones, strongly implicated in development and progression of breast tumors. On-going research concerns the role of key tumor suppressor pathways, such as p53 or Fbxw7, in negatively regulating self-renewal of tissue specific stem cells and in restricting reprogramming efficiency of induced pluripotent stem cells and the crosstalk between different pathways in the CSC biology. Epigenetics, chromatin remodelling and genome control Epigenetic regulators play key roles in controlling gene expression by modifying the local state and architecture of chromatin at multiple levels, thus altering the execution of biological processes under specific conditions. Altered regulation and function of chromatin modifications as well as of the remodelling machinery leads to global changes of both coding and non-coding gene expression. The high frequency of such alterations in human malignancies supports a key role of epigenetic deregulation in tumor progression. Our group already provided contribution to this field by identifying in Bromodomain-containing 7 (BRD7), a specificity factor of PBAF-specific SWI/SNF chromatin remodeling complex, a cofactor of p53 essential for transcriptional control of the cell-intrinsic tumor suppressive response named oncogene-induced senescence (Drost et al., Nat Cell Biol 2010). We are now exploring at a genome-wide level how chromatin remodelling machineries may restrain on multiple biological processes that impinge on tumor development and aggressiveness, e.g. genome instability, acquisition of plasticity and stem-cell traits, cell metabolism and interaction with tumor microenvironment. Our interest is to understand how epigenetic regulators co-ordinately modulate the expression of various classes of mutually interacting coding and non-coding genes, including miRNAs, long ncRNAs and mobile DNA elements controlling gene expression, chromatin organization and genome structure.
Sito web	https://dsv.units.it/it/ricerca/ambiti/linea/2386?q=it/node/8645
Responsabile scientifico/Coordinatore	DEL SAL Giannino (Scienze della Vita)

Settore ERC del gruppo:
LS3_3 - Cell cycle and division
LS3_8 - Signal transduction
LS4_6 - Cancer and its biological basis

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

MANTOVANI	Fiamma	Scienze della Vita	Ricercatore	BIO/13
INGALLINA	Eleonora	Scienze della Vita	Dottorando	BIO/13
RUGGERI	Naomi	Scienze della Vita	Dottorando	BIO/13
RUSTIGHI	Alessandra	Scienze della Vita	Ric. a tempo determ.	BIO/13
ZANNINI	Alessandro	Scienze della Vita	Dottorando	BIO/13

Altro Personale	Consorzio Interuniversitario Biotecnologie: Dr. Dawid Walerych, PhD (PostDoc); Dr. Ramiro Mendoza, PhD (PostDoc); Dr. Anna Comel, PhD (PostDoc); Dr. Giovanni Sorrentino, PhD (PostDoc); Dr. Valeria Capaci, PhD (PostDoc); Dr. Carolina Marotta, PhD (PostDoc); Dr. Carmelo Neri (PhD student), Dr. Elena Campaner (PhD student); Dr. Ilaria Maria Pia Voto (PhD student); Dr. Giada Pastore, PhD (Lab manager)

2. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Gruppo di ricerca Cromatina ed epigenetica nei tumori
Descrizione	The research program coordinated by Professor Guidalberto Manfioletti is centred mainly in basic aspects regarding the role of HMGA proteins in driving the process of neoplastic transformation. These architectural factors are able to assemble or modulate DNA/nucleoprotein macromolecular complexes thus participating in gene expression regulation, chromatin remodelling and dynamics, replication, and DNA repair. Being critical hubs in the chromatin network, they influence a variety of biological processes such as embryogenesis and differentiation and the deregulation of their activity leads to neoplastic transformation. A deep understanding of the pathways affected by HMGA1 could therefore point-out new potential targets for cancer therapy. All the activities within this program are organized in two main lines of research: Towards the definition of the global influence of HMGA1 proteins in cancer cells: an integrated genomic and proteomic approach High-throughput genomic and proteomic methods are available to study molecular networks in different systems. The ability of these techniques to simultaneously interrogate thousands of transcripts/proteins has led to important advances in a number of biological problems. With these approaches we are exploring the influence of HMGA1 on gene transcription and protein expression. Our current research is focused on breast cancer cells in which the silencing of HMGA1 causes a reversion of the tumoral phenotype resembling a mesenchymal-epithelial transition. We have evaluated the effect of HMGA1 silencing on the aggressiveness of breast cancer cells, demonstrating that HMGA1 is fundamental for controlling cell motility, invasiveness, and in maintaining stemness properties (Pegoraro et al. 2013). Now we are facing at exploring the global contribution of HMGA1 in gene transcription and protein expression. a) Genomic approach We are analyzing by DNA microarray and RNA-seq analyses the gene expression profile of breast cancer cells in which HMGA1 expression has been silenced. With the aid of bioinformatic tools we are dissecting the various pathways/factors tuned by HMGA1. The two techniques adopted provide different information, albeit RNA-seq offers a broader view since it circumvent the limitations of interrogating only the probes present on DNA microarray and extends also to the non-coding RNA world. b) Proteomic approach We aimed at dissecting by several different technical approaches (Label Free LC-MS/MS proteomic, 2D-DIGE proteomic, iTRAQ-based LC-MS/MS proteomic) the role of HMGA1 proteins in modulating the protein expression profile of cancer cells in order to find out cancer-associated molecules downstream HMGA1. We are focusing both on global proteomic alterations and on alterations regarding secreted proteins because of their importance as potential cancer biomarkers. The data we have already collected show that HMGA proteins have a very large impact on protein expression regulation. As usual in genome- and proteome-wide screening many proteins with an already known specific role in cancer are fished out, but we are currently focusing onto the less characterized factors from a molecular oncology point of view because they could unravel new pathways involved in cancer development and, more interestingly, new potential therapeutic targets. As well as for the genomic approach we will take advantage of bioinformatic analyses by which we will compare HMGA1-linked protein alterations with different datasets derived from tissue of breast cancer patients that include gene expression and clinical outcome data. The role of HMGA protein in influencing the epigenetic status of cancer cells.

	In cancer cells HMGA are abundantly expressed and their levels are almost comparable to those of histone H1. Given that these proteins bind directly to DNA and they act as architectural transcription factors favoring the formation of stereospecific macromolecular regulatory complexes at the level of enhancers/promoters, in order to understand their function it is fundamental to shed light on the HMGA1 genome occupancy and to evaluate whether they contribute to epigenetic alterations occurring in cancer cells. We are accomplishing this task exploiting the cancer cellular model described above to evaluate the interaction of HMGA1 with core histones and testing whether key histone post-translational modifications involved in gene transcriptional regulation can modulate this association. The translational aspect of this research task regards the identification of the enzymes responsible for these epigenetic alterations that could represent new potential therapeutic targets.
Sito web	https://dsv.units.it/it/ricerca/ambiti/linea/2386?q=it/node/8647
Responsabile scientifico/Coordinatore	MANFIOLETTI Guidalberto (Scienze della Vita)

Settore ERC del gruppo:
LS1 - Molecular and Structural Biology and Biochemistry: Molecular synthesis, modification and interaction, biochemistry, biophysics, structural biology, metabolism, signal transduction

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
ROS	Gloria	Scienze della Vita	Dottorando	BIO/10
SGARRA	Riccardo	Scienze della Vita	Ricercatore	BIO/10

Altro Personale	Silvia Pegoraro University of Trieste (DSV), Post-Doc, (assegnista di ricerca); Carlotta Penzo, University of Trieste (DSV), PhD student;Rossella Zanin, University of Trieste (DSV), PhD student; Serena Rizzo, University of Trieste (DSV), collaborator.

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3. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Geni oncosoppressori nel differenziamento e nell'oncogenesi
Descrizione	Novel insights into the p53 family network from the study of evolutionarily conserved protein interactions In the recent past, we searched the Drosophila genome for proteins that interact with Dmp53 in vitro. The approach involved a small pool based screening of the Drosophila Gene Collection by in vitro pull down, using baculovirus expressed recombinant Dmp53 as a bait. We reasoned that such an unbiased "phylogenetic" approach could reveal novel, highly conserved molecular circuits regulating this very important tumor suppressor pathway. Therefore, we used the Drosophila positive hits as a framework to study the corresponding interactions in mammals. We tested the human orthologs of 41 newly discovered Dmp53 interactors for association with human p53, p73 and p63, and obtained a list of 37 potential partners of these crucial tumor suppressor proteins. Following up on this work, we are studying selected p53 interactors that may be particularly relevant in cancer. Exploring the gain-of-function properties of mutant p53 through novel interacting proteins Another peculiar aspect of human cancers is that the tumor suppressor gene p53 is mutated very frequently. For some types of cancer, in much more than 50% of the cases. Notably, p53 mutations tend to be single aminoacid substitutions, resulting in expression of very stable p53 variants that not only lose their normal tumor-suppressive functions, but also acquire novel oncogenic properties (a phenomenon called gain-of-function), as they in fact promote tumorigenesis and drug resistance. Accordingly, tumors with mutant p53 tend to be more aggressive, and are often associated with worst prognosis. The mechanism underlying the gain of function partly depends on the capability to trascriptionally activate or repress specific genes, and partly on the ability to interact with cellular proteins. For example, several gain of function p53 mutants bind to and inactivate p73, and this interaction accounts for increased chemoresistance of tumors carrying specific p53 mutations. In fact, tumor-associated p53 mutations may drastically alter the protein interaction profile of p53. They may prevent interaction with certain proteins, while binding to other proteins may remain unaffected. Alternatively, mutant p53 might acquire the capability to interact with cellular proteins that normally do not bind wild-type p53. For this reason, there is

	considerable interest in defining the interaction profile of oncogenic p53 mutants as compared to that of wild-type p53. During our screening, we performed co-affinity purification experiments in human cells using MBP-p53(H175R) as a bait (unpublished data). Under these conditions, a large fraction of the proteins tested bound to mutant p53, and an even larger fraction bound to p73. As a follow up of these results, we are studying the possible role of mut-p53 interactors in the gain of function phenotype associated to oncogenic p53 mutants.
Sito web	https://dsv.units.it/it/ricerca/ambiti/gruppi/10608
Responsabile scientifico/Coordinatore	COLLAVIN Licio (Scienze della Vita)

Settore ERC del gruppo:
LS3_3 - Cell cycle and division
LS3_8 - Signal transduction
LS4_6 - Cancer and its biological basis

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BELLAZZO	Arianna	Scienze della Vita	Dottorando	BIO/13
DAL FERRO	Marco	Scienze della Vita	Assegnista	BIO/13

Altro Personale	Valentino Elena (PHd student); Sicari Daria (PHd student); Paternoster Nicolò (undergradutate student); Di Minin Giulio (former PhD student and PostDoc); Lunardi Andrea (former PostDoc); Chiacchiera Fulvio (former PhD student).

4. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Proprieta terapeutiche di farmaci basati su acidi nucleici
	The research program is centred on the selection of therapeutic NABDs targeting gene products causing diseases. Particular focus is put on hepatocellular carcinoma (HHC) and chronic lymphatic leukaemia (CLL). For HCC, as NABD targets the transcription factor E2F1, the serum response factor (SRF) and the elongation factor A1, have been chosen. For CLL the targets have been restricted to the elongation factor A1 and E2F1. With regard to HCC, the group also studies the possible use of drugs (i.e. the proteasome inhibit bortezomib and the demethylating agent 5-azacytidine) whose utilization in the clinic is at recommended for other diseases. With a combination of molecular, cellular, animal and bioinformatics approaches, the group studies the effectiveness of the therapeutic drugs as well as the molecular mechanisms responsible for their action. These investigations also allow to finely dissecting the contribution of the target gene products to oncogenesis. Current projects 1) eEF1A targeting by siRNAs and aptamer as a possible novel therapeutic strategy in chronic lymphocytic leukemia The chronic lymphocytic leukemia (CLL) is the most common form of leukemia in adults in Western countries. The available therapies are based on the use of chemotherapy, immunomodulators and monoclonal antibodies in combination with chemotherapy. In general, although initially effective, these therapeutic approaches almost never result in the complete remission of the disease. In addition, in older patients, often burdened by co-morbidities, the available treatments can cause unacceptable side effects. From all the above it follows the need of the identification of novel therapeutic strategies. The elongation factor 1 (eEF1A) is a protein primarily involved in protein translation. Two isoforms are known, eEF1A1 and eEF1A2 with very similar sequences and role in protein translation. The two isoforms are also involved in many other functions such as cytoskeleton organization, protein degradation, apoptosis and cell proliferation. Recent evidences have pointed towards the involvement of eEF1A in cancer development and progression in different human tumours including haematological diseases. As conventional therapeutic drugs are burdened by significant side effects, we plan to use nucleic acid based molecules

Descrizione	such as small interfering RNAs (siRNAs) and aptamers (APT) as eEF1A targeting agents. Based on our positive previous in vitro results, we will to test siRNAs and aptamers anti eEF1A in in vivo animal models and finally in an ex-vivo model system. We will use animal models with increased complexity i.e. a zebrafish model, a subcutaneous xenograft mouse model of CLL, a diffuse mouse model of human CLL and B-leukemic cells from CLL patients. 2) Targeting of eEF1A to down modulate the growth of hepatocellular carcimoma. Hepatocellular carcinoma (HCC), the fifth most common malignancy, represents a relevant cause of cancer death world-wide. No clinically tested useful therapy for the advanced stage of this hyper-vascular and chemotherapy-resistant tumour has been developed so far. Thus, the identification of novel therapeutic targets is of utmost relevance. In this project will study the effect of the targeting of eEF1A by means of siRNA and aptamers. Our in vitro results indicate that these molecules are effective in reducing the growth of HCC cells. To confirm the in vivo activity and to better define the mechanisms of action in a more realistic environment, we will study eEF1A targeting by siRNAs and aptamers in different in vivo model including a zebrafish model and a subcutaneous xenograft mouse model of HCC. 3) Use of the demethylating agent 5-aza as anti-hepatocellular carcimoma drug. HCC is a leading cause of cancer death world-wide, with an estimated 564,000 new cases and almost as many deaths in 2000. Despite alcoholization, chemo-embolization or thermal ablation, local recurrences are the rule and life expectancy is short. In addition, there is no clinically tested useful therapy for the advanced stage of the disease and any effective treatment has not been assessed in large controlled randomized trials for this kind of hyper-vascular and chemotherapy-resistant tumour. Given the important role of methylation in HCC, in this research we study the effects of the demethylating agent 5-azacytidine (5-aza). In vitro we have observed that 5-aza can prevent the growth and migration of HCC derived cells in a phenotypic dependent manner. Moreover, the effect on primary hepatocytes is significantly less pronounced than in HCC cells, suggesting that 5-aza may preferentially affects tumour cells. With regard to the mechanisms of action, we observed in vitro that 5-aza reduces the amount of S phase cells and increases those in G1/G0 and G2/M via the up-regulation of miRNA 663 and 139-5p. Moreover, 5-aza effectively prevent HCC cell migration down regulating MMP2 and the pathway controlling MMP2 expression. We now plan to test 5-aza in a xenograft zebrafish model of HCC and a subcutaneous xenograft mouse model of HCC.
Sito web	https://dsv.units.it/it/ricerca/ambiti/linea/2386?q=it/node/18204
Responsabile scientifico/Coordinatore	GRASSI Gabriele (Scienze della Vita)

Settore ERC del gruppo:
LS7_3 - Pharmacology, pharmacogenomics, drug discovery and design, drug therapy

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
DAPAS	Barbara	Scienze della Vita	Assegnista	BIO/12
SCAGGIANTE	Bruna	Scienze della Vita	Ricercatore	BIO/11

Altro Personale	Barbara Dapas (PostDoc); Michela Abrami (PhD student);Federica Tonon (PhD student)

5. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Peptidi di difesa dell'ospite - meccanismo d'azione e applicazioni
	The research programme coordinated by prof. Gennaro is focused on the study of biology and on the biotechnological use of natural bioactive peptides with antimicrobial properties. The host defense peptides (HDPs) or antimicrobial peptides (AMPs) are part of the innate immune system of eukaryotes and participate in the eradication/prevention of infections by killing pathogens and/or stimulating the immune system. The objectives of the researchs team are: To investigate the molecular mechanism of AMPs action. Differently to antibiotics, AMPs target bacteria by multiple modes of action. Research is aimed at clarifying these mechanisms and understanding the route of internalization of AMPs into the bacteria. To develop AMPs as novel drugs. AMPs show attractive characteristics as antimicrobials. Aim of the research group is to optimize them, combining high antibacterial activity with low toxicity and a reliable route of administration. The programmes activities are organized into 3 main projects:

Descrizione	Mode of action of proline-rich antimicrobial peptides (PR-AMPs) Most antimicrobial peptides (AMPs) inactivate target bacteria through pore formation or membrane barrier disruption, while others, including PR-AMPs, cross the membrane without damages and act inside the cells affecting vital processes. Little is known about their intracellular mode of action. The aim of this project is to investigate how this class of AMPs kills bacteria. Bac7 is a member of this group of AMPs. It is naturally produced and is stored in the immune cells of a number of mammals, such as artiodactyls,andtogether to several analogues it has been extensively characterized in our laboratory. We have recently shown that a Bac7 analogue crosses the cell envelope of Gram-negative bacteria exploiting a bacterial membrane transporter (SbmA) and it is translocated into the cytoplasm where it accumulates at high concentrations. Our laboratory contributed to the characterization of this transporter showing that Bac7 is bound and actively transported by SbmA, which functions as a dimer, driven by the electrochemical proton gradient. Our team recently found that once inside the cytoplasm Bac7 binds the ribosomes and kills bacteria by inhibiting protein synthesis in a very rapid and effective manner (see the figure). The aims of this project are: i) to unravel the precise molecular mechanism by which this PR-AMP kills bacteria identifying the ribosomal proteins/RNA involved in the interaction with the peptide, and ii) to study the regulation of the expression of SbmA as a tool to modulate the sensitivity of the bacterial cell to AMPs. Results will allow us to optimize this AMP as a potential new antimicrobial drug against Gram-negative bacteria. (Researchers involved: M. Scocchi, M. Benincasa, G. Runti, M. Mardirossian) Development of AMPs for biomedical applications An increasing number of pathogens are acquiring multi-drug resistance. The antibiotics currently used in the clinic consist of about 150 molecules from 17 different classes. However, bacteria have already developed different mechanisms of resistance for each of them. The problem is exacerbated by the capability of most bacteria to form biofilms (BF), which are present in up to 60% of infections and are intrinsically resistant to antibiotics. Considering cystic fibrosis (CF), more than 80% patients succumb to respiratory failure due to chronic bacterial infection. We have showed that different AMPs are active against P. aeruginosa and S. maltophilia strains and their BF forms, which cause most pulmonary chronic complications in CF patients. The emerging pathogens A. baumanniiand K. pneumoniae colonize medical devices causing up to 50% of ventilator-associated pneumonia infections. Our team is investigating the potential of AMPs against these antibiotic-resistant and/or BF producing pathogens and their use to prevent colonization of abiotic surfaces on medical devices. Ultimate aims of this research line are: i) to optimize AMPs by combining high antimicrobial activity with low cytotoxicity and a feasible route of administration, in order to maximize their efficacy as novel antibacterials for the treatment of CF-associated pulmonary infections; ii) to investigate the capacity of the AMPs to inhibit the bacterial colonization, the BF formation on, and their release from, medical devices. (Researchers involved: M. Scocchi, S. Pacor, M. Benincasa, M. Mardirossian) Fish innate immunity: a resource for aquaculture Cathelicidins are an important AMPs family mammals and characterized by an N-terminal conserved proregion followed by varied C-terminal antibacterial domains. Recently cathelicidins have been discovered also in fish. Up to date, only few studies exist about the functions of cathelicidins in innate immune system of fish and information about their expression in response to infection is limited. A better understanding of the mechanisms of fish innate immune response during infectious diseases and in particular of cathelicidins expression and activity could contribute to develop future applications in the fields of aquaculture and biopharmaceutics. Recently studies have suggested the use of AMPs as antimicrobials for fighting fish pathogens in aquaculture and for replacing chemicals and their toxic residues which may remain in . Our team is investigating salmonid cathelicidins to understand their structural and functional characteristics. Analysis of gene and protein expression indicated that salmonid cathelicidins are widely present in immune and non-immune tissues and are quickly and highly upregulated in response to stimulation by different pathogens (see the figure). Synthetic peptides corresponding to the C-terminus of fish cathelicidins have been shown to be active against the most important bacterial pathogens of trout and other salmonids. The objectives of our team for this research line are: i) to obtain new insights about the characteristics of salmonid cathelicidins and ii) to better define their role in the immune response of fish. The possibility to control the level of expression of cathelicidins, that may result in increasing the fish resistance to bacterial diseases, and the use of cathelicidin peptides as antimicrobials are two possible applications trying to transfer the academic research to the aquaculture world. (Researchers involved: M. Scocchi, M. Furlan)
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18208
Responsabile scientifico/Coordinatore	GENNARO Renato (Scienze della Vita)

Settore ERC del gruppo:
LS6_1 - Innate immunity and inflammation

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BENINCASA	Monica	Scienze della Vita	Assegnista	BIO/10
FURLAN	Michela	Scienze della Vita	Dottorando	BIO/18
MARDIROSSIAN	Mario	Scienze della Vita	Assegnista	BIO/10
SCOCCHI	Marco	Scienze della Vita	Ricercatore	BIO/10

Altro Personale	Giulia Runti, post-doctoral fellow;

6. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Polisaccaridi batterici
Descrizione	The research programme coordinated by Professor Roberto Rizzo is focussed on the investigation of bacterial exopolysaccharides both for their structural and conformational characteristics and for their impact on bacterial life. Recently, most of the research efforts were devoted to the macromolecular characterization of bacterial biofilms and specifically on the role of polysaccharides in the extracellular matrix set-up. Among the experimental methodologies used particularly relevant are: chromatographic techniques, NMR, mass spectrometry, AFM, and confocal microscopy. These studies are carried out mainly on species of the Burkholderia cepacia Complex which are particularly important for lung infections of cystic fibrosis patients All the activities within this programme are organized in two main lines of research: Structure determination of bacterial extracellular polysaccharides. Being localized around bacterial cells, extracellular polysaccharides primarily interact with the environment. Their structure is therefore modulated to protect bacteria against external threats and to interact with a variety of different molecular agents. Understanding their structure and the way they interact is important to design possible antibacterial strategies. The majority of the studies are focussed on species of the Burkholderia cepacia complex involved in serious lung infections in cystic fibrosis patients. However, also other bacteria that are opportunistic pathogens of this disease have been and are investigated like Pseudomonas aeruginosa, Stenotrophomonas maltophilia, and Inquilinus limosus. Recently, similar studies have been initiated on emerging pathogens like Klebsiella pneumoniae and Acinetobacter baumannii. Structural studies are carried out by means of classical chemical methodologies (alditol acetates analysis, methylation analysis) and modern techniques (bi-dimensional NMR, ESI mass spectrometry). Exopolysaccharide conformation and morphology are investigated by different spectroscopic techniques (CD, fluorescence) and modern microscopy (AFM, Infrared microimaging resorting to synchrotron radiation). Bacterial biofilm composition and structure Bacterial biofilm formation is a major problem in infections and is considered an important virulence factor. When imbedded in biofilms, bacterial colonies exhibit high tolerance to environmental stress, including increased resistance to antibiotics as well as components of the host immune system. Understanding the biophysical and biochemical constraints which play a critical role in biofilm architecture could constitute a major advance in developing novel anti-infection therapy routes based on biofilm disruption, and aimed at avoiding the induction of antibiotic resistance in bacteria, an issue of specific interest for the major national and international health agencies. Biofilms produced by the Burkholderia cepacia complex (BCC) are produced in different conditions and on different nutrition media and the biofilm matrix is analyzed for its polysaccharidic content. Identity of expolysaccharides secreted in the matrix is analyzed also resorting to the deep knowledge of the structure of exopolysaccharides produced by species of the BCC. Interactions of exopolysaccharides with themselves and with other molecular species are investigated with a variety of techniques to understand the factors stabilizing the biofilm scaffold and to envisage possible biofilm disruption strategies. The research group is involved in several international collaborations.

	Prof. Tim Tolker-Nielsen (Department of International Health, Immunology and Microbiology, Univ. of Copenhagen, Denmark): biofilm composition and structure. Prof. Neil Ravenscroft (Department of Chemistry, Cape Town University, South Africa): polysaccharide structure. Dr. Micha Häuptle (Glyco Vaxyn AG, Schlieren, Switzerland): glycoconjugate vaccine against Shigella. Prof. John W. Brady (Department of Food Science, Cornell University, Ithaca, USA): modelling of biofilm matrix.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18212
Responsabile scientifico/Coordinatore	RIZZO Roberto (Scienze della Vita)

Settore ERC del gruppo:
LS1_10 - Structural biology (NMR)
LS1_2 - General biochemistry and metabolism

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
CESCUTTI	Paola	Scienze della Vita	Ricercatore	BIO/10
LIUT	Gianfranco	Scienze della Vita	Prof. Associato	BIO/10

Altro Personale	Gianluigi De Benedetto (PhD Student); Research collaborators Ambra Delneri Aris Sveronis

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7. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Biofilms e genetica della farmaco-resistenza nei batteri
Descrizione	The research program of the group coordinated by Dr. Lagatolla is centred on epidemiology and genetics of bacterial drug resistance. Molecular biology techniques are used for typing bacteria, that is the differentiation between strains belonging to the same species, looking for those carrying genetic determinants that confer either virulence or resistance to drugs. This allows the identification of the most worrisome strains, tracing their diffusion and trying to limit their spread. Recently, the research interests of the team have focused on the production of biofilm, a surface-associated microbial community enclosed in an extracellular matrix, which contribute to protect bacterial cells towards a large array of antimicrobial compounds. At the centrepiece of this project there is the study of biofilm production on medical devices, looking for systems able either to reduce its formation or to break up the matrix after its production. The activities are organized in 2 lines of research: Characterization of Klebsiella pneumoniae clinical isolates producing KPC carbapenemases Klebsiella pneumoniae (KP) is an important nosocomial pathogen able to cause pneumonia and sepsis especially in patients with prolonged hospitalization. During the last decade, KP strains producing KPC (K. pneumoniae carbapenemase) beta lactamases have increasingly been reported worldwide and have become a matter of great concern. They are multi drug resistant, so the limited antibiotic options to treat these infections (often colistin, tigecycline or aminoglycosides) result in high mortality among patients with bloodstream infections. KPC-type enzymes include ten variants that have been detected in a large number of KP lineages. Among them, KPC-2 and KPC-3 are predominant. They are mainly disseminated worldwide by strains belonging to a single lineage (e.g.: the sequence type 258, as defined by multilocus sequence typing), although isolates belonging to different sequence types have been described in different countries too. The blaKPC genes coding for KPC carbapenemases have been identified on the chromosome of some strains, but more frequently they are carried by plasmids of different sizes. KPC producing K. pneumoniae (KPC-KP) have been reported in Italy since 2009 and appeared in Friuli-Venezia Giulia (FVG) during 2012. Our group investigates KPC-KP strains isolated in different FVG hospitals to trace their diffusion in our region, so that appropriate measures could be taken to limit their spread. Characterization of plasmids extracted from some clinical isolates leaded to the description of new blaKPC carrying plasmids never described before. (Figure 1: Molecular typing by macrorestriction analysis)

	Antimicrobial and anti-biofilm activities on emerging drug-resistant Gram-negative pathogens. Gram-negative bacteria resistant to a great number of commonly used drugs are a leading cause of infections acquired in hospital settings, with 175.000 deaths per year in Europe. Several mechanisms lead to their multi drug resistance (MDR) phenotype. Among them, the production of biofilm (BF) significantly reduces drugs access to target cells. Acinetobacter baumannii (Ab) and Klebsiella pneumoniae (Kp) are emerging pathogen responsible for ventilator-associated pneumonia and bloodstream, urinary or wound infections. Ab causes nosocomial meningitis too, and has become a major cause of Intensive Care Unit infections. Both these pathogens produce BF, which favours colonization of medical devices. The composition of the extracellular matrix of their BF is largely unknown. In collaboration with other research groups of the DSV, our team is studying the ability of selected Ab and Kp clinical isolates to form BF on models of abiotic surfaces, to evaluate: i) if the composition of the matrix is comparable among strains belonging to the same species or if variability among them exists; ii) if BF production might be affected by treatment with different antimicrobial compounds, such as host defence peptides (HDP) that are considered a possible alternative to currently used drugs. The final aim of this project might have an important practical application: the developing of a strategy that, by HDP-modification of abiotic surfaces, makes medical devices more resistant to colonization by infective strains of Ab and Kp.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18228
Responsabile scientifico/Coordinatore	LAGATOLLA Cristina (Scienze della Vita)

Settore ERC del gruppo:
LS6_11 - Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)
LS6_9 - Bacteriology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
MILAN	Annalisa	Scienze della Vita	Assegnista	MED/07

Altro Personale	Dr Raffaela Bressan; Dr Fabrizia Gionechetti;

8. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Peptidi di difesa dell'ospite - evoluzione e relazioni struttura-attivita
	Host defense peptides (HDPs) are an important component of innate immune system in animals, where they participate in the prevention and eradication of infections by killing pathogens and/or stimulating other components of the immune system. Our research program focuses on the study of how evolved features in their sequences or structures determine their modes of action on both bacterial and host cells. This knowledge can then be used to help design HDP-based molecules for biomedical and biotechnological applications. The objectives of the groups research are: - To find and characterize mammalian HDPs (especially cathelicidins and defensins)and identify significant evolved features. - To investigate the relationship between these features (e.g. sequence, physical characteristics, conformation, self-interaction) and modes-of-action on host or bacterial cells. - To use the acquired knowledge to rationally modify HDPs or de-novo design artificial AMPs for biomedical or biotechnological applications. Project 1: Identification, characterization and evolution of host defence peptides All vertebrate animals express numerous beta-defensins and at least one cathelicidin. We have been scanning genome, transcript and protein databases using bioinformatics tools to identify novel HDPs, and in particular members of the cathelicidin family. Although these show a considerable sequence diversity at the HDP level, they have quite large and

Descrizione	well-conserved pre-prosequences and gene organizations that allow efficient sequence mining. Their sequences are then inserted into a dedicated database that will assist in studying their phylogenetic relationships and evolution. Analysis of the sequence and specific physico-chemical characteristics of the HDP domain (e.g. charge and hydrophobicity patterns) can be used to predict the antimicrobial and immunomodulatory potential. Chemical synthesis of selected peptides then allows characterization of functional features (capacity to interact with membranes or internalize into bacteria, extent and type of membrane lesions or intracellular activity) and to validate and refine the original prediction. This process allows relating particular structural features that have been naturally selected for with specific functional features of the peptides. This information leads to i) a better understanding of the roles of cathelicidins in the immune responses of man and other animals, and ii) assessing what can be altered or needs be maintained in redesigning the peptides or de novo designing artificial molecules for biotechnological or biomedical uses. (A. Tossi and Stefano Gambato, with Giorgio Manzini as external collaborator) Project 2: Structural factors defining the effects of host defence peptides on microbial and host cells. HDPs can act either at cellular membranes or intracellularly. In the case of bacteria, they often impair the membrane at micromolar concentrations (via formation of pores or other types of lesions) or internalize and inactivate cytoplasmic targets. At high concentrations, they may also damage animal cells (cytotoxic effects) in a similar manner, whereas at low micromolar ones they can stimulate host cells by interacting with membrane or internal receptors (stimulating effects such as proliferation, chemotaxis and/or degranulation). A better understanding of these different functions will lead to a better understanding of the role of HDP in immune responses and potentially to their therapeutic exploitation. We are probing the biological roles of selected HDPs (currently human LL-37 and its primate or bovine orthologues, and the Pro-rich artiodactyl cathelicidins) by rationally modifying or truncating them and studying the capacity to interact with biological membranes, the mode by which this occurs, and other effects such as the capacity to internalize and hit internal targets. To this end, we make use of a wide range of biophysical and biochemical methods, such as steady state or time-resolved spectroscopic studies, surface plasmon resonance, flow cytometry and various types of antimicrobial activity assays. (A. Tossi, S. Pacor in collaboration with M. Benincasa) Project 3. Rational redesign and optimization of HDPs HDPs are considered to have a high potential for exploitation as anti-infective agents, both for biomedical and other applications. This is also due to their activity against strains multi-resistant to the antibiotics in clinical use, and relatively low tendency to elicit resistance themselves. However, they are normally not suitable for systemic use due to production difficulty, low bioavailability and insufficient therapeutic indices. Rational modification of their structures and sequences can however increase their potential for specific uses: - Optimization of size and physico-chemical characteristics can allow a cost-effective application for topical uses or to prevent contamination of biomedical devices - Functionalization of the relatively non-toxic, internally acting Pro-rich HDPs can allow their use as vehicles for poorly permeant antibiotics into susceptible bacterial cells - PEGilation of HDPs or their derivatives to increase serum stability and in vivo lifetime, and/or reduce cytotoxicity The implementation of modifications benefits from knowledge gathered on HDP characteristics and SAR obtained in the other projects of the group, and from a long-standing experience with solid phase peptide synthesis, modification and conjugation. (A. Tossi, S. Pacor, S. Gambato in collaboration with M. Scocchi, M. Benincasa, G. Runti, M. Mardirossian and F. Guida)
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18699
Responsabile scientifico/Coordinatore	TOSSI Alessandro (Scienze della Vita)

Settore ERC del gruppo:

LS1 - Molecular and Structural Biology and Biochemistry: Molecular synthesis, modification and interaction, biochemistry, biophysics, structural biology, metabolism, signal transduction

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
PACOR	Sabrina	Scienze della Vita	Ricercatore	BIO/14

Altro Personale	Stefano Gambato (PhD student)

9. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Immunologia della riproduzione e dei tumori
Descrizione	The research program coordinated by Roberta Bulla is mainly focused in trying to define the contribution of innate immunity, with particular regard to the complement system and macrophages, to embryo implantation in physiologic and pathologic pregnancy. The group dedicate its research activity on reproductive immunology and developed techniques to set up primary culture of cells isolated from human tissues with particular regard to endothelial cells (from normal and pathological decidua, uterus and skin) villous and extravillous trophoblast and other decidual cells which are now routinely employed for several research projects. Since women with endometriosis have a lower implantation rate and, at first pregnancy, have an increased risk of impaired obstetric outcome, we extended our interested to the study of the immunological mechanisms involved in this chronic disorder. More recently Bullas group extended its study to the alternatives roles of the complement system in tumour growth and invasion since tumour cells have borrowed many of the mechanisms for invasion used by the trophoblast to intrude into host tissue and to establish their blood supply. Role of the complement system in tissue and vascular remodelling in normal and pathological pregnancies. Successful implantation of the foetus into the uterine wall of the mother depends on special interactions that the foetus establishes with the mother. They both contribute to the structural organization of the placenta, a newly formed organ that plays a key role in the regular progression of pregnancy till it reachesfull term. Molecular implantation and early placentation defects process might be the primary lesion of several pregnancy disorders, therefore the study of implantation and the early steps of human development are fundamental for the understanding of the mechanisms involved in the pathogenesis of pathological pregnancies. In this context, one of the aim of our group is to investigate the contribution played by the complement system in the pathogenesis of pre-eclampsia. The study is finalized with the development of molecular markers for the investigation and the diagnosis of pre-eclampsia. The molecular pathways characterised by these markers should be important for the definition of potential therapies for this pregnancy pathology. We have recently demonstrated that C1q, the recognition molecule of the classical pathway activation of the complement system is present in placenta, is produced locally and it is involved in the endovascular (Bulla, Agostinis et al. MI 2008) and interstitial invasion (Agostinis, Bulla et al. JI 2012) of trophoblast cells. Collectively these data suggest that C1q plays an important role in promoting trophoblast invasion of the decidua and that defective local production of C1q may be involved in pregnancy disorders, such as pre-eclampsia, characterized by poor trophoblast invasion and vascular remodelling. Role of the complement system in tumour progression and development. A recent aim of our research is to evaluate the contribution of the complement system to the interaction of cancer cells with the tumour microenvironment and the role that this may play in tumour progression. The complement system is part of the inflammatory process and there are evidences that it may contribute to tumour invasion. In fact it has become increasingly apparent that the development of the inflammatory process creates a microenvironment that favours tumour growth, angiogenesis, and immune suppression. The project aims to investigate the contribution of the first complement component C1q in tumour development and progression. This idea comes from a recent finding in which locally secreted C1q was shown to be involved in trophoblast invasion of maternal decidual stroma and blood vessels during pregnancy. This process resemble to some extent tumour cell invasion, except that it is physiologic and it is tightly regulated in time and space. Our results show that the recognition molecules of the C system C1q contributes to the interaction of cancer cells with the tumour microenvironment and plays an essential role in tumour development. The understanding how C1q is implicated in tumour mass progression can help to develop new staging and diagnostic markers as well as new molecular targets to block tumour development. Study of the pathogenesisof endometriosis Endometriosis is a chronic estrogen-dependent disorder characterized by the presence of endometrium-like tissue outside the uterine cavity. It is associated with dysmenorrhea, dyspareunia, non-cyclic pelvic pain, subfertility and infertility. This frequent gynaecological disease affects 10-15% of women in reproductive age. It is well accepted that a blood supply is essential for the survival of endometriotic implants and it is noteworthy that vascular endothelium play a critical role in regulation of inflammatory processes. Endometriosis can be treated by excising peritoneal implants, deep nodules and ovarian cysts. This treatment is characterized by a relevant percentage of recurrences. In addition, a variety of medical hormonal therapies, all aimed to reduce the levels of circulating estrogens, are currently available. However, these treatments are often unsatisfactory and cannot be used over long periods of time, due to the occurrence of severe adverse effects.

	Our group in collaboration with the Institute for Maternal and Child Health, IRCCS Burlo Garofolo, recently demonstrated the efficacy of a new combination of drugs in the treatment for endometriosis that may have potential therapeutic uses in the prevention and treatment of patients (Agostinis et al, Mediators of Inflammation in press).
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/10612
Responsabile scientifico/Coordinatore	BULLA Roberta (Scienze della Vita)

Settore ERC del gruppo:
LS4_4 - Ageing
LS4_6 - Cancer and its biological basis
LS6_1 - Innate immunity and inflammation

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BOSSI	Fleur	Scienze Mediche, Chirurgiche e della Salute	Assegnista	MED/09
RAMI	Damiano	Scienze della Vita	Dottorando	MED/04

Altro Personale	Chiara Agostinis guest postdoc; Leonardo Amadio technician; Francesco Tedesco guest. Alumni Carla Danussi, postdoc fellow at the Institute for Cancer Genetics, Columbia University Medical Center, New York, NY 10032, USA. Francesca De Guarrini, Project Manager presso Charles River Laboratories Milano, Italia. Elisa Masat postdoc fellow at the University Pierre and Marie Curie, Paris, France. Claudia Loganes PhD student at IRCCS Burlo Garofolo, Trieste.

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10. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Potenziale patogenetico delle fibre di asbesto
	The research program coordinated by Dr. Violetta Borelli is focused on the study of the pathogenetic activity of asbestos fibres. All the activities are organized in following three main lines of research: 1) Lung iron homeostasis and pleural mesothelioma A) Characterization of the accumulation of iron in the lung. B) New approaches for genetic screening of the exposed population. Identify an association between certain genetic polymorphisms and individual susceptibility to develop pleural mesothelioma. 2) Study of the mechanisms of interaction of asbestos fibres with cellular compartments. 3) Assessment of the pathogenic potential of asbestos fibres after thermal inactivation. Lung iron homeostasis and pleural mesothelioma. A) The use of synchrotron x-ray microscopy for revealing early iron interaction with crocidolite fibre in the lung of exposed mice. Pulmonary toxicity induced by asbestos is thought to be mediated through redox-cycling of fiber-bound and bioavailable iron. Histological lung tissue examination revealed that asbestos fibers disrupt iron homeostasis in the human and mouse lung, leading to the deposition of iron onto longer asbestos fibers which forms asbestos bodies. An important initial step towards unraveling this issue is the identification and localization of the metal in native physiological environments in tissues and cells. In this respect synchrotron-based X-ray microscopy approaches are becoming very desirable tools providing correlated morphology and chemical information of the specimen. In the present study our team is trying to elucidate the very early distribution of iron, and possible other elements, in the mouse lung after asbestos exposure by means of soft X-ray imaging and X-Ray Fluorescence (XRF) microscopy (dott.ssa Lorella Pascolo-IRCCS Burlo Garofolo-Trieste/Elettra Sincrotone, Basovizza-Trieste). Lung iron homeostasis and pleural mesothelioma. B) Genetic screening for detection of subjects at risk of developing pleural mesothelioma following inhalation of asbestos: polymorphism analysis of genes involved in iron homeostasis. The purpose of this study is to investigate the association between polymorphisms of ferritin and some genes involved in iron homeostasis with the risk of developing pleural mesothelioma, in view of the potential role that the iron pulmonary overload plays in the pathogenesis of this tumor. The evaluation of the role played by polymorphic genes, involved in iron homeostasis, in the incidence of pleural mesothelioma could allow us to identify important genetic markers of risk of developing this cancer. The use of paraffin-embedded tissue for genetic studies using high-throughput technology platforms (Veracode chip Illumina- prof. Sergio Crovella- IRCCS Burlo Garofolo, Trieste) makes available a large number of samples of asbestos exposed individuals. These samples (for the period from 1988 to 2008) are available at the ASS2 Isontina and can be

Descrizione	characterized in a specific way as regards the asbestos exposure and cause of death. The use of this autopsy material will allow to define a true control population, individuals exposed to asbestos but died (aged>80) from diseases not asbestos-related, matched to the study group, individuals died for pleural mesothelioma. The identification of genetic markers of individual susceptibility may help identify those most at risk of developing mesothelioma in the exposed population. This population is particularly large in our region and the identification of individual risk factors is particularly urgent in view of reaching the peak incidence of cases of malignant mesothelioma expected in 2015. Study of the mechanisms of interaction of asbestos fibres with cellular compartments The mechanism of entry of asbestos fibers in the cellular compartment is currently unknown and may, at least in theory, allow the entry of asbestos fibers even in the nucleus, explaining the ability of asbestos fibers to induce alterations in DNA. We therefore planned to examine in this project, the mechanism of entry of asbestos fibers in cultured mesothelial cells and the possibility they reach the nuclear compartment. Determine if asbestos fibers (crocidolite, amosite and chrysotile) enter mesothelial cells with receptor-mediated mechanism (eg family Scavenger Receptors) or directly, in a passive way, regardless of receptors. Preliminary results obtained by ultrastructural analysis suggest that both mechanisms may be involved. The entry receptor-independent of the fibers, could allow the fibers to reach the nucleus and directly damage the DNA, causing mutations. It has been demonstrated that the DNA has a strong affinity for asbestos fibers (in particular those of chrysotile) and that once adsorbed on the fiber surface of asbestos is oxidized producing 8-hydroxy-2'-deoxyguanosine (8-OH -dG. Evaluation of the pathogenic potential of asbestos fibers after thermal inactivation In Italy, the asbestos was banned in 1992, but 20 years later more than 2 Gm2 of asbestos cement (AC) are still in the buildings and more than 300 Mm3 of friable asbestos are still in place. It is therefore clear that the disposal of materials containing asbestos (MCA) still present is a technical and economic problem of great importance. According to the Legislative Decree 152 " Environmental Code 'and the recent resolutions of the European Parliament (European Directive 2008/98 / EC), the need for environmentally friendly solutions, alternatives to landfill disposal, hazardous waste, such as MCA, urges the their recycling as secondary raw materials. In this context, an alternative solution to the disposal in landfills of MCA is its thermal transformation products "supposed" not dangerous, they can be safely recycled as secondary raw materials. Recently it has been developed and patented an industrial process, for the thermal destruction of MCA, mainly CA, which provides for its thermal transformation by prolonged annealing at 1200-1300°C. The resulting product is chemically comparable to a clinker rich in magnesium. Several publications ensure the reliability of the process of thermal transformation, however, the formal proof that the thermal inactivated product is free from pathogenic capability is currently lacking. In this project, with the collaboration of the Department of engineering and architecture of the University of Trieste (prof. Chiara Schmidt), we intend to characterize the products of the thermal treatment of the most pathogenic asbestos fibers, from the point of view of both physical-chemical and biological properties, in order to achieve the following objectives: - Develop the heat treatment most suitable for inactivating asbestos fibers and characterize the physical and chemical properties of the inactivated product. The inactivated products will be analyzed to demonstrate the loss of the structure and crystal chemistry of those surface characteristics responsible for the toxicity of the asbestos fibers (production of free radicals, chemical state of the iron). - Determine if the inactivated asbestos fibres, compared to the untreated counterpart, lose their pathogenicity traits towards cultured mesothelial. Presently we are at the first step of the project, that is the optimization of the inactivation procedure.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/10614
Responsabile scientifico/Coordinatore	BORELLI Violetta (Scienze della Vita)

Settore ERC del gruppo:
LS6_1 - Innate immunity and inflammation
LS6_3 - Phagocytosis and cellular immunity

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
TREVISAN	Elisa	Scienze della Vita	Assegnista	MED/04
VITA	Francesca	Scienze della Vita	Assegnista	MED/04

Altro Personale	Prof. Giuliano Zabucchi

11. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Fisiopatologia dei fagociti
Descrizione	Since the beginning of his career, dr. Menegazzi focused his research interest on the molecular mechanisms which govern some functional responses of human granulocytes under normal and pathological conditions. In particular, he performed studies on respiratory burst, adhesion and degranulation of neutrophils and eosinophils, genetic deficiency of myeloperoxidase and eosinophil peroxidase and genetic deficiency of NADPH oxidase (Chronic Granulomatous Disease). More recently, he addressed his studies on the role of chloride fluxes in the regulation of neutrophil activation. In this respect, dr. Menegazzi is currently investigating the interrelationship between the decrease of the intracellular chloride concentration and some functional responses of human neutrophils. Role of chloride fluxes in the activation of human neutrophil granulocytes under normal and pathological conditions: molecular aspects and functional correlations Neutrophilic granulocytes are key components of the innate immune response against bacterial and fungal infections. Defective function of these cells, as it occurs in chronic granulomatous disease is accompanied by a markedly increased susceptibility to severe infections. However, excessive or inappropriate cell activation may cause deleterious effects and lead to tissue damage and organ malfunction as observed in a variety of inflammatory syndromes. The comprehension of the mechanisms involved in the regulation of neutrophils activation may provide tools as to the design of strategies aimed at improving their defensive power or at dampening tissue damaging effects. Evidence accumulating in the recent years clearly indicates that chloride movements, in particular effluxes of this anion accompanied by a decrease in its intracellular concentration, are of crucial importance for activation of neutrophils in response to a variety of stimulatory agents such as fMLP, IL-8, PAF, LTB4, C5a, TNF, GM-CSF and opsonophagocytosis. The decrease in intracellular chloride would therefore represent a novel and essential step in the signaling pathways triggered by various agonists that lead to activation of cell responses. This project aims at addressing the following points: (1) functional characterization of the Cl- transport mechanisms and molecular identification of the channels/transporters involved in such a transport; (2) identification of the second messengers (kinases, phospholipases, etc.) that, after receptor engagement, lead to activation of Cl- transporters/channels; (3) analysis of the molecular mechanisms linking decrease in intracellular Cl- concentration to activation of various cell responses (adhesion, respiratory burst, degranulation etc.); (4) assessment of chloride movements in neutrophils from patients affected by chronic granulomatous disease (CGD). Since neutrophils from these patients exhibit marked alterations in membrane potential an ionic fluxes, particularly K+ and H+, it is conceivable that such alterations might be accompanied by changes in chloride movements as well. This could contribute to exacerbation of the microbicidal defect of these cells since chloride movements are crucial for cell activation.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18220
Responsabile scientifico/Coordinatore	MENEGAZZI Renzo (Scienze della Vita)

Settore ERC del gruppo:
LS6_1 - Innate immunity and inflammation
LS6_3 - Phagocytosis and cellular immunity

Componenti:

Cognome	**Nome**	**Struttura**	**Qualifica**	**Settore**

Altro Personale	Dr. Eva Decelva, PhD, research fellow

12. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Sviluppo di terapie mirate
	The research program coordinated by Paolo Macor is centred on the development of new therapeutic approaches. The pivotal aim of these strategies is to allow the delivery of a drug (recombinant antibody, chemotherapeutic agents, anti-miRNA, siRNA, DNA vectors or aptamers) to specific microenvironment in order to enhance the therapeutic effect increasing the local doses but reducing the side effects caused by the general distribution of the drug. Moreover Paolo Macor is an expert in the study of the pathophysiological role of the complement system. All the activities within this program are organized in 2 main lines of research. One is devoted to the development of targeted nanoparticles for the diagnosis and the treatment of B-cell malignancies, like Non-Hodgkin lymphoma and chronic lymphocytic leukemia; the second one is dedicated to the characterization of targeted recombinant antibodies and targeted nanoparticles for the treatment of inflammatory diseases like rheumatoid arthritis.

Descrizione

1. Treatment of B-cell malignancies

1.1 Development of anti-CD20 bicompatible/biodegradebla polymeric nanoparticles

B-cell malignancies are a heterogeneous group of clinical conditions with high variability. Current B-cell disorder treatments take advantage of dose-intensive chemotherapy regimens and immunotherapy via use of monoclonal antibodies. Unfortunately, they may lead to insufficient tumor distribution of therapeutic agents, and often cause adverse effects on patients. Due to the cytotoxicity of drugs, currently the major challenge is to deliver the therapeutic agent to neoplastic cells while preserving the viability of non-malignant cells.

Our team proposes a new therapeutic approach in which high doses of chemotherapeutic drug were loaded into biodegradable polymeric nanoparticles coated with an anti-CD20 antibody. We demonstrate their ability to target and internalize in tumor B-cells. Moreover, these nanoparticles were able to kill tumor B-cell lines, but also circulating primary cells expressing a low amount of CD20 and purified from leukemic patients. Their safety and their efficacy were demonstrated in models reproducing the clinical features of the pathologies.

The plasticity of the polymeric nanoparticles allows to load active molecules with different nature, such as recombinant antibodies, chemotherapeutic agents, anti-miRNA, siRNA, DNA vectors or aptamers. Several particles has been developed in our laboratories, loaded with fludarabine, bendamustine, anti-miR17, aptamers or siRNA blocking the protein eEF1A1, boron, or vectors encoding for luciferin, GFP and other proteins.

The specificity of targeted particles to tumor B-cells suggests the use of anti-CD20 nanoparticles as diagnostic tools to visualize tumor masses. To this end specific probes, like cynin5.5, gadolinium-complexes or iron-complexes, were loaded in targeted particles analyzed using near-infrared optical imaging, NMR and CT.
Although this approach is devised for treatment of B-cell malignancies, this strategy can easily be applied to different types of tumors, using other targeting agents to specifically deliver cytotoxic drug-loaded nanoparticles in cancer cells.

In these studies are involved different groups and companies: LNK Chemsolutions LLC (Lincoln, NE, USA), Bio-Target Inc (Chicago, IL, USA), CUCAIBA (Ministry of Health, La Plata, Buenos Aires, Argentina), Clinical and Experimental Onco-Hematology Unit, Centro di Riferimento Oncologico (I.R.C.C.S., Aviano, Italy), Department of Human Pathology, University of Palermo (Palermo, Italy).

1.2 Development of bispecific antibodies able to bind CD20 and to neutralize membrane complement regulatory proteins

Current strategies for cancer therapy with monoclonal antibodies (mAb) are mainly based on targeting proteins expressed on the surface of cancer cells that are easily accessible. These antibodies exert anti-neoplastic effects either by inducing apoptosis or by engaging immune effector mechanisms, such as Ab-dependent cellular cytotoxicity (ADCC), Ab-dependent cellular phagocytosis and complement-dependent cytotoxicity (CDC). Despite the advantages of the complement system (C) in the control of tumor growth, very few studies are based on methods that enhance C-mediated functions. The major limitation of C-mediated tumor cell lysis is the overexpression of the C-regulatory proteins CD46, CD55 and CD59 on the cell surface (mCRPs). These proteins permit evasion of complement attack and restricts the complement-dependent cytotoxic effect of several antibodies.

We generated two bispecific recombinant antibodies (bsAbs) that were designed to recognize CD20 and to neutralize the CD55 or CD59.
The choice to neutralize CD55 and CD59 was based on our previous observations. We have demonstrated that these two C regulators contribute to the protection of CD20+ B-lymphoma cells from complement-mediated killing induced by the anti-CD20 mAb rituximab.

Our data show that treatment with a mixture of the two bsAbs targeting CD20 on B-lymphoma cells prevents tumor development and results in the survival of all tumor-bearing animals.

This approach was devised for the generation of bsAbs carrying the specificity of the anti-CD20 Ab rituximab, but this strategy can easily be applied the other antitumor C-fixing antibodies currently used in the clinic or tested in preclinical studies using the same vector with the appropriate modifications.

In these studies are involved different groups: Clinical and Experimental Onco-Hematology Unit, Centro di Riferimento Oncologico (I.R.C.C.S., Aviano, Italy), Department of Human Pathology, University of Palermo (Palermo, Italy), Department of Health Sciences and IRCAD, University of Eastern Piedmont (Novara, Italy), Institute for Maternal and Child HealthIRCCS Burlo Garofolo (Trieste, Italy).

2. Treatment of rheumatoid arthritis

2.1 Development of nanoparticles specific for inflamed synovial tissue

Rheumatoid arthritis (RA) is an autoimmune disease characterized by chronic inflammation of synovial tissue, leading to cartilage destruction and bone erosion and causing the major clinical symptoms associated with RA like joint swelling and deformities, stiffness and pain. Nowadays, methotrexate is the most common drug used to treat RA patients. Due to its toxicity into high proliferative cells, it was originally developed to treat cancer and then was also used to treat autoimmune diseases. Despite the success of the treatment of rheumatoid arthritis, many patients fail to respond to the available therapies and true remission is achieved only by a minority. This is also due to a late diagnosis of the pathology. Moreover, the currently available therapies used to treat RA cause several side effects. There is therefore the need to develop a new tool for an early diagnosis of the disease but also to develop tissue specific agents able to

	reduce systemic side effects, increasing the potency of the drug using lower doses. The idea is to use biodegradable polymeric nanoparticles (BNPs) coated by a previously described homing-peptide specific for inflamed synovial tissue in order to: * drive into inflamed synovium BNPs filled by contrast agents (gadolinium or iron complexes) as a diagnostic tool for an early and functional diagnosis of joint inflammation * drive only into arthritic synovium BNPs loaded with methotrexate as a therapeutic agents. A complete preclinical study of these potential an diagnostic and therapeutic tools will be performed. In these studies are involved different groups and companies: LNK Chemsolutions LLC (Lincoln, NE, USA), Bio-Target Inc (Chicago, IL, USA), Istituto Auxologico Italiano IRCCS (Milan, Italy), Department of Clinical Sciences and Community Health, University of Milan (Milan, Italy), Department of Human Pathology, University of Palermo (Palermo, Italy). 2.2 Development of targeted recombinant antibody specific for inflamed synovial tissue Rheumatoid arthritis (RA) is a chronic, progressive, inflammatory autoimmune disease. T cells, B cells and the orchestrated interaction of pro-inflammatory cytokines play key roles in the pathobiology of RA. TNF is clearly of primary importance in the pathogenesis of RA and was the first cytokine to be fully validated as a therapeutic target for RA. Although the favorable efficacy profile of anti-TNF antibodies is promising, they are not without limitations and several potential clinical challenges, most notably safety, may be associated with their use. One innovative strategy for simultaneously lowering both the side effects and the cost is to deliver selectively the drug to inflamed synovium. We propose an alternative approach that was taken following the identification of a peptide that binds selectively to synovial microvascular endothelium with a selective accumulation of the drug at tissue level thus avoiding side effect that may derive from long-term systemic administration of therapeutic drugs. Targeted anti-TNF-α neutralizing antibody was already prepared in our laboratory and its initial characterization demonstrated its potential efficacy in the treatment of RA. This project was designed to provide a complete preclinical characterization of the targeted anti-TNF recombinant antibody, setting up its production, analyzing its binding to inflamed and not inflamed synovial samples and comparing therapeutic and side effects in vivo of targeted and untargeted anti-TNF recombinant antibody. These data are essential for the preparation of an investigator brochure, understand the potential clinical use of targeted anti-TNF recombinant antibody and its advantages over the commercial molecules. In these studies are involved different groups and companies: Istituto Auxologico Italiano IRCCS (Milan, Italy), Department of Clinical Sciences and Community Health, University of Milan (Milan, Italy), Department of Human Pathology, University of Palermo (Palermo, Italy), Institute for experimental medicine (Münster, Germany). 3. Analysis of the activation of the complement system in physiological and pathological conditions Complement, in immunology, is a complex system of more than 30 proteins that act in concert to help eliminate infectious microorganisms. Specifically, the complement system causes the lysis of foreign and infected cells, the phagocytosis (ingestion) of foreign particles and cell debris, and the inflammation of surrounding tissue. Disorders of the complement system are sometimes encountered in humans, since so many proteins are involved and inherited deficiencies of one or another is not surprised. Activation of the complement system must be tightly regulated, since it has the potential to be extremely damaging to host tissues. The role of the complement system in the development of several inflammatory disorder was clearly described and now there are several methods proposed ad therapeutic strategy for the inhibition of the a specific protein of the system to prevent or to treat pathologies like rheumatoid arthritis and other auto-immune diseases, hemolytic uremic syndrome, age-related macula degeneration and several others. Our laboratory is internationally recognized in the complement field and it is the unique structure in Italy able to the provide detailed analysis of the activity of the complement system in biological fluids as well as to study the capacity of molecules (like antibodies) or structures (like nanoparticles) to cause its activation.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18230
Responsabile scientifico/Coordinatore	MACOR Paolo (Scienze della Vita)

Settore ERC del gruppo:
LS6_1 - Innate immunity and inflammation
LS7_3 - Pharmacology, pharmacogenomics, drug discovery and design, drug therapy

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
CAPOLLA	Sara	Scienze della Vita	Dottorando	MED/04
DURIGUTTO	Paolo	Scienze della Vita	Assegnista	MED/04
MARZARI	Roberto	Scienze della Vita	Prof. Ordinario	BIO/06
ZORZET SCAREL	Sonia	Scienze della Vita	Prof. Associato	BIO/14

Altro Personale	Federico Colombo (PhD student) Luca De Maso (collaboratore di ricerca) Immacolata Luisi (collaboratrice di ricerca) Past group members and alumni Prof Francesco Tedesco was member of the group and he is now working at the Istituto Auxologico Italiano in Milan developing a new recombinant antibody for the treatment of anti-phospholipid syndrome.

13. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Gene biology
Descrizione	A growing body of evidence supports the hypothesis that amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) share underlying mechanisms and are placed on the opposite ends of a disease spectrum that leads to these pathologies. This connection is supported by the initial discovery that two different RNA binding proteins, TDP-43 and FUS/TLS, form neuronal inclusions in neurons of ALS and FTD patients. In addition, autosomal dominant forms of FTD, ALS, or a combined phenotype can occur in the same family. Further genetic studies have found an association between an expanded GGGGCC hexanucleotide repeat in the C9ORF72 gene and both familar and sporadic cases of FTD and ALS (namely, c9FTD/ALS) Several reports suggest that the increased nucleotide repeats in C9ORF72 causes the formation of RNA inclusions or of foci in the nucleus of affected cells. Apparently, the repeats expansion in C9ORF72 can be pathogenic by sequestering RNA binding proteins and/or perturbing both splicing and regulation of key factors implicated in neuronal metabolisms. It is interesting to note that TDP-43 and FUS/TLS play fundamental roles in RNA regulation and splicing, and their mutation causes alteration of these processes. Altogheter these findings suggest that defects in RNA metabolism can be a common pathway linking FTD and ALS, and are responsible for disease pathogenesis in a significant number of cases. Studies aimed at testing this hypothesis and determine the pathways regulated by these proteins will be helpful in improved understanding of the molecular mechanisms underlying the pathogenesis of ALS and FTD, ultimately opening up new routes of therapy for these devastating disorders. Keywords: AD, ALS, FTD, FTLD, FUS, TLS, C9ORF72, PD, TDP-43, proteinopathies, neurodegeneration, inclusion. Ongoing projects We are using different ex-vitro (cell lines) as well as in vivo (Drosophila) models along with biochemical techniques to characterize the mechanisms governing TDP-43 expression, TDP-43 aggregation, and the pathways controlled by this factor. In particular, the projects currently ongoing are: 1) Genetics and Epigenetics of neurodegerative diseases: In order to study the genetic and epigenetic mechanisms controlling the expression of the human TARDBP gene (associated with FTLD and ALS), our interest consists in: a) characterization of the promoter region of TARDBP gene, of the factors implicated in the transcription of this gene; b) testing the effects of compounds on TDP-43 transcription c) investigating the presence of methylated sites and explore the relationship between patterns of methylation and gene transcription. 2) Mechanisms of TDP-43 toxic aggregation in neurodegenerative processes: TDP-43 proteinopathy is strongly implicated in the pathogenesis of different neurodegenerative diseases, and in particular ALS and FTD. A crucial issue regarding the pathogenetic role of TDP-43 is whether its neurotoxicity arises from a gain of function or a loss of function. Although TDP-43 inclusions are an important histopathological feature in ALS and FTD, the relationship between these inclusions and the pathogenesis of these disorders is still an open question. The "gain of function" hypothesis suggests that the cytoplasmic TDP-43 inclusions might have acquired novel toxic properties, that are independent of the normal function of TDP-43. Indeed, it has also been suggested that TDP-43 toxicity might be the result of increased normal activity of TDP-43. Finally, The "loss of function" hypothesis consider that the the cytoplasmic TDP-43 inclusions may cause the secondary loss of its normal nuclear function. We are characterizing the mechanisms underlying TDP-43 aggregation in neurons using Drosophila as a model system. This model will be also useful to identify novel therapeutic options by screen for molecules able to counteract TDP43 aggregation.

	3) Identification of genes and pathways regulated by TDP-43/TBPH: Although several lines of evidence support the involvement of TDP-43 in neurodegenerative disorders, the underlying mechanisms are still unclear. Since the human and fly orthologs of TDP-43 show a high degree of functional similarity, Drosophila melanogaster is a simple but very promising model to shed light on the pathophysiological role of this protein in vivo. It has been demonstrated that depletion of the TDP-43 Drosophila ortholog (TBPH) induces deficient locomotive behaviours, reduced life span, as well as anatomical defects at the neuromuscular junction. To study the direct functional role of TBPH in the origin of this phenotype, we are currently characterizing fly genes, whose expression is potentially regulated by TBPH. These studies will be useful to characterize the pathways regulated and altered by TDP-43 as well ad to identify novel targets and for novel therapeutic options. Figure 1. Hrp38 and TBPH genetically interact to regulate flies locomotion and life span. A) Climbing ability analysis of Hrp38 silenced flies demonstrates the existence of a genetic interaction between TBPH and Hrp38. The phenotype of Hrp38 neuronal silencing becomes significantly stronger if one copy of TBPH is removed, as compared to the silencing in a wild type background (DicerX; TBPHD23,elavG4/+; Hrp38RNAi versus DicerX; elavG4/+; Hrp38RNAi, p<0,01). The results of Hrp38 silencing in a TBPH sensible background further support this genetic interaction. In fact, Hrp38 silencing exacerbated the phenotype caused by TBPH silencing (TBPHD23,elavG4/GFP;Dicer,TBPHRNAi vs TBPHD23,elavG4/+; Dicer,TBPHRNAi/Hrp38RNA, p<0,001). N = 200 flies for genotype, error bars indicate SEM (** indicates p<0,01 and *** p<0,001). B) Percentage of flies survivors during aging. Median lifespan are: 49 days for wild type (n=208), 51 days for DicerX; TBPHD23,elavG4 (n=159), 32 days for DicerX; TBPHD23,elavG4/+; Hrp38RNAi (n=312) and 36 days for DicerX; elavG4/+; Hrp38RNAi (n=235). Log rank test and p-value: wild type versus DicerX; TBPHD23,elavG4/GFP (p=n.s), wild type versus DicerX; TBPHD23,elavG4/+; Hrp38RNAi (p<0,0001), wild type versus DicerX; elavG4/+; Hrp38RNAi(p<0.0001) and DicerX; elavG4/+; Hrp38RNAi versus DicerX; TBPHD23,elavG4/+; Hrp38RNAi (p<0.0001). (*** indicates p<0.001). C) RNAi treatment against Hrp38, reduced mRNA expression levels in Drosophila heads, as compared to control, untreated, flies. (JBC 2014, 289 (10), 7121-7130).
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18234
Responsabile scientifico/Coordinatore	ROMANO Maurizio (Scienze della Vita)

Settore ERC del gruppo:
LS1_4 - RNA synthesis, processing, modification and degradation
LS5_11 - Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease)
LS5_2 - Molecular and cellular neuroscience

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

Altro Personale	Alessia Mondello (studentessa CTF - Università di Trieste) Maria Letizia Pellegrino (studentessa CTF - Università di Trieste)

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14. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Sviluppo di farmaci per terapie antitumorali e antimicrobiche
	The research program coordinated by Professor Gianni Sava is centred in both basic and translational aspects of the pharmacological approaches to the treatment of solid tumour metastases. The research interests of Savas team are focused on the identification of hits and on the characterization of leads to selectively target solid tumour metastases. With a combination of molecular, cellular and omics approaches and of integrative methods, the group studies the a number of potential backbone chemical structures potentially leading to me too drugs. Among the main actual interests of Savas investigations there are the study of the pharmacological modulation of integrins for the control of metastasis growth; the characterization of targets of the metastatic niche of colorectal cancer; the study of the molecular mechanism of action of NAMI-A; the characterization of an in vitro model for the study of hits and leads selectively active against tumour metastases. The Plastic Mouse. The Plastic Mouse is a new biotechnological device for the screening of target-specific anti-metastatic lead compounds, overcoming the need of animal use.

Descrizione	Similarly to cell cultures, also animal models represent an approximation of the human disease, and cannot exactly reproduce the human pathological process (mouse tumours very rarely mimic their human counterparts and human tumours grown in mice require the ablation of the immune responses to avoid rejection). Also, the selection of a Hit or of a Lead with in vivo tests needs a great number of animals, yet without guaranteeing the success of the tested molecule, leading to ethical debates on this strategy. The European Union has undertaken a policy to stimulate the search of methodologies alternative to animal experimentation, according to the 3R principle, to replace, refine and reduce animal use (European law 86/609/CEE, and directive 2010/63/UE). The aim of this project is to develop and validate a full in vitro model for the development of Hits and Leads active against the liver metastases of colorectal tumours, based on a device that reproduces the physio-pathological conditions of the metastatic process. The biotechnological system, for simplicity called plastic mouse, supported by researchers of the Department of Engineering and Architecture of the University of Trieste, represents a bridge between classical in vitro and in vivo studies. Tumour cells are allowed to migrate, through a microcircuit (the blood/lymphatic system), from a well (the primary tumour: colorectal cancer) to a second well (the liver: metastasis target). This device, already available as a prototype, allows to closely reproduce what occurs in vivo, with the advantage of an in vitro controlled device. With the plastic mouse we can study the behaviour of the metastatic cell in a physiological context closed to that undergoing cells in vivo. Then also the targets of chemical entities have more realistic features, allowing more chances of success of the active principles identified by this system. The model will be validated with the liver metastases from colon-rectal cancer, a disease of great social impact in western countries, with poor prognosis and life-time expectancy, mainly due to liver metastases. It is however clear that the plastic mouse can be applied to other tumours and also to PK, PD pharmacological studies with chemical entities of different application. The metastasis niche of CRC: Druggable miRNAs in Colon Rectal Cancer (CRC) metastasis controlled by liver microenvironment. Colorectal cancer (CRC) is one of the most common cancer forms in Western countries and a leading cause of cancer related deaths. Over one-half of patients who die of colorectal cancer have liver metastases at autopsy, and the majority of these patients die as a result of their metastatic liver disease. Cancer metastases are closely related to tumour microenvironment that acts as a functional entity inducing and responding to tumour and host factors, at the same time and influences tumour cells migration toward a specific distant organ future site of metastasis. Recently, we investigated how the liver microenvironment modulates CRC metastasis formation, a process where the interactions of integrins with ECM are crucial to activate intracellular signalling pathways that control growth, differentiation, migration and survival. We found out that soluble factors released by hepatocytes synergize with ECM components, such as fibronectin, to modulate integrin a5b1 activity, influencing downstream also other integrins, involved in the adhesion process of CRC cells to the liver matrix. Emerging evidences suggest that deregulation of miRNAs contribute to the neoplastic development and subsequent metastatic progression by controlling the expression levels of many crucial cell adhesion molecules including integrins and organizing diverse aspects of the related biochemical pathways. In the present project, we examine how miRNAs of CRC cells are misregulated by the influence of liver microenvironment and how this event affects tumour biology and in particular CRC cell adhesion to the liver ECM controlling integrins expression/activation and their signal transduction pathway. Rare and novel miRNAs as well as known miRNA sequences variations in HCT-116 human colorectal cancer cell line grown in the medium conditioned by the human hepatic cell line IHH are quantitated by the highly sensitive and specific next generation transcript expression analysis (miRNA-Seq). The expression of these miRNAs will be confirmed in ex-vivo biopsies from CRC patients undergoing surgery. Ex vivo analyses will be performed on resected human metastatic liver by using the innovative tissue culture technique of Precision-cut tissue slices (PCLS), that mimics the multicellular characteristics of organs in vivo. The miRNAs related to integrin modulation, identified by the use of specific databases, will be overexpressed/silenced to investigate the effects on the profile of integrin expression and on the tumour cell behaviour with appropriate CRC metastasis models. As in vivo CRC model, we will take advantage on the use of zebrafish that allow to easily manipulate tumours and their microenvironment on a large scale providing us the opportunity to confirm the role of the selected miRNAs on the metastatic process.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18214
Responsabile scientifico/Coordinatore	SAVA Gianni (Scienze della Vita)

Settore ERC del gruppo:
LS3 - Cellular and Developmental Biology: Cell biology, cell physiology, signal transduction, organogenesis, developmental genetics, pattern formation in plants and animals, stem cell biology
LS4 - Physiology, Pathophysiology and Endocrinology: Organ physiology, pathophysiology, endocrinology, metabolism, ageing, tumorigenesis, cardiovascular disease, metabolic syndrome
LS7 - Diagnostic Tools, Therapies and Public Health: Aetiology, diagnosis and treatment of disease, public health, epidemiology, pharmacology, clinical medicine, regenerative medicine, medical ethics

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

JOVIC	Masa	Scienze della Vita	Assegnista	BIO/14
LUCAFO'	Marianna	Scienze Mediche, Chirurgiche e della Salute	Assegnista	MED/38
PACOR	Sabrina	Scienze della Vita	Ricercatore	BIO/14
ZORZET SCAREL	Sonia	Scienze della Vita	Prof. Associato	BIO/14

Altro Personale	Dr. Alberta Bergamo (Ric) Dr. Moreno Cocchietto (Ric) Dr. Chiara Pelillo (post-Doc) Prof. Tullio Giraldi (contratto di insegnamento) Alumni Dr. Marina Bacac - Leads a cell-biology group at Roche Glycart, Schliern (Switzerland) Laura Brescacin Drugstore pharmacist Maria Elena Carotenuto; Dr. Claudia Casarsa - Freelancer, nutritionist Anna Castellarin - Drugstore pharmacist Valentina Ceschia; Ilaria Crucil - Drugstore pharmacist Riccarda Delfino; Fabiana Frausin - Drugstore pharmacist Davide Gallo Drugstore pharmacist Chiara Garrovo Post Doc research at Institute for Maternal and Child health, IRCCS Burlo Garofolo, Trieste, Italy Barbara Gava; Monica Magnarin Teacher at the Scientific Liceum Duca degli Abruzzi, Gorizia, Italy Dr. Alessia Masi - Freelancer, nutritionist Dr. Giovanni Salerno - Director Project Integration at Evolva SA (Switzerland) Claudia Turrin Drug sales representative at AstraZeneca Dr. Marta Vadori Senior Researcher, Consorzio per la Ricerca sul Trapianto d'Organo, Immunology Lab, Italy Dr. Vania Vidimar Post-Doc fellow at Kim lab (North Western University, Feinberg, School of Medicine, USA) to study the molecular mechanisms underlying leiomyoma cell death upon inhibition of the Akt pathway Laura Zorzin - Drugstore pharmacist

15. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Farmacologia molecolare e farmacogenomica
	The research program coordinated by Professor Giuliana Decorti is centred on both basic and translational aspects of the pharmacology of immunosuppressants and antileukemic medications. The research interests of Decortis team are focused on identifying and studying molecular and cellular features that can be used to personalize immunosuppressive and antileukemic therapy in pediatric patients. With a combination of pharmacokinetic, pharmacodynamic and pharmacogenomic approaches the group studies the role and interconnection of these features and their association with patients response to therapy. At the centrepiece of Decortis investigations is the personalization of therapy for pediatric inflammatory bowel disease, acute lymphoblastic leukemia, nephrotic syndrome and juvenile idiopathic arthritis, with a particular focus on the pharmacology of relevant drugs used in these diseases. Pharmacological approaches for the personalization of therapy of pediatric inflammatory bowel disease (IBD) IBD consists of chronic idiopathic intestinal inflammation and comprises two main disorders: Crohns disease and ulcerative colitis. IBD peak onset is in persons 15 to 30 years of age; however the occurrence of the disease in pediatric patients is frequent and globally rising rates of IBD (in particular of Crohns disease) have been demonstrated in both developed and developing countries, constituting a real epidemic in children. In spite of the introduction in therapy of highly effective biological agents, such as the TNF-alpha inhibitor infilixmab, glucocorticoids and thiopurine (azathioprine) are still employed respectively to induce and maintain remission in moderate to severe IBD, but considerable inter-individual differences in their efficacy and toxicity have been reported. In particular for glucocorticoids, the effectiveness of these drugs is very variable and side effects, particularly severe in pediatric patients, are common and often unpredictable: the understanding of the complex gene regulation mediated by glucocorticoids could shed light on the causes of this variability. In this context, microRNAs (miRNAs) represent a new and promising field of research. The project aims to identify associations between gene expression profiles (mRNA and miRNA expression, and their combinations) and the pharmacological phenotypes considered (i.e. in vivo and in vitro glucocorticoid response) in paediatric IBD patients. For azathioprine, current research considers the concentration of thiopurine metabolites in children with IBD and associates it with polymorphisms in candidate determinants of thiopurine biotransformation, such as thiopurine-S-methyl transferase (TPMT), inosine-triphosphate-pyrophosphatase (ITPA) and glutathione-S-transferase (GST). A particular focus is put on developmental aspects of thiopurine biotransformation during patients growth. Biological therapy with TNF-alpha antagonists such as infliximab has significantly improved clinical management of pediatric patients with severe IBD: studies about monitoring of infliximab treatment by pharmacokinetic and pharmacodynamic approaches are being set up to further optimize and rationalize infliximab therapy in children needing this effective but expensive medication. The expected information obtained by these translational studies will be extremely useful to optimize therapy, improving cure rates and reducing side effects. Pharmacological approaches for the personalization of therapy of acute lymphoblastic leukemia (ALL) Risk-adapted polychemotherapeutic protocols successfully cure ~85% of paediatric ALL, the most frequent haematological tumour in childhood. Besides this important success rate, ALL therapy is complicated by inter-individual, currently unpredictable, variations in the clinical response. Indeed, among patients who relapse, 50-70% face a fatal outcome; moreover, most of the patients develop severe, even life-threatening chemotherapy-related toxicities. A multicentric prospective study, mainly focused on the antimetabolites methotrexate and mercaptopurine employed for almost the entire duration of the 2-years therapy, is actually ongoing. This study is performed on patients enrolled in the

Descrizione	current AIEOP-BFM (Associazione Italiana Ematologia e Oncologia Pediatrica- Berlin Frankfurt Munchen) ALL 2009 protocol and is meant to integrate several pharmacological (pharmacogenetic, pharmacokinetic and pharmacodynamic) measurements with their response to ALL therapy to provide clinicians with tools to better tailor treatment to patients. Pharmacogenomics variables considered are single nucleotide polymorphisms in the genes involved in mercaptopurine metabolism (TPMT, ITPA, PACSIN2), in the SLCO1B1 gene involved in methotrexate influx as well as the deletion of phase II GST-M1 and GST-T1 genes, assessed on both patients germline and leukemic DNA. Variants of interest are also retrospectively investigated in patients enrolled on previous AIEOP-BFM ALL 2000 protocol whose DNA and clinical data are already available. Pharmacokinetics measurements include methotrexate clearance during consolidation phase, and the assessment of MP main active metabolites (thioguanine nucleotides and methylated methylmercaptopurine nucleotide) as well as TPMT and ITPA enzymatic activity, monitored during consolidation and maintenance therapy. The pharmacodynamic parameters are provided by the in vitro MTT assay on blasts at diagnosis measuring the cytotoxic effects of antileukemic medications. Statistical analyses evaluate the association between patients' in vitro pharmacological parameters and the in vivo response, to verify the prognostic role on clinical outcome. Pharmacological approaches for the personalization of therapy of nephrotic syndrome (NS) NS is a common childhood kidney disease caused by impaired glomerular function that typically presents in the first decade of life. Steroids are considered the first line therapy of idiopathic childhood NS, and are able to induce remission in 90-95% of patients. Steroid responsiveness at diagnosis is of major prognostic importance with regard to kidney function, which is generally preserved well in steroid sensitive NS. Primary and secondary steroid resistant NS is seen in 5-10% and 1-3% of children respectively and those patients are prone to progressive disease and renal failure. Relapses are also common, and children with relapsing disease are at risk of severe complications. Many efforts have been made to predict glucocorticoid response in children with NS to avoid useless drug therapy and side effects, but with conflicting results. The primary objective of this research is the evaluation of the role of polymorphisms of genes involved in the pharmacokinetics and pharmacodynamics of glucocorticoids in the response to steroid therapy in pediatric patients treated for NS with a common standardized treatment protocol and the identification of genetic markers useful in predicting a priori the efficacy and toxicity of steroid therapy. Secondary objectives are: 1 - Check the possible relationships between the presence of the investigated polymorphisms and the occurrence of side effects (effects on growth, blood pressure, etc.). 2 - Test the role of polymorphisms on possible changes in behaviour and quality of life, assessed by means of self-assessment questionnaires, in individuals with SNI after treatment with steroids. 3 - Check the possible relationships between genetic polymorphisms and response to glucocorticoids in vitro (test of proliferation of mononuclear cells. Pharmacological approaches for the personalization of therapy of juvenile idiopathic arthritis (JIA) For children with JIA who fail to respond to methotrexate, the delay in identifying the optimal treatment at an early stage of disease can lead to long-term joint damage. Recent studies indicate that the most relevant variants to predict methotrexate response in JIA are those in 5-aminoimidazole-4-carboxamide ribonucleotide-transformylase (ATIC), inosine-triphosphate-pyrophosphatase (ITPA) and solute-liquid-carrier-19A1 (SLC19A1) genes. The purpose of the study is therefore to explore the role of these candidate genetic factors on methotrexate response in an Italian cohort of children with JIA. Clinical response to methotrexate is evaluated as disease activity scores (JADAS and ACRped) values and changes, and as clinical remission stable for a 6-months period. The most relevant SNPs for each gene considered are assayed on patients DNA. ITPA activity and concentration of methotrexate polyglutamate is measured in patients erythrocytes. Primary objective is therefore to identify the pharmacogenetic and pharmacokinetic markers useful in predicting methotrexate efficacy in patients with JIA. Indeed, identification of patients who are likely to respond to methotrexate before treatment in JIA would be very useful for the clinician and our study should support the development of multilocus pharmacogenetic signatures to predict response to methotrexate in these patients. Genotyping should be performed at diagnosis and patients with a genotype predisposing to response, should be treated with methotrexate, given the high probability of response to this treatment. This study provides a rational for reserving biologics to patients that will likely not benefit from less expensive but still effective treatments such as methotrexate. On the contrary, patients with variants associated with lack of efficacy of methotrexate, should be switched more rapidly to a more aggressive treatment (i.e., methotrexate + biologics or biologics alone). Mechanistic in vitro studies on the pharmacokinetics, pharmacodynamics and pharmacogenomics of glucocorticoids and antimetabolites Hypothesis, even molecular ones, generated on the basis of observations done in patients are verified in vitro, to get insights on cellular and molecular mechanisms underlying relevant clinical phenomena and to further improve clinical practice. Currently, these in vitro experiments are focused on: - identifying long non coding RNAs as potential markers involved in glucocorticoid molecular mechanism thus providing a new view upon their implication in the phenomenon of steroid resistance; an important aim of this research is to supply

	a tool that could allow the optimization of steroid therapy in patients treated with these drugs. - developing a biotechnological model to study thiopurines effects in vitro and the contribution of genetic determinants in modulating the cytotoxic effects and the biotrasformation of antimetabolites, with a particular focus on events occurring in intestinal, hepatic and pancreatic tissues: this model could then be used to validate the role of genetic factors (emerging even from genome-wide studies) on patients sensibility to thiopurines and to mimic the effects of treatment adjustments.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18216
Responsabile scientifico/Coordinatore	DECORTI Giuliana (Scienze della Vita)

Settore ERC del gruppo:
LS7_2 - Diagnostic tools (e.g. genetic, imaging)
LS7_3 - Pharmacology, pharmacogenomics, drug discovery and design, drug therapy
LS7_5 - Toxicology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
CANDUSSIO	Luigi	Scienze della Vita	Ricercatore	BIO/14
CUZZONI	Eva	Scienze della Vita	Dottorando	MED/38
FLORIO ERICE	Chiara	Scienze della Vita	Ricercatore	BIO/14
LUCAFO'	Marianna	Scienze Mediche, Chirurgiche e della Salute	Assegnista	MED/38
ROMANO	Maurizio	Scienze della Vita	Ricercatore	MED/04
STOCCO	Gabriele	Scienze della Vita	Ricercatore	BIO/14
TUBARO	Aurelia	Scienze della Vita	Prof. Ordinario	BIO/15
VENTURA	Alessandro	Scienze Mediche, Chirurgiche e della Salute	Prof. Ordinario	MED/38

Altro Personale	Borsisti Sara De Iudicibus (contratto I.R.C.C.S. Burlo Garofolo) Raffaella Franca (contratto I.R.C.C.S. Burlo Garofolo) Studenti Marta Novello CTF Alice Avian Genomica Funzionale

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16. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Farmacologia e tossicologia delle sostanze naturali
	The team is involved in two main lines of research: 1. Risk characterization of algal biotoxins and setting up new methods for their detection in seafood, the producing organisms and/or seawater, which include: (a) in vivo/in vitro studies on the toxic effects and the mechanisms of action of algal toxins; (b) set up of new methods for the detection and quantification of algal toxins (structural assays to detect the toxins in seafood, phytoplankton and seawater; functional assays, based on their mechanism(s) of action) as well as of biosensors to improve their sensitivity. 2. Pharmacological and toxicological investigation of herbal drugs for their use in health care and as source of new drugs, which include: (a) in vivo pharmacological studies on medicinal plants (study of the pharmacological activity, identification of the active principles using a bioassay-oriented fractionation approach); (b) in vitro studies on the mechanisms of action of the active principles. Dermotoxicity of palytoxin, an emergent Mediterranean problem. Palytoxin (PLTX), a marine biotoxin identified in Palythoa corals and Ostreopsis dinoflagellates, represents an increasing hazard for human health after different exposure routes: severe human poisonings ascribed to PLTX have been followed to ingestion of contaminated seafood in tropical areas, while in Mediterranean area adverse effects at the upper respiratory system and skin have been associated to inhalational and/or cutaneous exposure to marine aerosol or direct seawater during Ostreopsis blooms. The last effects have been reported also after handling Palythoa corals in aquaria. Despite the increasing human cases of dermotoxicity attributed to PLTX, very few data about its cutaneous toxicity are available. Hence, the project is aimed to characterize the effects and the mechanism of action of PLTX at skin level and to verify the toxin absorption through the skin. The expected results will provide useful information to

Descrizione

characterize the PLTX-induced adverse effects after cutaneous exposure as well as their possible pharmacological treatment.

Prevention of adverse effects by algal toxins: set up of rapid screening methods.

Marine algal toxins represent a worldwide sanitary and economic problem, being responsible for human intoxications due to consumption of contaminated seafood. In Italy, since 1989 edible shellfish contamination by Diarrheic Shellfish Poisoning (DSP) toxins (okadaic acid and its analogues) and/or other lipophilic compounds was reported almost every year and, more recently, further algal hydrophilic toxins, including the highly toxic palytoxins (PLTXs; mainly the analogue ovatoxin-a), were identified also in other edible marine organisms.

Thus, the project is aimed to identify functional methods for an easy, rapid and sensitive detection of DSP toxins in shellfish as well as to set up an assay to detect palytoxins. These methods will be compared with already well established methods or other commercially available fast tests. In particular, a functional colorimetric method to detect okadaic acid, based on the toxin ability to inhibit protein phosphatase 2A activity, is under evaluation in comparison to the liquid chromatography-mass spectrometry (LC-MS) and a lateral flow assay. Moreover, a hemolytic assay has been set up and is under evaluation to detect palytoxins, in comparison to LC-MS.

These assays will allow an easy and rapid screening of shellfish samples for the presence of these biotoxins, useful for self-monitoring by producers as well as for institutional monitoring programs before confirmatory chemical analyses in case of positive results. These rapid screening assays will avoid human poisonings but also reduce economic losses to the aquaculture and fishery industries caused by to the block of harvesting and commercialization of contaminated shellfish.

Study of the cardiotoxic effects of palytoxin.

The marine biotoxin palytoxin and/or its analogues have been associated to fatal human poisonings in tropical and subtropical areas, after consumption of contaminated fish or crustaceans. In the last decade, blooms of microalgae belonging to the genus Ostreopsis producing palytoxins occurred also in the Mediterranean Sea, with the toxins detection also in edible mollusks and echinoderms.

Since palytoxin seems to interfere with the function of Na+/K+ ATPase, a toxin effect on excitable cells, mainly at muscular level, has been hypothesized. In fact, the most frequent signs and symptoms associated to human poisonings ascribed to palytoxins include myalgia and cardiac problems, while observations from the available oral toxicity studies showed effects that seem to involve myocardial tissue. Anyway, toxicological data on these toxins are still limited, and the toxic effects at cardiac level have not been yet clarified.

Consequently, the project is focused on the in vitro study of the palytoxins effects on cardiomyocytes and on the relevant mechanisms of cardiotoxicity. Furthermore, the effects on cardiac function will be studied by in vivo animal models to define the maximal dose without adverse effects (No Observed Adverse Effect Level, NOAEL), or at least the Lowest Observed Adverse Effect Level (LOAEL), necessary for the assessment of the risk associated to palytoxins ingestion by people with cardiac problems, which could be considered population at risk.

Toxicity by co-exposure to palytoxin and okadaic acid.

Palytoxin (PLTX) and okadaic acid (OA) are two marine toxins that can be detected as seafood contaminants. The first is known to block the Na+/K+ pump and the latter inhibits the serine/threonine protein phosphatases 1 and 2A. PLTX was originally described as a molecule diffused in tropical and subtropical areas, even though from the end of the last century it is frequently detected also in the Mediterranean Sea. The entrance of new toxins, such as PLTX and its analogues, into our ecosystem not only represents a challenge per se but also reopens the evaluation of the toxicological risk due to the co-occurrence of other biotoxins. Thus, the aim of the project is to define, through in vivo studies, the effects of PLTX and OA, alone or combined, after acute or repeated oral administration in mice. Moreover, interaction between PLTX and OA at cellular levelis investigated by in vitro studies. The results will provide more robust bases for the comprehension of the actual hazard represented by the entrance of PLTX and OA into the food chain and, hopefully, to prevent to larger extent risk to consumers.

In vivo and in vitro toxicity on azaspiracid analogues.

Azaspiracids (AZAs) are polyether marine toxins produced by the dinoflagellate Azadinium spinosum that may accumulate in edible shellfish, inducing severe gastrointestinal symptoms after consumption of contaminated seafood. AZAs include more than 30 analogues, but only AZA1−3 are regulated by the European Union. After intraperitoneal injection in mice, the toxic potency of these compounds (AZA2>AZA3>AZA1) provided the guidance to propose toxic equivalence factors (TEF: 1.0, 1.8 and 1.4 for AZA1, -2 and -3, respectively), used to determine the total AZA concentration in shellfish. Nevertheless, considering the dietary exposure to these toxins, the relevant TEFs should be derived on the basis of comparative oral toxicity data, which have been lacking for regulated AZAs. Thus, AZA1−3 are studied for their acute oral toxicity in mice to determine the relevant TEFs for regulatory purposes to assess total AZAs in edible shellfish. In addition, in vitro effects of these toxins on specific cells are under study to identify the mechanisms of toxicity.

Acute oral toxicity in mice of Vulcanodinium rugosum and of pinnatoxins.

Pinnatoxins (PnTxs) include a series of toxic cyclic imines produced by the benthic dinoflagellate Vulcanodinium rugosum, detected in shellfish belonging to the genus Pinna and other edible bivalves from different geographical areas.

	Although no human poisonings after consumption of PnTxs contaminated shellfish have been reported so far, due to their peculiar mechanism of action on nicotinic acetylcholine receptors, the European Food Safety Authority (EFSA) recommended the study of the oral toxicity of these compounds for the risk characterization. Thus, V. rugosum extracts and its main pinnatoxins are investigated for their in vivo toxic effects. Anti-inflammatory principles from plant kingdom Plant kingdom is a source of a wide variety of bioactive compounds of therapeutic potential. Several plants are used by the traditional medicine, even though experimental studies are needed to confirm their properties and to identify the relevant active principles, for a proper use but also as lead compounds in the development of new therapeutic agents. The project is aimed to identify and exploit the use of medicinal and food plants as source of anti-inflammatory compounds potentially useful in the treatment of different inflammatory based diseases. In particular, the anti-inflammatory activity of volatile, semi-volatile and non-volatile components of plants selected on the basis of ethnobotanical and phytochemical parameters is investigated following a bioassay-oriented fractionation approach, aimed to identify the active principles. The latter are studied in detail to identify their mechanisms of action and verify possible toxic effects, in view of a therapeutic use.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18218
Responsabile scientifico/Coordinatore	TUBARO Aurelia (Scienze della Vita)

Settore ERC del gruppo:
LS7_3 - Pharmacology, pharmacogenomics, drug discovery and design, drug therapy
LS7_5 - Toxicology
LS9_11 - Biohazards, biological containment, biosafety, biosecurity

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
DEL FAVERO	Giorgia	Ingegneria e Architettura	Assegnista	ING-IND/22
D'ORLANDO	Elisabetta	Scienze della Vita	Dottorando	BIO/15
FLORIO ERICE	Chiara	Scienze della Vita	Ricercatore	BIO/14
PELIN	Marco	Scienze della Vita	Assegnista	BIO/15
PONTI	Cristina	Scienze della Vita	Ricercatore	BIO/16
SOSA	Silvio	Scienze della Vita	Ricercatore	BIO/15

Altro Personale	Roberto Della Loggia: contract professor Valentina Brovedani: PhD student Sara Finotto: student Marco Giacomel: student Davide Lunardo: student Alumni (Past PhD students) Altinier Gianmario: employed in a pharmacy Barreras Alvaro: fellowship at the Universidade de Vigo (Spain) Beltramo Dario: researcher at Istituto di Ricerche Biomediche Antoine Marxer RBM SpA, Colleretto Giacosa (Torino) Bossi Consuelo: directional consultant at a consulting agency De Bortoli Marco: research contract at the University of Trieste Del Favero Giorgia: postdoctoral fellow at the University of Trieste DellOvo Valeria: research contract at Shriners Hospitals Pediatric Research Center, Center for Neural Repair and Rehabilitation, Temple University School of Medicine, Philadelphia, PA, USA De Ninis Valeria: employed in a pharmacy Faudale Mariangela: employed in a pharmacy Raffaele Michela: employed in a health-food shop Ursella Sara: teacher Zamolo Valeria: employed at Sterling, Sliema, Malta

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17. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Nutrizione molecolare e medicina rigenerativa
	The 6 researchers of this group hold a wide scientific background, spanning from medicine, to environmental chemistry, biochemistry, biology, molecular biology and biotechnology. They are sharing their specific expertise to investigate the impact of the environment, the diet and the lifestyle on basic biological processes. A distinctive feature of this research group is a mix of personal skills put action to promote knowledge and technology transfer, aimed at direct users of the research output, such as public and private bodies. Various kinds of cooperation or partnerships are in force. Thus, the research results of this group contribute to the regional technological specialisations life sciences and agrifood. In more detail, this group contributes to:

Descrizione	* Biomedical technologies, molecular and regenerative medicine; * Drugs and innovative therapeutic approaches; * Neurosciences, in collaboration with other colleagues (Prof. Lorenzon and Tongiorgi). Structure and function of bilitranslocase in the biosphere (Passamonti & Tramer) Bilitranslocase is a membrane transporter (UniProt O88750; TC 2.A.65.1.1), originally found in the rat liver and later discovered in other rat and human organs (kidney, gastro-intestinal epithelium, and vascular endothelium), in the fish hepatopancreas (sea-bass) and in many plant organs (carnation petals, grape berries, pea stems and leaves). It must play a fundamental role in cellular biology, given its conservation in different domains of life. Its unusual primary structure shows no homology with other known proteins (including membrane transporters). It corresponds to an anti-sense segment of the ceruloplasmin (EC 1.16.3.1) gene, makes it difficult (so far impossible) to isolate its mRNA by standard molecular biology approaches. We do not know enough about sense/anti-sense transcription regulation. Thus, its gene is unknown. The technical tools used to investigate such an enigmatic piece of cell biology are three anti-sequence antibodies, produced against three distinct domains of the protein (said antibodies A, B and C). These antibodies have been used to immunochemically identify bilitranslocase in different species and organs thereof. Antibodies A and B inhibit the transport function of bilitranslocase in experimental models of increasing morphological complexity (i.e. sub-cellular fractions, intact cells, intact tissue fragments, and isolated organs). The transport phenotype of bilitranslocase is clearly distinct from that of other membrane transporters, such as organic anion and nucleoside transporters. Its substrates are: i) bilirubin; ii) flavonoids (specifically, anthocyanis and some other flavonols); iii) purine and pyrimide nucleotides. A QSAR analysis shows that these substrates interact with the transporters via H-bonds and tautomer-selectivity. The 3D structure of bilitranslocase, analysed by in silico modelling, involves 4 trans-membrane domains, forming a central aqueous pore with conformational flexibility. Targeting dietary flavonoids and their metabolites to the brain (Passamonti & Tramer) Diets rich in fruits and vegetables correlate with reduced risk of cardiovascular, neurological and cancer diseases. A plethora of in vitro studies shows that flavonoids and their metabolites protect the cells against oxidative-stress related injuries. We have demonstrated that bilitranslocase-mediate transport of anthocyanins into the vascular endothelium induces vasodilation and cardio-protection. We are currently testing the capacity of some flavonoids (specifically anthocyanins) and their metabolites to cross the blood-brain barrier and reach the brain. These studies will provide sound knowledge about the mechanism by which the diet can have a positive influence of brain health and healthy aging. Human Elastin-Like Polypeptides for tissue regeneration (Bandiera & D'Andrea) In the last years Prof. Bandiera lab has been dedicated to set up a molecular biology strategy to construct synthetic genes for protein based biopolymers production in bacterial expression systems. The design of biomimetic macromolecules based on a human elastin naturally occurring module was undertook, following the example of the elastin-like polypeptides, in the view to develop a new generation of biomimetic materials. Elastin, one of the components of the extracellular matrix, is characterized by rubber-like elasticity undergoing deformation without rupture and has become an important model for biomaterial design. A family of Human Elastin-like Polypeptides (HELPs) has been developed with the purpose of enhancing some peculiar characteristics of the native protein. The functionality of these biopolymers can be extended by addition of functional, bioactive domains, thus improving the potential of the final product. The potential of these compounds as basic components of innovative biomaterials for biotechnological and biomedical purposes is currently investigated. In particular, HELP-based adhesion substrates have been developed to improve tissues regeneration. At this regard, skeletal muscle tissue engineering holds promise for the replacement of muscle damaged by injury and for the treatment of muscle diseases. Mammalian adult skeletal muscle has a limited capacity to repair after injury, usage or trauma. To date, three different Human Elastin-Like Polypeptides (HELPs) have been used as adhesion substrates for myoblastic cells. Depending on their structure, they stimulate cell adhesion, spreading, proliferation and myogenic differentiation at a different extent, thus making possible to correlate the structure of adhesion substrate with specific cellular functions. Besides inducing morphological differentiation, myoblasts adhesion on HELP substrates stimulates at different degree the maturation of the excitation-contraction coupling mechanism, assessed by single-cell Ca2+ imaging. To modulate and manage the mechanical properties of HELP biopolymers, a method for obtaining highly controlled enzymatic crosslinking of hydrophilic residues has been developed, thus paving the way for the preparation of 3D microenvironments suitable for tissue culture.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18206
Responsabile scientifico/Coordinatore	PASSAMONTI Sabina (Scienze della Vita)

Settore ERC del gruppo:
LS3_2 - Cell biology and molecular transport mechanisms
LS7_3 - Pharmacology, pharmacogenomics, drug discovery and design, drug therapy
LS9_10 - Biomimetics

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BANDIERA	Antonella	Scienze della Vita	Ricercatore	BIO/11
D'ANDREA	Paola	Scienze della Vita	Prof. Associato	BIO/10
URBANI	Ranieri	Scienze della Vita	Ricercatore	CHIM/04
SCAGGIANTE	Bruna	Scienze della Vita	Ricercatore	BIO/11
TRAMER	Federica	Scienze della Vita	Ricercatore	BIO/10

Altro Personale	Past lab. members: Giorgio Tessarolo, Lovro Ziberna, Jovana Cvorovic, Stefano Fornasaro, Antonio Filippi, Giulia Runti, Luca Escoffier, Lucia Corich, Michela Furlan. Contratti per fornitura di servizi: T&B Associati s.r.l., Divulgando s.r.l.

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18. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Interfacce cervello-computer
Descrizione	The research program coordinated by Professor Battaglini is centred on the involvement of the cerebral cortex in the preparation and execution of voluntary movement in humans healthy subjects. More recently, he has launched a new line of research, based on brain-computer interfaces and neurofeedback in order to better understand the mechanisms that are the basis of voluntary movements. New strategies are being developed to enable interpersonal communication and to drive devices of various kinds with the electrical activity of the brain only. The procedures adopted from time to time are also tested for their potential to contribute to the cognitive and neuromuscular rehabilitation in severely neurologically affected patients. The neurophysiology of developmental stuttering in adulthood: brain connectivity and motor functioning. A line of research to study the neurophysiology of developmental stuttering that persists in adulthood (PDS) has been recently activated. PDS is a speech disturbance, where the subject exactly knows what he wants to say, but he is unable to do it fluently. PDS is characterized by a series of brain dysfunctions, also at the motor level. Its aetiology and neurophysiologic profiles are not well understood. In the present project, motor markers of PDS, as well as its neural networks, are investigated by using Transcranial Magnetic Stimulation (TMS), also in co-registration with electroencephalography (EEG). TMS is be used to evaluate the excitability of motor structures in PDS, evaluating the functioning of motor effectors that are directly related with speech as well as those that are not directly related with speech. When registering EEG, is administered on motor/premotor regions, evaluating the cortical reactivity of the brain as well as the neural sources of the evoked activity. Thus, it is possible to evaluate the connectivity among the stimulated brain regions and those areas that are connected with them. The main expected results are: - Characterization of a series of markers specifically related to the motor system of stutterers; - Characterization of the cortical reactivity related to DS and of the connectivity of functional networks of the motor system in DS. Data will be useful in order to suggest new rehabilitation treatments for DS that persists in adulthood. Neurofeedback Treatment for Parkinson Disease This project is carried out with the collaboration of dr Susanna Mezzarobba, Physiotherapy Unit, University of Trieste. The present project aims at investigating the efficacy of a novel neurorehabilitation treatment for Parkinsons Disease, using an approach based on Brain Computer Interfaces (BCIs). These systems allow to interact with the external world by using only brain signal, which is usually recorded non-invasively with electroencephalography (EEG). People can learn to control their own cortical waves through mental tasks. One way is to use motor imagery, where the person imagines to make an action without actually performing it. Motor imagery produces EEG changes almost undistinguishable from those associated to real movements. In a BCI system, when the EEG is properly modulated over certain cortical areas, the subject receives a clear signal (neurofeedback) which is both a reward and an encouragement to proceed. In the present project, neurofeedback is given by the BCI system as a movie showing the imaged action (i.e. walking), given from the patient point of view. The movie flows as smoothly as the control of brain waves mimics the correct execution of the given movement. In our opinion, the coupled application of motor imagery and neurofeedback should help to fight motor symptoms such as freezing of gait, festination and other gait deficits. As an added value, the exercise and the need of attention which are related to the neurofeedback might delay the cognitive decay which is common in late Parkinson disease.

	In search for the give up instant This project is carried out with the collaboration of dr Paolo Gallina and Agostino Accardo, Department of Ingegneria e Architettura. Each of us, at least once in his or her lifetime, experienced a moment of tiredness during a physical activity (i.e. running, swimming, playing any sport). In literature it has been shown that changes in brain activity may occur due to metabolic changes associated with central fatigue during prolonged exercise. In particular, at a certain point of the prolonged physical effort, it is common to perceive what we can identify a give up instant (GUI): a psychological state, not entirely simply to physical fatigue, in which we decide to stop going on. The present project aims to find the neurophysiologic correlates of this decision-making process. To do so, electroencephalographic recording is used: in fact, EEG is a non-invasive, relatively low cost method very useful to globally investigate brain activity. Healthy volunteers are recruited: their task is to lift a weight as long as they can, while their cerebral activity is recorded with an EEG cap. Two conditions have been designed for each experimental session: one in which participants reach the GUI and leave the weight, and one in which, after a certain period, the test is interrupted by the experimenter. In this way it should be possible to separate brain signal components related to physical fatigue from the ones related to the psychological driven GUI. Once a reliable marker of GUI will be determined in terms of brain waves changes, it would be possible to build a proper neurofeedback strategy in order to delay it and improve performance. Action for perception: Insights on how goal directed actions impact perception and vice-versa. This project is carried out in collaboration with prof. Carlo Fantoni, Department of Life Sciences. Please, refer to the page of prof. Fantoni for details.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/10616
Responsabile scientifico/Coordinatore	BATTAGLINI Piero Paolo (Scienze della Vita)

Settore ERC del gruppo:
LS5_11 - Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease)
LS5_9 - Systems neuroscience

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BUSAN	Pierpaolo	Scienze della Vita	Assegnista	BIO/09
TURCONI	Marcello Maria	Scienze della Vita	Dottorando	BIO/09

Altro Personale	Joanna Jarmolowska, PhD, contratto di ricerca, Alumni: Amir Muzur, PhD - University of Rijeka, Faculty of Medicine, Croatia, Neurology; Andrea Brovelli, PhD - Institut de Neurosciences de la Timone (INT), UMR 7289, CNRS - Aix Marseille Université, Marseille; Josè Naranjo, PhD - Universitätsklinikum Freiburg, Clinic of Psychosomatic Medicine and Psychotherapy, Germany; Lucia Carriero, PhD - Max Planck Institute of Psychiatry, Muenchen (Germania); Luca Weis - Fondazione Ospedale San Camillo, Venezia.

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19. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Neurogenesi e riparazione
	The research program coordinated by Professor Giampiero Leanza is focused on the analysis and modeling of events associated to neurodegeneration, with their anatomical, neurochemical and functional consequences, on the investigation of spontaneous plastic/regenerative responses and on the development of restorative strategies based on the use of neuroprotective agents and/or cell replacement in rodents. Research work carried out in the Neurogenesis and Repair Lab employs a combination of anatomical, behavioural, neurochemical, cellular, molecular and imaging approaches. Thus, the laboratory is endowed with facilities for stereotaxic microsurgery to adult and developing rodents, analysis of cognitive and sensory-motor behaviors (Morris and Radial Arm Water Maze, Rota-Rod, Open Field etc), histo- and immunohistochemistry, bright and fluorescence microscopy, stereological analyses, cell culture and PCR. All the activities are organized in 3 main lines of research: Neurotransmitter interactions in the genesis of cognitive disturbances and histopathological alterations in

	neurodegenerative diseases Previous findings of Cholinergic, Dopaminergic, and Noradrenergic neuron loss in patients suffering from Alzheimers disease (AD) or Parkinsons (PD), indicate both these pathologica conditions as multi-system disorders, particularly as far as cognitive dysfunction (leading to overt dementia) is involved. Studies carried out in the Neurogenesis and Repair lab (also conducted in close collaboration with colleagues at the University of Lund, Sweden) are presently ongoing to confirm and extend previously published (also own) findings in both rat and humans. Thus, the relative contribution of either transmitter system (alone or concurrently) in the development of cognitive deficits (in AD models) or non-motor symptoms (in PD models), as well as in the occurrence of histopathological alterations (e.g. amyloid, tau, TDP-43 or alpha-synuclein overexpression) in relevant brain areas are being investigated following selective ablation of discrete neuronal populations. The results are expected to improve the understanding of disease mechanisms, and to help the design of adequate therapeutic strategies, such as those involving the use of newly developed, non-commercial neuroactive compounds, to be tested in the adopted models. (Modified from Antonini et al., 2011)
Descrizione	Functional analysis of human umbilical cord stem cells and their suitability for implantatation in rodent models of central and peripheral neural dysfunction The therapeutic use of cell protection/replacement strategies for the treatment of neurodegenerative diseases originates from the unmet needs defined by the clinicians, and is today a much debated, high-expectation issue. Certainly, however, the identification of ethically sustainable, qualitatively/quantitatively plausible, sources of implantable cells to be tested in a reliable pre-clinical setting, is of paramount importance. Within such framework, the Neurogenesis and Repair Lab contributes with experimental work investigating in vitro features such as survival, development, and differentiation of stem cells and neural precursors from various sources, as well as their integration and functional capacity following transplantation. Ongoing studies are centered on two major endpoints, both with a high traslational relevance: (i) the possibility to improve the anatomical and functional reconstruction of the severed peripheral nerve (so far seen relatively weak and slow) by functionalized nerve tubulization using growth factor-releasing human umbilical mesenchymal stem cells (HUMSCs), and (ii) the disease-modifying potential of HUMSCs following implantation in transgenic mice recapitulating the dynamics of motoneuron degeneration and motor impairments seen in patients suffering from Amyotrophic Lateral Sclerosis (ALS). Noradrenergic modulation of hippocampal neurogenesis and cognitive abilities in the rat. A severe noradrenergic depletion is known to occur in the neocortical and hippocampal areas of AD and PD patients, where it exceeds cholinergic and dopaminergic loss, respectively. However, studies on the functional role of the ascending noradrenergic system in the regulation of cognitive functions have so far been hampered by the lack of selective tools to selectively lesion these neurons. Owing to the recent introduction of a noradrenergic immunotoxin, the lab has started an extensive characterization of its efficiency and selectivity, investigating the anatomical, neurochemical and functional effects of its administration to developing and adult rats. In the early studies, the immunotoxin proved to be an excellent tool to address issues of spontaneous reinnervation of partially deafferented territories, as well as the potential of transplanted noradrenergic neuron progenitors to remarkably reinstate noradrenergic innervation and neurotransmission in sub-totally denervated spinal territories. Ongoing studies investigate the noradrenergic (and/or the combined noradrenergic-cholinergic) regulation of hippocampal neurogenesis and hippocampus-dependent cognitive abilities. The restorative effects of implanted noradrenergic (or noradrenergic-cholinergic)-rich neural progenitors upon these events are being investigated as well.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18222
Responsabile scientifico/Coordinatore	LEANZA Giampiero (Scienze della Vita)

Settore ERC del gruppo:
LS5_11 - Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease)
LS5_2 - Molecular and cellular neuroscience
LS5_3 - Neurochemistry and neuropharmacology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
SGUBIN	Donatella	Scienze della Vita	Dottorando	BIO/09

	PhD and Post-docs: Dr. Alessandro Perin (ext coll) aperin@gmail.com Students: M.Sci. Stefano Frausin, M.Sci. Serena Viventi, M.Sci.Roberta Pintus, B.Sci. Chiara Trevisan, B.Sci. Michele Gallo, B.Sci. Laura Andreoli. Alumni: Vuokko Antonini, Marino Coradazzi, Carlo Cusulin, Hoffmann-Roche Basilea, Switzerland, Giulio Kleiner, Columbia University College of Physicians and Surgeons, USA; Donatella Sgubin, Neurochirurgia, Ospedale Niguarda, Milano, Alessandro

Altro Personale	Perin, Istituto Neurologico Carlo Besta, Milano; Margherita Riggi, SISSA Trieste; Marco Ledri, Hungarian Academy of Sciences;Veronica Francardo, Basal ganglia Pathophysiology, Lund University;Elena Giusto, Stem Cell Institute, Cambridge University; Elena Bianchetti, Dept.Pathology & Cell Biology, Columbia University;Miriana Quattromani, Experimental Brain Research, Lund University; Michael Jewett, Neurodegeneration and Inflammation Genetics, Lund University;Irene Sebastianutto, Basal ganglia Pathophysiology, Lund University; Eleonora Vianello, Centro Studi Fegato, Trieste.

20. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Neurobiologia cellulare e dello sviluppo
Descrizione	Prof. Tongiorgi laboratory has given a major contribution to the understanding of the biological functions of Brain-Derived Neurotrophic Factor (BDNF). They demonstrated that BDNF splice variants provide a spatial and quantitative code for local expression and selective morphological shaping of dendrites during development. They investigated BDNF proteolytic forms as biomarkers of chronic stress, depression, multiple sclerosis, autism and cognitive impairment in schizophrenia. The laboratory is part of the Italian network on BDNF (In-BDNF). Current research is focused on the rescue of neuronal atrophy by exploiting the BDNF variants expression code and pharmacological treatments and its monitoring by serum/CSF biomarkers. The spatial and quantitative code model of BDNF splice variants The neurotrophin Brain-Derived Neurotrophic Factor (BDNF) is a key morphoregulatory molecule in neuronal development and plasticity. Transcription of the bdnf gene leads to 34 transcripts in humans and 22 in rodents, each with the same coding region (CDS) a different 5UTR, and either a short or a long 3UTR. To explain the biological role of these multiple BDNF splice variants we proposed the spatial and quantitative code model. This model is based on our finding that BDNF mRNA variants become spatially segregated in response to neuronal activation within three distinct subcellular domains: the soma (exons 1, 3, 5, 7, 8, 9a), the proximal (exon 4) or the distal (exon 2, 6) dendrites. We also showed that each mRNA variant has a different translatability and produces different quantity of BDNF in response to different neurotransmitters. Current research is focused on understanding the mechanisms of BDNF mRNA variants segregation and local translation and exploitation of the BDNF code to rescue dendritic atrophy. Collaborations: Maurizio Popoli University of Milano, Antonia Ratti University of Milano, Michele Simonato University of Ferrara, Lucia Gardossi University of Trieste, Barbara Bardoni CNRS Nice (France). Translational Outcomes: 1) Patented high throughput cell-based assay to screen for natural and synthetic compounds able to modulate BDNF protein translation. 2) BDNF spatial code database in human and rodent brain for rational design of strategies to rescue neuronal atrophy and cognitive impairment in different brain areas. Pharmacological rescue of neuronal atrophy in Rett Syndrome Brain weight loss, shrinkage of the cortex with reduced soma and dendritic arborization in absence of neurodegenerative processes is a typical feature of the neurodevelopmental disorder Rett syndrome, an X-linked genetic disease mainly caused by mutations in the MeCP2 (Methyl-CpG binding protein-2) gene. Current major hypotheses for the causes of neuronal atrophy involve intrinsic (cell-autonomous) and extrinsic (non-cell autonomous) factors including impaired neurotrophic support due to reduced BDNF, decreased monoamine neurotransmission, increased oxidative stress and impaired neuron-glia crosstalk. Accordingly, we are testing drugs to enhance monoamines and neurotrophic factors, reduce oxidative stress and rescue neuronal atrophy. The project is taking advantage of in vivo and in vitro models using a MeCP2 knock-out mouse and iPSCs-derived neuronal cultures produced from patient fibroblasts. Collaborations: Marina Sciancalepore & Annalisa Bernareggi DSV University of Trieste, Sabina Passamonti DSV University of Trieste, Michela Matteoli CNR Milano, Joussef Hayek University of Siena, Giuseppe Valacchi University of Ferrara. Translational Outcomes: 1) Highly standardized mouse or rat cell-based model of neural development in vitro suitable for drug screening by high-content imaging analysis (Baj, Patrizio et al. Frontiers in Cellular Neuroscience, 2014). 2) Test of FDA/EMEA approved drugs in MeCP2 knock-out mouse in vivo and in vitro models to speed up translation towards clinical trials (repositioning approach).

	Serum and cerebrospinal fluid Biomarkers Analysis (TABA service) The laboratory runs an ISO 9001-certified facility for clinical testing of biomarkers in serum and liquor (CSF) for the diagnosis of neurological and neuropsychiatric disorders (TABA Service http://www.units.it/taba/). Analyses are offered as a service for public hospitals and private clinics and include all available tests for autoimmune neurological diseases and the main biomarkers for neurodegenerative disorders with cognitive deficits. Research activities associated to the service are related to the development of novel tests for autoimmunity and the analysis of growth factors (particularly BDNF) and cytokines in serum and CSF to monitor neuro-rehabilitative treatments of cognitive deficits in patients with neuropsychiatric and neurodegenerative diseases. In addition, the laboratory is currently investigating the serum levels of growth factors and cytokines to identify biomarkers in working stress. Collaborations: Nicola De Carlo & Alessandra Falco University of Padova, Manola Comar University of Trieste, Alessio Bratina Cattinara Hospital Trieste. Translational Outcomes: 1) Service for clinical testing of serum and liquor (CSF) for autoantibodies and biomarkers of neurological and neuropsychiatric disorders (TABA Service http://www.units.it/taba/) 2) Development and validation of innovative in vitro assays for clinical diagnosis.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18224
Responsabile scientifico/Coordinatore	TONGIORGI Enrico (Scienze della Vita)

Settore ERC del gruppo:
LS5_12 - Psychiatric disorders (e.g. schizophrenia, autism, Tourettes syndrome, obsessive compulsive disorder, depression, bipolar disorder, attention deficit hyperactivity disorder
LS5_2 - Molecular and cellular neuroscience
LS5_6 - Developmental neurobiology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BAJ	Gabriele	Scienze della Vita	Assegnista	BIO/06
COLLIVA	Andrea	Scienze della Vita	Dottorando	BIO/06
METELLI	Giuliana	Scienze della Vita	Assegnista	BIO/06
POLACCHINI	Alessio	Scienze della Vita	Dottorando	BIO/06

Altro Personale	Alumni (ex-PhD students): Bittolo Tamara (CRO, Aviano), Boscolo Sabrina (Eurospital, Trieste),Chiaruttini Cristina (Eurospital, Trieste), Leone Emiliano (Cephaid, Trieste), Vaghi Valentina (FBK - Bruno Kessler Foundation, Trento), Vicario Annalisa (VivaBioCell, Udine), Zulian Stefania (Alphagenics, Trieste).

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21. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Plasticita neuromuscolare
	The research activity of the group is focused on the identification of new strategies to improve skeletal muscle regeneration. In more detail, the team is studying the role of electrical activity and local trophic factors in the microenvironment of satellite cell niche and in the post-mitotic myogenesis. Skeletal muscle progenitors (satellite cells) are studied in vitro to identify, in a controlled environment, the pathways regulating the regenerative potential of the skeletal muscle. The experimental planning includes the use of electrical field stimulation, electrophysiological recordings, biochemical techniques, immunocytochemistry and videoimaging. The final aim is to discover new strategies to counteract the impaired functionality of the neuromuscular system due to ageing and diseases. Currently, three are the main research projects. Interplay between adenosine and acetylcholine receptors Adenosine is a well-known modulator of metabotropic and ionotropic neuroreceptors at the central and peripheral synapses. Adenosine receptors (ARs) control the cAMP/PKA cascade and cause the functional modulation of neuronal acetylcholine receptor (AChR) through its phosphorylation. Several types of adenosine receptors have been detected in developing and differentiated skeletal muscle cells, but little is known about the functional outcome of AR modulation on muscle AChRs.

Descrizione	In this project, the group intends to investigate the nature and the role of adenosine and AR signalling pathways on the two isoforms of muscle AChRs: the embryonic (g-AChR) regulating synaptogenesis and muscle development and the adult (e-AChR) with a role in nerve-muscle communication. The results of the proposed research will advance the understanding of important aspects of the neuromuscular physiology such as the modulation of the neuromuscular transmission and the skeletal muscle plasticity. In this light, they will be useful for identification of new pharmacological tools to control the activity of muscle AChRs and, thus, for finding novel strategies for neuromuscular diseases associated with altered neuromuscular transmission Role of neural agrin in skeletal muscle ageing With ageing, skeletal muscle undergoes a severe reduction in tissue mass, leading to a decrease in strength (sarcopenia). A gradual decrease in the number of muscle fibres begins in the fifth decade, such that about 50% of skeletal muscle mass is lost by the ninth decade. Recent experimental evidences suggest that altered systemic and/or local trophic factors are crucial in the development of sarcopenia. The contribution of nerve-derived factors remains the less characterised. One of the trophic factors released by the nerve terminals is agrin. The group already discovered that neural agrin improves the differentiation of human muscle satellite cells. However, the successful outcome of muscle regeneration also depends on the satellite cell proliferation. Currently, the goal of the project is to explore the mitogenic potential of neural agrin. Demographic trend suggests that sarcopenia will soon reach epidemic proportions. The aged-related musculoskeletal impairment and the consequent reduction of independence and quality of life pose an outstanding social burden. The project fits within this frame as it aims at identifying molecular mechanisms able to foster the intrinsic regenerative potential of satellite cells, to prevent sarcopenia and/or counteract it in the elderly. Electrical stimulation to improve skeletal muscle regeneration Skeletal muscle produces reactive oxygen species (ROS) in an activity-dependent way. Interestingly, muscle undergoing massive exercise are characterised by an imbalance between the production of ROS and the antioxidant defences. The resulting oxidative stress is one of the proposed reasons for the well-known impaired activity of satellite cells upon extreme exercise. On the other hand, ROS are also important physiological signaling molecules. According to the recent concept of hormesis, if skeletal muscle progenitors are damaged by high ROS levels, they benefit and require low doses of radicals to achieve muscle regeneration and maintain muscle mass. Nowadays, electrical field stimulation provides an excellent new tool to study the role of ROS in skeletal muscle progenitors at the single cell level. The research team has recently developed a bioreactor producing electrical stimulation of muscle cells. Combining electrophysiological and biochemical techniques, the working hypothesis is to identify electrical activity patterns able to control and maintain ROS at permissive levels to preserve and/or foster the regenerative capacity of skeletal muscle. The project aim at contributing to the future design of more efficient stimulation protocols and innovative electrical devices for rehabilitation of patients suffering from weakened or injured muscles.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18226
Responsabile scientifico/Coordinatore	LORENZON Paola (Scienze della Vita)

Settore ERC del gruppo:
LS3_2 - Cell biology and molecular transport mechanisms
LS3_5 - Cell differentiation, physiology and dynamics
LS3_7 - Cell signalling and cellular interactions

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BERNAREGGI	Annalisa	Scienze della Vita	Ricercatore	BIO/09
SCIANCALEPORE	Marina	Scienze della Vita	Ricercatore	BIO/09

Altro Personale	Ph.D students: Elisa Ren. Students: Valeria Ortolano, Gaia Ziraldo, Carlo Raminelli. Alumni: Elisa Luin - Department of Physiology and Pharmacology, University of Rome La Sapienza (Italy); Paolo Lorenzon - Department of Biomedical Sciences, University of Padua (Italy); Alberto Montalbano - Department of Neuroscience, University of Florence (Italy); Mihaela Jurdana - Faculty of Health Sciences, University of Primorska, Izola (Slovenia); Ewa Nurowska - Department of

	Physiology and Pathology, Medical University of Warsaw (Poland); Daniela Papadia - Center for Alzheimer Research/NVS, Karolinska Institute, Stockholm (Sweden); Martina Perin - Department of Cellular and Molecular Biology, University of Lausanne (Switzerland).

22. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Neuroni e nanomateriali
Descrizione	Laura Ballerini vision is to take advantage of the local (Friuli Venezia Giulia region) strong scientific environment to gather all the knowledge on the design and characterization of materials at the nanometer scale, on neurophysiology and on neurobiology, to exploit nanotechnology research in the central nervous system and to develop novel biotechnologies that can open a new frontier for brain research and directly or indirectly aid in CNS repair. In summary, our experimental systems suggest the emergence of a true neuro-nano hybrid structure where the frontiers between biological tissues and artificial materials are lifted by functional cross talk between the two. Our results set the stage for next ambitious goals: fostering concepts such as the design of a new generation of CNS interfaces able to perform bidirectional communication at different levels: molecular, synaptic and cellular ones, enriched with the ability to trigger, via the use of smart materials, desired molecular, synaptic and cellular reorganization in a neuronal network ultimately leading to the development of artificial tissue constructs able to interface, transform and repair damaged nerve tissue. Such enabling technologies posed between material science and bioscience may also provide tools for new experiments or measures promoting a better understanding of living and thinking systems. Spinal network development, plasticity and physiology Laura Ballerini has been working for almost two decades on the physiology of spinal cord neurons/spinal cord networks and has vast experience in using a variety of experimental electrophysiological techniques and in vitro model systems. Laura Ballerini has provided important contribution to the understanding of spinal network physiology, plasticity and development. In her laboratory at the University of Trieste she developed and is currently using the organotypic slice cultures from the rat/mouse spinal cord as a model system. Using this model, where spinal 3D segments are maintained in culture for weeks, and using single cell patch clamp recordings, multi unit recordings, calcium imaging, immunofluorescence, electron (transmission and scanning) and confocal microscopies, Laura Ballerini described for the first time in mammalian neurons the presence of dynamic changes in motor synaptic networks aimed at preserving network excitability. This form of plasticity, developmentally regulated, has been named homeostatic plasticity and it may influence network operation via adaptive changes towards regulating rhythmic outputs during motor circuit maturation (Galante et al., 2000 and subsequent publications). In a distinct set of studies, focused more on membrane biophysics of developing spinal pre-motor neurons, using the same in vitro model, Laura Ballerini also showed for the first time that all embryonic pre-motor GABAergic interneurons express m-erg genes that code for a potassium current termed IK(ERG) that possesses unusual kinetic features, including fast inactivation with strong resurgent properties after hyperpolarization. Laura Ballerini demonstrated that IK(ERG) is involved in the control of GABAergic interneuron excitability during spinal network antenatal development and thus controls, before birth, the output of spinal networks (Furlan et al 2007). Finally, Laura Ballerini has recently reported a novel type of neuronal calcium signal arising as repeated neuronal oscillations independent from action potential or synaptic activity and depending on mitochondrial calcium buffering (Fabbro et al., 2007). In a recent work Laura Ballerini investigated the temporal relationship between activity-dependent and -independent calcium signaling in spinal segments. Her main finding is that neuronal and synaptic growth shifted the generation of spontaneous calcium signals from early waves driven by synaptic activity invading the entire spinal region to late, activity-independent asynchronous oscillations generated by few neurons in restricted ventral areas. The role of such neurons could hint a multimodal strategy to handle intracellular calcium over a crucial time for motor circuit development (Sibilla et al., 2009). Neuronano: the carbon nanotubes/neuron hybrids and developments The application of nanotechnology to contemporary neuroscience promotes innovative solutions that may be useful for promoting tissue restoration and repairing lesions or defects of the brain and spinal cord (CNS). One of the more promising CNS reconstructive/repairing strategy is directed at providing a functional bridge covering damaged tissue and restoring function by implantable assistive devices. Cell-free neural implants mainly consist of biomimetic materials. Tissue-bridges need to provide a bioactive scaffold for axon re-growth and guidance to proper targets. Reaching new frontiers in tissue engineering requires strategies that establish a convergence of chemical engineering and membrane biophysics in the design of new materials. Such convergence sets the stage for bio-nanotechnology research. In the last decade Laura Ballerini has been working in collaboration with Maurizio Prato (professor of organic chemistry at the University of Trieste) on the interactions between living neurons and micro-nano fabricated substrates or bioactive-composite containing carbon nanotubes. The discovery and manipulation of innovative nanomaterials, such as carbon nanotubes (CNT), are becoming increasingly helpful in biomedical applications in general and in neuroscience research approaches and developments in particular, thus providing new tools able to specifically interact with the nervous system and with neurons at the nanoscale. The potential of CNT to integrate with neurons and neuronal function has been investigated in 2D neuronal cultures. Culturing brain circuits provides a simple in vitro model of a complex neuronal network, where particular, e.g. cortical, neuronal activity regimens can be obtained via pharmacological manipulations or by means of electrical stimulation. In such network models, single-neuron, synaptic and microcircuit properties can be investigated, allowing the study of neuronal processing in cortex circuits when integrated with a CNT network. Cultured brain circuits offer a variety of investigative levels to answer fundamental questions in neurobiology, such as how neurons reconstruct a functional network, how they rebuild active synapses or what rules govern such interactions. In the present framework the value of this in vitro model relies on its ability to suggest answers to many questions regarding the integration between functionalized CNT and brain circuits.

	Interfacing neuronal network formation to carbon nanotube substrates Laura Ballerini demonstrated for the first time that carbon nanotubes substrates boost neuronal network activity under chronic growth conditions by enhancing the occurrence of spontaneous postsynaptic currents (Lovat et al, 2005). In carbon nanotubeneuron hybrid networks, the cultured neurons always display a boost in signal transmission, which is detected as an increase in the frequency of heterogeneous synaptic events (Mazzatenta et al., 2007). Laura Ballerini recently reported that direct nanotubesubstrate interactions with the membranes of neurons can affect single-cell activity (Cellot et al., 2009) and that the unique material properties promote, by carbon nanotube supporting platforms, network connectivity and synaptic plasticity in mammalian cortical circuits (Cellot et al., 2011). Thus CNTs represent a unique material to shape neuronal signaling, as CNT scaffolds used as substrates for neuronal growth in vitro are able to affect single cell integrative abilities, to promote neuronal network connectivity and synaptic plasticity and to remotely increase the efficacy of synaptic responses (Fabbro et al., 2012). Nanotechnology applications to modern neuroscience include several ambitious goals to be pursued in the next decades, which can be categorized into three major objectives: 1) the design of new generation-interfaces between an artificial system and the nerve tissue, able to perform bidirectional communication at different levels: molecular, synaptic and cellular ones; 2) the achievement of computational descriptions of the performance of hybrid artificial-neural systems; 3) the design of smart materials triggering specific molecular, synaptic and cellular reorganization in a neuronal network, aiming at an endogenous and material-driven accurate manipulation of the neural system. Ultimately, the potential of nanomaterial/neuron hybrid endeavor includes the challenge of using an artificial submicroscopic man-designed device to co-operate to neuronal network activity, generating hybrid structures able to cross the barriers between artificial devices and neurons. 3D functional tissue engineering: neuronal bricks constructs Reproducing 3D tissue properties in artificial constructs requires combining the design of new generation of synthetic materials with cell biology to form hybrids. Self-repairing bricks done by neuronal networks could be, in our imaginary, implanted in diseased parts of our CNS as hybrid-patches able to restore lost functionalities or take care of the enduring tissues. Cells can be compartmentalized into a synthetic scaffold of controllable physical and chemical properties resulting in a functional semi-artificial block. The synergic combination of material characteristics, cell phenotype and guided connectivity will lead to the final functionality of the hybrid block. We are developing a prepackaged brick of healthy neuronal cells entrapped in a tailored 3D scaffold able to reproduce the real tissue behavior. We have already designed a nanocomposite system where CNTs are integrated into a polymeric matrix that can be modelled into different porosity, stiffness and shapes. As a proof of principle, we developed a hybrid synthetic/cellular construct based on the PDMS porous matrix and dissociated cells of rat hippocampus. The final result of our research was a supporting scaffold allowing neuronal colonization and 3D synaptic network reconstruction but soft enough to match the viscoelastic nature of native hippocampal neural tissue. We further modified the PDMS porous scaffold surfaces via MWCNTs enrichment, thus endowing the structure of nano-features and implementing its electrical conductivity. We tested the biocompatibility of both 3D materials by growing hippocampal cells in vitro. In both cases proper neuronal growth and development were documented by immunofluorescence staining and confocal microscopy. Three core milestones were set up by our pioneering work: first, a three-dimensional cellular organization is per se able to induce neuronal network outputs that strongly differ from the usual 2D construct; second, we succeeded in extending from 2D to 3D the exceptionally unique capabilities of CNTs to improve and boost neuronal functionality; third, the 3D PDMS scaffold was biocompatible when implanted for 4 weeks in the rat brain. Together these three achievements pave the way to further develop new and innovative paradigms in the nano-neuroscience research arena.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18852
Responsabile scientifico/Coordinatore	BALLERINI Laura (Scienze della Vita)

Settore ERC del gruppo:
LS5 - Neurosciences and Neural Disorders: Neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, neuroimaging, systems neuroscience, neurological and psychiatric disorders
LS6 - Immunity and Infection: The immune system and related disorders, infectious agents and diseases, prevention and treatment of infection
PE5_6 - New materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
FABBRO	Alessandra	Scienze Chimiche e Farmaceutiche	Assegnista	BIO/09
MEDELIN	Manuela	Scienze della Vita	Dottorando	BIO/09
RAUTI	Rossana	Scienze della Vita	Dottorando	BIO/09
SCAINI	Denis	Scienze della Vita	Ric. a tempo determ.	BIO/09

Altro Personale	Current group members: Jummi Laishram PhD (assegnista di ricerca),Emily Rose Aurand PhD (assegnista di ricerca), Niccolò Pampaloni (PhD student), Sadaf Usmani (PhD student), Vincenzo Giacco (PhD student), Mattia Musto (PhD student), Mauro Pulin (undergraduate student), Gloria Mancinelli (undergraduate student), Matilde Forni (undergraduate student).

23. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Biopolimeri e ingegneria tissutale
Descrizione	Professor Paoletti's main fields of interest are: the study of the correlation between structure, interactions and functions of biopolymers (mainly polysaccharides) and related model systems, the study of the technological, biotechnological and biomedical applications of natural and modified biopolymers, and of biomaterials, the investigation of the enzymatic synthesis of biologically active oligosaccharides.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18210
Responsabile scientifico/Coordinatore	PAOLETTI Sergio (Scienze della Vita)

Settore ERC del gruppo:
LS1 - Molecular and Structural Biology and Biochemistry: Molecular synthesis, modification and interaction, biochemistry, biophysics, structural biology, metabolism, signal transduction
LS7_6 - Gene therapy, cell therapy, regenerative medicine
PE5 - Synthetic Chemistry and Materials: Materials synthesis, structure-properties relations, functional and advanced materials, molecular architecture, organic chemistry

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BORGOGNA	Massimiliano Antonio	Scienze della Vita	Assegnista	BIO/10
SACCO	Pasquale	Scienze della Vita	Dottorando	BIO/10
TARUSHA	Lorena	Scienze della Vita	Dottorando	BIO/10

Altro Personale	Eva Decleva, Senior PostDoc

24. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Polisaccaridi e biomateriali
	The research laboratory coordinated by dr Ivan Donati is focused on various aspects of biomaterials science, from conception of novel solutions to lab-scale manufacturing and characterization of materials and devices for biomedical applications. In particular, the research activities involve the use of natural polymers and their combinations/mixtures to design biomaterials with novel applications in tissue engineering. The research activities are at cross-borders between chemistry, engineering and biotechnology and the team has a multidisciplinary approach focused on research and development of biomaterials and biopolymers. The research group is involved in the characterization of natural and chemically modified polysaccharides, in the development of nanostructures and nanocomposite biomaterials, in the mechanical and physical-chemical synthesis of biomaterials and their in vitro biological characterizations (both on eukariotic and bacteria cells). AnastomoSEAL AnastomoSEAL (Development of a resorbable sealing patch for the prevention of anastomotic leakage after colorectal cancer surgical treatment) is a EU financed project (2012-2015) with a Consortium composed of two Universities (University of Trieste and University of Maastricht), three SMEs (SIGEA Italy, Rescoll France and Impuls - Poland) and one Large Industry (FMC - Norway). The goal of the AnastomoSEAL project is the development of a biomaterial for preventing the Anastomotic Leakage (AL) following the surgical treatment of colorectal cancer (CRC), aiming at increasing the quality of life of patients as well as decreasing the costs of health and long term care. CRC is the second commonest form of cancer in Europe, with an age-standardized incidence rate of 48 cases per 100000 in 2008, mostly affecting elderly people. The basic idea is the design of an engineered bioresorbable biomaterial to promote a rapid tissue healing after colorectal resection with the formation of a safe anastomosis. At present, no such specific material

Descrizione	for clinical use is available on the market. This device has the potential to become the material of choice for non-invasive technique and represents an opportunity for the European companies involved in the project to pursue innovation in the biomaterial market. The combination of a sealing effect and the promotion of tissue regeneration is expected to endow the biomaterial developed with ideal characteristics for reducing the incidence of AL. The project is coordinated by Ivan Donati. For more information please visit http://www.anastomoseal.eu/ Spinal injury: towards the development of cell-instructive scaffolds for nerve tissue repair. The project is financed by the Italian Ministry of Education, University and Research (2014-2016). The goal of the project is to develop a new generation of biomaterials for multifunctional implantable devices targeted to the treatment and repair of spinal cord lesions. The novelty of this proposal is represented by the convergence among different fields like biochemistry, nanotechnology, material science, neurobiology and neurophysiology research, in order to provide new concepts and solutions for the exploitation of nanostructured-bio-hybrid synthetic implants. The National project is coordinated by prof. Laura Ballerini, Full Professor at the Department of Life Sciences (University of Trieste). The major goal of the project is the development of a new generation of multifunctional implants targeted to the treatment/repair of spinal cord lesions. Biomaterial-based implantable devices will be designed to build a bridge across injured areas through which axons can regenerate. The novel materials will address multiple key design criteria, such as biocompatibility, bioactivity, electrical conductivity, adequate rheological performance and support for cellularization. The goal of the group is the development of natural based nanoengineered functional scaffold systems for promoting neural regeneration following both acute and chronic injury.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biomedicina?q=it/node/18232
Responsabile scientifico/Coordinatore	DONATI Ivan (Scienze della Vita)

Settore ERC del gruppo:
PE5_11 - Biological chemistry
PE5_14 - Macromolecular chemistry
PE5_7 - Biomaterials synthesis

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
COK	Michela	Scienze Chimiche e Farmaceutiche	Dottorando	CHIM/06
PORRELLI	Davide	Scienze della Vita	Dottorando	BIO/10
SCOGNAMIGLIO	Francesca	Scienze della Vita	Dottorando	BIO/10
TRAVAN	Andrea	Scienze della Vita	Assegnista	BIO/10

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25. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Biodiversita ed ecofisiologia delle macroalghe marine
	The investigations of the group focus on both biology and ecology of marine macroalgae. We foster an interdisciplinary, collaborative approach to address challenging questions, with a combination of taxonomy and eco-physiological approaches (both in field and laboratory). The activities within the current funded programs are organized in 3 main lines of research: Macroalgal Biodiversity - Evaluation of the Quality Status of water bodies Over the past three decades, it has been recognized worldwide that spatial and temporal patterns of species diversity and physical and biological habitats structure have changed as a result of anthropogenic disturbances. Diversity within and among species drives the functioning of ecosystems (i.e. biogeochemical cycles, productivity, climate regulation) through countless reciprocal interactions with the physical and chemical components of the environment. Thus the conservation of biodiversity is essential to sustainability. The benthic algal flora, widely used to monitor coastal ecosystems, is regarded as a good descriptor of environmental features, and is able to highlight changes in the ecological parameters through its specific richness and community structure. This is also the basic approach of the European Water Framework Directive (EC, 2000) and a number of biological indices based on macroalgae have recently been proposed for use within the Mediterranean Sea.

Descrizione	Our group is involved in several researches aimed at the implementation of long-term and large-scale monitoring programs on benthic flora biodiversity, habitat distribution, status and trends, along the coastline of the Adriatic Sea. In this contest high-resolution geographic information system databases have been produced to assess the quantitative spatial distribution of the endemic brown alga Fucus virsoides and of marine Angiosperms along the Northern Adriatic coastline. The studies carried out in the last years permitted us to update the check list of the Northern Adriatic marine flora and to highlight important changes in the marine vegetation. These shifts mainly involve the structure of the algal communities: e.g. migration of sciaphilous macroalgae in shallower waters, reduction/disappearance of habitat-forming species, increase of turf and opportunistic taxa. Coralligenous and Rhodolit Beds Coralligenous is defined as a biogenic substratum that thrive in relatively calm waters at low irradiance, resulting from the building actions of calcareous organisms, in particular encrusting coralline algae. Rhodolith beds (RBs) are characterized by the accumulation of living and dead unattached thalli of coralline algae and peyssonneliaceans. Both habitats, constituted by engineers species, form a complex structure, thus increasing biodiversity. Coralligenous and RBs are menaced by human impacts mostly linked to sediment increasing and trawling fishing. To fulfill the Habitats Directive and to be in line with the measures of environmental protection delineated by Horizon 2020, it is urgent to identify habitat types that deserve management and protection and, after Posidonia, coastal bioconstructions are an almost obligate choice. In the framework of some National and International programs our group contributed to broaden the knowledge of species composition and structure of macroalgal assemblages growing on the biogenic outcrops of the Adriatic, investigating their spatial variability and the environmental variables and geo-morphological features that accounted for the observed variability. These researches also permitted to describe new taxa for the Adriatic and Mediterranean. In the contest of the Marine Strategy Directive our researches focused on the structure of Rhodolith beds of the Tyrrhenian Sea, with the aim to evaluate the degree of conservation of this habitat. Within a research in progress on the Italian Bioconstructions, we are focusing on the redaction of guidelines for the: -individuation of sites to propose as Sites of Community Importance; -identification of agents of disturbance; -identification of management objectives and criteria; -recognition of indicators of the efficacy of management. Climate Change - Ocean Acidification Ocean acidification and climate change are currently under investigation due to the threats that they represent for biodiversity and function of marine ecosystems. Current increases in atmospheric carbon dioxide (CO2) and temperature due to human activities may pose a particular menace to organisms with calcareous skeletons that are vulnerable to dissolution in acidified waters. Although the physiological response of marine organisms to ocean acidification is variable among taxa, the decrease in the availability of CO32- is known to affect the ability of marine calcifiers to form their skeleton or shells. Seawater acidification is also likely to affect photosynthesis. The calcareous coralline algae are considered among the most sensitive calcifying organisms to respond to ocean acidification, as they conduct both photosynthesis and calcification. Several experiments are in progress at our laboratory to study the response of Mediterranean crustose coralline algae to elevated pCO2 and temperature. Designed manipulative experiments in marine mesocosm aquaria are in progress to investigate algae response to stress.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/18358
Responsabile scientifico/Coordinatore	FALACE Annalisa (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_4 - Biodiversity, conservation biology, conservation genetics, invasion biology
LS8_8 - Environmental and marine biology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
KALEB	Sara	Scienze della Vita	Assegnista	BIO/03

Altro Personale	Current lab members: Collaboratori a progetto: Dr. Fabio Favoretto. Studenti interni: Giacomo Brunetta.

26. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Oceanografia microbica
Descrizione	The research program coordinates by Professor Serena Fonda is centered on marine ecosystem dynamics, in the Mediterranean and Antarctic Sea. The team has a long experience in measuring Carbon fluxes within the pelagic trophic web from viruses up to mesozooplankton using an experimental approach (grazing and dilution experiments). In the last period, beside the quantitative approach, the team is focusing on the selectivity of predation on prokaryotes by using molecular tools (ARISA, NGS). The same tools are used to investigate protists biodiversity with particular regard to the deep sea environment. All the activities within this program are organized in 2 main lines of research: Effects of microzooplankton and heterotrophic nanoplankton predation on prokaryotic biomass and diversity. In the past the model of marine pelagic food web was based on microphytoplankton production and the pivot role of mesozooplankton (copepods) in transferring energy to the higher trophic levels. More recently it appeared clear that microzooplankton and heterotrophic nanoplankton play a major role in linking the microbial food web to the classic grazing food web. Both dimensional fractions are able to feed on prokaryotes thus controlling, together with virus, their biomass and diversity. To assess the effects of predation on biomass we use the method of dilution (Landry & Hasset, 1983) with incubation in situ on board during the cruises in which we are involved under the umbrella of the different funded projects (Perseus, Ritmare, PNRA) in both Mediterranean and Antarctic Seas, with particular regard to the deep sea dominion. To assess the predation effects on prokaryotic diversity we use a metagenomic approach by extracting DNA and amplifying V1 V3 region of the 16S rRNA. The sequences are now obtained with the Iron Torrent sequencer present at the Department of Life Sciences. The aim of these researches is to test the hypothesis that predation is selective and able to shape the prokaryotic community thus justifying the presence and dominance of some clades over the world oceans. Diversity of protists (in collaboration with prof. Pallavicini) Protists are the most abundant organisms in both microzooplankton and nanoplankton fraction. Classic microscopic analyses are able to identify at species level only a relative small portion of total community. Now new generation sequencing allows us to identify at level species also the smallest organisms belonging to nanoplankton. We collect water samples during all cruises in which we are involved in the Mediterranean and Antarctic Sea for both microscopic and metagenomic analyses that will be compare each other. In an outstanding collaboration with Aberto Pallavicini, we target the 18S rRNA and sequence it by using Ion Torrent sequencer. The final aim to these researches is to discover their unrevealed biodiversity, particularly in the bathypelagic realm, and eventually to find a relationship between predator (protists) species and prey (prokaryotes) species. We are involved in an Antarcitc project in collaboration with AWI (Germany) researches on krill diet. In this case we will try to identify krill gut content at species level by using this metagenomic approach.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/18701
Responsabile scientifico/Coordinatore	FONDA Serena (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_8 - Environmental and marine biology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
ZOCCARATO	Luca	Scienze della Vita	Dottorando	BIO/07

Altro Personale	PhD students: Massimo Marvelli, Tommaso Diociaiuti.

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27. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Ecologia applicata e Telerilevamento
	The research group of Miris Castello and Alfredo Altobelli conducts experimental research in the field of ecology and conservation biology, including analyses, monitoring, conservation and management of ecosystems and plant and animal populations, monitoring of alien species, analyses of land use and land cover dynamics.

Descrizione

Biodiversity is threatened by many processes, including habitat loss, global climate changes, invasive alien species, diseases, over-exploitation. However, species and habitats of conservation interest may be also threatened by abandonment of land management and traditional agricultural and grazing practices. Modern approaches to biodiversity conservation are strongly based on in-situ strategies of conservation of species in their natural habitats; in Europe, conservation of natural habitats and threatened species is a priority, recognized also by international law.

The research program of the group strongly focuses on the vegetation component of ecosystems, as vegetation represents the key element to identify and analyse habitats, to assess their conservation status, to study spatial patterns and ecological processes at landscape scale, to provide fundamental information for land-use planning and management.

Research activities are based on field work and advanced GIS methods and remote sensing.

Geographic Information Systems (GIS) represent a considerable change in environmental data management, as they connect territorial information to different databases, allowing for the integration of the territory, adding and producing new information. The use of remote sensing tools, either aerial or based on satellite, multi and hyper spectral, permits the gathering of many kinds of territorial information and the investigation of aspects that are difficult to monitor. The effectiveness of GIS is optimized by the combination of GIS and statistical analysis and in particular by the application of multivariate methods. In this case GIS is not an isolated technology but part of integrated methodology of analysis. Multivariate analysis renders legible and decipherable amounts of data sets which are difficult to understand at a glance.

In this context vegetation mapping is an important tool for natural resources management and land use planning, since vegetation acts as a base for all living organisms, and plays an essential role in global dynamics.

The research activities of the Applied Ecology & Remote Sensing group are organized in two main lines:

- plant ecology and conservation (ref. M. Castello; email: castello@units.it)

- GIS and Remote Sensing (ref. A. Altobelli; email: altobelli@units.it)

Our goal is to investigate ecological and natural resource conservation questions through integrated field work and remote sensing, from the population to the landscape scale.

Conservation of karst grasslands by the reintroducing of grazing and High Nature Value Farming areas

The dry grasslands of the North Adriatic Karst are habitats very rich in species and characterized by a high occurrence of rare and endemic species: they are recognized by the Habitats Directive (92/43/EEC) as habitats of conservation interest at European level. Karst grasslands are semi-natural habitats created through time as the result of low-intensity human activities; abandonment of traditional agricultural and grazing practices and the consequent natural process of development of scrubland and woodland are leading to a strong reduction of these habitats.
Our group conducts extensive researches on the dry grasslands of the Italian Karst, on the effects on plant communities of deforestation and grazing as means of conservation, and on the impacts of alien plant species on these fragile habitats.

Plant diversity of inland wetlands

Inland wetlands are habitats with high ecological value dramatically declining as consequence of land-use changes, human alteration, global warming and natural dynamic processes. The degradation or the loss of these habitats are a major threat to many species. In karstic areas, characterized by the lack of a superficial hydrographic system, aquatic habitats are often man-made bodies of water, artificially created for the needs of the humans, animals and agriculture. In Italy, the abandonment of traditional economic activities after World War II and the lack of management led to the disappearance of many ponds, precious habitats for biodiversity conservation.
Our group carries out a research program on the flora and vegetation and the conservation status of aquatic habitats of karstic areas: researches are focused on the classic Karst area and on mires and ponds of the Cansiglio montane area (Veneto region).

Cave habitats

The Friuli Venezia Giulia Region has an impressive number of caves (over 7700 known caves according to the Regional Cave System Archive); caves are one of the most distinctive notes of the Italian Karst landscape (over 3100 known caves).

Caves are very peculiar and fragile habitats, yet not well known, but of great value for biodiversity. In biospeleology, the knowledge on the plant component is still incomplete: in particular bryophytes, representing a fundamental element of cave habitats, have been long neglected.
Green plants usually grow at the entrances of caves, but are not present in the inner parts due to the lack of sunlight. In natural caves opened to the public and in artificial caves or mines, the electrical lighting enables phototrophic organisms to grow in the underground: a vegetation of cyanobacteria and algae, bryophytes and ferns, called lampenflora can be found around lamps. These communities represent an alteration of the underground environment and may cause damages both to speleothems and cave fauna. The development of lampenflora is a typical problem for show cave management.
Our activities involve different aspects of cave ecosystems, including plant communities of wild and show caves and the problem of lampenflora.

	The Red List of the Italian flora The group is involved in a national project for a new Red List of the Italian Flora carried out by the Italian Botanical Society (SBI) and Italian Ministry of Environment for the Protection of Land and Sea (MATTM) within the Italian national strategy for the conservation of biodiversity of MATTM. Micro-UAVs (drones) for the study of vegetational lanscape The recent advent of proximal or low altitude remote sensing using small drones (UAV/RPAS) opens up new perspectives for the study of the vegetational landscape. The advantage of these aircraft lies mainly in the high spatial resolution and their operativity which is significantly simple compared to traditional aerial and satellite platforms. On the basis of the photographs acquired by the drone and as a result of the partial overlap of the frames it was possible to create a three-dimensional model of the ground surface (DSM) of the area of interest. The DSM (Digital Surface Model) represents, in digital form, the level of the land with all the objects found on a given plot including buildings, infrastructure and vegetation. Temporal GIS and Climate Change In order to describe and predict the effects of climate change on the functioning of ecosystems it is possible to monitor continuously them by means of satellite parameters such as: green vegetation indices, surface temperature and moisture. In the past the handling of spatial-temporal data in the GIS environment was difficult. Now, thanks to the new GRASS GIS Temporal Framework (TGRASS) processing capacity is significantly increased.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/19349
Responsabile scientifico/Coordinatore	CASTELLO Miris (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_4 - Biodiversity, conservation biology, conservation genetics, invasion biology
PE10_4 - Terrestrial ecology, land cover change

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BORSATO	Veronica	Scienze della Vita	Dottorando	BIO/07
ALTOBELLI	Alfredo	Scienze della Vita	Ricercatore	BIO/07
ZANATTA	Katia	Scienze della Vita	Dottorando	BIO/07

Altro Personale	PhD students: Dr. Costanza Uboni

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28. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Informatizzazione della biodiversità
	The research program coordinated by Stefano Martellos is centred on the organisation, networking and aggregation of biodiversity data, and on their use for scientific and didactic purposes. The team is developing large datasets of primary biodiversity data and taxon-rleated information, as well as image archives on vascular plants, mosses and liverworts, lichenised and non-lichenised fungi, butterflies, and freshwater fishes. By combining biodiversity informatics and biological skills, the team is addressing the development of online resources and tools, such as digital identification keys, checklists and floras, information systems, etc. The activities within this program were part of past National and European research projects, and are now part of the current project CSMON-LIFE. CSMON-LIFE

Descrizione	CSMON-LIFE (2014-2017) is funded in the framework of the European LIFE+ initiative (LIFE13 ENV/IT/842). Background The EU 2020 Biodiversity Strategy foresees various actions with the aim of halting the loss of biodiversity, conserving and restoring natural habitats, and maintaining and enhancing ecosystems and their services. This strategy requires the cooperation and the engagement of citizens, and the launch of citizen science initiatives. These initiatives have a strong potential for gathering and interpretating scientific data, for the dissemination of scientific information among the general public, and for the active involvement of people in the conservation of biodiversity. Objectives CSMON-LIFE aims at contributing to a new strategic approach, by improving the knowledge base for biodiversity policies in Italy. This goal will be achieved by involving citizens in data collection and validation, thus accelerating the progress towards the objectives of the European 2020 Biodiversity Strategy, and contributing to the formation of new green jobs. The project is promoting active collaboration among scientists, public administrations and citizens in discovering, monitoring and protecting biodiversity, thus providing a further contribution to the needs of policy makers. The project is making use of ICT instruments to collect geo-referenced and validated biodiversity data, which will be integrated into the databases of the Italian National Biodiversity Network. Expected results * A sustainable network of at least 2 000 citizen scientists; * Dissemination of the aims of the project both in the whole study area and at the national level through different media, in order to reach at least 200 000 citizens; * Organisation of international events with the involvement of the EU infrastructure Lifewatch and the European Association for Citizen Science (EACS); * Contribution to the project 'Sistema Ambiente 2010' of the Italian Ministry of the Environment; * Contribution of data, technology and methods to European and global networks of biodiversity, including Lifewatch and GEO BON
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/19610
Responsabile scientifico/Coordinatore	MARTELLOS Stefano (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_4 - Biodiversity, conservation biology, conservation genetics, invasion biology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
MORO	Andrea	Scienze della Vita	Assegnista	BIO/02
NIMIS	Pierluigi	Scienze della Vita	Prof. Ordinario	BIO/02
PIZZUL	Elisabetta	Scienze della Vita	Ricercatore	BIO/07
AVIAN	Massimo	Scienze della Vita	Prof. Associato	BIO/05

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29. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Ecofisiologia delle piante
	The research programmes coordinated by Prof. Andrea Nardini span from basic understanding of plant physiological processes related to water uptake and transport, to applied topics in the fields of forest and urban ecology. The efficiency and safety traits of plant water transport systems are studied with a combination of biophysical, molecular and ecological tools. Both laboratory experiments, field surveys and controlled greenhouse experiments are used to investigate how plant water balance is affected by different environmental parameters, and how plants cope with reductions in soil water availability and/or high atmospheric evaporative demand. Mechanisms of drought-induced tree mortality: from physiological bases to ecological consequences Ongoing climate warming is leading to increased frequency and intensity of heat and drought waves in several areas of the globe. One of the consequences of these extreme climatic events is tree die-off in forests. Tree mortality implies a reduction of net primary productivity and a conversion of forest ecosystems from net carbon sinks to net carbon sources, with impacts on climate at a regional scale and modifications of competitive processes, and consequences on ecosystem biodiversity and stability.

Descrizione	We currently investigate the physiological mechanisms linking drought to tree die-off. Prolonged/intense drought causes a progressive decrease of plant water potential leading to xylem embolism and blockage of root-to-leaf water transport, plant desiccation and death ('hydraulic failure'). On the other hand, stomatal closure to prevent xylem embolism causes a halt of photosynthesis leading to progressive depletions of reserves on non-structural carbohydrates and impairment of plant metabolism ('carbon starvation'). We seek for connections between plant water and carbon metabolism, and in particular to the role of carbon starvation into the impairment of the plants' ability to recover from drought stress via energy-dependent xylem refilling. We are currently investigating the species-specific roles of hydraulic failure and carbon starvation in tree decline and recovery capability, as a function of stress intensity and duration. We also aim at quantifying the species-specific critical stress levels inducing increased mortality risk and eventual increase of vulnerability to successive drought events. The hydraulic engineering of the Angiosperm leaf The intricate and delicate network of leaf veins is a wonderful example of evolutionary engineering, and leaf vasculature has always fascinated scientists, as well as artists. From a functional viewpoint, this complex plumbing system is designed to efficiently deliver water to photosynthetic cells, thus replacing the huge amount of water that plants lose to the atmosphere during the transpiration process. In fact, large water losses are unavoidably coupled to stomatal opening and CO2 diffusion from the atmosphere into the leaf interior, which is crucial to fuel photosynthetic processes. We investigate the structure/function relationships between the architecture of the vein system and leaf hydraulics. We are particularly interested in the responses of leaf hydraulic conductance to different environmental factors, and specifically to drought stress. We analyse the relationships between leaf hydraulic efficiency and safety, investigating basic mechanisms underlying the loss of leaf hydraulic conductance under stress conditions, and the processes allowing eventual recovery upon stress release. We are also very interested in the trade-offs between leaf construction costs, hydraulic safety and efficiency, and the ecological consequences in terms of plants competitiveness and distribution in different habitats, ranging from local to regional and global spatial scales. We use both anatomical, biophysical and molecular tools to investigate leaf hydraulics, and we also apply basic knowledge to the development of screening criteria to identify drought-resistant genotypes of different woody crops. Green roofs for the Mediterranean The negative environmental impacts of urbanization are partially driven by the replacement of natural vegetation with hard, impervious surfaces such as concrete and asphalt. Green roofs provide environmental, economic, and social benefits to urban areas, including reduction and delay of water run-off, mitigation of heat island effect, thermal and acoustic insulation of buildings, pollution abatement, habitat and biodiversity conservation. However, green roofs represent challenging environments for plant survival due to high temperatures and dramatic fluctuations in water availability, especially in drought-prone areas like the Mediterranean, where in fact green roof technologies are still under-represented. Our research is mainly focused on plant selection process to identify key physiological parameters assuring high plant performance over arid green roofs. The selection of suitable plant species is based on an ecophysiological approach, starting from identification of drought-adapted species via the study of local natural habitats with environmental characteristics similar to those found on green roofs, and coupled to sound analysis of physiological traits related to drought resistance. The survival of plants over green roofs has been reported to be positively correlated with the substrate depth, as likely related to the higher water-holding capacity of deep substrates compared to shallow ones. However, green roof installations have to be reconciled with buildings' structural features, and deep substrates lead unavoidably to larger structural loads. Hence, a key target of green roof research is to increase the amount of water available to plants, while maintaining reduced substrate depth. We investigate how to improve the amount of water available to vegetation by targeted modification of green roof layering and substrate properties.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/18356
Responsabile scientifico/Coordinatore	NARDINI Andrea (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_8 - Environmental and marine biology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
SAVI	Tadeja	Scienze della Vita	Dottorando	BIO/04

30. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Relazioni inter-gruppo e cognizione sociale
Descrizione	The research program of our lab is mainly concerned with social cognition, stereotyping, and inter-group relations. Specifically, our research is focused on how individuals organize their knowledge about social environments. Moreover, we look at how social, cognitive and biological factors affect individuals attitudes and behaviors towards ingroup and outgroup members, and how these factors can result in inter-group conflict and discrimination. Our lab considers applying research to societal problems to be highly important and necessary. One core focus is the evaluation and implementation of homophobic bullying prevention programs. Another focus is the analysis of the cognitive determinants of alcohol abuse, and the study of alcohol-abuse preventive interventions. We are also interested in the way individual differences and stereotypes play a role in the appraisal of STD-associated risk. Are social groups different from living and non-living entities? In this line of research, we seek to understand how individuals appraisal of information about social groups (such as Jews, homosexuals, and women) is different from their appraisal of information concerning other living and non-living entities (such as cats, apples and bicycles). In collaboration with Raffaella Rumiati and Luca Piretti (SiSSA-Trieste), we have worked with primary dementia patients and, relying on double dissociation methodology, we have demonstrated that knowledge about social groups is independently represented to other semantic knowledge (see Rumiati, Carnaghi et al. Cog Neuroscience, 2014). Since these precursory results, we have been addressing whether social group knowledge involves dedicated brain networks. In collaboration with Rumiatis Lab, we have tested patients with temporal or frontal brain tumors, either in the left or right hemisphere, to gather initial evidence on the role of these brain regions in the processing of social group information (see Piretti Carnaghi et al., Front. Psychol: Accademy of Apahsia 2014). Despite these studies demonstrating that social information is processed differently to information related to other living and non-living entities, other evidence (such as violence against women) suggests that, at least in certain cases, human beings might be reduced to the status of objects and animals. In collaboration with Giorgia Silani and Carlotta Cogoni (SISSA-Trieste), our lab analyzes the cognitive factors that promote the objectification of women and justify sexual harassment (supported by PRIN 2013 funds). Moreover, and in collaboration with Valentina Piccoli (PhD student, DSV) and Francesco Foroni (SISSA-Trieste), we address whether hormonal fluctuations across menstrual cycle can affect the de-humanization of women and men (see PiccoliI, Foroni, Carnaghi, 2013 PSPB; Piccoli, Cobey, Carnaghi 2014, Pers. Ind. Differeces). In so doing, we recast the analyses of inter-group attitudes within a broader biological framework. Language and inter-group relations This line of research analyzes whether linguistic cues might affect the way individuals perceive and judge other individuals. Firstly, our lab investigates the inductive potential of different grammar forms in person perception. Specifically, our lab has collaborated with Anne Maass (University of Padova) to analyze whether the use of nouns (e.g. Jews) enhances stereotypical inferences, inhibits alternative categorization and leads to the perception of membership being more genetically based, relative to the use of adjectives (e.g., Jewish; see Carnaghi et al. JPSP 2008; Maass, Carnaghi & Rakić, in press). Our lab, again in collaboration with Prof. Maass (University of Padova), is also working on whether the grammatical manners in which psychiatric labels are framed (e.g., she is anorexic vs. she is an anorexic) affect the prognostic judgment. In a related line of work, our lab is collaborating with Anne Maass (University of Padova), Fabio Fasoli (ISCTE-Lisbon) and Paola Paladino (University of Trento) to analyze whether and how politically incorrect language affects individuals attitudes and behaviors towards the group that is victim of such language. Specifically, we address whether homophobic epithets, such as fag, compared to the category term gay, increase the automatic prejudice towards homosexuals (Carnaghi et al., JLSP 2008) and affect behaviors towards homosexuals (Fasoli, Maass, Carnaghi, BJSP in press). Furthermore, we study whether the overhearing of such epithets might alter male heterosexuals self-perception by increasing their endorsement of masculinity norms (Carnaghi et al., PSPB 2011). Finally, our lab, and in particular Christopher Hunt, in collaboration with the Regione Friuli Venezia Giulia and Arcigay association, has analyzed the use of anti-homosexual language in schools and set up interventions aimed at reducing anti-gay bullying among adolescents (Hunt, Piccoli, Carnaghi et al., under review, JoH). Stereotype and Stereotyping Stereotypes are beliefs about social groups that influence what information is sought out, attended to and remembered

	about group members. Stereotypes also influence social behaviors and justify inter-group conflict and discrimination. Our lab is interested in studying the ways in which stereotypes can be revised and changed. Our lab addresses how social influence mechanisms can lead individuals to give up or, at least in certain case, preserve their stereotypes (Carnaghi et al. 2006; 2007 EJSP). Our lab, in collaboration with Mara Cadinu (University of Padova) further analyzes how stereotypes influence the representation of the self (self-stereotyping) in majority and minority group members (Latrofa, Vaes, Cadinu, Carnaghi, PSPB 2010). Furthermore, again in collaboration with Prof. Cadinu (University of Padova), our lab investigates the distinct cognitive processes that entail ingroup and outgroup stereotyping of minority and majority groups (Cadinu, Latrofa, Carnaghi, Self & Identity, 2013; Cadinu & Carnaghi, under revision PSPB). As our lab considers applying research to societal problems to be highly important, we also address how stereotypes can affect risk behaviors, especially in the case of the perceived risk associated with sexually transmitted diseases (Carnaghi et al., IRSP 2011, Carnaghi et al. AIDS-care 2007). Alcohol use and abuse The incentive sensitization theory of drug addiction posts that this pathological condition is a consequence of drug-induced changes in the brain, in particular in the mesocorticolimbic system. Repeated drug consumption sensitizes these brain areas and increases the salience of the drug-related stimuli. As a consequence, drug-related stimuli acquire the ability to grab drug-consumers attention and drive his or her behavioral tendency towards drug use. Our lab, and in particular Marijana Music (PhD Student), is using the framework of the incentive sensitization theory to examine alcohol abuse. In collaboration with Anna Pelamatti (DSV) and Alessandro Vegliach (A.S.S.n.1), our lab is investigating whether implicit attitudes towards alcoholic beverages and implicit self-representations can orient alcohol abusers attention towards alcohol-related stimuli. In so doing we recast the analyses of alcoholism within a social-cognition framework. These studies rely on a sample of individuals with a history of alcohol abuse who are now abstaining from alcohol use, and on a sample of individuals who report occasional binge drinking, and utilize methods adapted from the social cognition tradition.
Sito web	https://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16953
Responsabile scientifico/Coordinatore	CARNAGHI Andrea (Scienze della Vita)

Settore ERC del gruppo:
SH2_1 - Social structure, inequalities, social mobility, interethnic relations
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes
SH4_5 - Social and clinical psychology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
MUSIC	Marijana	Scienze della Vita	Dottorando	M-PSI/01
PELAMATTI	Giovanna Maria	Scienze della Vita	Prof. Ordinario	M-PSI/01

Altro Personale	Valentina Piccoli (PhD Student); Christopher Hunt (Post DocTALENTS UP fellowship programme; AREA and FVG); Andrea Caputi (trainee, research assistant); Raffaella Rumiati, Luca Piretti, Francesco Foroni (Neuroscience and Society Lab, SISSA-Trieste); Giorgia Silani, Carlotta Cogoni (Collective Emotions and Social Cognitive Neuroscience Lab, SISSA-Trieste); Anne Maass, Mara Cadinu (SPECOLAb, University of Padova); Alessandro Vegliach (A.S.S.n.1 Trieste); Paola Paladino (University of Trento);Fabio Fasoli (Instituto Universitario de Lisboa, ISCTE-IUL). Centro de Investigacao e Intervencao Social (CIS). Past Lab members: Fabio Fasoli has a post-doc position at Instituto Universitario de Lisboa, ISCTE-IUL. Centro de Investigacao e Intervencao Social (CIS); Marco Brambilla is assistant professor in Social Psychology at the University Milano Bicocca.

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31. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Biologia della simbiosi lichenica
	The research program coordinated by Mauro Tretiach is centred on both basic and applied aspects of lichen biology. A large part of the research activities are carried out with a young and motivated research team built up in the last years. At present, the group includes two post-doc researchers, one scolarship holder, eight PhD students, and three master thesis students. The group studies the diversity of the lichen symbionts, the functioning of the lichen symbiosis in response to the environmental stressors, and analyse the information these organisms can provide on their habitat, by combining molecular, ecophysiological and omics approaches. The research activities are organized in seven main lines, as follows:

Lichen cell biology

Lichens are poikilohydric, desiccation-tolerant organisms able to withstand frequent dehydration-rehydration cycles thanks to structural modification in the cytoplasm and an efficient pool of antioxidant molecules. Under different controlled conditions we are co-culturing lichen mycobionts and photobionts, optionally lichenized fungi and rock inhabiting, melanized fungi which were previously isolated individually in culture. This allows us to investigate (i) their desiccation tolerance at cellular and molecular level, (ii) the molecular signals that are up- or down-regulated in the different fungal-algae associations and (iii) in the initial phases of lichenization, when a lichen symbiosis is re-establishment in vitro.
Microscopy techniques are applied to investigate the modification of the cellular structures, biochemical analyses are performed to identify the involved metabolites, whereas transcriptomic analyses are implemented to understand the key molecular processes involved.

We are also taking part to a project of the University of Innsbruck (UIBK) and the University of Basque Country (UPV/EHU) to study the glassy state formation, a condition in which non-reducing sugars substitute water to maintain the membrane integrity and avoid cellular collapse during desiccation. Preliminary results seem to point out that lichens can keep this state at higher temperatures than their isolated algal partners, thus resulting more effective in surviving desiccation. We are planning to repeat the experiments including also the mycobionts.

[ref.: Lucia Muggia, Teresa Craighero, Elisa Banchi]

Transcriptomics of a lichen photobiont: Trebouxia gelatinosa

Deep sequencing (Illumina RNA-seq) provides a fast and reliable approach to generate large expression databases for functional genomic analysis, and is particularly suitable for non-model species with genomes still not sequenced. The analysis of transcriptomes has produced an unexpected amount of data on transcript identity in vascular plants, including resurrection plants, but little information is available for green algae.

Our laboratory, in collaboration with the research group of Prof. A. Pallavicini (DSV, UniTS), has recently obtained the complete transcriptome of the lichen photobiont Trebouxia gelatinosa Archibald. This species is one representative of the green algal genus Trebouxia, which occurs in c. 50% of the ≈18.000 known lichen species. Our results represent a significant step forward towards the genomic characterization of lichenized algae, with important outcomes for the comprehension of the lichen biology. Variations in the expression profiles of selected genes or at whole transcriptome level proved useful to understand how symbiotic organisms cope with several stress factors, and particularly with desiccation. The molecular mechanisms involved in and responsible for the desiccation tolerance of lichen photobionts are still largely understudied but might be of fundamental importance for understanding the physiological adaptations that enabled the landing of aquatic algae.

Our future researches aim at developing and extending the transcriptomic analyses to further lichenological and phycological aspects. In particular we will study the molecular modifications which occur during the instauration of the lichen symbiosis and those induced by new-generation pollutants on the lichen symbionts.

[ref. Fabio Candotto Carniel, Alice Montagner, Lucia Muggia]

Ecotoxicology of nanomaterials

Nanomaterials are already in a broad range of products available in every-day-life. In the near future, an enhanced and/or uncontrolled release of nanomaterials into the environment is expected, but consequences for the ecosystems are still unclear. Special attention should be given to the interactions between nanoparticles and photoautotroph organisms, because they are at the basis of the primary production of ecosystems, both marine and terrestrial.

We are currently testing the ecotoxicity of two types of nanomaterials, carbon nanotubes and graphene-derived materials, with a main focus on graphene, as part of the EU FP7 project GRAPHENE FLAGSHIP, WG2 Health and Environment, leaded by Prof. M. Prato (DSCF, UniTS). As target-organisms we have selected terrestrial micro-algal species grown in axenic conditions, and soon moss protonemata will also be tested.
The exposure effects are characterized through growth measurements, total photosynthetic pigments content quantification, SEM, TEM and confocal microscopy observations, chlorophyll a fluorescence measurements, and transcriptomic analysis.

Future work will be focused on the effects on pollen tube formation, that is the first and more delicate step in the reproduction process of all seed plants, whereas field experiments will allow to study the toxicity of graphite minerals on the cryptogamic flora of mine-spoil heaps of the Western Alps.

[ref.: Alice Montagner, Massimo Bidussi]

Urban climate change and lichen biology

Climate change, an urgent and complex issue, is one of the major challenges faced by our society. Lichens are among the most widely used biomonitors of environmental pollution in the terrestrial environments, particularly in urban areas, though the effects of the predicted future climate changes on the lichen communities of urban environments are largely unknown. Recent transplant experiments in highly standardized conditions suggest that water availability interplays with air pollutants and limits lichen survival in urban environments. It is predictable that in the next future the increasing temperatures and the rarefaction of rainfall will determine a worsening of the urban conditions with a further

Descrizione

intensification of the urban stress, that will reduce the colonization capability of lichens. It cannot be excluded that also the confidence levels of the information lichens provide as biomonitors of air quality, both in natural and in anthropogenic habitats, will drastically worsen.

Our aims are: (i) to study the combined effect of urban mesoclimate, airborne pollutants, and photo-oxidative stress on the performance of a transplanted lichen, Flavoparmelia caperata, at a functional and transcriptomic level, determining possible future scenarios in relation to the predicted 2050 climate conditions; (ii) to characterize the transcriptomics of F. caperata photobiont, Trebouxia gelatinosa, under photo-oxidative stress; (iii) compare the lichen communities and the lichen diversity values of urban sites characterized by similar pollution loads but with significant differences in air humidity, determined by water bodies that cross the urban fabric.

This project is part of a wider, interdisciplinary PRIN 2010-2011 project [Planning the green city in the global change era: urban tree functions and suitability for predicted future climates (TreeCity), www.treecity.eu], leaded by Prof. Lorenzini (University of Pisa), and run in collaboration with seven other teams of Italian universities and research institutions.

[ref.: Stefano Bertuzzi, Danijela Kodnik, Francesco Panepinto; Federica Bove]

Biomonitoring of persistent airborne pollutants: from basic research to the (good) practice

The activities in this field are of paramount importance for the economy of this research group. They can be divided in two types: basic research and applied services.
Here the basic research aims at increasing the intrinsic quality of biomonitoring protocols, being specifically planned to clarify some poorly known aspects of bioaccumulation processes in mosses and lichens. Two national projects on these topics were funded by the Italian MIUR (2004 and 2008), focused on PM10 and O3, that allowed to deepen our knowledge of the effects of vitality changes in transplanted material, the evaluation of biotic and abiotic factors affecting the bioaccumulation process, and the mechanisms that protect lichens against ozone. The research group is part of the FP7 MOSSCLONE consortium (www.mossclone.eu), aimed at inventing and testing a novel, inexpensive method to monitor air contamination, especially by heavy metals and PAHs, based on the use of a devitalized Sphagnum clone as passive contaminant sensor, which is exposed in a new-generation device, the mossphere.

Other important aspects developed to increase the quality of our biomonitoring surveys are (i) the magnetic characterization and quantification of airborne particulate matter, (ii) the planning of sampling designs aimed at obtaining error maps based on the intra-station data variability, and (iii) the launching of a national project for the detection of background levels of trace elements in the epiphytic lichen Pseudevernia furfuracea at national scale.

The biomonitoring services are generally carried out under the commitment of local authorities and environmental agencies, and represent important sources of funding for the research group. They consists in the application of standard protocols of wide use in Italy in which lichens are used as bioindicators of air quality (being sensitive to SO2, NOx, H2S etc.), or as active and passive bio-accumulators of persistent airborne pollutants (e.g. heavy metals, PAHs, dioxins etc.). Recent biomonitoring surveys were conducted around industrial plants located close to Spilimbergo, Fanna and Monfalcone, respectively, and in the municipality of Jesi; several others, including their planning, were carried out for private companies (e.g. CESI spa, Milan; Sbe-Varvit spa, Monfalcone).

[ref.: Fabio Candotto Carniel, Fiore Capozzi, Lorenzo Fortuna]

WHAT: Control of photoautotrophic deteriogens of open-air monuments by wet heat treatments

The identification of innovative techniques for removing the biofilms from outdoor monuments surfaces is an important goal in the field of restoration of cultural and historical heritage. Bryophytes, lichens and many aeroterrestrial algae are among the primary actors in the processes of biodeterioration of stone surfaces. These dangerous organisms are commonly eradicated by using biocides - i.e. chemical compounds containing active principles with toxic effects on living organisms - potentially harmful for the workers, the substratum, and the environment. Our main goal in this field is to study alternative approaches, whose pre-requisite is to be totally eco-compatible.

WHAT (Wet HeAt Treatment) is a new technique, consisting in the exposure of the biodeteriogens, kept artificially hydrated, to mild temperatures (40-60 °C) for relatively short times (3-6 hours).

So far the efficacy of WHAT has been tested (through epifluorescence observations, histochemical observations by confocal microscopy and chlorophyll a fluorescence emission measurements) with excellent results (i.e. obtaining the death of all tested organisms) on a wide array of bryophytes, lichens and aeroterrestrial green algae. Thermo-tolerant when dry, these organisms are in fact thermo-sensitive when wet.
For comparison, the devitalization effects of some commercial biocides with different active principles has been also verified, alone or together with heat treatments: there is an increase in the devitalization effect only when the biodeteriogen is kept fully hydrated, and its temperature artificially increased.

At middle latitudes, as in the Mediterranean area, the WHAT technique can be applied directly in the field using tap water and nylon foils during the warmest hours of a summer day, but we are testing some thermal devices that should extend the WHAT use also to more problematic environmental conditions.
Promising collaborations with public institutions, private companies and a German University are ongoing.

[ref.: Stefano Bertuzzi, Gaia Pandolfini]

Systematics and molecular phylogenetics

	Morphological and phylogenetic species concepts have become complementary parts of the lichen systematics and have been applied to resolve critical taxa and explain their phylogenetic affiliations. In our researches the genetic diversity and the phylogenetic placement of lichen symbionts and lichen-associated fungi (lichenicolous fungi) are studied by multiple nuclear, mitochondrial and plastidial markers. The taxa which have been included in our researches represent endolithic, crustouse, fruticose and sterile lichen species characterized by either low morphological diversity, highly morphological and ecological polymorphism, unknown phylogenetic relationships, or were fungi presenting different life styles. Their taxonomy and systematics was confirmed by combining morphological and multilocus molecular data at diverse taxonomic ranking. We have established collaborations with the research groups of Dr. Grube and Prof. Hafellner (Graz, Austria) and Dr. Wedin (Stockholm, Sweden). [ref.: Lucia Muggia (lmuggia@units.it)]
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/18748
Responsabile scientifico/Coordinatore	TRETIACH Mauro (Scienze della Vita)

Settore ERC del gruppo:
LS8_1 - Ecology (theoretical and experimental; population, species and community level)
LS8_11 - Species interactions (e.g. food-webs, symbiosis, parasitism, mutualism)
LS9_8 - Environmental biotechnology, bioremediation, biodegradation

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BERTUZZI	Stefano	Scienze della Vita	Assegnista	BIO/03
BOVE	Federica	Scienze della Vita	Dottorando	BIO/02
CANDOTTO CARNIEL	Fabio	Scienze della Vita	Dottorando	BIO/01
CAPOZZI	Fiore	Scienze della Vita	Dottorando	BIO/02
KODNIK	Danijela	Scienze della Vita	Dottorando	BIO/02
MUGGIA	Lucia	Scienze della Vita	Ricercatore	BIO/01
PANEPINTO	Francesco	Scienze della Vita	Dottorando	BIO/02

Altro Personale	PhD students: Dott.ssa Elisa Banchi (elisa.banchi@phd.units.it), tutor: Prof. Alberto Pallavicini, DSV, Trieste; Dott.ssa Teresa Craighero (teresa.craighero@phd.units.it); Dott. Lorenzo Fortuna (lorenzo.fortuna@phd.units.it); Dott.ssa Alice Montagner (alice.montagner@phd.units.it). Master thesis students: Dott.ssa Elva Cecconi, Dott. Lorenzo Cestaro, Dott. Gaia Pandolfini. Scholarship holders: Dott. Massimo Bidussi. Alumni: Dott. Laurence Baruffo, PhD (secondary school teacher); Dott.ssa Jessica Bonazzi, MD; Dott.ssa Paola Crisafulli, MD (researcher in a private company); Dott. Francesco Dal Grande, MD (post-doc researcher at the Biodiversität und Klima Forschungszentrum, Frankfurt, Germany); Dott.ssa Giula Gaiola, MD; Dott.ssa Marina Hager, MD; Dott.ssa Silvia Pavanetto, MD; Dott. Massimo Piccotto, PhD (manager in a private company); Dott.ssa Giulia Pipan, MD; Dott.ssa Elena Pittao, PhD (post-doc researcher at the University of Sassari); Dott.ssa Annabella Russo, PhD (primary school teacher); Dott. Davide Zanelli, MD (employed in a private company).

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32. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Pensiero, Memoria e decisione
	Research carried out in the Cognitive Processes Lab at the Department of Life Sciences of the University of Trieste includes the following topics: 1) Judgment and Decision Making: attentional and memory bases of judgment and decision making, individual differences in judgment and decision making (including age-related ones), decision structuring processes; 2) Memory: facilitation and interference related to retrieval cues in memory retrieval and high-order cognitive tasks, interference effects, executive functioning and cognitive control in high-order cognitive tasks. Research also includes applied cognitive psychology studies on decision-making and memory.

Descrizione	Individual and age-related differences in decision-making competence In this project, we investigate individual differences in several facets of decision-making competence, with the aims of (1) shedding light on the cognitive processes underlying judgment and decision making, and (2) explaining age-related changes. A first stream of studies focused on the relation between executive functioning skills, general cognitive abilities, and various facets of judgment and decision-making. A second stream of studies has investigated age-related differences in judgment and decision making and their relations with memory changes, as an extension of the Betula excellence project on memory, aging, and dementia (http://www.betula.su.se/en/). Published papers are available for download (http://www.units.it/delmisfa). International cooperation in this project involves Timo Mäntylä and Lars-Göran Nilsson (Stockholm University), Patrik Hansson (Umeå University), Wändi Bruin be Bruine (Leeds University), and Andrew M. Parker (RAND). Parts of this project have been funded by Riksbanken Jubileumsfond, the Swedish National Council, and the Wenner-Gren Foundation. Cuing and interference in memory and higher order cognition The aim of this research project is to better understand the circumstances in which providing cues helps vs. hinders performance, both in traditional episodic and semantic memory tasks and in more complex cognitive tasks involving ill-structured decision making. We initially focused on the ironic effects of retrieval cues that, in some circumstances, hinder memory retrieval and memory-based decision making (i.e., part-set cuing effects in option generation). Later on, the neural bases of the part-set cuing effects and cue-related interference in Parkisons disease have been studied. Neural/patient studies have been carried out with Cristiano Crescentini (University of Udine, formerly at SISSA PhD), and in collaboration with Tim Shallice (SISSA, UCL) and Emiliano Macaluso (Santa Lucia Foundation). Published papers are available for download (http://www.units.it/delmisfa). New studies on the functional role of cues in memory-based decision making are ongoing. A different (and just started) research effort aims at reaching a deeper understanding of interference effects as related to information presentation, both in episodic memory and in memory-based decision making. This work has been supported by the University of Trieste and partner institutions. Decision structuring: underlying processes and assessment Decision structuring (i.e. the construction of a representation of the decision problem enabling choice) is a core aspect of decision making, and it relies on a variety of components (e.g., option generation, attribute identification, estimation), and underlying skills. However, despite the theoretical and applied importance of the topic, empirical research is scarce. In this project, we are investigating some aspects of decision structuring (in particular, option generation and estimation) with a variety of approaches (lab experiments, individual-differences studies, and neural paradigms), in order to shed more light on the nature of decision structuring components and on their underlying cognitive and neural bases. Age-related differences in decision structuring are also being investigated. Another aim of the project is to develop and validate psychometrically-sound measures for the assessment of individual differences in decision structuring. This project is carried out in cooperation with Timo Mäntylä (Stockholm University), Wändi Bruine de Bruin (Leeds University), and Andrew M. Park (RAND), with the support of the University of Trieste (FRA grant), Stockholm University, and other partner institutions.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16937
Responsabile scientifico/Coordinatore	DEL MISSIER Fabio (Scienze della Vita)

Settore ERC del gruppo:
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
PEREGO	Elisa	Scienze Giuridiche, del Linguaggio, dell`Interpretazione e della Traduzione	Ricercatore	L-LIN/12
STRAGA'	Marta	Scienze della Vita	Dottorando	M-PSI/01

Altro Personale	Main Research Collaborations: Timo Mäntylä (Department of Psychology, Stockholm University); Wändi Bruine de Bruin (Leeds University Business School), Andrew M. Park (RAND corporation). Lab Members: Valentina Coni (trainee / research assistant), Alessia Sassano (trainee / research assistant), Cristina Tomarchio (trainee / research assistant), Valentina Piccoli (PhD student). Alumni: Chiara Terpini, PhD, neuropsychologist (currently with a scholarship at Unità Operativa Età Evolutiva Prevenzione Handicap, Alto Isontino ASS2).

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33. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Percezione, Azione, Attenzione e Comunicazione

Descrizione	I served as - national coordinator of four COFIN-PRIN projects on color and 3D organization, visual interpolation, categorical perception, crossmodal binding; - responsible for work packages oncomfort & ergonomics and perceived quality of interiors(EcoAutobus-Industria 2015 project); - supervisor of dr. Sara Rigutti in the SHARM project on Eco-Web for FVG Industries (2013-2014); - organizer of the Fourth International Conference on Event Perception and Action (Trieste, 1987); - head of the organizing committee of the European Conference on Visual Perception (Trieste, 1999). I currently serve as - co-supervisor of dr. Francesco Marcatto (together with Donatella Ferrante) in the ASS2-UniTs project on the prevention of drinking problems in the FVG region (2013-15); - co-supervisor of dr. Cinzia Chiandetti (together with Piero Giulianini) in the DIANET outgoing project on Multimodal integration as innovative method to contrast the Louisiana red crayfish and preserve the biodiversity of the Danube river basin (2014-15); - principal investigator of the DSV-ChiaLab joint project on Typographic Legibility and Dyslexia(2014-15); - co-organizer (with Paolo Bernardis and Carlo Fantoni) of the Kanizsa Lecture and theTrieste Symposium on Perception and Cognition (1993-).
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16939
Responsabile scientifico/Coordinatore	GERBINO Walter (Scienze della Vita)

Settore ERC del gruppo:
PE8_11 - Industrial design (product design, ergonomics, man-machine interfaces...)
SH4_10 - Philosophy of mind, epistemology and logic
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BERNARDIS	Paolo	Scienze della Vita	Ricercatore	M-PSI/02
CAVALLERO	Corrado	Scienze della Vita	Prof. Ordinario	M-PSI/01
DEL MISSIER	Fabio	Scienze della Vita	Ricercatore	M-PSI/01
FANTONI	Carlo	Scienze della Vita	Ricercatore	M-PSI/01
GIULIANINI	Piero Giulio	Scienze della Vita	Ricercatore	BIO/05
AGOSTINI	Tiziano	Scienze della Vita	Prof. Ordinario	M-PSI/01
MARCATTO	Francesco	Scienze della Vita	Assegnista	M-PSI/01

Altro Personale	current collaborators include: Cristina Burani (ISTC-CNR), Teresa Farroni (University of Padua), David Pearson (University of Aberdeen, Scotland), Rob van Lier (Radboud University, Nijmegen), Cinzia Chiandetti(post-doc). Sze Chai Kwok, Elena Makovac (post doc, IRCCS Santa Lucia Foundation, Rome) Emmanouil Athanasakis, Chiara Barbiero, Rado Gorjup, Fabrizio Sors, Laura Tamburini, Pierluigi Struzzo (PhD students).

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34. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Pensiero, Memoria e decisione
	Thinking & Decision Lab current research interests include the following topics: 1. Counterfactual thinking. Research investigates (i) what kinds of couterfactual thoughts were generally produced, (ii)

Descrizione	what purposes they serve and (iii) how the thoughts of what might have been influence affect, motivation and social judgments; 2. Work-related stress. Research is aimed at (i) developing psychometric instruments for the assessment of job stress at the organizational level and (ii) exploring the relationship between work-related stress dimensions, psychological outcomes (e.g,, perceived stress, job satisfaction and job motivation) and health problems; 3. Health Promotion. Research in this field is aimed at developing and testing interactive on-line assessment and intervention for reducing risky lifestyles. Counterfactual Thinking Much of the research on counterfactual thinking, if not all, has been conducted using vignettes depicting hypothetical scenarios. Although it is typically assumed that the results obtained in these studies also apply to personally relevant counterfactual simulations, our recent studies raise questions about the extent to which the results from studies using vignettes are applicable to the process of counterfactual simulations about ones own personal life. In particular, our studies have shown that some effects that were found when participants had to think about alternative outcomes to events described in vignettes do not hold when participants have to think about alternative ways in which their own past personal events could have occurred (Girotto, Ferrante, Pighin, & Gonzalez, 2007; Pighin, Byrne, Ferrante, Gonzalez, & Girotto, 2011). Hence, our results suggest that the current accounts of counterfactual thinking offer an incomplete picture and cast doubt on the generality of the previous studies conclusions. Another recent line of research concerns the comparison between counterfactual thinking, and episodic future thinking. Ferrante, Girotto, Straga, and Walsh (2013) found that when participants thought counterfactually, their thoughts focused on uncontrollable features, whereas participants in the future condition thought about controllable features. We interpreted this asymmetry in temporal simulations as reflecting different constraints in the way each kind is deployed for strategizing about future actions. In the most recent study we replicated and extended previous finding in a more ecological setting. Athletes, who have just run a marathon, were asked to generate counterfactual or prefactual thoughts. The results showed the same temporal asymmetry. In addition, we found that focusing on training instead of other elements resulted in a greater intention to train harder for the next marathon in prefactual condition, but not in counterfactual condition (Stragà, Ferrante, Girotto, 2014). Work-related stress We have translated and validated an Italian adaptation of the HSE Management Standards Work-Related Stress Indicator Tool (HSE-MS IT), an instrument for assessing work-related stress at the organizational level, originally developed in Britain by the Health and Safety Executive. The psychometric properties of this adapted version have been extensively studied in samples composed of public and private sector employees, confirming the instruments reliability and validity (internal, construct and concurrent) (Marcatto, DErrico, Di Blas, & Ferrante, 2011; Marcatto, Colautti, Larese Filon, Luis, & Ferrante, 2014). Moreover, we have found a specific sensitivity of the HSE-MS IT scales to assess different aspects of work-related distress, including self-perception of stress at work, job satisfaction and job motivation, and to predict physical and psychological pathologies, such as gastrointestinal disorders, insomnia, anxiety and depression. These results can have practical implications for the occupational well-being of employees. Development and testing of an on-line intervention for reducing risky lifestyles There is strong evidence that screening and brief interventions are effective in reducing risks factors associated with modifiable lifestyles, such as alcohol consumption and physical inactivity. Our research in this field is aimed at developing and testing interactive on-line assessment and intervention for reducing risky lifestyles. Starting from the original British website "Down Your Drink", whose effectiveness has already been tested empirically, we have developed an Italian web site dedicated to online brief intervention in primary care for reducing alcohol consumption and the harms associated with hazardous drinking (www.itatvb.it). We have conducted an usability test of the website (heuristic evaluation and user testing, Tognolli, Marcatto, Plet, Struzzo, Wallace, & Ferrante, 2014), and its applicability in clinical practice is currently being evaluated by a research involving 40 general practitioners working in Friuli Venezia Giulia (EFAR-FVG Trial, Struzzo et al., 2013). Starting from these results, we are planning to develop a new website for testing and providing brief intervention in the following risky lifestyles: alcohol consumption, smoking, and nutrition.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/17093
Responsabile scientifico/Coordinatore	FERRANTE Donatella (Scienze della Vita)

Settore ERC del gruppo:
LS7_8 - Health services, health care research
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes
SH4_5 - Social and clinical psychology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

MARCATTO	Francesco	Scienze della Vita	Assegnista	M-PSI/01

Altro Personale	Current group members: Dr. Gabrio Toniolli (tutor, research assistant), Dr. Marta Stragà (postdoc IUAV University [Ve], research assistant),Dr. Piero Struzzo (PhD student).

35. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Percezione, Azione, Attenzione e Comunicazione
Descrizione	In my studies on the motor and perceptive systems, I try to conjugate the use of several techniques, like psychophysics, event related potentials, neurodegenerative models, and comparative studies. My activities are currently organized along 2 main lines of research: Multisensory protocols for the treatment of Parkinsons Disease In the last years Parkinson's disease rehabilitation has became a center of interest due to the lack of new drugs treatment, and because of the presence of dopamine-resistance symptoms, such as freezing of gait, postural instability, and cognitive impairment that makes rehabilitation of PD an important tool in the functional recovering and functional independence process. The aim of the project is to verify the efficacy of new treatment protocols based on the action observation technique, in which the gait and his sub-phases are treated with the use of multi-sensory stimuli. These multi-sensory stimuli are based on visual information of gait plus the sonification of the foot velocity recorded during the gait. The result is a video of gait in which the audio trace represents the velocity of feet during the gait (sonification). The treatment efficacy is evaluated with classic Parkinson Clinical Scales and through the comparison of gait kinematics before and after the treatment of patients. This project is carried out in collaboration with: Mauro Catalan, MD at the Neurology Clinic of the Trieste Hospital; the Gait Analysis Lab at the Physical Therapy School; Björn Krüger, Researcher at the Institute of Computer Science II, Bonn University. Perceptual Learning comparative studies How the adult brain adapts to important environmental changes? This is an important and debated issue in neuroscience. The brain needs to adapt to new environments, but at the same time its architecture must be protected from modification by the continual bombardment of unwanted information. The way the brain put together the need for stability and plasticity in its sensory areas is an unresolved issue. Perceptual learning in adult humans and animals refers to improvements in sensory abilities after training. In this way perceptual learning can be considered as a manifestation of plasticity in sensory cortical processes. These improvements had been thought to occur only when attention is focused on the stimuli to be learned (task-relevant learning) but recent studies demonstrate performance improvements outside the focus of attention (task-irrelevant learning). We investigate task-irrelevant visual perceptual learning using a comparative approach. In fact, our experiments involve humans and pigeons (Columba livia). This project is carried out in collaboration with: Walter Gerbino and Cinzia Chiandetti form the DLS, and the Biopsychology Department, Faculty of Psychology, Ruhr-Universität, Bochum.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/17095
Responsabile scientifico/Coordinatore	BERNARDIS Paolo (Scienze della Vita)

Settore ERC del gruppo:
LS5_11 - Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease)
SH4_3 - Neuropsychology
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BUSAN	Pierpaolo	Scienze della Vita	Assegnista	BIO/09

	Collaboratori Esterni Strutturati: Björn Krüger - Researcher, Institute of Computer Science II, Bonn University; Mauro Catalan - MD, Neurology Clinic, Ospedali Riuniti, Trieste; Nicola Bruno - Full professor, Department of Neuroscience, University of Parma; Alessia Granà - Neuropsychologist, Physical Medicine and Rehabilitation Institute, Ospedale

Altro Personale	Gervasutta, Udine. Collaboratori Post-doc: Cinzia Chiandetti, Mauro Murgia Dottorandi: Susanna Mezzarobba (advisor), Jessica Galiussi (advisor) Tirocinanti-Tesisti: Alessandra Liguori - Tirocinio e LM neuroscience; Federica Disnan - LM psicologia Alumni: Giulia Rampone PhD student in the Visual Perception Lab of the University of Liverpool, UK.

36. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Percezione, Azione, Attenzione e Comunicazione
Descrizione	Acting within the environment involves a complex interaction between visual and nonvisual information resulting from bodily states. Since actions, multisensory processing and internal states are tightly linked I studied them in a closed action/perception loop, focusing on the understanding of how sensing the body internal/external states allows humans to aid the interpretation of visual stimulation to achieve a stable and coherent representation of the world which in turn influence motor judgments. To improve measures of perception-action I develop and test computational models and integrate new technology. This is all possible at the Active Perception Laboratory where a variety of methods are used including kinematic-analysis, VR, reaction time, psychophysics, with the aid of a sophisticated rendering and motion tracking system. Our activities are organized in 3 main lines of research: Active vision: Insights on the perception of a stable world One of the real mystery of visual perception resides in the sensation of visual stability that 3D objects convey when viewed during body movements. When an observer moves, the retinal projections of 3D objects in the world change accordingly but we tend to perceive the outside world as almost stable. This investigation is aimed at understanding how the sensing of body movements allows human observers to aid the interpretation of visual stimulation in order to achieve visual stability. Previous studies suggest that the brain infers the 3D metric properties of the visual scene by combining the knowledge of the observers egomotion with retinal information in a statistically optimal fashion. We instead showed that active perception of 3D structures is far from being optimal. Such a suboptimal perception of 3D structures during head movements is accounted for by an heuristic Bayesian model ignoring extra-retinal signals from lateral head movements and relying mainly on the gradient of velocity of image projected textons (i.e., def component of the optic flow). Our team is investigating how such a model can be generalized and integrated to account for the effect of different components of head movement (i.e., rotational vs. translational) and different component of the optic flows that has been so far neglected such as the translational components as well as those components resulting from micro-head movements. The effect of the presence of occlusion on the perception of actively viewed 3D structured is also investigated in order to understand if visual completion might affect the interpretation of 3D structure by enhancing the likelihood of 3D rigid vs. non-rigid solutions. This program utilize our Active Vision Apparatus, which by means of an OPTOTRAK Certus allows for the precise localization of infrared markers that are rigidly attached to the observers head. This allows to precisely track the 3D position of the observers head. This information is transmitted in real time to PC that generates the images of 3D objects on a Hi-Res computer display. The images are generated by a program that calculates the projections of the 3D object on the monitor display, so to produce the correct visual stimulation on the observers retinas. The system also allow the reply of the exact same optic flow generated by a moving observer to an observer in an immobile position, as needed to correctly estimate the effect of non-visual information on performance. Visual 3D completion & non-visual information Biological systems recover the structure of the world by (1) picking-up projective invariants that specify 3D properties of distal objects which are partially specified in the image (Fantoni 2008), and (2) using interpolation/approximation processes to overcome spatial and temporal fragmentation due to occlusion, both at the level of contours and at the level of surfaces (Fantoni, Gerbino et al., 2003; Fantoni, Gerbino et al., 2008). Although the perception of wholes from visual fragments has traditionally been considered only as the results of the processing of sensory data, growing evidences suggest it could be a component of the actionperception cycle. Extraretinal signals from egomotion are indeed used for the interpretation of different cues to depth (Wexler, van Boxtel, 2005). Tactile exploration contributes to the disambiguation of sensory information by reducing the alternation between perceptual solutions equally compatible with the visual input (Conrad, Vitello, Noppeney, 2012). Again, the knowledge of head translation velocity is determinant for the perception of structure from motion displays as reducing the likelihood of tilt reversals (Wexler, Panerai, Lamouret, Droulez, 2001), and enhancing the sensitivity to planar surface orientation, motion and rigidity (Fantoni et al., 2010, 2012; Caudek et al., 2011; Fantoni, Caudek et al., 2014). One of the new frontiers of vision sciences thus coincides with the development of innovative new probes of human behaviour - as based on the usage of the Active Vision Apparatus - allowing for the systematic study of how the perception of 3D visual fragments and their unification are affected by non-visual information, i.e., extraretinal signals from egomotion, proprioception from harm movements and tactile stimulation. The main objective of the program is to overcome the restrictions of the traditional approach to visual completion based on the passive observer while focusing on the active observer. Empirical evidences will be provided to support the necessity to develop a new theory of functional wholes that re-asserts the primacy of embodiment, development, and interaction in cognitive systems. Two innovative behavioural measures are being tested to this aims: (1) probing of amodally completed dihedral angles during pointing with congruent/incongruent visuo-haptic information; (2) rigidity detection task with twisted patched viewed during active vs. passive vision in presence/absence of occluding surfaces.

	Action for perception: Insights on how goal directed actions impact perception and vice-versa Classic research on prehensile movements focused on the role of vision for the control of fundamental motor action that humans perform with great dexterity, such as reaching and grasping (Goodale, Milner, Jakobson, & Carey, 1991). On the other hand, 3D vision has traditionally been considered as an optimal cue integration process of sensory data leading into an almost metric 3D representation of the environment. Some recent works from my Lab are challenging these views as showing that hand proprioception induced by congruent/incongruent visuomotor adaptation might alter basic perceived features of objects, such as shape, position, and size as well as tactile sensitivity (Volcic et al., 2013). Furthermore we have recently discovered that the perceived quality of our global experience of the environment can be modulated by the valence of the action we perform. This result provide a first evidence that expressive qualities of the social environment can be altered by subjective feelings associated to motor actions (Fantoni & Gerbino, 2014). This program thus seeks to broaden both leading views on vision and motor control by providing and testing evidences showing that: (1) goal directed actions are not only visually driven but also emotionally and socially driven; (2) visual perception is not only stimulus dependent but also action as well as emotion dependent. The way in which different kinds of perceptual alterations (both visual and tactile) are induced by motor information will be further tested through our novel Motor Action Mood Induction Procedure - MAMIP - (Fantoni & Gerbino, in press) and Visuomotor Adaptation Techniques combined with behavioural and Event-Related Potentials measures. This is necessary for the ultimate understanding of how the effects of visuo-motor recalibration on tactile sensitivity are represented into the brain (collaboration with the DSV research group of Piero Paolo Battaglini).
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/17097
Responsabile scientifico/Coordinatore	FANTONI Carlo (Scienze della Vita)

Settore ERC del gruppo:
PE6_12 - Scientific computing, simulation and modelling tools
SH2_10 - Communication networks, media, information society
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BUSAN	Pierpaolo	Scienze della Vita	Assegnista	BIO/09
GALLINA	Paolo	Ingegneria e Architettura	Prof. Associato	ING-IND/13
RIGUTTI	Sara	Scienze della Vita	Assegnista	M-PSI/01
SOMMACAL	Elena	Scienze della Vita	Dottorando	M-PSI/05

Altro Personale	Collaboratori Post-doc: Joanna Jarmolowska. Dottorandi: Laura Tamburini (co-advisor). Tirocinanti-Tesisti: Maria di Vece - Tirocinio e LM neuroscience, Luca Ianza - LM psicologia. Collaboratori Esterni Strutturati: Fulvio Domini, professor Brown University, Senior Researcher IIT@UNITN; Robert Volcic, senior post-doc IIT@UNITN; Carlo Nicolini, scientific programmer, senior technician, IIT@UNITN, PhD student University of Verona; Corrado Caudek, associate professor University of Florence; David Pearson, Lecturer Aberdeen University. Alumni: Elena Milani - Research Assistant, Master degree - Postgraduate Master School in Science Communication (Padova); Matteo Manzini - Research Assistant, Bachelor degree - Master Student at the University of Padova, Department of Psychology; Eddie Valvason - Bachelor degree - Project Engineer at VI-Grade.

37. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Afasia: diagnosi e approcci terapeutici
	Research activity of the Neuropsychology and NPS Rehabilitation Laboratory at the Dpt of Life Sciences a) neuropsychology of communicative deficit in brain damaged adults b) neuropsychology of high functional autism c) rehabilitation of communicative deficit in aphasic adults d) visuo-lexical therapy for developmental and aphasic dysgraphia. Research carried out in the Neuropsychology and Rehabilitation Lab at the Department of Life Sciences of the University of Trieste includes the following topics: 1) Discourse assessment in aphasic adults and dementia 2) Referential Communication Task and coverbal gestures in the assessment of communicative deficit in brain damaged adults; 3) Neuropsychology of high functional autism,

Descrizione	4) Cognitive approaches to rehabilitation of developmental and aphasic dysgraphia. Effects of visuolexical training in developmental dysgraphia In this project, we investigate effects self-administered therapy programs in communicatively impaired individuals with developmental dysgraphia or semantic dementia. These studies include collaboration with Clinical services of the FVG-ASS1 and the IRCSS Santalucia Foundation in Rome (prof G.A. Carlesimo) for single case studies of semantic dementia and with Neuropsichiatric Services for Children of ASS-1 FVG (dr Dionis and dr Vidoni) for studies on developmental dysgraphia therapy. The project takes advantage from a collaboration with the dr Cristina Burani, senior researcher of the ISTC-CNR Rome for ad-hoc organisation of treatment and assessment materials. Two pilot studies have been conducted involving respectively a person with semantic dementia and a group of children with developmental dysgraphia. Referential communication and gestures in severe aphasia The aim of this research project is to better understand the pattern of referencing activities in severely impaired individuals with aphasia. Their gestures are analysed following new methodology including analysis of gesture semantic content. Published papers are available. New studies on the functional role of gestural cues in the communication of these subjects are ongoing with the collaboration of prof S. Chieffi (seconda Università di Napoli). High functioning autism and savant syndrome: underlying processes and assessment We extensively examinate calendar calculators abilities in high-functioning autistic persons. The results indicate that hypermnesia (past dates) and using calculation algorithms (future dates) may explain his performance. These results are now analysed in the framework of current paradigms for studying autistic disorders with the collaboration of prof. A. Iavarone (Stroke Unit, ASS-Napoli1). Discourse in Frontotemporal Dementia, Progressive Non-fluent Aphasia and Semantic Dementia. We extensively examinate by multilevel discourse analysis methods elicited narratives from these subjects in order to evaluate macro- and micro-linguistic organisation of their narrative discourse. This would provide an interesting framework for analysing relationships between semantic organization of discourse and cognition. Papers on the discourse analysis methods are available. The project takes advantage from the collaboration of dr A. Marini, assistant Researcher of the University of Udine.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16945
Responsabile scientifico/Coordinatore	CARLOMAGNO Sergio (Scienze della Vita)

Settore ERC del gruppo:
SH4_3 - Neuropsychology
SH4_8 - Psycholinguistics and neurolinguistics: acquisition and knowledge of language, language pathologies
SH4_9 - Use of language: pragmatics, sociolinguistics, discourse analysis, second language teaching and learning, lexicography, terminology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

Altro Personale	Collaborators: Cristina Burani (senior researcher, ISTC-CNR); Andrea Marini (research collaborator); Sergio Chieffi (research collaborator); Alessandro Iavarone (research collaborator).

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38. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Valutazione quantitativa della personalita e disegni di ricerca multivariati
	Currently, research interests of prof. Di Blas and her collaborators are focused on personality development in school years and personality assessment from between-people and within-people approaches. As to personality development, her research investigates how 6- to 10-year-old childrens self-views are associated to relevant people around them across time. Via longitudinal studies, the main purpose of her research is to better understand to what extent the development of childrens self-concepts is sensitive to how other people perceive the children. A related line of research deals with personality development in adolescence. Via the psycholexical approach, her work is intended to explore and define possible salient personality domains which are age-emic and therefore relevant for better understanding how adolescents view themselves and how these age-specific domains account for a (dis)adaptive development from adolescence to young adulthood.

Descrizione	Personality assessment techniques from a within-person approach are examined also in relation to findings from a between-people approach, in order to better understand how the main underlying theories (trait theories and social-cognitive theories) may be combined theoretically. Personality development in elementary-school years More and more attention has been focused on how personality develops from childhood to old age. Different quantitative indices coherently suggest that personality traits tend to be rather stable across years, though there is significant room for change as well at all ages. Longitudinal designs have also revealed how person and environment actively work and interact to favour stability or change of personality. As to childhood, most research is based on parents reports on their children personality, whereas less in known on personality development when childrens self- and peer view are analysed. Our research is aimed at investigating how childrens personality develops across elementary school years. In our longitudinal studies, we adopt a multi-rater perspective and analyze how childrens self-views change in function of the perceptions that peers and adults have of the children. Specifically, we examine to what extent others perceptions represent antecedents of changes in childrens self-views and to what extent change levels in personality ratings of different informants on the target child are associated. Our preliminary findings show that childrens ratings of their characteristics are rather stable in younger as well as older children; they also show that children are sensitive to others perceptions and their changes in self-views are correlated to peers as well as adults ratings, at different extents across different domains of their personality. Our research contributes towards revealing which personality domains are more susceptible to change and possible interpersonal mechanisms underlying the development of childrens self-perceptions. Personality development in adolescence Adolescence represents an age of important changes and leads to adulthood. In these years, personality traits development has been largely investigated by adopting personality domains emerged in adulthood. Bottom-up studies on self-concept in adolescence have however demonstrated coherently that specific domains characterize this age; moreover, adolescents are concerned with peculiar developmental tasks and risk-taking behaviours are salient to them. Our research project is aimed at exploring personality development in adolescence by using an age-emic approach, that is, by first defining and then adopting personality domains that are relevant for adolescents. Via psycholexical studies, we mapped personality dimensions and their sub-components from the perspective of adolescents. Our preliminary findings showed that the way domains and sub-domains are organized in adolescence only partially reflects personality taxonomies in adulthood. Control of cognitive and behavioural impulses are of special relevance in adolescence, together with physical appearance. More is to be investigated on how these categories develop across time and whether they represent significant antecedents of dysfunctional behaviours and self-representations in adolescence. Attention is also given to the role of perceived and received parental support in adolescence. We developed a measure of parental support in agreement with the interpersonal circumplex model. Our cross-sectional results show that support linked to resources of love, but not power, is a strong predictor of several indicators of self-reported emotional and behavioural difficulties in adolescents. Personality assessment via within-person and between-person approaches In the last years, social-cognitive theories has openly challenged between-people trait approaches on their theoretical assumptions as well as on their utility in empirical advances in personality research. Strong emphasis has been given to within-person approaches for understanding and mechanisms underlying personality functioning and coherence. The so-called KAPA model proposes a peculiar assessment procedure aimed at evaluating personal constructs of the single and how these (self-) schemata determine contextualized appraisals of observable behaviors. Such an assessment procedure reveals within-person behavior variability across contexts in function of how people believe a schematic quality can favor / hinder a successful performance. We are adopting the KAPA assessment procedure to evaluate its tenability across different domains; moreover, we are analyzing whether a traditional between-people assessment procedure can account for additional variability in peoples appraisals of their self-efficacy across different situations.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16955
Responsabile scientifico/Coordinatore	DI BLAS Lisa (Scienze della Vita)

Settore ERC del gruppo:
SH4_2 - Human life-span development
SH4_5 - Social and clinical psychology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore

CINCO	Riccardo	Scienze della Vita	Dottorando	M-PSI/03

Altro Personale	Francesca dOrlando, Ph.D, Psychoterapist

39. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Psicologia sociale e delle comunità
Descrizione	Here is a synthesis of the main research activities carried out at present time in the Laboratory of Social and Community Psychology (LSCP). Violence and health: analyzing gender differences. In a large cross-sectional study with a University students sample, we analyze the frequency of different types of violence (Sexual violence, Intimate Partner Violence, Sexual harassment) and their impact on health (symptoms of depression, anxiety; psychoactive drugs use; eating disorders), separately for young women and men. In the female sample, also the impact of violence on menstrual disturbances is analyzed. Study design, data collection and analyses are being carried out in collaboration with F.Bastiani, C.Cedolin, R.Pisacane, and L.Beltramini (see Persone for the affiliations). Dr. M.J.Saurel-Cubizolles (INSERM, Paris) and Prof. Vicenta Escribà (CSISP, Valencia) will collaborate to the analyses. Results will be shared and discussed with the Head of the Servizio Psicologico di Ateneo, Dr. Micaela Crisma, and will become tools for preventive and therapeutic interventions. Being a feminist: associated factors and consequences on couple relationship. In this study, with a large sample of students, we investigate the correlates and the meaning of being a feminist, for male and for female young persons, and the associations between identifying themselves as feminist and the quality of couple relationships. F.Bastiani, C.Cedolin, R.Pisacane, L.Beltramini (see Persone for the affiliations), and Prof. L.Di Blas (DSV) collaborate to the study. The predictors of escaping violence: a two-years follow-up of women who sought help at an Anti-Violence Centre (AVC). In a preliminary study (with L.Beltramini e L.Pomicino), we analyzed the data from an Italian AVC, showing that for many women, the ending of the relationship does not mean the ending of violence. In the present study (that constitutes the PhD research of F.Bastiani), data will be collected prospectively (at AVCs intake with Questionnaire 1 and two years later with Questionnaire 2) on a large sample of women attending four AVC in northern Italy. Results will make possible to discover which factors psychological, social, linked to the characteristics of violence- promote the escape from violence or, on the opposite, represent risk-factors for its continuation. We will also analyze the associations between specific typologies of violence and specific health symptoms, and the intervening role of womens psychological and social characteristics. Beside F.Bastiani, collaborate to the study, M.C.Feresin, R.Pisacane, and L.Beltramini (see Persone for the affiliations), Prof. F.Larese (DSM, University of Trieste), and Prof. J.M.Turan, School of Public Health, University of Alabama at Birmingham, USA. The results have the potential for becoming useful tools in the development of social policies and for the training of health and social workers in the field of gender-based violence. Pornography and prostitution: scientific results and social controversies. With Lucia Beltramini, we carried out several studies, analyzing the exposure to pornography among young people and the factors specifically associated with the exposure to violent material. Presently, we are carrying out a thorough review of the literature on prostitution, as a preparatory work for an empirical study. Interventions to prevent violence and promote Equal Opportunities among adolescents and children. Researchers at the Laboratory have developed and implemented the first Italian Web-site (Scelgo il rispetto! www.units.it/noalla violenza/) aimed to inform young people as well as parents and teachers about violence and the ways to stop it. The sites contents are based on the results of a study with a large sample of adolescents; a sites preliminary version was tested with focus groups with adolescents. Presently, another project is in progress: Il gioco del rispetto (Play with respect), in collaboration with several grassroots Associations. The project aims to evaluate the implementation and the effects of an intervention to promote the basis of Gender parity among pre-school children.

	To the development of the web-site Scelgo il rispetto! have collaborated L.Beltramini, D.Paci and L.Pomicino. The project Il gioco del rispetto is developed by L.Beltramini, D.Paci and B.Gargiulo. Projects pending grants confirmation Gender-based violence against older women Older women, too, may be victims of violence inflicted by their partners. Little is known about these womens health, about the influence past or present violence may have had upon their health, and about the caring work that some women may paradoxically find themselves taking on with regard to their violent partners. Aims of this qualitative study are to look at the experiences of a sample group of elderly women who have suffered violence, at their state of health and at the possible conflicts connected to their caring work, while at the same time performing a parallel analysis of the beliefs and expectations of relatives and health-care workers. A further aim is to develop indicators, which will enable health-care workers to identify these situations promptly and provide an adequate response. Violence against women and Emergency Health Services: a controlled trial to compare different training programs for health workers Violence against Women (VaW) has a significant impact on victims mental health, and health-care providers are likely to be the victims first professional contact. This is a clustered randomized, controlled trial comparing professionals working in 3 Emergency Departments (EDs), in 3 different conditions: Group 1 will receive an in-person group training on VaW by instructors; Group 2 will be provided training with the same contents as Group 1 but via an e-learning procedure; and Group 3 will not receive either of the trainings. The primary endpoint will be the difference in the number of violence cases registered in the medical records of the participating EDs, in the year after the trainings compared with the previous year. Secondary endpoints will include: number of women referred to local anti-violence centres, score changes at the Attitudes Towards Survivors of Intimate Partner Violence (ATSI) survey, and the cost-effectiveness of the training programmes. Validation procedures for the Italian ATSI survey will also be conducted. (Bando giovani Ricercatori, Ministero della salute) Collaborators: Laura Pomicino, IRCCS San Giovanni di Dio Fatebenefratelli (Brescia).
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16957
Responsabile scientifico/Coordinatore	ROMITO Patrizia (Scienze della Vita)

Settore ERC del gruppo:
LS7_9 - Public health and epidemiology
SH2_6 - Violence, conflict and conflict resolution
SH4_5 - Social and clinical psychology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
DI BLAS	Lisa	Scienze della Vita	Prof. Associato	M-PSI/03
LARESE FILON	Francesca	Scienze Mediche, Chirurgiche e della Salute	Prof. Associato	MED/44

Altro Personale	Current group members: Federica Bastiani, PhD Student; Pierre Guillaume Prigent, PhD Student (tesi in co-tutela, with the Université Européenne de Bretagne); Mariachiara Feresin, Graduate student; Rossella Pisacane, Graduate student. Collaborators: Lucia Beltramini, Ph.D, Psychologist, and Disability Service, University of Trieste; Laura Pomicino, Ph.D, Psychoterapist, IRCCS Burlo Garofolo; Marie-Josèphe Saurel-Cubizolles, PhD, Researcher, INSERM, Paris; Vicenta Escribà, Associate Professor, University of Valencia and Servei de Promoció de la Salut, Direcció General de Salut Pública, Valencia, Spain; Janet M.Turan, Associate Professor, School of Public Health, University of Alabama at Birmingham, USA.

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40. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Differenze individuali nelle abilita e difficolta di apprendimento
	The main goal of the research group coordinated by Professor Maria Chiara Passolunghi is to explore the relationship

Descrizione	between working memory and learning. More in particular we focus on precursors of mathematical ability and disability and on the development of working memory trainings and number sense trainings for preschool children and children with intellectual disabilities. On the other hand we are also interested in the investigation of the emotional-motivational and personality factors that may have a significant influence in the development of learning disabilities. The research in the last two years has been founded by the University of Trieste (FRA grant 2012 "Influence of cognitive factors and stereotypes on mathematical learning in school-aged children") and by Municipality of Trieste (project Ricreiamoci). Precursors of mathematical learning: identification and training The present research is aimed to the creation of a theoretical model that allows the identification of relationships between domain specific and domain general precursors of early mathematical skills in children from kindergarten to second grade. We will attempt to identify which abilities are stronger predictors of math learning in kindergarten and in first and second grade of primary school. Different studies indeed focused on single factors without take into account a more complete model (Hecht, Torgesen, Wagner, & Rashotte, Krajewski & Schneider, 2009; De Smedt et al. 2009). Furthermore, some doubts linger regarding which components of the working memory are more involved in the development of primary mathematics skills (Passolunghi & Mammarella, 2010; Swanson & Sachse-Lee, 2001). On the other hand, the aspect of number sense is less investigated and there isn't agreement in relation of its involvement in formal math learning (Gilmore et al., 2010; Halberda et al., 2008; Mazzocco et al., 2011). The detection of the more relevant precursors is essential because their early monitoring allows the identification of children who can develop a math learning disability. Finally, on the bases of this model, we will set out different training procedures thus observing which of them can lead to the best improvements in math learning (Holmes, Gathercole and Dunning 2009; Thorell et al., 2009; Gestern et al., 2005). The possible positive transfer effect of training procedures to basic mathematical skills of children could demonstrate that is possible to intervene in preschool years with children considered at risk to develop mathematical learning disabilities. Mathgender stereotypes Differences between males and females in mathematical ability are one of the oldest established findings in the area of gender differences (Kimura, 1999). Despite the abundant research on this phenomenon, its causes and the age at which it appears remain unclear (Gallagher & Kaufman, 2005). Gender stereotypes that emphasize the conception that males are more competent in mathematics than females can greatly impact girls and women by impairing their math performance (Spencer, Steele, & Quinn, 1999) and math learning (Appel, Kronberger, & Aronson, 2011), and causing them to devalue their actual math ability while also placing less value on math success (Eccles, 2011). Despite this evidence, relatively few studies have examined mathgender stereotypes from childhood through early adolescence, and few works have investigated the relation between mathgender stereotypes and math-related beliefs in primary- and middle-school children. The present research project investigates gender stereotypes about math and fall under three main research themes: (a) Emergence and development of gender differences in mathematical ability (b) The presence of gender differences in mathematics performance (c) The presence of differences in attitudes toward mathematics between males and females (d) A conjunction of many factors that contribute to these differences (e.g. Math Anxiety) ANS abilities in preschool children The approximate number system (ANS) is a noisy, imprecise, non-verbal system that allows discrimination of large numerosities without counting or numerical symbols. Numerous studies have found positive correlations between the acuity of the ANS in preschoolers and their mathematical abilities (Gilmore, McCarthy, & Spelke, 2010; Libertus, Odic, & Halberda, 2012; Mazzocco, Feigenson & Halberda, 2011). It has also been argued that domain general abilities mediate the relationship between ANS acuity and mathematical abilities. In particular, some studies demonstrated that working memory abilities, underlie nonsymbolic approximate addition processing (Barth et al. 2006; Rasmussen & Bisanz, 2005; Xenidou- Dervou, van Lieshout, van der Schootalready, 2013) suggesting that individual differences in approximation skills can be explained by individual differences in WM capacity. The fact that ANS abilities might drive mathematical abilities later on in life is a good start for interventions and training programmes. There are currently a number of mathematical programmes available that are aimed at preschoolers (Right Start: Cotter, 2000; Number Worlds: Griffin, 2004; Big Math for little kids: Greenes, Ginsburg & Balfanz, 2004). However, most of these focus on counting and symbolic mathematical knowledge rather than ANS abilities per se. It is thus unclear whether ANS abilities can be improved in preschool and whether improving ANS abilities can result in better number abilities at a young age. The present research project is a collaboration between the Univeristy of Trieste and The Kingston University of London (Dr Jo Van Herwegen). The aim of the current study is to investigate whether playing PLUS (preschool number learning scheme) games that target the ANS system on a daily basis would improve preschool childrens ANS abilities. The results from the prior study carried out in UK showed that, playing PLUS games that target ANS abilities each day for five weeks improved childrens ANS abilities, as well as their counting, and their non-verbal working memory abilities immediately post training, and their overall mathematical abilities five weeks later at follow-up. These findings stress the importance of performing estimation and guessing activities during preschool years in order to promote the development of early numeracy abilities underlying mathematical learning.
Sito web	http://dsv.units.it/it/ricerca/ambiti/psicologia?q=it/node/16949
Responsabile scientifico/Coordinatore	PASSOLUNGHI Maria Chiara (Scienze della Vita)

Settore ERC del gruppo:
SH4_2 - Human life-span development
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
COSTA	Hiwet Mariam	Scienze della Vita	Dottorando	M-PSI/04

41. Scheda inserita da questa Struttura ("Scienze della Vita"):

Nome gruppo*	Genomica applica e comparata
Descrizione	Our research focuses on the comparative genomics of the animal immune system. Diversity at immune genes is necessary for long term survival of species, populations and individuals. Our research will largely exploit the analysis of next generation sequence data, including transcriptome assembly and annotation, sequence homology predictions and phylogenetic analyses. Most of our research focuses on the early natural history of the invertebrate innate immune system (Bivalves and Crustaceans), with particular attention given to the genetics of antimicrobial peptides (AMP), pathogen receptors (PRR) and the relative signal transduction. Our long standing expertise on genomic data management paved the way for long term collaborations with colleagues interested in the comparative genomics of vertebrates, in particular fishes. Part of our team is contributing to the study of human autoimmunity with the mass sequence analysis of antigen/antibody interaction identified with phage display analysis. Genomics of bivalve immunity (Researchers involved: Alberto Pallavicini, Marco Gerdol) The evolution of innate defense systems exposes the never-ending race to arms between animal hosts and more quickly evolving pathogenic microorganisms. Coastal waters are subject to relevant changes in temperature, salinity and oxygen availability due to seasonal variations, which can result in significant alterations of the microbial communities, occasionally leading to an increased presence of bacteria and to harmful algal blooms. In addition, costal marine waters are among the most heavily impacted environments by anthropic activities and pollution by heavy metals, fertilizers, hydrocarbons, etc. Marine filter-feeding bivalve mollusks have developed specific defense strategies to deal with these potential hazards. In particular the mussel Mytilus galloprovincialis, an important seafood in the Mediterranean area, is relatively tolerant to a wide range of pathogens and environmental changes, thus being often selected as a sentinel species in ecotoxicological investigations. However, even though mortality events caused by infective agents and parasites apparently occur less frequently in mussels than in other bivalves, the molecular bases of such tolerance are unknown. The main aim of this project is to elucidate the molecular players involved in the bivalve immune response, using a combination of classical molecular biology techniques and omic approaches. This topic is of particular interest in invertebrates, which are organisms unable to mount long-term responses due to the lack of an adaptive immune system. The application of next generation sequencing technologies to the study of mussel transcriptome has already permitted to evidence that massive events of gene family expansion and the fast diversification rate of immune receptors and effectors are essential for pathogen sensing and targeting in this species. The main lines of research in this project concern the in depth study of the variability and the regulation of mussel pattern recognition receptors (PRRs), antimicrobial peptides (AMPs) and of the signal transduction pathways involved in the bivalve innate immune response to bacteria, viruses and other parasites. On the other hand, the available genome of the Pacific oyster Crassostrea gigas comparatively offers an opportunity for the study of the same topic in a species which is in turn rather susceptible to pathogen-associated mass mortalities. Comparative and evolutionary genomics (Researchers involved: Alberto Pallavicini, Marco Gerdol) The increasing accessibility of next generation sequencing technologies now permits the analysis of non-model organisms which have been so far almost completely neglected in genetic and genomic studies due to a series of heterogeneous factors including excessive costs, huge genome sizes and difficult maintenance of specimen in laboratory conditions. Owing to the demolition of these technical barriers, in the past few years our laboratory moved towards the study of species of high importance in the field of evolutionary biology. These include coelacanths, living fossils thought to be extinct and rediscovered only in the late 30s, which are believed to cover a key position at the basis of the tetrapod evolutionary tree. In 2013 we sequenced and assembled the transcriptome of the Indonsian coelacanth Latimeria menadoensis, a resource which was fundamental in the genome annotation process of its sister species, the African

	coelacanth Latimeria chalumnae. Not just limited to transcriptomic analysis, this line of research permitted to the study of different aspects of coelacanth biology and evolution, including sex determination, purine metabolism and the activity of transposable elements and atypical RNAs. At the present time our study is focused on the lungfish Protopterus annectens, which has been clarified as the most likely true ancestor of tetrapods by the coelacanth genome paper. Besides coelacanths, other species of interest in the field of evolutionary and comparative genomics are those adapted to extreme environments, such as Antarctic notothenioid fishes which have developed peculiar strategies to cope with freezing water temperatures, and more common fishes of great commercial importance in aquaculture, such as the seabass Dicentrachus labrax, which we have recently analyzed by RNA-seq to identify T-cell specific transcripts which might play a fundamental role in fish innate and acquired immune responses. In the frame of the coffee genome initiative we are involved in the transcriptome definition and on the comparative analysis of gene involved in biochemical pathways of peculiar interest like caffeine, chlorogenic acids, monoterpene synthases and aquaporins. Prokaryotic and eukaryotic metabarcoding (Researchers involved: Alberto Pallavicini and Fiorella Florian) DNA metabarcoding refers to the automated identification of multiple species from a single bulk sample containing entire organisms or from a single environmental sample containing degraded DNA (soil, water, faeces, skin, etc.). Our unit works on the definition of the microbial community of aquacultured bivalves but also, in collaboration with ecologists, on samples of different marine niches for the ecological assessment of microbial and zooplakton communities. Moreover these techniques are applied to explore human-microbes interactions. Humans live in constant association with microbes that are present on surfaces and in cavities of the human body, and even within our cells. The number of our microbial companions exceeds by at least ten-fold those of cells of our own body and the number of unique genes they encode is at least 100-fold greater than the number of genes in our own genome. This complex and dynamic microbiota has a profound influence on physiology, nutrition, immunity and development and disruptions in these human-associated microbial communities are a significant factor in many diseases. Defining the dynamic microbial diversity represents the next frontier of genomics. In this contest bacterial metabarcoding analysis are ongoing for gut, vaginal and tooth samples linked to different pathologies.
Sito web	http://dsv.units.it/it/ricerca/ambiti/biologia-ambientale?q=it/node/18399
Responsabile scientifico/Coordinatore	PALLAVICINI Alberto (Scienze della Vita)

Settore ERC del gruppo:
LS2_1 - Genomics, comparative genomics, functional genomics
LS2_2 - Transcriptomics
LS8_3 - Systems evolution, biological adaptation, phylogenetics, systematics, comparative biology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BERTUCCI MARESCA	Victoria	Scienze della Vita	Dottorando	BIO/18
EDOMI	Paolo	Scienze della Vita	Ricercatore	BIO/18
FLORIAN	Fiorella	Scienze della Vita	Ricercatore	BIO/06
GERDOL	Marco	Scienze della Vita	Assegnista	BIO/18
TORBOLI	Valentina	Scienze della Vita	Dottorando	BIO/18

Altro Personale	Alumni Simeone Dal Monego, Bioinformatics, Cluster in Molecular Biomedicine CBM, (TS-Italy); Elisa Asquini, Plant genomics, Fondazione Mach, San Michele allAdige (TN-Italy); Renè Dreos, Bioinformatics, Renè Dreos, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Debora Gasperini, Plant genomics, University of Lausanne (Switzerland); Barbara De Nardi, Plant genomics, Agricultural Research Council CRA-VIT, Conegliano (TV-Italy).

42. Scheda inserita da altra Struttura ("Scienze Mediche, Chirurgiche e della Salute"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Gruppo di Ricerca sui Gender Dysphoria

Descrizione	Studio clinico multidisciplinare
Sito web	
Responsabile scientifico/Coordinatore	TROMBETTA Carlo (Scienze Mediche, Chirurgiche e della Salute)

Settore ERC del gruppo:
LS4_3 - Endocrinology
LS5_12 - Psychiatric disorders (e.g. schizophrenia, autism, Tourettes syndrome, obsessive compulsive disorder, depression, bipolar disorder, attention deficit hyperactivity disorder
LS6_11 - Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)
LS7_2 - Diagnostic tools (e.g. genetic, imaging)
LS7_9 - Public health and epidemiology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BERTOLOTTO	Michele	Scienze Mediche, Chirurgiche e della Salute	Ricercatore	MED/36
FABRIS	Francesco	Matematica e Geoscienze	Prof. Associato	INF/01
GERBINO	Walter	Scienze della Vita	Prof. Ordinario	M-PSI/01
LUZZATI	Roberto	Scienze Mediche, Chirurgiche e della Salute	Prof. Associato	MED/17
PASCOLO-FABRICI	Elisabetta	Scienze Mediche, Chirurgiche e della Salute	Ricercatore	MED/25

Altro Personale	1) BERGAMINI Pier Riccardo, Responsabile Struttura Semplice Deontologia e Responsabilita Professionale, Azienza per i Servizi Sanitari n.1 "Triestina"; 2) BOBICH Giorgia, Psicologa, Trieste 3) CAVALLINO Maria Francesca, psicologa e psicoterapeuta, Associazione Italiana per l'Educazione Demografica (AIED), sede di Genova; 4) CIAMPALINI Stefano, urologo, Associazione Italiana per l'Educazione Demografica (AIED), sede di Udine; 5) CICILIATO Stefano, urologo, Associazione Italiana per l'Educazione Demografica (AIED), sede di Udine; 6) SCATI Laura, psicologa e psicoterapeuta, Associazione Italiana per l'Educazione Demografica (AIED), sede di Pordenone; 7) BARBONE Fabio, professore associato, Settore SSD: MED/42, Scienze Mediche e Biologiche, Università degli Studi di Udine

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43. Scheda inserita da altra Struttura ("Scienze Mediche, Chirurgiche e della Salute"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Gruppo Senologico Triestino
Descrizione	Il gruppo universitario di ricerca in senologia, afferente al Dipartimento SM costituisce il Core della Unità Interaziendale di Senologia, del programma di Screening Mammografico (responsabile prof. Zanconati), dellUnità di Chirugia Senologica (responsabile prof.ssa Bortul) nonché costituisce il nucleo di riferimento della Breast Unit (coordinatore prof. Arnez). Il gruppo si riunisce con cadenza settimanale (tutti i lunedì alle ore 15.00) con la discussione di casi clinici e periodici audit clinici e discussioni di problematiche specifiche emerse nel corso della settimana precedente. Il gruppo partecipa inoltre in maniera attiva ad eventi nazionali ed internazionali pertinenti la patologia senologica in collaborazione strettissima con personale strutturato di altri dipartimenti ed il personale sanitario. In tale ambito sono stati presentati numerosi lavori presentati sotto forma di poster o comunicazioni orale durante i congressi di Anatomia Patologica, i congressi europei di anatomia patologica, le riunioni periodiche del GISMa (Gruppo Italiano Screening Mammografico). Il gruppo comprende la figura del data manager (dott.ssa Fabiola Giudici assegnista di ricerca presso il Dipartimento) che si occupa di coordinare ed informatizzare la raccolta dati popolando ed aggiornando giornalmente il data base informatico locale (attivo dal 2000 su iniziativa coordinata tra il prof. Zanconati ed il prof. Torelli del Dipartimento di Matematica che attualmente raccoglie oltre 15.000 pazienti di cui il 30% risultati affetti da neoplasia maligna della mammella. Sono state inoltre promosse attività collaborative con le associazioni di volontariato (LILT Lega Tumori di Trieste) che hanno permesso di curare la presentazione scientifica dei dati raccolti mediante interviste dirette o mediante la somministrazione di questionari dedicati utili per lanalisi degli stili di vita, per la valutazione del grado di rischio di sviluppo del carcinoma familiare, per il monitoraggio costante degli obiettivi di qualità nei vari campi del percorso multidisciplinare con particolare riguardo alla diagnostica radiologica e citoistopatologica, al turn-round time, agli indicatori di performance della chirurgia oncologica e della chirurgia ricostruttiva plastica, delle terapie e dei follow-up. E stato possibile aderire a studi nazionali (studio tripli negativi coordinato dal prof. Giannino Del Sal) e partecipazione a programmi di sperimentazione clinica e di didattica multidisciplinare. E in programma lattivazione presso la Sede di Trieste della Scuola di Specializzazione in Anatomia patologica del diploma supplement in senologia.
Sito web	
Responsabile scientifico/Coordinatore	ZANCONATI Fabrizio (Scienze Mediche, Chirurgiche e della Salute)

Settore ERC del gruppo:
LS7_2 - Diagnostic tools (e.g. genetic, imaging)

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BONIFACIO	Teresa	Scienze della Vita	Dottorando	M-PSI/05
BORTUL	Marina	Scienze Mediche, Chirurgiche e della Salute	Prof. Associato	MED/18
COVA	Maria Assunta	Scienze Mediche, Chirurgiche e della Salute	Prof. Ordinario	MED/36
GIUDICI	Fabiola	Scienze Mediche, Chirurgiche e della Salute	Assegnista	MED/08
GRASSI	Gabriele	Scienze della Vita	Prof. Associato	BIO/12
LONGO	Renata	Fisica	Prof. Associato	FIS/07
ARFELLI	Fulvia	Fisica	Prof. Associato	FIS/07
RIGON	Luigi	Fisica	Ricercatore	FIS/01
ARNEZ	Zoran Marij	Scienze Mediche, Chirurgiche e della Salute	Prof. Ordinario	MED/19
RIZZARDI	Clara	Scienze Mediche, Chirurgiche e della Salute	Ricercatore	MED/08
SCAGGIANTE	Bruna	Scienze della Vita	Ricercatore	BIO/11
TORELLI	Lucio	Matematica e Geoscienze	Prof. Associato	MED/01

Altro Personale	1) BOTTIN Cristina (BTTCST70C59L424P) Categoria C - Area socio-sanitaria - Scienze Mediche, Chirurgiche e della Salute; 2) TROMBA Giuliana (TRMGLN59P63L424L) Elettra-Sincrotone, Trieste; 3) PONTI Antonio, Centro di Prevenzione Oncologica, Azienda Ospedaliero Universitaria "Città della Salute e della Scienza" di Torino; 4) PELLIS Giorgio, Casa di Cura "Sanatorio Triestino"; 5) DE MORPURGO Pierluigi, Casa di Cura "Sanatorio Triestino"; 6) PETZ Giorgio, Consulente Servizio di Radiologia, Casa di Cura "Salus", Trieste; 7) ABBONA Michela, Responsabile Servizio di Radiologia, Casa di Cura "Salus", Trieste; 8) ZANIER Loris, Direttore del Servizio epidemiologia e flussi informativi - Direzione centrale salute, integrazione sociosanitaria, politiche sociali e famiglia, Regione Autonoma Friuli Venezia Giulia; 9) FRANZO Antonella, Responsabile aziendale screening oncologici, Azienda per i Servizi Sanitari n.6 "Friuli Occidentale"; 10) LIZZA Nicola, Responsabile Chirurgia, Casa di Cura "Sanatorio Triestino"; 11) TONUTTI Maura, Dipartimento di Diagnostica per Immagini (struttura complessa di Radiologia-Cattinara), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 12) MAKUC Elisa, Dipartimento di Diagnostica per Immagini (struttura complessa di Radiologia-Cattinara), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 13) CRESSA Cristina, Dipartimento di Diagnostica per Immagini (struttura complessa di Radiologia-Maggiore), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 14) ASSANTE Martina, Dipartimento di Diagnostica per Immagini (struttura complessa di Radiologia-Maggiore), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 15) DELL'ANTONIO Andrea, Dipartimento di Chirurgia Generale e Toracia (struttura complessa di Chirurgia Generale), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 16) MARTINOLLI Stefano, Dipartimento di Chirurgia Generale e Toracia (struttura complessa di Chirurgia Generale), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 17) VIDALI Cristiana, Dipartimento di Oncologia (struttura complessa di Radioterapia), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 18) DORE Franca, Dipartimento di Diagnostica per Immagini (Direttore della struttura complessa di Medicina Nucleare), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 19) MALAGOLI Maria, Dipartimento di Oncologia (struttura complessa di Oncologia), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 20) GUGLIELMI Alessandra, Dipartimento di Oncologia (direttore della struttura complessa di Oncologia), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 21) CECCHERINI Rita, Struttura Complessa del Centro Sociale Oncologico (Responsabile della Struttura Semplice di Oncologia", Azienda per i Servizi Sanitari n.1 "Triestina"; 22) DELLACH Carla, Struttura Complessa del Centro Sociale Oncologico (Struttura Semplice di Oncologia", Azienda per i Servizi Sanitari n.1 "Triestina"; 23)LUISE Michele, Responsabile del Servizio Screening dell'Azienda per i servizi Sanitari n.2 "Isontina"; 24) PESAVENTO Valentina, Dipartimento di Ortopedia, Riabilitazione e Medicina del lavoro (Direttore della Struttura Complessa di Medicina Riabilitativa), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 25) RENZI Nadia, Dipartimento di Chirurgie Specialistiche (Struttura Complessa di Chirurgia Plastica), Azienda Ospedaliero-Universitaria "Ospedali Riuniti" di Trieste; 26) PRAVATO Marta, Dipartimento di Diagnostica per Immagini (Struttura Complessa di Radiologia-Maggiore), Azienda Ospedaliero-Universitaria "Ospedali Riuniti", Trieste; 27) GIOVAGNOLI Angela, Responsabile Riabilitazione, Distretto 4, Azienda per i Servizi Sanitari n.1 "Triestina", 28) ABRAM Giulia, Centro Sociale Oncologico, Servizio di Psicologia, Azienda per i Servizi Sanitari n.1 "Triestina"

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44. Scheda inserita da altra Struttura ("Scienze Mediche, Chirurgiche e della Salute"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Gruppo di Ricerca su Obesità e Nutrizione
Descrizione	Gruppo di ricerca su obesità: fisiopatologia, complicanze e terapia.

Sito web	
Responsabile scientifico/Coordinatore	BARAZZONI Rocco (Scienze Mediche, Chirurgiche e della Salute)

Settore ERC del gruppo:
LS4_3 - Endocrinology
LS4_4 - Ageing
LS4_5 - Metabolism, biological basis of metabolism related disorders

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
CHENDI	Enrico	Scienze Mediche, Chirurgiche e della Salute	Specializzando	MED/26
DE NARDO	Daniele	Scienze Mediche, Chirurgiche e della Salute	Specializzando	MED/38
GORTAN CAPPELLARI	Gianluca	Scienze della Vita	Dottorando	MED/09
MAMOLO	Lorenza	Scienze Mediche, Chirurgiche e della Salute	Specializzando	MED/30

Altro Personale	SEMOLIC Anna Maria (SMLNMR67A61L424G) Categoria C - Area socio-sanitaria - Scienze Mediche, Chirurgiche e della Salute

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45. Scheda inserita da altra Struttura ("Scienze Mediche, Chirurgiche e della Salute"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Gruppo di Ricerca Ematologico
Descrizione	Biologia molecolare delle leucemie, biologia molecolare dell'epatocarcinoma
Sito web	
Responsabile scientifico/Coordinatore	POZZATO Gabriele (Scienze Mediche, Chirurgiche e della Salute)

Settore ERC del gruppo:
LS4_1 - Organ physiology and pathophysiology

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
GRASSI	Gabriele	Scienze della Vita	Prof. Associato	BIO/12

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46. Scheda inserita da altra Struttura ("Scienze Mediche, Chirurgiche e della Salute"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Gruppo di Ricerca in Biomedicina Molecolare
Descrizione	Campi di ricerca. Terapia dei linfomi non-Hodgkin (in collaborazione con Intergruppo Linfomi) Terapia delle leucemie acute dellanziano (in collaborazione con GIMEMA) Caratterizzazione molecolare della Leucemia Linfatica Cronica Studio effetti del bortezomib su linee cellulari tumorali Potenziale ruolo terapeutico degli siRNAs nelle patologie linfoproliferative croniche
Sito web	
Responsabile scientifico/Coordinatore	POZZATO Gabriele (Scienze Mediche, Chirurgiche e della Salute)

Settore ERC del gruppo:
LS2_6 - Molecular genetics, reverse genetics and RNAi

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
DAPAS	Barbara	Scienze della Vita	Assegnista	BIO/12
GRASSI	Gabriele	Scienze della Vita	Prof. Associato	BIO/12

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47. Scheda inserita da altra Struttura ("Scienze Chimiche e Farmaceutiche"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	CHIMICA DELLAMBIENTE E DEI COMPOSTI AERODISPERSI
Descrizione	Chimica dellambiente e messa a punto di metodi e caratterizzazione chimica di composti aerodispersi (gas, vapori e polveri) negli ambiti ambientale, sanitario, merceologico e industriale. Il gruppo di ricerca studia la dispersione di contaminanti organici in atmosfera, tecnologie di combustione, formazione di aerosol secondario, tecnologie di rilevazione di miscele odorigene, marcatori gassosi di alterazioni metaboliche.
Sito web	http://dscf.units.it/it/ricerca/ambiti/energia-ambiente-e-chimica-sostenibile?q=it/node/6342
Responsabile scientifico/Coordinatore	BARBIERI Pierluigi (Scienze Chimiche e Farmaceutiche)

Settore ERC del gruppo:
PE10_1 - Atmospheric chemistry, atmospheric composition, air pollution
PE4_5 - Analytical chemistry

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
LICEN	Sabina	Scienze Chimiche e Farmaceutiche	Assegnista	CHIM/12
TOLLOI	Arianna	Scienze della Vita	Dottorando	CHIM/12

Altro Personale	Dr. Sergio Cozzutto, Dr. Gianpiero Barbieri (Spin off ARCo SolutionS srl)

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48. Scheda inserita da altra Struttura ("Scienze Politiche e Sociali"), tra i componenti risultano persone afferenti a questa Struttura:

Nome gruppo*	Ambiente, tecnologia e società
Descrizione	Il gruppo si occupa da anni di temi di ricerca afferenti alle problematiche del territorio, dellambiente, della città e campagna, delle tecnologie e dei relativi rischi, dei conflitti su e delle forme di uso e governo di tali problematiche. Queste aree di indagine sono state sviluppate attraverso progetti, collaborazioni e pubblicazioni a livello nazionale e internazionale (FRA, PRIN, FP e Interreg della UE, ecc.). Temi specifici includono: Conflitti ambientali e tecnologici Valori, atteggiamenti, identità territoriale Aree fragili, città e politiche del territorio Politiche e impatti socio-economici della tecno-scienza Rischio ambientale e tecnologico Responsible research and innovation Transizione energetica Global environmental change, mutamento sociale e nuove forme di socialità Governance, governamentalità, partecipazione e deliberazione pubblica Ambiente, tecno-scienza e teoria sociale
Sito web	
Responsabile scientifico/Coordinatore	PELLIZZONI Luigi (Scienze Politiche e Sociali)

Settore ERC del gruppo:
SH2_11 - Social studies of science and technology
SH2_5 - Democratization, social movements
SH2_7 - Political systems and institutions, governance
SH3_1 - Environment, resources and sustainability
SH3_10 - Urban studies, regional studies
SH3_2 - Environmental change and society
SH4_4 - Cognitive and experimental psychology: perception, action, and higher cognitive processes

Componenti:

Cognome	Nome	Struttura	Qualifica	Settore
BLASUTIG	Gabriele	Scienze Politiche e Sociali	Ricercatore	SPS/09
CARROSIO	Giovanni	Scienze Politiche e Sociali	Assegnista	SPS/10
GABASSI	Piergiorgio	Scienze Politiche e Sociali	Prof. Ordinario	M-PSI/06
AGOSTINI	Tiziano	Scienze della Vita	Prof. Ordinario	M-PSI/01
LUGHI	Vanni	Ingegneria e Architettura	Ricercatore	ING-IND/22
MAURO	Giovanni	Studi Umanistici	Ricercatore	M-GGR/01
SULLIGOI	Giorgio	Ingegneria e Architettura	Ricercatore	ING-IND/32
OSTI	Giorgio	Scienze Politiche e Sociali	Prof. Associato	SPS/10
ZANETTI	Chiara	Scienze Politiche e Sociali	Dottorando	SPS/09
ZOTTI	Jacopo	Scienze Politiche e Sociali	Ricercatore	SECS-P/01

Altro Personale	Alessandro Massi Pavan (collaboratore presso Dipartimento di Ingegneria e Architettura), Simone Arnaldi (Istituto Maritain e collaboratore presso Dipartimento di Studi Umanistici)