Regione Piemonte - Bando Converging technologies 2007 - Piedmont Region Converging technologies call 2007

Title

Developing White and Green Biotechnologies by Converging Platforms from Biology and Information Technology towards Metagenomics

RESPONSIBLE

PAOLA BONFANTE, Università degli Studi di Torino, Dipartimento di Biologia Vegetale Università di Torino

GENERAL INFORMATIONS

ID: 9
TITLE: Developing White and Green Biotechnologies by Converging Platforms from Biology and Information Technology towards Metagenomics
ACRONYM: BioBITs
SECTOR: Biotechnology - ICT
ABSTRACT: Metagenomics is the branch of science that integrates biology and technology. Based on the genomic analysis of DNA that is extracted directly from environmental samples, it has the power to solve problems in many different fields, from positively impacting human health to enabling a better understanding of the environment and agricultural systems as well as creating new biological sources of energy.

Computer science is becoming as indispensable for biology as mathematics has been for physics. Mapping the human genome would have been impossible without computers, algorithms and syntax to model structures: the representation of DNA as a formal language over a four character alphabet, and the use of search and matching algorithms over strings, have been key factors in this achievement.

Our project will integrate Biology and Information Technology platforms applying them to a soil Metagenomics system. The goal is to identify new molecules relevant for agrochemical industries. The study will start from a complex biological system, consisting of three levels: i) populations of uncultivable bacteria living inside a symbiotic, arbuscular mycorrhizal fungus (AMF), ii) AMFs which associate to plant roots and originate the most widespread symbiosis in the plant kingdom, and iii) plant roots. This tripartite system will be investigated as a source of undescribed molecules/metabolic pathways, and will also be analysed with simulation tools. AMFs are fundamental in projects of sustainable agriculture, they furnish a better mineral nutrition and are considered crucial means for improving the plant health increasing pathogen resistance. In addition to this widely recognised aspects, AMFs could also be exploited as a still unknown resource to promote

green (agriculture) and white (industrial) biotechnologies.

The Academic proponents (University of Torino and Piemonte Orientale) will cooperate on an innovative genome sequencing project, focused on uncultivable bacteria, by using Metagenomics; will annotate the bacterial genes in order to identify candidate proteins/enzymes of industrial relevance; will investigate the behaviour of such systems by considering them as biological computing units and by developing models for their simulation; will define the metabolic pathways that in planta lead to bioactive molecules (strigolactones) which are active on the fungal/bacterial system (but are also useful in the biocontrol of plant pests); will produce synthetic more active analogues of such molecules. The Academic partners will also have the expert support of an IPP-CNR group.

These first results will represent the basis for the industrial partners to develop green/white biotechnologies for use in food and feed, and for the IT companies to validate their prototypical simulation softwares. The agro-chemical industry as well as the inoculum company involved in the project have a strong motivation to probe these resources, which can lead to the development of novel enzymes, processes, products and applications. ISAGRO is one of the few Italian industrial groups which invest in innovation and development of new molecules, and CCS has a sound experience in microbial production. Other actors are however required for the new enzymes/bioactive molecules identified through Metagenomics to become an economic success. A computer science (ETICA) and two bioinformatics companies (Delos, Jeol) will add a qualified support cooperating with the Academic partners. The main feedbacks that the co-proponents may receive will concern genome sequences, data bases, new software, new synthetic molecules as well as processes and products relevant for agro-industries.

Lastly, the young researchers temporarily hired to work on the project will be trained both in academic institutions and private companies and, by the end of the project, will represent a highly specialized personnel for different innovative sectors.
DURATION (months): 36
TECHNICAL SCIENTIFIC OBJECTIVES: The project aims at applying innovative technologies to an emerging research field (Metagenomics) in order to identify new molecules and metabolic pathways of interest for Piedmont agro-industries.

Metagenomics is a science branch that integrates biology and technology: based on DNA extracted from environmental samples, it circumvents organism culturing and offers millions of genes/proteins to be classified, identified and used as a new information. Metagenomics has the potential to substantially impact industrial production.

Our project applies Metagenomics to a complex tripartite system, which will be investigated keeping in mind two major objectives: discovering new molecules for the production of green (agricultural) and white (industrial) biotechnologies; developing simulation tools for analysing biological behaviour based on computational models (to be delivered in form of prototypal but effectively usable software).

These objectives will be reached through specific goals which include scientific, technological and industrial topics: assembly of a genome from an uncultivable bacterium; development of modular databases which allow new data implementation; identification of molecules of bacterial and plant origin; their chemical synthesis and potential improvement in their natural traits thanks to computational biology; in vivo experiments.

Our innovative proposal derives from a solid background. The study will start from a biological system deeply investigated at the Department of Plant Biology. Experimental

material will be given by the AMF Gigaspora margarita, which lives in symbiosis with many plants and has the peculiar feature to host a population of uncultivable endobacteria in its cytoplasm.

Six workpackages are planned: WP1 will sequence the genome of the endobacterium Candidatus Glomeribacter gigasporarum living inside the AMF. Since the bacterium is not cultivable, a Metagenomics approach will be used. A fosmid library has already been developed starting from the fungus. The fosmids will be sequenced and subjected to bioinformatic analysis using Sanger sequencing and 454 technology to reach a hybrid assembly. WP2 annotates the endobacterium genome. The process will enlighten the interest on some pathways (e.g., vitamin B12, BTX detoxification). Computer science researchers will support the correct creation, setting up and integration of data bases/warehouses. In WP3, a model endowed with bio-mimetic primitives will be developed, with attention to membrane interactions and stochastic/probabilistic aspects. To model the complex behaviour at Plant/Fungal/Bacteria level, we shall consider the probabilities of reactions, possibly changing over time, to be associated with the evolution rules. We will design and implement prototypical software simulation tools. The next WPs derive from a study (Akyama et al, 2005) showing that plants release molecules (strigolactones) which are perceived by AMFs and cause the extensive branching essential for a successful colonization. Similar molecules have a large relevance in chemistry since they induce seed germination from parasite plants, like Striga, which infest the two-thirds of crop lands in Africa (Humphrey et al., 2006). WP4 investigates pathways that lead to the active molecule in planta (active sites in the putative receptor will be identified by using computational biology, a virtual set of ligands will be generated), while WP5 will synthesize the analogs to 5-deoxystrigol. WP4 requires synergy between bioinformatics and biologists to optimize activity, availability, ecocompatibility of the target compounds. Selected molecules will be labelled with fluorescent probes, and will be an instrument for fungal receptor binding and characterization. WP6 will be headed by the industrial partner and will develop green house experiments with different types of AM inocula to test the efficiency of AMs/bacterial and plant molecules with respect to plant pests.
STATE OF THE ART: Agrochemical industries develop chemicals used in agriculture for pest management, taking care of their development, use, metabolism, toxicology and mode of action. They represent an important issue in Piedmont economy where conventional agriculture provides a large part of the income. Biotech is effectively changing the way the largest chemical companies do business: it goes in fact after biological solutions, as demonstrated by pharmaceutical industries, where DNA is used to create novel therapeutics. A crucial advance in this direction is coming from Metagenomics, the emerging science branch that has the potential to substantially impact industrial production, as shown by the company founded by Venter (http://www.tigr.org/). Industries have different motivations to probe the enormous resource that is uncultivated microbial diversity. Currently, there is a global political drive to promote white/green biotechnologies as a central feature of the sustainable economic future of modern industrialized societies. This requires the development of novel enzymes, processes, products and applications. However, acquiring data on the genomic sequences and on their interaction with the environment is still a hard task which can greatly benefit from the development of the appropriate information technologies.

The pioneering work by Regev et al. (2001) brought out the similarities between computer systems and biological systems. Nowadays, there are various process calculi extended to a better use in the biological domain. Among them we mention BioAmbients (Regev et al., 2004), in which compartments are described as a hierarchy of boundary ambients, and Cardelli's Brane calculi (2004), a family of calculi for modeling dynamically nested

membranes. Barbuti et al. (2005) defined the Calculus of Looping Sequences. Its terms are constructed from basic constituent elements and the behaviour of a system is described by a set of rewrite rules.

Since metagenomics investigates biological consortia, advances in new technological/analytical platforms have enabled the study of interactions, also when uncultivable partners are involved. Among the remarkable papers recently appeared about these topics, Gill et al. (2006) demonstrate that human gut is home to a large microbiome and conclude that humans are superorganisms whose metabolism represents a mixture of microbial and human attributes. Another strong reason of interest is based on the assumption that these symbiotic consortia may lead to new metabolic pathways and to the appearance of molecules important for the development of novel therapies and other applications in biotech.

The more widespread symbiosis in the plant kingdom is established between the 90% of plants and a group of fungi (the AMFs) which have unique biological features: being uncultivable, asexual, multinucleated microbes. They play an important role as biofertilisers leading to the definition of AMs as the symbiosis which helps to feed the world (Marx, 2004). AMs are in the mainstream of biology research, since the new highthroughput platforms allow to investigate the transcriptome of mycorrhizal plants showing how plant and fungal genes are finely regulated (Kluger et al.2007). However, the impact of their endobacteria, and the potentialities given by a prokaryotic genome, have never been investigated (Bonfante, 2003). Recent researches gave an important contribution to our understanding of early plant/fungal interactions (Genre and Bonfante, 2007), and a plant strigolactone has been identified as a key signalling molecule (Akiyama et al., 2005). Due to the industrial relevance of such a molecule, different synthesis procedures have been described since the seventies. However, a synthetic approach leading to heterocycle based strigol analogues has never been tested so far, as well as computational biology approaches to identify potential receptor sites, allowing to develop new high tech strategies for plant pest control.
POTENTIAL IMPACT: The project is aimed to integrate scientific knowledge and innovative platforms for the development of biotechnologies in the agrochemical sector. Since the project stems from the sequencing of uncultivable bacteria according to Metagenomics approaches, it requires a large-scale analysis which will be performed by computer science and bioinformatics teams capable of managing and exploiting the data obtained from the genome sequencing. Such information will be used to produce models which may be extended to other complex biological systems. The second part of the project aims at defining the pathways that in planta lead to bioactive molecules (strigolactones) which are active on symbiotic fungal/bacterial consortia, and at producing synthetic (more active) analogues of such molecules. It is worth noticing that strigolactones are also useful in the process of biocontrol of plant pests. Our research on this kind of bio-systems will i) increase our scientific knowledge on the complex interactions among plant/fungi/bacteria, and on the characterization of metabolic pathways and molecules which play a bioactive role on communication events; ii) produce original information readily available to bioinformatics and IT companies as a source for creating new databases and designing new system models; and iii) lead to the synthesis of new molecules with improved traits, and potential improvements in crop pest management.

A part of the project is expected to increase scientific knowledge: this has a positive impact on the Academic partners, who -thanks to the synergy among groups on an innovative topic- will have reciprocal advantages. AM fungi are usually regarded as biofertilisers and bioprotectors since their best understood functions are the improvement

of plant mineral nutrient acquisition, and plant protection from biotic and abiotic stress, resulting in positive host growth. Thanks to such characters,AMs are regarded as plant health determinants in the framework of sustainable agriculture and eco-compatible biotechnologies. Our project offers a new vision for exploiting their multifunctional traits. On the basis of our preliminary results and from the data obtained by the recent literature, we propose to investigate AMs as a source of new undescribed bio-active molecules characteristic of the symbiosis, in order to clearly understand their broad range of applications (that really crosses the traditional disciplinary boundaries). For that, the biologists and the chemists involved in WPs1,2,4,5 (Torino University and CNR groups) will take advantage from the computer sciences and bioinformatics expertise in order to better manage and exploit the new genomic data. The groups of computer science from both University of Torino and Piemonte Orientale, leading WP3, will investigate new models to describe the relevant metabolic pathways that will be used in simulation experiments.
Technological and Industrial feedbacks, including Patents, for co-proponents. ISAGRO will benefit of new synthetic molecules as well as of addressed processes and products relevant for agro-industries. The know-how in plant/microbes management will be the main feedbacks the company acquires thus implementing its extension service activity. ETICA benefits from the experience of designing and implementing advanced software tools, while GEOL/DELOS will improve its ability in applying the biocomputational-informatics skills to a multidisciplinary, industry driven project with high probabilities of product innovation. Improved knowledge of microbe influence on plant performances/fruit harvesting, and the bioinformatics knowledge on crop management will improve the services offered by the CCS in the agricultural sector. Patents: new compounds; virtual libraries of compounds. Young researchers- hired for the project and trained in academic institutions and private companies- by the end of the project will represent a highly specialized personnel for innovative sectors.
DESCRIPTION OF THE RESOURCES: Five departments participate as proponents: four out of them belong to Torino University (Plant Biology, Informatics, Organic Chemistry, Arboriculture and Pomology), while the other Informatics Dep belongs to Piemonte Orientale University. IPP-CNR acts as proponent, too. The institutions have developed specific expertises in multiple aspects of plant biology, plant/microbe interactions, synthetic reactions, warehouse data bases, simulation and modelling, computational biology, and are all well-known research structures on international scale. Researchers have a long experience in training undergraduate and PhD students, and post-docs with long and short-term fellowships.
The group at Plant Biology and IPP-CNR (WP1-2) has a long tradition in studies on biology of mycorrhizas, where the main scientific mission is to understand the cellular and molecular bases of plant-microbe interactions. Their expertise is witnessed by a number of original, review and technical papers and multiple national and international collaborations. The group is currently involved in: CEBIOVEM (Centro di Eccellenza per BIOsensoristica VEgetale e Microbica), European projects, Marie Curie Actions for PhD student training, and three sequencing projects.
The group at Chemistry Department has a multi-year expertise in organic synthesis, and in catalyzed organometallic reactions which are the basis of many synthetic steps required in the project. Recently the scientific interest of the group has been focused on the synthesis of biological active molecules. The activity is documented by more than 50 publications in referee journals, lectures at international congresses, seminaries.
The Department of Arboriculture and Pomology has a long-standing interest in plant physiology, molecular biology and biochemistry, as witnessed by the publications of its members. The group is experienced in the management of national and international projects.
The group of Computer Science Department in Torino (WP3) has almost 40 years of

expertise in the design of formal calculi to model systems of interacting components and in prototypical implementations of related tools, witnessed by many publications and participation to EU Projects DART (Dynamic Assembly, Reconfiguration and Type-checking), Mikado (Mobile Calculi based on Domains) and TYPES. The group has also started to apply some of the techniques used to model concurrent distributed systems to the field of system biology. A first result is the innovative Calculus of Looping Sequences, which has been used to successfully model different kinds of biological interactions. The group of Computer Science Department (Piemonte Orientale) has a long collaboration with Torino group. It has matured an extremely strong background in the field of computational complexity.
Geol is a small company involved in projects of research and biocomputing carried out mainly by means of the new bioinformatic platform DELOS. DELOS is a product of Delos, a spin off company of Milano Bicocca University. Geol will benefit from the platform and hardware facilities provided by Delos, as well as from the scientific support of Delos personel.
ISAGRO is the only Italian Agrochemical Company covering all the life cycle of agrochemicals: discovery, development, manufacturing, formulation and distribution. ISAGRO R&D activities are focused on solutions for crop production and nutrition. In ISAGRO R&D STRATEGY, chemicals and biologicals are seen as complementary parameters. ISAGRO expertise is supported by 65 patents. Novel active ingredients are scheduled to be launched by 2008 (low-rate cupric fungicides, inducers of innate plant defenses and innovative osmoprotectants).
CCS AOSTA is a society settled at Environmental Park, Torino. It is a leader group for fungal and bacterial production to be used for crops, green houses, phytodepuration and phytoextraction processes.
The laboratories include all the facilities for the genomics, molecular, chemical, cellular studies and the bioinformatics analyses.
ORGANIZATION: The present project is presented by the Universities of Torino and Piemonte Orientale which participate as proponent of the project with five departments located in Piedmont. Applying to the present call, the proponents converge their peculiarities and expertise completely fulfilling the expectations of the Regione Piemonte (strengthening the research competences present in the Region by creating actively cooperating networks and pulling together relatively small and highly competitive research teams, industries and companies already present in the region). This approach is extremely innovative and represents a good example of a joint effort of quite different research groups to participate in a project with common goals as a unique homogeneous team.

The heading department (Plant biology) has developed very specific competences in different aspects of plant biology compartment and is a well-known research structure on international scale. It has been identified as a Centro di Eccellenza per la BIOsensoristica VEgetale e Microbica in the frame of the special ministry projects and has received the certification of the ISO quality for the laboratory procedures.
The Project Coordinator (PC) will work throughout the project in strict cooperation with all the Principal Investigators (PIs) of each WP. Each PI will work in strict cooperation with all the participants in his/her WP and will tutor the research activities of the temporary hired young researchers. Each PI will be responsible of producing a resume of the research activity of its group, reporting on the achieved results, every 6 months from the beginning of the project. The resume will be sent to the PC. Co-Proponents (CoPs) will work in strict cooperation with the PC and the PIs.

Communication:
All the communication between the PC, the CoPs and the PIs will be carried through

email, mail or phone. Appropriate mailing lists will be created to facilitate the communication among all the participants, the member of a WP, and the PIs. Papers, documents, and data will be shared through electronic media. Electronic tools for preparing and maintaining working files such as documentation, source code and web pages will facilitate the cooperation among the partners. Paper copies of the most important documents will be available.

Meetings and reports:
After the initial kick-off meeting, we plan regular plenary meetings (every six months) in order to take under control the project development. Specific thematic meetings will be organized when results can be presented or discussion is required to implement some WP. The young researchers involved in the project can present their results during the meetings. The meetings will also host discussion about project implementation. Members of the Regione Piemonte will be invited to participate. The PC will make agendas and inform all the partners and the responsible Regional Officer at least 4 weeks before the scheduled date of the meetings.

Progress Report:
Once a year, the PC will produce a report containing a description of the results achieved in each WP and will e-mail it to all the project participants and to the responsible Regional Officer. This scientific progress report, together with a financial report relative to the budget consumed, will be provided to the Administrative Regional Office.

Administration:
Administration at the department of Plant Biology is undertaken by dedicated Personnel who has extensive experience of managing EU and national projects
DISSEMINATION: The results of the project will be presented at national and international scientific meetings (conferences and workshops) and released for publication in scientific journals.

The prototypical software implementations realised by the Academic partners will be published online under the terms of the GNU General Public License as published by the Free Software Foundation. In this way they could be freely used by the scientific community.

The PC will be in charge for other dissemination actions. She will organize advanced meetings and workshops intended for experts in the chosen subject. She will also promote events of scientific communications intended for a more general audience in order to enhance the public appreciation of new technologies. The events might also make use of media technologies such as web sites and e-learning.
DIFFUSION OF THE RESULTS: The Proponents and the Co-proponents of this proposal agree that all the results obtained within the project will be available for discussion to all the partners and released for publication in the appropriate scientific journals, meetings and any other dissemination tool considered convenient by the Project-Coordinator and the Principal Investigators of the different WPs. In the mean time, under agreement, some results could be kept strictly under control and will circulate exclusively among the project partners. They will be kept highly confidential until acceptance for publication.

A web page collecting the proposal, a description of the ongoing work, a summary of the obtained results and any other "public" information related to the project, will be published online. The web page will also provide a calendar for scheduling the various project meetings.

All the activities involving the industrial partners will be protected, until the patent achievement, according to the rules which regulate the University of Torino and its industrial partnerships.

The support of the Regione Piemonte will be explicitly acknowledged at each data valorisation (Journal, Conference, Workshops, etc.) with a reference to the project.

At the end of the project, an official presentation of the results is planned with the involvement of the local press and scientific journals in order to give visibility to the findings.
ISSUES ETHICS: None
ATS (more than one coproponent): Yes
Industrial research (%) : 40
ASSOCIATED KEYWORDS: 6.3.1.5 Plant biotechnology ,6.3.1.3 Food biotechnology ,3.2.3.7 Computational biology ,6.3.4.4 Software technology ,3.2.3.12.4 Environmental genomics ,4.2.12.3 Organometallic chemistry
ASSOCIATED ACTIVITY CODES: 1.1.1.4 Bioinformatics ,1.1.1.5 Multidisciplinary functional genomics approaches to basic biological processes ,2.2.2.2 New strategies, algorithms and tools for systematic and accurate design, prototyping and control of complex distributed systems ,1.1.2.5 Innovative research in post-genomics, which has high potential for application
FREE KEYWORDS: Endobacteria,Mycorrhizal fungi,Signal molecules,Sorgolactons,Systems biology
FREE ACTIVITY CODES: Microbial genomics,Molecular Plant Microbe Interactions,Organic Chemistry,Plant and Microbial technology,Computer Science;
FINANCING TOTAL: 4851967
FINANCING TOTAL PROPONENT: 3059156
FINANCING TOTAL COPROPONENT: 1792811

Work Package: A metagenomics approach to sequence the genome of Candidatus glomeribacter gigasporarum

NUMBER: 1
TITLE: A metagenomics approach to sequence the genome of Candidatus glomeribacter gigasporarum
RESPONSIBLE: PAOLA BONFANTE
STARTING MONTH: 1
ENDING MONTH: 12
OBJECTIVES: The aim of the research project is to provide the description of the complete genome sequence of the bacterial endosymbiont Candidatus Glomeribacter gigasporarum which lives inside the arbuscular mycorrhizal fungus Gigaspora margarita which lives associated to the root plants.
Symbiotic associations between endocellular bacteria and eukaryotic cells are widespread among animals and plants, but only a few examples have been described in the fungal kingdom. Arbuscular mycorrhizal (AM) species, belonging to the family Gigasporaceae, represent a specialized niche for rod shaped bacteria, named Candidatus Glomeribacter gigasporarum (Bianciotto et al, 2003). Morphological and molecular studies on G. margarita BEG34 have shown that Ca. G. gigasporarum is a homogeneous population closely related to the b-proteobacterial genus Burkholderia. Ca. G. gigasporarum is vertically transmitted through fungal generations and all attempts to grow it in pure culture failed (Bianciotto et al, 2004). Candidatus has a relatively small genome, approximately

1.4Mb (Jargeat et al, 2004). These findings suggest that these bacteria are obligate endocellular components of their AM fungal host.
Bacteria living inside AM fungi represent thus far a hidden microbial world for which almost no genomic information is currently available despite their potentially important impacts on their eukaryotic hosts. Because Ca. G. gigasporarum can not be cultured apart outside of the host for traditional genetic or physiological techniques, analysis of the genome sequences offers a valuable tool to infer its metabolic functions. The complete genome sequence of Ca. G. gigasporarum will provide a critical step forward in our ability to answer fundamental questions concerning the biology, ecology and evolutionary history of this endosymbiont. In addition, this information may have a relevant role also for applicative purposes. Since the pioneer work of Craig Venter (2004) on the Sargasso sea, an emerging field of research is the exploration of the genetic diversity of unculturable microorganisms from environmental samples, through the so called Metagenomic approach, with the aim to discover new bioactive molecules of biotechnological interest. For this reason metagenomes have attracted the attention of academia and private companies (Lorenz & Eck, 2005).
The main aim of the WP is to provide an overall genomic information of Candidatus Glomeribacter gigasporarum by using a metagenomic approach. In collaboration with Peter Lammers (New Mexico State University) we have constructed a genomic library into a fosmid vector starting from the fungal spores (Gigaspora margarita). The library has been demonstrated to be representative of the Ca. G. gigasporarum genome.

For more than twenty years the corner stone of whole genome sequencing was the Sanger method that suffered modifications and variations with substantial improvement in the sequencing techniques and data analysis. The Sanger method is still in the top of the sequencing methods even today due to its quality to produce long reads of DNA sequences, but recently new methods such as ‘pyrosequencing’, which is at the basis of the ‘454 technology’, are becoming popular as complementary methods that allow sequencing of difficult genomic regions and improve the overall reading coverage (Goldberg et al 2006).
According to this current situation, we will face the two experimental strategies:
i)The full genome sequencing approach, based on the Sanger sequencing technology, will be performed on validated clones (current number of validated clones: 1095). The sequencing will be done in collaboration with the Parco Tecnologico padano, PTP http://www.tecnoparco.org
ii)454 technology which will be applied on a purified bacterial DNA fraction, which will require the development of new protocols (bacteria isolation and whole genome amplification).
DESCRIPTION: The project requires a Metagenomics approach, since Candidatus Glomeribacter gigasporarum is an endobacterium for which no pure cultures are available. A fosmid genomic library constructed from the fungal host Gigaspora margarita has been recognized as a valuable source of Ca. G. gigasporarum sequences. We already set up a protocol to isolate putative clones containing Ca. G. gigasporarum sequences: randomly selected clones were sequenced at both ends using primers for the vector and obtained sequences were analysed by Blast programs to look for similarity to bacterial, in particular Burkholderiaceae, sequences. Phylogenetic trees contructed on the ribosomal genes demonstrate that Candidatus belongs to the Betaproteobacteria, and is related to Burkholderiaceae. A survey of 620 primary clones revealed that 143 showed similarity to sequences from the Burkholderiaceae group, indicating that a large number of clones may belong to Ca. G. gigasporarum genome. In addition, a further validation step, consisting in PCR assays on G. margarita sporal DNA with primers specifically designed on fosmid ends from candidates bacterial clones, was routinely performed. As a negative control, a cured line of G. margarita (Lumini et al., 2007), was included in the experiments.

Following this procedure, a total number of 1059 clones has so far been validated and assigned to the bacterial endosymbiont. So far 24 fosmids have been completely sequenced and assembled into 538,000 Mb (about 1/3 of the complete genome).
The following activities are planned within the WP1:
1) Completion of the Candidatus Glomeribacter gigasporarum genome sequence (4X genome coverage) by using the classical Sanger technology. The sequencing will be performed at the Parco Tecnologico Padano using the 'dye-terminator sequencing' with ABI 3100 machine. It will require: isolation of additional primary recombinant fosmid clones from the G. margarita genomic library; sequencing of both ends with T7 and R2 vector primers; similarity searches to identify candidate Ca. G. gigasporarum clones; validation of candidate clones by means of PCR assays with specific primers; sequencing of the selected fosmids through the transposon insertion method and Sanger sequencing technology; sequence assembly (from 0 to 6 months);
2) Development of new protocols which will lead to the isolation of a small quantity of purified bacterial cells, which will be subjected to the so called whole genome amplification (WGA); the quality and quantity of the amplified genomic DNA will be estimated from gel electrophoresis as well as by quantification with ND-1000 instrument. The presence of fungal contamination will be checked on WGA by conventional PCR (from 0 to 3 months)
3)The purified material will be sequenced through the innovative 454 (Margulies et al., 2005). The sequencing which is based on the pyrosequencing technology will be done in the United States by the Roche Applied Biosystem. The instrument is able to detect the sequence of more than 400.000 individual reads per 7.5 hour simultaneously run. However, only short sequences (about 240 bps) are usually read: for this reason the assembly from mixed genomes is particularly difficult (from the 6th to 8th month).
4)The data will be assembled according to an innovative hybrid strategy. A first assembly will be provided by the Roche 454 company. It will be presumably composed by contigs assembled from fungal or bacterial sequences. Those contigs will be filtered using a custom script based on the blastx program, in order to select the contigs having a homologue in a Uniprot database populated only by proteins from the bacterial division. The remaining contigs will be assembled together with the Sanger reads using conventional approaches (swat/cross_match/phrap assembly engines, Phil Green). Gap closing between remaining contigs will be performed by computer assisted and manual approach consed. (from the 8th to the 12 months)
ATTENDED RESULTS: The activities planned in this workpackage will lead:
1) to develop a fosmid library which is representative of both fungal and bacterial genomes. In the project we will focus on the bacterial genome, but the availability of the fungal genome will represent an additional outcome to be exploited in the future;
2) to develop an innovative protocol for the bacterial isolation and its whole genome amplification, leading to material which can be investigated with the 454 technology;
3) to determine the whole genome sequence of Ca. Glomeribacter gigasporarum (up 4X genome coverage) by using a mixed (Sanger and 454)technology. This, to our knowledge, will represent the first complete genome of a fungal endosymbiont and one of the few examples of prokaryotes complete genomes so far assembled from mixed DNA samples.

All these outcomes are innovative and original. The information from genomes of animal endosymbionts already provided a series of beneficial outcomes by bringing into the light complex symbiotic interrelations, but the genomes of endosymbionts still have some other lessons to teach the scientific world. Bacteria living inside AM fungi represent a hidden microbial world for which almost no genomic information is currently available despite their potentially important impacts on their eukaryotic hosts. According to this rational, the proposed genome sequencing and analysis project ideally complements current crucial

topics in environmental genomics such as defining the metabolic potential of currently unculturable organisms and in better understanding evolutionary biology especially the origin of reduced bacterial genomes.

The outcome of the WPs has therefore a strong scientific and technological value in itself, but on the other hand it represents the starting fuel for the whole project.

Participant to the Work Package: A metagenomics approach to sequence the genome of Candidatus glomeribacter gigasporarum

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 12
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 48

AGENCY PARTICIPANT: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 12
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 4

TOTAL PEOPLE/MONTHS OF ACTIVITY A metagenomics approach to sequence the genome of Candidatus glomeribacter gigasporarum: 52

Work Package: Candidatus Glomeribacter gigasporarum genome annotation and selection of candidates genes of biotechnological interest

NUMBER: 2
TITLE: Candidatus Glomeribacter gigasporarum genome annotation and selection of candidates genes of biotechnological interest
RESPONSIBLE: LUISA LANFRANCO
STARTING MONTH: 3
ENDING MONTH: 36
OBJECTIVES: The main goals of the workpackage are i) to provide the annotation of the Candidatus Glomeribacter gigasporarum genome, that is, to give a functional classification of all the identified genes; ii) to explore the potentials of this completely unknown microbe as a “genes reservoir”, that could be considered as a source of metabolic pathway and possibly novel bio-active molecules of biotechnological interest; iii) to develop a data warehouse dedicated to Ca. G. gigasporarum oriented to the management of genomic sequences, annotation, functional and comparative data.
These aims will be achieved through specific steps described in details in the section “Descrizione”.
Genome annotation is a rapidly evolving field in genomics made possible by the large-scale generation of genomic sequences and driven predominantly by computational tools. The goal of the annotation process is to assign as much information as possible to the

raw sequence of complete genomes with an emphasis on the location and structure of the genes. This can be accomplished by ab initio gene finding, by identifying homologies to known genes from other organisms, by the alignment of full-length or partial mRNA sequences to the genomic DNA, or through combinations of such methods.
Genome annotation currently depends on discovering homologies to genes with known functions from other species and thus strongly relies on comparative genomics studies. At large scale comparative genomics is the analysis and comparison of genomes from different species.
The genome annotation is a crucial step towards the identification and the characterization of genes involved in specific metabolic pathways. Bioinformatics analyses give predictions of gene function; this information is instrumental to plan targeted experiments to finally confirm the biochemical activity and/or the biological role of given DNA sequences.
Alignment of DNA sequences is the core process in comparative genomics. Several powerful algorithms have been developed to align two or more sequences. Some of these sequence-similarity tools are publicly accessible over the Internet (e.g. BLAST). However, the computational power required to align billions of nucleotides between two or more species vastly exceeds what is normally available. Thus, several research groups make available pre-computed alignments of genomes through servers or browsers. To this respect, the relevance of building tools that allow to “navigate” flexibly data, from arbitrary, at least in principle, perspectives, under different degrees of approximation, is rapidly growing. These requirements match the typical design and implementation principles of data warehouse, a concept that dates back at least to the mid-1980s. Basically, since its introduction it was meant to provide architectural and conceptual models for exploiting data and information, extracted from a set of traditional databases, inside tools able to support people-involved decisional tasks. The systematic support to the organization and storage in large structures of large-scale collections of data, the related ability to carry out extensive, multifaceted querying by means of a data warehouse that uses protocols harnessing data stored remotely in distinct databases, and the possibility to be queried them flexibly, are gaining evidence as key factors for the successful development of tools to explore genetic and genomic relatedness. Some examples of databases developed in the area of bioinformatics are ENZYME, KEGG, BioCyc, Universal Protein Resource (UniProt). A successful experience was recently described by Cornell et al. (2007), who presented the e-Fungi data warehouse. This tool was exploited to answer some fundamental questions about fungal evolutionary biology, including patterns of gene loss and gene duplication and extent of protein family conservation among the kingdom Fungi, and enable integrative analyses of genome sequence and functional genomic data.
DESCRIPTION: The general aim of the workpackage is to provide the annotation of the Candidatus Glomeribacter gigasporarum genome and the selection of candidates genes of biotechnological interest.
The workpackage comprises the following tasks:
1. Annotation of the bacterial genome. The annotation process will comprise 2 main phases: the first phase is the automated annotation when programs utilize algorithms to map genes from reference genomes to the new sequence or even compile a de novo gene annotation using training set of sequences already mapped on the same genome; the second phase is the manual curation of those automated annotations, when the gene models are checked and corrected by humans. (from month 6 to month 36)
2. Bioinformatic analyses of sequence data for comparative studies with other bacterial genomes. Comparative analyses with sequences form other bacterial genomes, including those from free-living and endosymbionts species, will be performed. (from month 6 to month 36)
3. Characterization of genes of biotechnological interest by means of gene expression profiles using quantitative RT-PCR along the different steps of the fungal life cycle

(spores, germinating spores, spores treated with strigol analogues; symbiotic in planta phase) and/or complementation assays using culturable prokaryotes for which mutants defective of specific gene functions are available. Potential candidates will be genes related to vitamin B12 biosynthesis. Vitamin B12 biosynthesis is one of the most enigmatic and exigent metabolic pathways in nature, requiring around 30 enzymes for de novo construction of the molecule (Warren et al, 2002). Its synthesis is restricted to certain microorganisms. There is no genetic evidence that any eukaryote is able to make it, but numerous eukaryotes have a B12 requirement for growth (Roth et al, 1996). Deficit in vitamin B12 in humans causes pernicious anemia. B12–dependent enzymatic reactions have been also reported among fungi (Stutzenberger 1973) and plants (Poston 1977). (from month 6 to month 36)

4. Kernel of an experimental data warehouse to manage Ca. G. gigasporarum genomic sequences, annotation and functional data, as well as comparative analyses. From a technical point of view, a data warehouse architecture consists of various combinations of interconnected elements that can be classified as follows: 1) Operational and external database layer: the source data for the data warehouse. 2) Informational access layer: the tools, the end user access to extract and analyze the data. 3) Data access layer: the interface between the operational and informational access layer. 4) Meta-data layer: the data directory or repository of meta-data information. In particular, the development of a data warehouse dedicated to Ca. G. gigasporarum will consist of combining and exploiting existing software, oriented to the management of genomic sequences, annotation and functional data, as well as to develop comparative analyses. One of the candidate tools for the afore-mentioned development is Vista Tools (http://genome.lbl.gov/vista/index.shtml), freely downloadable and exploitable under academic license. Vista Tools is capable to integrate sequence, annotation and functional data of bacterial genomes with data warehouse-like browsing interfaces. We plan to write routines aiming to translate raw data of interest assembled in different formats, with the guarantee of providing the necessary infrastructure in order to make the experimental data warehouse available on-line, assuring standard requirements in terms of reliability and security. (from month 3 to month 36)

ATTENDED RESULTS: The activities planned in this workpackage will lead to:

1. The annotation of the Ca. G. gigasporarum genome along with the description of the chromosomal features.
2. An overview of the Ca. G. gigasporarum genomic structure and organization in comparison to model organisms, related species and other bacteria showing symbiotic life style.
3. Discovering the potentials of Ca. G. gigasporarum genome as a source of metabolic pathway and possibly novel bio-active molecules.
4. The characterization of genes involved in vitamin B12 biosynthesis and other genes of biotechnological interest.
5. The kernel of a data warehouse with a working instance of pre-computed sequences, annotations and functional data relative to the bacterial genomes under investigation. Since such a kernel will be the result of assembling existing software modules of third party developers, we shall be in the position to get another basic result: the assessment of the obtained tool, as a whole. Specifically, we shall be able to mark its interface usability and both data browsing and data structure reorganization grade. This is a necessary step for future developments that cannot be contemplated in this workpackage. We mention explicitly two interesting future developments, in order to emphasize the relevance of setting up the experimental data warehouse kernel. The first one will be the basis for the development of parts of a genomic analysis-oriented data warehouse, whose focus is to re-define the data structure of the above mentioned “Data access layer” present in a (three-layer) data warehouse architecture; indeed, a good data representation inside the Data access layer plays a central role for obtaining fine-grained data navigation and

investigation, with flexible aggregation tools. The other possible development will be the integration of software that implements in silico cellular processes models and simulations of metabolic pathways, whose development is planned in WP3.

Participant to the Work Package: Candidatus Glomeribacter gigasporarum genome annotation and selection of candidates genes of biotechnological interest

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Informatica
STARTING MONTH PEOPLE ACTIVITIES: 3
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 52

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 3
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 103

AGENCY PARTICIPANT: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
STARTING MONTH PEOPLE ACTIVITIES: 12
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 8

AGENCY PARTICIPANT: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
STARTING MONTH PEOPLE ACTIVITIES: 3
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 5

TOTAL PEOPLE/MONTHS OF ACTIVITY Candidatus Glomeribacter gigasporarum genome annotation and selection of candidates genes of biotechnological interest: 168

Work Package: In Silico Design and Analysis of Biological Systems

NUMBER: 3
TITLE: In Silico Design and Analysis of Biological Systems
RESPONSIBLE: MARIO COPPO
STARTING MONTH: 1
ENDING MONTH: 36
OBJECTIVES: Our long-term goal is to provide biologists with an environment for tackling problems at a system level, which cannot be handled without using Information

Technology. This environment will provide biologists with modelling, analysis and simulation tools capable of dealing with complex behaviours and of representing emerging properties. We thus advocate a convergence between computer science and life sciences, putting ourselves on the computational side of Systems Biology. This emerging paradigm of biology moves from the classical reductionist approach to a system level understanding of life, where unpredictable, complex behaviours show up. Essential to that shift is the ongoing change of focus in biology from structure to functionality. In our terminology, passing from structure to function amounts to equipping syntax with a behavioural semantics. In this WP we plan to develop models, languages and tools for describing, analysing and implementing in silico bio-systems, as an additional contribution of information technology to those typical research areas in current bio-informatics, such as storing, organizing and retrieving large amounts of biological data, or searching and matching DNA sequences, just to mention two well-known topics.

We will start with the development of extensions of the CLS model (see below), with particular attention to inter-process interactions and stochastic and probabilistic aspects. These primitives will reflect the way living organisms act when interacting with one another, or with the environment. Our newly tailored formalisms will share with the existing ones their formal, executable semantics, thus allowing for re-use of established theories, methods and tools. Particularly relevant are the interpreters that run the specification of a biological organism: each run can be seen as an experiment in silico. Of course, stochastic parameters are of paramount importance to that simulation, as well as any statistical tool for further analysis of the simulated behaviour.

We will design appropriate software simulators. These will help us to check the effectiveness and the correctness of our models. The parameters and behaviours of complex systems are directly affected by even little changes of the many different operating conditions. To model complex behaviours, we shall then consider models where probabilities, possibly changing over time, are associated with evolution rules. The stochastic approach we are proposing results more adequate than the one based on differential equations, when low-concentration reactants are involved in many processes active at the same time. Our ideas and proposals will be tuned, tested and validated over case studies selected in agreement with the biologists involved in the project. Experimental data will be provided by the AM fungus Gigaspora margarita, which lives in symbiosis with many plants and has the peculiar feature of hosting a population of uncultivable bacterial endosymbionts in its cytoplasm, and by the endobacterium Candidatus Glomeribacter gigasporarum that lives inside the fungus. The feasibility of our approach will be further validated by designing and implementing prototypical software tools, based on the theoretical framework developed in the first phase of the investigation.

We expect our simulation tools to contribute (and receive feedbacks) also during the process of synthesis of the final products (WP5 and WP6). Thus, we provide a support for the process of developing the new molecules and realising the green house experiments that will test the efficiency of AMs and strigolactones with respect to plant pests.

If successful, this project will confirm a general understanding in the scientific community that Information Technology will be as indispensable for biology and viceversa, as mathematics has been for physics. In any case, there will certainly be a fruitful cross-fertilization between biology and computer science.
DESCRIPTION: Tight connections between biological and computer systems are widely recognized, starting from the fact that programming language techniques and tools can be used to model, analyse and simulate the dynamic behaviour of biological systems. Indeed, biological systems are often described as entities that change their states

because of the occurrence of (bio-chemical) interactions, giving rise to some observable behaviours. Just in the same way, computer systems are frequently presented as abstract machines, and their behaviours specified by the possible transitions, which change the internal states of the abstract machines. Another similarity is that both kinds of systems result from combinations of smaller parts. Usually, the behaviours of the components are well understood, while that of their composition remains largely unexpected and often characterized by the so-called emerging properties. The advantage of computer systems is that their abstract machines can be easily run, and their behaviours inspected. Emerging properties are explicitly made visible and available for analysis and, if unwanted, the designer of the computer system can modify the associated abstract machine until the required behaviour is obtained.

On the one hand, we plan to develop and use methods typical of computer science for describing, analysing and implementing in silico the biological systems set up in the WP1 and WP2. On the other hand, we feel that the biological world may inspire the production of tools and techniques which would be able to deal with much more complex Information Technology problems than the ones approachable with the current technology. Examples of them are knowledge discovery in structurally and behaviourally complex systems acting in probabilistic environments, or the development of modelling and simulation tools for handling (partial) knowledge at different levels of detail.

Barbuti, Maggiolo, Milazzo and Troina have defined a calculus, called Calculus of Looping Sequences (CLS for short), for describing biological systems. The terms of the calculus are constructed from basic constituent elements composed through operators of sequencing, looping, containment and parallel composition. Sequencing can be used to describe biological elements such as DNA fragments and proteins. DNA fragments can be modelled as sequences of nucleotides or of genes; proteins can be modelled as sequences of amino acids or of interaction sites. Looping allows tying up the ends of a sequence, thus creating a circular sequence of the constituent elements. A looping sequence represents a membrane, in a finer way than the one given in specialized membrane calculi (see, e.g., Cardelli's Brane Calculi and Regev's et al. BioAmbients), as it allows for representing interaction of the elements constituting the membrane. The containment operator can be used to represent when an element is inside the membrane, and parallel composition expresses juxtaposition of elements. The behaviour of a system is described by a set of rewrite rules to be applied to terms.

Using CLS as a starting methodology, the present work package will focus on languages and models for specifying the biological interactions behind the Plant/Fungal/Bacteria levels, for simulating their behaviours and for verifying their properties formally.

The descriptions of these interactions will include both qualitative aspects, e.g. cause-effect relationships, and quantitative phenomena, e.g. those depending on time and on probabilistic distributions typical of biological systems. We plan to use linguistic mechanisms and models specifically tailored for describing and manipulating aspects of the living matter such as biochemical reactions, metabolic pathways and membranes. Therefore, we are required to adapt existing linguistic tools and models and to develop new ones.
ATTENDED RESULTS: -Selection of Case Studies (1-6)

We plan to single out a significant set of biological interactions and situations that we will model with the aim of determining which of their aspects are particularly relevant for description, analysis, and simulation. As an example, as regards the study of the endobacterium, we plan to analyse the metabolic pathways for vitamin B12, BTX

detoxification and III type secretion. These have already been identified, even if the genome sequencing has not yet been completed. Obviously, this activity will be carried on in tight cooperation with the biologists involved in the project.

-Extensions of CLS (1-24)

CLS still lacks adequate linguistic features for expressing all the interaction mechanisms typical of biochemical processes. For example, bio-chemical reactions require the reactants to collide on specific active sites, and to have a sufficiently high chemical affinity. These notions call for features only partially present in the primitives offered by CLS. Also, bio-chemical reactions often happen to be reversible and are always endowed with experimental rates of occurrence. These rates take the form of kinetic constants and usually depend on many factors. To support the stochastic aspects present in biological behaviours, we will use the typical approximate Gillespie's algorithm to enhance CLS with features for expressing time and probability (the speed of events is modelled as a rate of the rewrite rule).

-Modelling Case Studies, Analysis and Validation (13-36)

We plan to model the case studies selected in the previous phase. Needless to say, our models will be compared with similar ones in the literature, to further assess our ideas. The activity of modelling will cause a feed-back giving rise to the necessary tuning of the extensions proposed in the first phase to the formal methods we use. This activity will be carried on together with the biologists involved in the project, in order to continuously check whether our in silico results conform with the standard ones known from the in vivo or in vitro experiments. Of course, a model is validated if the statistical distributions obtained in this way significantly overlap those obtained with biological experiments. Changes in the initial or in the operating conditions will be performed to check how the models reflect such alterations. Indeed, simulations in the biochemical arena are especially sensible to initial conditions and variability of parameters. Various statistical analysis are then possible, including the frequencies of some reactions, the growth rates of some products in time, the presence of specific metabolites, the time evolution of probability densities for selected chemical species concentrations, etc.

-Implementations of Prototypes for Simulation and Analysis (13-36)

Contemporarily with modelling, we will complete the prototypes for the execution of our specifications, as well as those for the analysis of their behaviours. The given simulators should enable biologists both to explain and to predict the behaviours of biological processes. For example, we shall expect them to allow for discovering novel metabolic pathways. We will implement the interpreter(s) of the stochastic operational semantics of CLS determined in the previous phase. The stochastic extension appears to require huge computational resources, if the standard Gillespie's algorithm is implemented naively. Optimization techniques should keep the overall resulting interpreters usable and efficient. Also, these simulators will be instrumented to extract from computations the relevant information, e.g. the concentration of a specific component. Additionally, to assist the user in understanding the dynamics of the modelled biological system, we should devise graphical representations of the descriptions. To help him collecting and analysing the virtual experimental data, the interpreter needs to be coupled with statistical packages.

Participant to the Work Package: In Silico Design and Analysis of Biological Systems

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Informatica
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 127

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 3

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
STARTING MONTH PEOPLE ACTIVITIES: 18
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 3

AGENCY PARTICIPANT: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
STARTING MONTH PEOPLE ACTIVITIES: 3
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 49

AGENCY PARTICIPANT: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
STARTING MONTH PEOPLE ACTIVITIES: 3
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 39

TOTAL PEOPLE/MONTHS OF ACTIVITY In Silico Design and Analysis of Biological Systems: 221

Work Package: Biological and structural study of a plant product: biosynthesis and activity elucidation and bioinformatics study, aiming at the discovery of synthetic compounds with desired properties

NUMBER: 4
TITLE: Biological and structural study of a plant product: biosynthesis and activity elucidation and bioinformatics study, aiming at the discovery of synthetic compounds with desired properties
RESPONSIBLE: GRAZIELLA RANGHINO

STARTING MONTH: 1
ENDING MONTH: 36
OBJECTIVES: Objectives 3000.

The objective of the WP4 is to analyze a plant bioactive molecule (a strigolactone) in order i) to investigate its biological impact on plants/fungi/ bacteria; ii) to identify the crucial steps of the metabolic pathways, iii) to define the receptor-binding sites in both plant and fungi by using bioinformatics approaches and iv) to simulate the conditions for ligand site optimisation by computational biology.

The WP represents the starting point of the second part of the project (Fig.2 attached to the paper copy) which has the main aim to develop new molecules of interest for white and green biotechnologies. Strigolactones are a group of sesquiterpene lactones, previously isolated as seed-germination stimulants for the parasitic weeds Striga and Orobanche8. The natural strigolactones 5-deoxy-strigol, sorgolactone and strigol, and a synthetic analogue, GR24, induced extensive hyphal branching in germinating spores of the AM fungus Gigaspora margarita at very low concentrations.

The project starts from this remarkable study demonstrating that plants as Lotus japonicus release an active molecule, (a strigolactone) which is perceived by the AM fungus G. margarita and causes an extensive branching which is essential for the successful colonization events (Akyama et al., Nature, 2005). Enhanced hyphal growth is a pre-requisite for the colonization, since it increases the number of potential contact points with the host surface. Interestingly, strigolactones are known to stimulate the seed germination of parasitic plants. Besserer et al (2006) found that a strigolactone from a monocotyledonous plant, Sorghum, strongly and rapidly stimulated the proliferation of the AM fungus Gigaspora rosea, at concentrations as low as 10âˆ’13 M. Within one h of treatment, the density of mitochondria in the fungal cells increased, and their shape and movement changed dramatically. Strigolactones derive from the carotenoid pathway and belong to the group of apocaroteinoids, which have been identified as the yellow pigments often present in mature mycorrhizas (Walter et al., 2007): these new results suggest that apocarotenoids play important and distinct roles in mycorrhizas.

Strigolactons therefore are active

1. on seed germination of parasitic plants (and can be used as biopest control)
2. on AM fungi (and can be used as stimulators in microbial inocula)
3. on endobacteria (our unpublished results)

However, there is no information on the receptor/s which bind such active molecule. This avoids any current applicative use of this strigolactone in green biotechnologies. In the context of projects dealing with the detection of differential gene expression during AM-plant interactions by analyzing microarrays in model plants, the activation of genes involved in the carotenoid has been demonstrated. However, a direct relationship with the strigolacton pathways has not yet been determined.

In conclusion, the main goals of the WP4 are twofold : first is the definition of the metabolism and activity of strigolactons as a powerful bioactive molecule, with identification of candidate biosynthetic genes through oligochips analysis; second is the characterization by means of biocomputational tools of the putative enzymatic function and structure of the genetically derived receptors which will give insights into the receptor-binding sites. This last result will guide the bioinformatic definition of analogs suitable to synthetic approach.

DESCRIPTION: Description

The project will be developed thanks to the interaction of different expert teams: plant biologists, plant physiologists, informatics, coordinated by bioinformatics.

4.1 identification of genes involved in the biosynthetic pathway: Even if the genome of Lotus is not yet available, we will take advantage of Lotus japonicus GeneChip arrays (Affymetrix) set up at the Kazusa organization (http://www.kazusa.or.jp). The global expression profile during the early interactions between L. japonicus and Gigaspora margarita.will be investigated.We will focuss on the steps which precede the physical contact between the partners. Genes involved in the secondary metabolism or related to strigolacton synthesis will be investigated also by constructing specific primers in quantitative real time experiments.
Start: month 1
Dutation: 8 months
WP 4.2 validation of the role in strigolactone biosynthesis of the genes identified at point 4.1

WP 4.2.1 prediction of the function of the proteins encoded by the plant genes transcriptionally regulated upon perception of AM fungi and supposed to act in the carotenoid biosynthetic pathway, on the basis of their similarity to known enzymes.

Start: month 7

Duration: 1 month

WP 4.2.2 Amplification of the corresponding full-length cDNAs from a L. japonicus library with gene-specific primers, and, if appropriate, cloning in bacterial expression vectors for the production of recombinant proteins by E. coli.

Start: month 8

Duration: 6 months

WP 4.2.3 Affinity purification of the recombinant proteins translationally fused with tags.

Start: month 10

Duration: 6 months

WP 4.2.4 Enzymatic activity tests in vitro to determine if their activities can be characterized and be fitted in the postulated biosynthetic route for strigolactones, which is supposed to branch off the carotenoid pathway (Matusova et al. Plant Physiol. 2005 139:920-34).
Most metabolite analyses will be performed by high-performance liquid chromatography, HPLC (Sato et al. J. Agric. Food Chem. 2003 51:1162-8)

Start: month 13

Duration: 23 months

WP 4.3 By means of computational biology define the 3D structure of the receptor and the binding features of the natural ligand and of analogs suitable for the synthetic

approach.
Duration: 30 months

WP 4.3.1
Action 4.3.1.1 A preliminary investigation will be done on ProteinDataBank in order to find proteins that bind or process chemical moieties similar to strigolacton. The structural features of the binding will be analysed and simulated.

Start: month 1

Duration: 3 months

Action 4.3.1.2 On the basis of the sequence provided by WP4.2 and WP4.1, the homology modeling of the putative receptor will be attempted, using known 3D structures as templates. This step implies the alignment of the new with other proteins sequences with similar activity and/or folding.

Start: month 4

Duration: 4 months

Action 4.3.1.3 3D refinement of the receptor structure by means of Molecular Dynamics.

Start: month 6

Â Duration : 8 months

WP4.3.2 Docking of the native ligand to the putative receptor and generation of a small library of compounds based on strigolactone skeleton as template

Action 4.3.2.1 Using the proprietary software DELOS the docking and structural characteristics of strigolactone and strigolactone-like molecules will be described. A library of compounds generated by means of the bioinformatic tools will be generated taking as starting template the scaffold of the strigolactone

Start: month 12

Duration: 8 months

Action 4.3.2.2 Characterization of the elements of the virtual library and docking to the receptor. This will allow a ranking of the library in terms of binding features. A flexible docking of the best elements obtained in the ranking will be performed in order to get the final ranking.

Start: month 20

Duration 10 months
ATTENDED RESULTS: Results
The activities planned in this workpackage will lead to the following results and deliverables:

4.1
List of genes involved in in the biosynthetic pathway leading to strigolactone production

4.2
deliverable of 4.2.1:
Assignment of a putative function to candidate biosynthetic genes provided by activity 4.1

deliverable of 4.2.2:
Full-length cDNAs amplified and cloned in the appropriate expression vectors

deliverable of 4.2.3
Recombinant proteins purified in sufficient amounts

Deliverable of 4.2.4
Validation or the enzymatic activities postulated at 4.2.1, and simulation of metabolic pathways in vitro.

Deliverables of WP4.3.1

1. 3D structure of the enzyme/receptor derived by genetic studies
2. Binding site stereochemical description.

Deliverables of WP 4.3.2

1. Energy and structural features of natural lactones or other metabolites bound to their partner macromolecules;
2. Virtual library of compounds that are able to bind to the putative receptor and are based on the scaffold of the native ligand

Check point: At the end of WP4.3.1 the modelled receptor structure and the results of the WP4.2 will have to be compared in order to decide wether a single or a multiple choice of target should be considered. In the case of unavailability of reliable 3D structural template, the virtual library will be generated on the basis of the stereochemical properties of different strigolactones

Participant to the Work Package: Biological and structural study of a plant product: biosynthesis and activity elucidation and bioinformatics study, aiming at the discovery of synthetic compounds with desired properties

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 12
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 40

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento Colture arboree
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 52

AGENCY PARTICIPANT: (Fondazione di diritto privato che, per prioritarie finalità

statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 30
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 63

AGENCY PARTICIPANT: Isagro Ricerca Srl
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 3

TOTAL PEOPLE/MONTHS OF ACTIVITY Biological and structural study of a plant product: biosynthesis and activity elucidation and bioinformatics study, aiming at the discovery of synthetic compounds with desired properties: 158

Work Package: Synthesis of heterocycle-derived structural analogues of sorgolactones

NUMBER: 5
TITLE: Synthesis of heterocycle-derived structural analogues of sorgolactones
RESPONSIBLE: CRISTINA PRANDI
STARTING MONTH: 1
ENDING MONTH: 36
OBJECTIVES: The aim of the project related to workpackage 5 is to assess the germination stimulant abilities of a number of synthetic strigolactone analogues, in order to better understand the role of the structural features of the molecules involved. A first generation of analogues of natural strigolactones in which the A-ring of the molecule is an heterocycle will be synthesised and their biological activity will be checked. The initial approach will be focused on the A ring of the tricyclic framework of the target molecule. The scheduling of work package 5 will be planned as follows:
5.1 0-18 m. Synthesis of four structural analogues of 5-deoxystrigol in which the A ring of the molecule will be respectively a carbacycle, an O-, N- and S- derivative. To our knowledge, up to date, no heterocycles analogues have ever been synthesized. With respect to N-heterocycles we will consider the possibility of quaternarization of the N atom: as a consequence, the corresponding ammonium salts are expected to be more soluble in the biological medium and, we hope, more active.
5.2 18-20 m. Biological tests on fungal germination (Isagro).
5.3 10-36 m. Use of bioinformatics proprietary package in order to perform a screening of possible candidate molecules to be designed and synthesized by partner 6 (Isagro).
5.4 20-36 m. On the basis of the bioassays results of this first class of analogues and the indications arising from the bioinformatics package (Geol, WP4), our attention will be focused on the more active molecules. The aim is to obtain compounds that are suitable to be produced in an industrial plant (WP6), are environmentally stable and have low general and ecological toxicity. A new generation of derivatives will then be synthesized, allowing our synthetic sequence the introduction of a number of substituents on ring A. Moreover, we plan to achieve a complete enantioselective synthesis of the most promising structural analogue, so that the biological activity of both enantiomers will be compared.

5.5 20-36. In addition, knowledge of which part of the molecule can be elaborate without significantly impairing the germination activity would be useful in the design of labelled analogues suitable for determining the site and mode of action. The choice of suitable functional substituents on ring A, will allow the introduction of fluorescent probes and molecular imaging investigations. In view of biotechnological applications, our attentions will be directed on the enol ether functionality that links the tricyclic framework ABC of the target molecule to ring D. It has been reported (Zwanenburg et al. J. Agric. Food Chem. 1992) that the first interaction with the receptor, involves a nucleophilic attack at the enol ether bridge with consequent release of the D-ring as a leaving group. The fact that the germination stimulant activity of strigolactones is critically dependent by the presence of the labile enol ether D-ring structural unit has meant that it has not so far been possible to synthesise active analogues with a soil halflife sufficient to provide activity in a single treatment at low concentration. From an organic chemistry point of view, our efforts will be directed to change the enol ether bridge with a less sensitive functionality (i.e. an imine), so that the structural features could be considered compatible both with bioactivity and with treatment in soil.
5.6 As far as the target molecules have been synthesized in a stable form, greenhouse experiments in the presence of the host plant would be undertaken by the industrial partner. The collaboration is expected to result in the possible applications of these molecules to increase the root colonization as well as in the field of biocontrol against pests.
DESCRIPTION: Strigolactones are traditionally described as sesquiterpene lactones. The structural core of the molecules is a tricyclic lactone (A, B, C rings) connected via an enol ether bridge to an unsaturated furanone mojety (the D-ring). In recent years in our laboratory we set up a synthetic methodology that affords hetero or carba bicyclic fused systems (Prandi et. al. Journal of Organic Chemistry 2003, 2004 and 2005, Organic Letters 2005). In this project we propose the application of the same synthetic approach to the synthesis of structural analogues of 5-deoxystigol. The first synthetic steps are aimed to the construction of ABC-ring. The synthetic route may be reconducted to four main steps.
5.1 Palladium catalyzed carbonylative Suzuki cross-coupling. The core structure of sorgolactone analogues will be obtained in an expeditious way by a carbonylative cross coupling reaction, field that has been thoroughly investigated in our group in recent years. Starting materials will be an appropriate organic boronate and a series of enol triflates derivatives of cyclic ketons (C-analogues), lactones (O- analogues), thiolactones (S-analogues) and lactams (N- analogues). Enol triflates are easily obtained from commercially available starting materials.
5.2 Nazarov cyclization to construct rings AB. The products obtained from 2.1 present the right electronic arrangement to undergo an electrocyclic reaction (Nazarov reaction) to afford the AB nucleus. Because Nazarov cyclizations are diastereoselective processes, an enantioselective synthesis of rings AB, starting from enantiopure compounds, should be straightforward.
5.3 Construction of ring C. The scheme proposed in our project differs from literature published synthesis also in the construction of C-ring. The boronate used in step 2.1 is planned in such a way that the AB nucleus formed in that step will present a suitable hanging arm to get the ring C via a simple lactonization process.
5.4 Finally, the coupling of ABC framework with bromofuranone will lead to the introduction of the D-ring and then to the target molecule.
A significant challenge in the proposed strigol analogues synthesis, is the development of methods that allow an enantioselective version of the proposed strategy. Our synthetic project, as stated before, allows the control of stereochemistry and, consequentely the avaibility of enantiomerically pure ABC-ring fragment. This, joined to the fact that control of the stereochemistry of step iv), namely the D-ring coupling reaction, and hence the

configuration at C-2', which is critical for the germination stimulant activity of strigolactones, has already been reported (Zwanenburg et al.J. Agric. Food Chem. 1997) will lead to the enantioselective total synthesis of heterocycles strigol analogues. It's remarkable to underline that the commercial avaibility of starting materials with different patterns of substitution on A ring will potentially afford a number of structural analogues. Moreover the synthetic strategy proposed will allow the introduction of proper functional groups in view of the further derivatization with fluorescent probes. Scalability of the chemical synthesis and patentability of the compounds as well as patent coverage will be taken into consideration.

ATTENDED RESULTS: The experimental data obtained from this project are expected to provide a systematic framework for structure-activity studies on strigol analogues. The choice of introducing variability on ring-A of the target molecule has been made on the base of biological activity data of strigol analogues found in the recent literature. As a matter of fact, a range of variations in the structure of the A-ring can generally be tolerated. Active GR (germination releaser) compounds include several molecules with aromatic A- rings (GR24 and derivatives), and a few with no A-ring at all (GR7 and derivatives). The syntheses of analogues in which ring-A is a saturated heterocycles has never been proposed so far, the biological activity of such a kind of molecules remains an unexplored field. The scientific results expected by the proposed project are scheduled according to the following sequence:

5.1 Synthesis of carba-, oxy-, thio-and aza derivativesanalogues of strigolactone.

5.2 Refinement of the lead compounds based on the data obtained both from the biological tests and from the computational WP4 results.

5.3 On the base of the results of this first series of tests our attention will be focused on the more active and promising structures. Interesting results are expected from the comparison of the biological activity of enantiomers. We hope that, given the preliminary remarks, one or more active molecules will be individuated, that would serve for subsequent developments.

5.4 Generation of new and original ranked library of structural analogues.

5.5 Evaluation of the biological data and of the results coming from WP1, Wp2, WP3 and WP4 in order to select the candidate molecules suitable to be produced in an industrial plant (WP6), that proved to be environmentally stable and have low general and ecological toxicity.

5.6 The active target molecules will be then functionalized with fluorescent probes. In our purpose the overall sequence will lead to set up an affinity tag procedure for the detection of strigolactone-binding proteins in the AM fungus.

5.7 The fact that the germination stimulant activity of strigolactones is critically dependent on the presence of the labile enol ether-D-ring structural unit has meant that it has not so far been possible to synthesise active analogues with a soil half-life sufficient to provide effective anti-Striga activity in a single treatment at low concentration. A further aim of the project related to WP 5 is to spot out structural analogues with a different functional group that tethers ABC nucleus to ring-D. The new structural feature must be thought in such a way that the molecule would be reactive enough to interact with the receptor but, at the same time, resistant to hydrolysis at the pH of the soil. Moreover, as far as AM fungi are involved, the active molecules in soil could be used to stimulate hyphal branching and increase the root colonization. We are confident that the scientific results obtained from this project will be useful for a more precise comprehension of the mechanisms at the base of both hyphal branching in AM fungi and germination in parasitic seeds of dangerous pests (like Striga) that affects crop yield in African countries. We believe that the results of these studies would be of great interest for developing biocontrol strategies.

Participant to the Work Package: Synthesis of heterocycle-derived structural analogues of sorgolactones

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 93

AGENCY PARTICIPANT: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
STARTING MONTH PEOPLE ACTIVITIES: 13
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 3

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 18
ENDING MONTH PEOPLE ACTIVITIES: 20
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 4

AGENCY PARTICIPANT: Isagro Ricerca Srl
STARTING MONTH PEOPLE ACTIVITIES: 12
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 34

TOTAL PEOPLE/MONTHS OF ACTIVITY Synthesis of heterocycle-derived structural analogues of sorgolactones: 134

Work Package: Checking the green/white biotechnological potentialities of BIOBIts

NUMBER: 6
TITLE: Checking the green/white biotechnological potentialities of BIOBIts
RESPONSIBLE: FRANCO PELLACINI
STARTING MONTH: 1
ENDING MONTH: 36
OBJECTIVES: The main objective of the WP6 is to exploit the scientific and technological results produced in the previous WPs ,to check their effectiveness in setting up new application procedures which are adapted to agricultural practices in Piedmont Region. The general objective will be reached through these specific objectives:

1. to evaluate the impact of the endobacteria on the growth parameters of the mycorrhizal plant;

2. to evaluate the impact of the added Vit B12 on some health plant parameters;

3. to investigate the impact of strigolactone-like molecules (both of natural origin as well as synthetic analogues, as resulting from WP5) on the mycorrhizal success and on plant health;

4. to check the effects of such molecules on germination of weeds plants.

BIOBITs specifically addresses the call of Converging Technologies on Biotechnology e ICT.
The conclusive aim will be in fact to increase competitiveness of Piedmont companies, through the development of strategies favoring microbial-based crop production systems and improved application strategies.
DESCRIPTION: The WP6 represents a crucial moment of the activities planned in BIOBIts. It has the main aim to check in in vivo experiments the molecules and the products stemmed by the previous WPs, setting up new application procedures. The strategy expects to develop knowledge (WP1 and 2), technology (WPs 3, 4) and biotechnological/industrial outcomes. The exploitation of products and processes coming from WPs 2, 4 and 5 activities will be developed in the WP 6 thanks to the interaction of the different expert teams (plant biologists, plant physiologists, chemists, inoculum producers) coordinated the by ISAGRO team. The company has in fact the availability of large surfaces located inside modern greenhouses where controlled experiments can be performed before moving to the field trials. They are aimed to check:
The impact of the endobacteria on the growth parameters of the mycorrhizal plant; The impact of the added Vit B12 on some health plant parameters; The impact of strigolactone-like molecules (both of natural origin as well as synthetic analogues, as resulting from WP5) on the mycorrhizal success and on plant health; the effects of such molecules on germination of weeds plants.
The specific activities will be planned as follows:

6.1 Partner 9 will develop a prototype of industrial production for the commercial inoculum; will set up an industrial fermentation process for the endobacterium/fungal association and for the greenhouse production of G margarita.

6.2. Partner 9 will develop a greenhouse production of G. margarita variant strain without endobacteria (cured spores).

6.3 Partner 9 will produce a mixed inoculum to be used as a comparison with the one developed at the point 1.

6.4 Partner 6 will conduct growth experiments by comparing the effects of the complex Gigaspora margarita with the bacterial population on tomato (Lycopersicon esculentum) plants in different fertilization conditions (versus the effects of the commercial inoculum) Quantitative analyses of growth parameters will be performed on mycorrhizal plants.

6.5 Partner 6 will conduct greenhouse growth experiments after vitamin B12 treatment. Due to the so far enigmatic role of vitamin B12 on fungal and plant development, tomato plants inoculated with G. margarita wild type or cured spores and treated or not with vitamin B12 will be analyzed considering growth and health parameters.

6.6 As far as the target molecules have been synthesized in a stable form, greenhouse experiments in the presence of the host plant would be undertaken by partner 6. The

following parameters will be considered: Mycorrhization success, Growth parameters, Secondary metabolites

6.7 Strigolactones molecules will be applied to weed plants to check their effects on the germination rate.
ATTENDED RESULTS: The expected results will be:

Optimized techniques of AM/bacterial inoculum production
Optimized procedure for application of biofertilizers under greenhouse conditions
Optimized procedure for application of molecules with impact on crop/food products (Vit B12, secondary metabolites)
The optimized strategies for fertilization will be used to generate models
Increased competitiveness of Piedmont Companies

The results will be reached according to the following Time scale and deliverables.

WP 6.1 (0-15 months) set up of the industrial process for the inoculum production

WP 6.2 (2-18 months) set up of the industrial process for the cured spore production

WP 6.3 (18-36 months) inoculum production for large scale experiments

WP 6.4 (10-36 months) inoculum bioactivity data on tomato

WP 6.5 (4-36 months) data on the effect of Vit B12 on plants, and their evaluation

WP 6.6 (8-36 months) biological data on new agrochemicals and evaluation of Mycorrhization success, Growth parameters, Secondary metabolites

WP 6.7 (8-36 months) Evaluation of biological data of strigolactons on weed germination

Participant to the Work Package: Checking the green/white biotechnological potentialities of BIOBIts

AGENCY PARTICIPANT: Isagro Ricerca Srl
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 114

AGENCY PARTICIPANT: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) CENTRO COLTURE SPERIMENTALI VALLE D'AOSTA S.R.L.
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 15

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
STARTING MONTH PEOPLE ACTIVITIES: 12

ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 10

AGENCY PARTICIPANT: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
STARTING MONTH PEOPLE ACTIVITIES: 1
ENDING MONTH PEOPLE ACTIVITIES: 36
PEOPLE/MONTHS ACTIVITIES FOR PARTICIPANT: 3

TOTAL PEOPLE/MONTHS OF ACTIVITY Checking the green/white biotechnological potentialities of BIOBIts: 142

N	Titolo Work Package	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	A metagenomics approach to sequence the genome of Candidatus glomeribacter ...																																				
2	Candidatus Glomeribacter gigasporarum genome annotation and selection of ca...																																				
3	In Silico Design and Analysis of Biological Systems																																				
4	Biological and structural study of a plant product: biosynthesis and activi...																																				
5	Synthesis of heterocycle-derived structural analogues of sorgolactones																																				
6	Checking the green/white biotechnological potentialities of BIOBIts																																				

Costs of the staff who participates to the proposal:

NAME OR TYPE: Research grant
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 54
2 year (0-12) : 36
3 year (0-12) : 36

COST:
1 year (0-12) : 103680
2 year (0-12) : 69120
3 year (0-12) : 69120

NAME OR TYPE: Research grant
AGENCY TYPE: Coproponent
NAME: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 12
2 year (0-12) : 12
3 year (0-12) : 12

COST:
1 year (0-12) : 23040
2 year (0-12) : 23040
3 year (0-12) : 23040

NAME OR TYPE: Research grant
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 12
2 year (0-12) : 12
3 year (0-12) : 12

COST:
1 year (0-12) : 23040
2 year (0-12) : 23040
3 year (0-12) : 23040

NAME OR TYPE: Research grant

AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 12
2 year (0-12) : 12
3 year (0-12) : 12

COST:
1 year (0-12) : 23040
2 year (0-12) : 23040
3 year (0-12) : 23040

NAME OR TYPE: Research grant
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 48
2 year (0-12) : 48
3 year (0-12) : 48

COST:
1 year (0-12) : 92160
2 year (0-12) : 92160
3 year (0-12) : 92160

NAME OR TYPE: Research grant
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 12
2 year (0-12) : 12
3 year (0-12) : 12

COST:
1 year (0-12) : 23040
2 year (0-12) : 23040
3 year (0-12) : 23040

NAME OR TYPE: Research grant
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento Colture arboree
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 12
2 year (0-12) : 12
3 year (0-12) : 12

COST:
1 year (0-12) : 23040
2 year (0-12) : 23040
3 year (0-12) : 23040

NAME OR TYPE: Research grant
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 24
2 year (0-12) : 24
3 year (0-12) : 24

COST:
1 year (0-12) : 46080
2 year (0-12) : 46080
3 year (0-12) : 46080

NAME OR TYPE: MARA NOVERO
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 12575
2 year (0-12) : 12575
3 year (0-12) : 12575

NAME OR TYPE: MARIO COPPO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 1
2 year (0-12) : 1

3 year (0-12) : 1

COST:
1 year (0-12) : 12030
2 year (0-12) : 12030
3 year (0-12) : 12030

NAME OR TYPE: ANDREA GENRE
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4
2 year (0-12) : 4
3 year (0-12) : 5

COST:
1 year (0-12) : 11260
2 year (0-12) : 11260
3 year (0-12) : 14075

NAME OR TYPE: IVAN BONDONI
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 8460
2 year (0-12) : 11280
3 year (0-12) : 11280

NAME OR TYPE: LUCA ROVERSI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 1

COST:
1 year (0-12) : 11642

2 year (0-12) : 11642
3 year (0-12) : 5821

NAME OR TYPE: VIVIANA BONO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 1

COST:
1 year (0-12) : 10152
2 year (0-12) : 10152
3 year (0-12) : 5076

NAME OR TYPE: ANGELO TROINA
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 3
3 year (0-12) : 3

COST:
1 year (0-12) : 8445
2 year (0-12) : 8445
3 year (0-12) : 8445

NAME OR TYPE: ANNA BRONDOLO
AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) CENTRO COLTURE SPERIMENTALI VALLE D'AOSTA S.R.L.
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 4600
2 year (0-12) : 4600
3 year (0-12) : 4600

NAME OR TYPE: ANNA TANCORRA
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 11529
2 year (0-12) : 15372
3 year (0-12) : 15372

NAME OR TYPE: LAVINIA EGIDI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 9848
2 year (0-12) : 9848
3 year (0-12) : 9848

NAME OR TYPE: MAURO GIRAUDO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 6956
2 year (0-12) : 6956
3 year (0-12) : 6956

NAME OR TYPE: DANIELE FORGIA
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 7209
2 year (0-12) : 9612
3 year (0-12) : 9612

NAME OR TYPE: PAOLA BONFANTE
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4
2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 48120
2 year (0-12) : 48120
3 year (0-12) : 48120

NAME OR TYPE: PAOLA GIANNINI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 3
3 year (0-12) : 2

COST:
1 year (0-12) : 13230
2 year (0-12) : 19845
3 year (0-12) : 13230

NAME OR TYPE: SILVANO PANERO
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4

2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 11596
2 year (0-12) : 11596
3 year (0-12) : 11596

NAME OR TYPE: ANDREA SCHUBERT
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento Colture arboree
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) :
2 year (0-12) : 1
3 year (0-12) : 1

COST:
1 year (0-12) :
2 year (0-12) : 6615
3 year (0-12) : 6615

NAME OR TYPE: CRISTINA PRANDI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4
2 year (0-12) : 2
3 year (0-12) : 3

COST:
1 year (0-12) : 19696
2 year (0-12) : 9848
3 year (0-12) : 14772

NAME OR TYPE: GIOVANNI MEAZZA
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:

1 year (0-12) : 26560
2 year (0-12) : 26560
3 year (0-12) : 26560

NAME OR TYPE: LUISA LANFRANCO
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 25380
2 year (0-12) : 25380
3 year (0-12) : 25380

NAME OR TYPE: CARLO GARAVAGLIA
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 37925
2 year (0-12) : 37925
3 year (0-12) : 37925

NAME OR TYPE: CESARE ACCOMAZZO
AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 3

COST:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 20100

NAME OR TYPE: CLAUDIO LOVISOLO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento Colture arboree
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) :
2 year (0-12) : 3
3 year (0-12) : 3

COST:
1 year (0-12) :
2 year (0-12) : 14106
3 year (0-12) : 14106

NAME OR TYPE: FRANCO BETTARINI
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 40225
2 year (0-12) : 40225
3 year (0-12) : 40225

NAME OR TYPE: FRANCO PELLACINI
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 39760
2 year (0-12) : 39760
3 year (0-12) : 39760

NAME OR TYPE: GABRIELE PIAZZON
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl

UNDER 32 YEARS: Si

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 7515
2 year (0-12) : 10020
3 year (0-12) : 10020

NAME OR TYPE: ALESSANDRA BROSIO
AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 1
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 6600
2 year (0-12) : 13200
3 year (0-12) : 13200

NAME OR TYPE: FERRUCCIO DAMIANI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 1
3 year (0-12) : 1

COST:
1 year (0-12) : 10152
2 year (0-12) : 5076
3 year (0-12) : 5076

NAME OR TYPE: GIANLUCA STRANGES
AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) CENTRO COLTURE SPERIMENTALI VALLE D'AOSTA S.R.L.
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 3
3 year (0-12) : 3

COST:
1 year (0-12) : 3600
2 year (0-12) : 5400
3 year (0-12) : 5400

NAME OR TYPE: GIUSTO GIOVANNETTI
AGENCY TYPE: Coproponent
NAME: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) CENTRO COLTURE SPERIMENTALI VALLE D'AOSTA S.R.L.
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 1

COST:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 5000

NAME OR TYPE: GRAZIELLA RANGHINO
AGENCY TYPE: Coproponent
NAME: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 10
2 year (0-12) : 10
3 year (0-12) : 10

COST:
1 year (0-12) : 70000
2 year (0-12) : 70000
3 year (0-12) : 70000

NAME OR TYPE: ISABELLA VENTURINI
AGENCY TYPE: Coproponent
NAME: Isagro Ricerca Srl
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3

2 year (0-12) : 4
3 year (0-12) : 4

COST:
1 year (0-12) : 13980
2 year (0-12) : 18640
3 year (0-12) : 18640

NAME OR TYPE: MARGHERITA BARBERO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4
2 year (0-12) : 2
3 year (0-12) : 3

COST:
1 year (0-12) : 23308
2 year (0-12) : 11654
3 year (0-12) : 17481

NAME OR TYPE: MARIANGIOLA DEZANI
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 1

COST:
1 year (0-12) :
2 year (0-12) :
3 year (0-12) : 12868

NAME OR TYPE: VALERIA BIANCIOTTO
AGENCY TYPE: Adjuntive proponent
NAME: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 10072
2 year (0-12) : 10072
3 year (0-12) : 10072

NAME OR TYPE: FRANCESCA CARDINALE
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento Colture arboree
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 3
2 year (0-12) : 2
3 year (0-12) : 3

COST:
1 year (0-12) : 14106
2 year (0-12) : 9404
3 year (0-12) : 14670

NAME OR TYPE: ANNAMARIA DEAGOSTINO
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 4
2 year (0-12) : 2
3 year (0-12) : 3

COST:
1 year (0-12) : 18804
2 year (0-12) : 9402
3 year (0-12) : 14103

NAME OR TYPE: MARIATERESA DELLA BEFFA
AGENCY TYPE: Proponent
NAME: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 5
2 year (0-12) : 5
3 year (0-12) : 5

COST:
1 year (0-12) : 14495
2 year (0-12) : 14495

3 year (0-12) : 14495

NAME OR TYPE: RAFFAELLA MARIA BALESTRINI
AGENCY TYPE: Adjuntive proponent
NAME: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) : 2
3 year (0-12) : 2

COST:
1 year (0-12) : 7806
2 year (0-12) : 7806
3 year (0-12) : 7806

NAME OR TYPE: SIMONETTA RONCHI DELLA ROCCA
AGENCY TYPE: Adjuntive proponent
NAME: (Università degli Studi di Torino) Dipartimento di Informatica
UNDER 32 YEARS: No

NUMBER OF MONTHS/MAN OF PARTICIPATION TO THE PROPOSAL:
1 year (0-12) : 2
2 year (0-12) :
3 year (0-12) :

COST:
1 year (0-12) : 24060
2 year (0-12) :
3 year (0-12) :

TOTAL COST OF STAFF

1 anno (0-12) : 958816
2 anno (0-12) : 911481
3 anno (0-12) : 955470

TOTAL COST OF STRUCTURED STAFF

1 anno (0-12) : 601696
2 anno (0-12) : 588921
3 anno (0-12) : 632910

TOTAL COST OF NON STRUCTURED STAFF

1 anno (0-12) : 357120

2 anno (0-12) : 322560
3 anno (0-12) : 322560

TOTAL COST OF UNDER 32 YEARS STAFF

1 anno (0-12) : 388749
2 anno (0-12) : 361917
3 anno (0-12) : 361917

Other costs

COST TYPE: Instruments
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 15000
MOTIVATION: The Agilent 2100 bioanalyzer is a microfluidics-based platform, offering solutions for the quantitative analysis of DNA, RNA, proteins and cells. It delivers automated, high quality digital data. It is a basic instrument for all genome-based projects.

COST TYPE: Instruments
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 85000
MOTIVATION: The Agilent DNA microarray scanner is a 48-slide scanning system that can read any mix of 1 x 3” glass slide microarrays (both Agilent and non-Agilent) and seamlessly feature extract them all using Agilent’s Feature Extraction Software.It is a crucial instrument for the annotation project. It will also be of great importance for the WP4

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 70000
MOTIVATION: The development of the sequencing project requires a still huge work for the sequencing of the remaining fosmids. The work will be done by the Parco Tecnologico Padano. The cost is evaluated as 30000 euros, while the other will cover the usual lab expenses for the consumables.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 30000
MOTIVATION: The development of the annotation project requires both experimental and informatics work. Sequencing and expression analysis requires lab expenses for the consumables, while the development of the data bases will require expenses as planned by the department of Informatics (Torino University)

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 50000
MOTIVATION: The development of the annotation project requires both experimental and informatics work. Sequencing and expression analysis requires lab expenses for the consumables, including quantitative RT-PCR (extraction kits, polymerases, 10.000 euros) and microarray analysis (probe labelling, fluorescent kits for 20.000 euros)

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 50000
MOTIVATION: The development of the annotation project requires both experimental and informatics work. Sequencing and expression analysis requires lab expenses for the consumables, as previously described.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 45000
MOTIVATION: we will have to cover the general expenses for the management of the whole project

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 37000
MOTIVATION: Project management and general costs

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 37000
MOTIVATION: Project management and general costs

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 37000
MOTIVATION: Project management and general costs

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 15000

MOTIVATION: Due to the high number of researchers involved as well as the presence of "in formation" researchers, we plan to have at least 1 presence for each participant to international meetings/ or schools. The meetings which will be of direct interest to the Project and already planned in the next years will be: Molecular Plant Microbe Interaction, Quebec.2009 ; International Congress of Mycorrhiza, Brasil 2008, Environmental Microbiology, 2008; Fungal genetics USA, 2009;
Internation Congress of Mycology, Edinbourgh 2009

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 20000
MOTIVATION: Due to the high number of researchers involved as well as the presence of "in formation" researchers, we plan to have at least 1 presence for each participant to international meetings/ or schools. The meetings which will be of direct interest to the Project and already planned in the next years will be: Molecular Plant Microbe Interaction, Quebec.2009 ; International Congress of Mycorrhiza, Brasil 2008, Environmental Microbiology, 2008; Fungal genetics USA, 2009;
Internation Congress of Mycology, Edinbourgh 2009…

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 30000
MOTIVATION: congresses and meetings

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 30000
MOTIVATION: congresses and meetings

COST TYPE: Services
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 45000
MOTIVATION: Once the sequence genome is available microarrays chips have to be developed to be delivered to the WP2. The chip production will be charged to specialized companies like Genoscope (Paris).

COST TYPE: Services
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
COST: 40000
MOTIVATION: Biotech companies will be charged for the following activities:
1. Production of synthetic peptides and antibody development
2. Acquisition of mutant strains, defective in specific traits in order to accomplish complementation experiments

COST TYPE: Instruments
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 85000
MOTIVATION: Personal computers and one laptop would be required.
Updated software for molecular modeling and structural chemical identification. As concerns scientific instruments, 2 magnetic stirrers with electronic control of temperature would be necessary for overnight experiments.Moreover, part of the financial support will be used to buy a MS/MS instrument.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 50000
MOTIVATION: The synthetic project proposed requires a number of specific reagents. In particular enantiopure chemicals and commercial chiral auxiliaries are very expensive (100 euros/gr from Aldrich). More over the purifications and spectroscopic characterization of products, both intermediates and final products, involves the use of sophisticated instruments. As concerns purification, GC, GC-MS, HPLC, HPLC-MS are required to be equipped with specific chromatographic columns with chiral stationary phases (2000 euros each). NMR needs a periodic refilling of liquid nitrogen (200 euros every 2 weeks)and liquid helium (1300 euros twice a year).

The 10% of the expenses will be devoted to the maintainance of instruments that require a "quality check" each year

The project will require a huge quantity of fungal spores which will be bought directly from a French Company -Biorhize (5000 euros)

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 50000
MOTIVATION: Reagents, chemicals and consumables as previously described

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 50000
MOTIVATION: Reagents, chemicals and consumables

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 22000
MOTIVATION: to cover general expense for the management of the project

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 22000
MOTIVATION: to cover general expense for the management of the project

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 22000
MOTIVATION: to cover general expense for the management of the project

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 20000
MOTIVATION: Our intent is to attend meetings, International Conferences
and to present our scientific results to the International Scientific Community. We plan two foreign missions for each partecipant. In the field of organic synthesis a number of interesting meetings are scheduled in the next three years: 22-27 June 2008
17th International Conference on Organic Synthesis (ICOS 17),
Daejeon, Korea.
8-11 March 2009
10th Florida Heterocyclic Conference,
Gainesville, Florida, USA. International
Symposium on Carbanion Chemistry, Madison USA 2010. Moreover, it would be helpfull to spend short periods as visiting hosts in foreign laboratories with specific expertises, to acquire deeper skills in the field of enantioselective synthesis.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 20000
MOTIVATION: Congresses and meetings

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 20000
MOTIVATION: Conferences and meetings

COST TYPE: Services
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
COST: 40000
MOTIVATION: Once the synthesis of the structural analogues of sorgolactone has been accomplished, a company with multi-year expertises in molecular imaging will be

contacted in order to develop the design of a suitable fluorescent probe useful in the investigation of the receptor site.

COST TYPE: Instruments
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 12000
MOTIVATION: Two laptops and one PC. These expenses refer to the Department of P.O. University for the first year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 30000
MOTIVATION: Consumables and computer maintenance. These expenses refer to the Department of Turin University for the second year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 30000
MOTIVATION: Consumables and computer maintenance. These expenses refer to the Department of Turin University for the third year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 1000
MOTIVATION: Consumables and computer maintenance. These expenses refer to the Department of P.O. University for the third year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 1000
MOTIVATION: Consumables and computer maintenance. These expenses refer to the Department of P.O. University for the first year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 1000
MOTIVATION: Consumables and computer maintenance. These expenses refer to the Department of P.O. University for the second year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 35000
MOTIVATION: Project management and general costs. These expenses refer to the Department of Turin University for the first year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 29000
MOTIVATION: Project management and general costs. These expenses refer to the Department of Turin University for the third year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 4000
MOTIVATION: Project management and general costs. These expenses refer to the Department of P.O. University for the first year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 4000
MOTIVATION: Project management and general costs. These expenses refer to the Department of P.O. University for the second year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 4000
MOTIVATION: Project management and general costs. These expenses refer to the Department of P.O. University for the third year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 17000
MOTIVATION: Congresses and meetings. These expenses refer to the Department of Turin University for the second year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 17000
MOTIVATION: Conferences and meetings. These expenses refer to the Department of Turin University for the third year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 4000
MOTIVATION: We plan to attend meetings, International Conferences
and to present our scientific results to the International Scientific Community. We plan one foreign missions for each participant. These expenses refer to the Department of P.O. University for the first year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica

COST: 4000
MOTIVATION: Congresses and meetings. These expenses refer to the Department of P.O. University for the second year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 4000
MOTIVATION: Congresses and meetings. These expenses refer to the Department of P.O. University for the third year.

COST TYPE: Travel
NAME OF AGENCY: (Università degli Studi di Torino) Dipartimento di Informatica
COST: 17000
MOTIVATION: Our intent is to attend meetings, International Conferences
and to present our scientific results to the International Scientific Community. We plan one foreign missions for each participant. These expenses refer to the Department of Turin University for the first year.

COST TYPE: Instruments
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 12000
MOTIVATION: Hardware & Software Licenses

COST TYPE: Other
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 2000
MOTIVATION: Consumables and maintenance

COST TYPE: Other
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 2000
MOTIVATION: Consumables and maintenance

COST TYPE: Other
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 2000
MOTIVATION: Consumables and maintenance

COST TYPE: General expenses
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 7000

MOTIVATION: project management and general costs

COST TYPE: General expenses
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 7000
MOTIVATION: project management and general costs

COST TYPE: General expenses
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 7000
MOTIVATION: project management and general costs

COST TYPE: Travel
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 1800
MOTIVATION: partecipation to meetings and workshops

COST TYPE: Travel
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 1800
MOTIVATION: partecipation to meetings and workshops

COST TYPE: Travel
NAME OF AGENCY: (Ente di ricerca privato, con autonoma personalità giuridica che per prioritarie finalità statutarie svolga attività di ricerca scientifica-tecnologica) ETICA srl
COST: 1800
MOTIVATION: partecipation to meetings and workshops

COST TYPE: Acquisto di licenze e/o brevetti
NAME OF AGENCY: Isagro Ricerca Srl
COST: 70000
MOTIVATION: Software License for Molecular modeling and biocomputations

COST TYPE: Acquisto di licenze e/o brevetti
NAME OF AGENCY: Isagro Ricerca Srl
COST: 70000
MOTIVATION: Software License for Molecular modeling and biocomputations

COST TYPE: Acquisto di licenze e/o brevetti
NAME OF AGENCY: Isagro Ricerca Srl
COST: 70000

MOTIVATION: Software License for Molecular modeling and biocomputations

COST TYPE: Other
NAME OF AGENCY: Isagro Ricerca Srl
COST: 10000
MOTIVATION: Consumables

COST TYPE: General expenses
NAME OF AGENCY: Isagro Ricerca Srl
COST: 21000
MOTIVATION: To cover general expense for the management of the project

COST TYPE: General expenses
NAME OF AGENCY: Isagro Ricerca Srl
COST: 21000
MOTIVATION: To cover general expense for the management of the project

COST TYPE: General expenses
NAME OF AGENCY: Isagro Ricerca Srl
COST: 21000
MOTIVATION: To cover general expense for the management of the project

COST TYPE: Travel
NAME OF AGENCY: Isagro Ricerca Srl
COST: 2600
MOTIVATION: Travels and meetings

COST TYPE: Travel
NAME OF AGENCY: Isagro Ricerca Srl
COST: 2600
MOTIVATION: Travels and meetings

COST TYPE: Travel
NAME OF AGENCY: Isagro Ricerca Srl
COST: 2600
MOTIVATION: Travels and meetings

COST TYPE: Services
NAME OF AGENCY: Isagro Ricerca Srl
COST: 10000
MOTIVATION: Consumables

COST TYPE: Services
NAME OF AGENCY: Isagro Ricerca Srl

COST: 10000
MOTIVATION: Consumables

COST TYPE: Instruments
NAME OF AGENCY: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
COST: 40000
MOTIVATION: We need to provide some of the researchers involved in the project (in particular the temporary ones) with powerful notebooks for writing documentation and running advanced software tools for implementation of the software tools we plan to develop. Moreover some high performance server is needed for providing extra computational power and supporting web services for communication and coordination. These expenses refer to the Department of Turin University for the first year.

COST TYPE: Other
NAME OF AGENCY: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
COST: 30000
MOTIVATION: consumables and computer maintenance. These expenses refer to the Department of Turin University for the first year.

COST TYPE: General expenses
NAME OF AGENCY: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
COST: 28000
MOTIVATION: Project management and general costs. These expenses refer to the Department of Turin University for the second year.

COST TYPE: Instruments
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 3000
MOTIVATION: Use of computer time; hardware maintenance

COST TYPE: Instruments
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 3000
MOTIVATION: Use of computer time; hardware maintenance

COST TYPE: Instruments
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 3000
MOTIVATION: Use of computer time; hardware maintenance

COST TYPE: Other
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 60000
MOTIVATION: Consumables

COST TYPE: Other
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 60000
MOTIVATION: Consumables

COST TYPE: Other
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 60000
MOTIVATION: Consumables

COST TYPE: General expenses
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 42000
MOTIVATION: Project management, general expenses

COST TYPE: General expenses
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 42000
MOTIVATION: Project management, general expenses

COST TYPE: General expenses
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 42000
MOTIVATION: Project management, general expenses

COST TYPE: Travel
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 2000
MOTIVATION: Travels and meetings

COST TYPE: Travel
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 3000

MOTIVATION: Travel expenses and partecipation to meetings

COST TYPE: Travel
NAME OF AGENCY: (Fondazione di diritto privato che, per prioritarie finalità statutarie, sia impegnata nella promozione di attività di ricerca) GEOL SAS DI CIBRARIO OTTAVIO E C.
COST: 2000
MOTIVATION: Travel expenses and meetings

Reassumed

Acquisto di licenze e/o brevetti: 210000
General expenses: 536000
Instruments: 258000
Other: 639000
Services: 145000
Travel: 238200

PROPONENT

Organization type: Università degli Studi di Torino
Name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
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Fax: +39 011 6705962
E-mail: gabriella.zaccone@unito.it
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I.C.O. code: Enti di ricerca
Localized office in Piedmont
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Email: gabriella.zaccone@unito.it
Responsible
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Email: paola.bonfante@unito.it
Web address: http://web086.unito.it/cgi-bin/bioveg/home.pl

Participant for proponent

Name: MARIATERESA
Surname: DELLA BEFFA

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National insurance number: MTRDLL55B65L219K
Gender: Female
Date of birth: 1955-02-25
Nazionality: ITALIAN
Document number: TO2732745D
Passport number:
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City: TORINO
Address: Viale Mattioli
Number: 25
CAP: 10125
Telephone: 0116502927
Fax: 0116705962
Mobile:
Organization type: Università degli Studi di Torino
Role: Contratto di lavoro a tempo indeterminato
Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education: Degree in Agricultural Engineering
Work experience in the last 5 years:
Technical, organizational and social skills:
Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:
Type of the role in the search: Researcher
Total cost in the proposal: 43485

Name: SILVANO
Surname: PANERO
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National insurance number: PNRSVN68H13L219V
Gender: Male
Date of birth: 1968-06-13
Nazionality: ITALIAN
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Mobile:
Organization type: Università degli Studi di Torino
Role: Contratto di lavoro a tempo indeterminato
Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education:

Work experience in the last 5 years:
Technical, organizational and social skills:
Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:
Type of the role in the search: Researcher
Total cost in the proposal: 34788

Name: MARA
Surname: NOVERO
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National insurance number: NVRMRA73R53E020N
Gender: Female
Date of birth: 1973-10-13
Nazionality: ITALIAN
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Number: 25
CAP: 10125
Telephone: 0116705971
Fax: 0116705962
Mobile:
Organization type: Università degli Studi di Torino
Role: Contratto di lavoro a tempo indeterminato
Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education: University degree in Natural Science
Work experience in the last 5 years:
Technical, organizational and social skills:
Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research: Lumini, E., Bianciotto, V., Jargeat, P., Novero, M., Salvioli, A., Faccio, A., Bécard, G., Bonfante, P. (2007). Presymbiotic growth and sporal morphology are affected in the arbuscular mycorrhizal fungus Gigaspora margarita cured of its endobacteria. Cellular Microbiology 9 1716-1729.

Navazio, L., Moscatiello, R., Genre, A., Novero, M., Baldan, B., Bonfante, P., Mariani, P. (2007). A diffusible signal from arbuscular mycorrhizal fungi elicits a transient cytosolic calcium elevation in host plant cells. Plant Physiology 144 673-681.

Navazio, L., Moscatiello, R., Genre, A., Novero, M., Baldan, B., Bonfante, P., Mariani, P. (2007). The arbuscular mycorrhizal fungus Glomus intraradices induces intracellular calcium changes in soybean cells. Caryologia 60 137-140.

Splivallo, R., Novero, M., Bertea, C.M., Bossi, S., Bonfante, P. (2007). Truffle volatiles inhibit growth and induce an oxidative burst in Arabidopsis thaliana. New Phytologist 175 417–424.

Bonfante, P., Lumini, E., Bianciotto, V., Jargeat, P., Salvioli, A., Genre, A., Blal, B., Novero, M., Faccio, A., Batut, J., Bécard, G. (2006). Endocellular bacteria/Gigaspora margarita/ host plants: experimental evidences of arbuscular mycorrhizas as tripartite interactions. In: Sánchez, F., Quinto, C., Lopez-Lara, I. M., Geiger, O. (eds.), Biology of Plant-Microbe Interactions, Volume 5: Proceedings of the 12th International Congress on Molecular Plant-Microbe Interactions, Mérida, Yucatán, México, December 14-19, 2005. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 552-558.

Maffei, M., Mithöfer, A., Arimura, G., Uchtenhagen, H., Bossi, S., Bertea, C.M., Cucuzza, L.S., Novero, M., Volpe, V., Quadro, S., Boland, W. (2006). Effects of feeding Spodoptera littoralis on lima bean leaves. III. Membrane depolarization and involvement of hydrogen peroxide. Plant Physiology 140 1022-1035.

Lanfranco, L., Benedetto, A., Cappellazzo, G., Ghignone, S., Novero, M., Salvioli, A., Bonfante, P. (2005). Geni e funzioni nei funghi micorrizici arbuscolari: nuove prospettive di ricerca. Informatore Botanico Italiano 37 644-645.

Lanfranco, L., Novero, M., Bonfante, P. (2005). The mycorrhizal fungus Gigaspora margarita possesses a CuZn superoxide dismutase that is up-regulated during symbiosis with legume hosts. Plant Physiology 137 1319-1330.

Miozzi, L., Balestrini, R., Bolchi, A., Novero, M., Ottonello, S., Bonfante, P. (2005). Phospholipase A2 up-regulation during mycorrhiza formation in Tuber borchii. New Phytologist 167 229-238.

Sisti, D., Giomaro, G., Cecchini, M., Faccio, A., Novero, M., Bonfante, P. (2003). Two genetically related strains of Tuber borchii produce Tilia mycorrhizas with different morphological traits. Mycorrhiza 13 107-115.
Type of the role in the search: Researcher
Total cost in the proposal: 37725

Name: ANDREA
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National insurance number: GNRNDR70T12L219S
Gender: Male
Date of birth: 1970-12-12
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Number: 25
CAP: 10125
Telephone: 0116705971
Fax: 0116705962
Mobile:
Organization type: Università degli Studi di Torino
Role: Researcher

Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education: University degree in Biology
PhD in Biology and Biotechnology of Fungy
Work experience in the last 5 years: - Class D2 Technician at the Dipartimento di Biologia Vegetale dell'Università di Torino fino until 30.09.2007
- Researcher at the Dipartimento di Biologia Vegetale dell'Università di Torino since 1.10.2007

Technical, organizational and social skills: My technical expertise covers different fields of microscopy, from optical to fluorescence, electronic and confocal microscopy; plant cell biology, with approaches such as live cell imaging, in vivo localization of fluorescent proteins, FRAP, FRET, immunolocalization, microtomy; in vitro cultures of plants, fungi and bacteria; genetic transformation of plants and bacteria.
Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research: Bianciotto V., Genre A., Jargeat P., Lumini E., Bécard G., and Bonfante P. (2004). Vertical Transmission of Endobacteria in the Arbuscular Mycorrhizal Fungus Gigaspora margarita through Generation of Vegetative Spores. Appl. Envir. Microbiol. 70: 3600-3608.
Genre, A., Bianciotto, V., Jargeat, P., Lumini, E., Uetake, Y., Becard, G., Bonfante, P. (2004). Arbuscular mycorrhizal fungi harbor endocellular bacteria. In: Tikhonovich, I., Lugtenberg, B., Provorov, N. (eds.), Biology of Plant-Microbe Interactions, Volume 4: Proceedings of the 11th International Congress on Molecular Plant-Microbe Interactions, St.-Petersburg, Russia, July 18-26, 2003. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 445-447.

Genre A. and Bonfante P. (2005). Building a mycorrhizal cell: How to reach compatibility between plants and arbuscular mycorrhizal fungi. Journal of Plant Interactions1(1): 3-13.

Genre A., Chabaud M., Timmers T., Bonfante P. and Barker D.G. (2005). Arbuscular Mycorrhizal Fungi Elicit a Novel Intracellular Apparatus in Medicago truncatula Root Epidermal Cells before Infection. The Plant Cell 17: 3489-3499.

Bonfante P., Genre A. and Spanu P. D. (2006). Plant-microbe interactions in Yucatán: hurricanes didn't curb the whirlwind of discovery. Meeting report. New Phytologist 170: 653-655.

Genre, A., Chabaud, M., Timmers, T., Bonfante, P., Barker, D. (2006). GFP tagging in Medicago truncatula roots reveals a novel plant intracellular apparatus required for arbuscular mycorrhizal colonization. In: Sánchez, F., Quinto, C., Lopez-Lara, I. M., Geiger, O. (eds.), Biology of Plant-Microbe Interactions, Volume 5: Proceedings of the 12th International Congress on Molecular Plant-Microbe Interactions, Mérida, Yucatán, México, December 14-19, 2005. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 525-530.

Bonfante, P., Lumini, E., Bianciotto, V., Jargeat, P., Salvioli, A., Genre, A., Blal, B., Novero, M., Faccio, A., Batut, J., Bécard, G. (2006). Endocellular bacteria/Gigaspora margarita/ host plants: experimental evidences of arbuscular mycorrhizas as tripartite interactions. In: Sánchez, F., Quinto, C., Lopez-Lara, I. M., Geiger, O. (eds.), Biology of Plant-Microbe Interactions, Volume 5: Proceedings of the 12th International Congress on Molecular Plant-Microbe Interactions, Mérida, Yucatán, México, December 14-19, 2005. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 552-558.

Navazio L., Moscatiello R., Genre A., Novero M., Baldan B., Bonfante P., Mariani P. (2007). A diffusible signal from arbuscular mycorrhizal fungi elicits a transient cytosolic calcium elevation in host plant cells. Plant Physiology 144: 673-681.

Siciliano, V., Genre, A., Balestrini, R., Cappellazzo, G., deWit, P. J. G. M., Bonfante, P. (2007). Transcriptome analysis of arbuscular mycorrhizal roots during development of the pre-penetration apparatus. Plant Physiology 144: 1455-1466.

Genre, A., Bonfante, P. (2007). Check-in procedures for plant cell entry by biotrophic microbes. Molecular Plant-Microbe Interactions 20(9): 1023-1030.

Navazio L., Moscatiello R., Genre A., Novero M., Baldan B., Bonfante P. and Mariani P. (2007). The arbuscular mycorrhizal fungus Glomus intraradices induces intracellular calcium changes in soybean cells. Caryologia 60(1): 137-140.

Siciliano, V., Genre, A., Balestrini, R., Cappellazzo, G., deWit, P. J. G. M., Bonfante, P. (2007). Pre-Penetration Apparatus Formation During AM Infection is Associated With a Specific Transcriptome Response in Epidermal Cells. Plant Signalling and Behaviour 2(6): 533-535.
Type of the role in the search: Researcher
Total cost in the proposal: 36595

Name: LUISA
Surname: LANFRANCO
Email: luisa.lanfranco@unito.it
National insurance number: LNFLSU68B47L219Z
Gender: Female
Date of birth: 1968-02-07
Nazionality: ITALIAN
Document number: U15275763W
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Address: Viale Mattioli
Number: 25
CAP: 10125
Telephone: 0116705969
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Mobile:
Organization type: Università degli Studi di Torino
Role: Associate Professor or senior researcher
Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education: 1991 Degree of Biological Sciences at University of Torino

1994 - 1997 Ph.D. in Biology and Biotechnology of Fungi, University of Torino. Ph.D. Thesis title: “The genome of arbuscular mycorrhizal fungi: a molecular approach”. A period of the PhD was spent at "The Samuel Roberts Noble Foundation" Plant Biology Division, Ardmore, Oklahoma, U.S.A.

1997-1999 Fellowships from the C.N.R. on "Plant-microbe interactions: analysis of the genetic and functional diversity of fungal symbionts"

1999-2005 Researcher at the Plant Biology Department , University of Torino

Since 2005: Associate Professor the Plant Biology Department, University of Torino

Work experience in the last 5 years: Luisa Lanfranco is currently Associate Professor at the Plant Biology Department of the University of Torino. Her research activity has been focused on the molecular aspect of the arbuscular mycorrhizal (AM) symbiosis. She has been investigating the molecular mechanisms underlying nutrient uptake and responses to stresses in AM fungi. She is also currently involved in the genome project of the bacterial endosymbiont of an AM fungus.

Teaching and academic activities:
2002-2008 Plant Molecular Biology and Plant Biotechnology courses at University of Torino (Biological Sciences and Biotechnology School)

Since 2006: Coordinator of the Master in Plant Biology University of Torino

- Member as teacher of the PhD School "Biology and Biotechnology of Fungi" University of Torino

Research activities:
- EU Researcher responsible in the frame of the European project (local coordinator Paola Bonfante) GENOMYCA devoted to the identification of useful genetic traits in AM fungi and intracellular bacteria and in the frame of the COST ACTION 821
- Researcher responsible of local Italian Projects CEBIOVEM (Centro di Eccelenza per la BIOsensoristica VEgetale e MIcrobica)
- Partner of the European project FUNGYMIC - Influence of the sterol biosynthesis inhibitor fungicides on the arbuscular mycorrhizal symbiosis -MESTCT-2004-514213
- Responsible of the Regional Project CIPE B74 - Impact of virus and mycorrhizal fungi on plant health: analysis of gene expression profiles in tomato.

Technical, organizational and social skills: Technical expertise: long experience in molecular biology (cloning, construction and screening of cDNA and genomic library, PCR, proteins purifications, SDS-Page, western blot, assays for DNA-protein interactions, gene expression analysis by real-time PCR and microarrays, complementation assays in yeast mutants, sequence analyses)

- Tutor of undergraduate and PhD students for research activities in the field of mycorrhizal symbioses

- Referee for international journals (New Phytologist, Mycorrhiza, Current Genetics, Fungal Genetics and Biology, Journal of Plant Interaction)

- Involved in the organization of workshops including theory and pratical training devoted to mycorrhizal fungi

- Invited speaker to international congresses
Skills to achieve some searches with companies:
Loans managed for the last 5 years: European project FUNGYMIC - Influence of the

sterol biosynthesis inhibitor fungicides on the arbuscular mycorrhizal symbiosis -MESTCT-2004-514213
(1/02/2004 -31/1/2009) 170,943 euro

Regional Project CIPE B74 - Impact of virus and mycorrhizal fungi on plant health: analysis of gene expression profiles in tomato.
(12/2005- 11/2008) 70,000 euro

Publications for the last 5 years, licences or other products of research: Lanfranco L. (2003) Engeneering crops, a deserving venture. Rivista di Biologia, 96:31-54.

Lanfranco L., Balsamo R., Martino E., Bonfante P, Perotto S. (2004) Zinc ions differentially affect chitin synthses gene expression in an ericoid mycorrhizal fungus. Plant Biosystems 138:271-277.

Lanfranco L., Novero M., Bonfante P. (2005) The mycorrhizal fungus Gigaspora margarita possesses a CuZn superoxide dismutase that is up-regulated during symbiosis with legume hosts. Plant Physiol. 137:1319-1330.

Benedetto A., Magurno F., Bonfante P., Lanfranco L. (2005) Expression profiles of a phosphate transporter gene (GmosPT) from the endomycorrhizal fungus Glomus mosseae. Mycorrhiza 15:620-627.

Balestrini R., Lanfranco L. (2006) Fungal and plant gen expression in arbuscular mycorrhizal symbiosis. Mycorrhiza 16:509-524.

Cappellazzo G., Lanfranco L., Bonfante P. (2007) A limiting source of organic nitrogen induces specific transcriptional responses in the extraradical structures of the endomycorrhizal fungus Glomus intraradices. Current Genetics. 51: 59-70.

Lanfranco L. (2007) The fine-tuning of heavy metals in mycorrhizal fungi. New Phytologist 174: 3-6.

Bergero R., Lanfranco L., Ghignone S., Bonfante P. (2007) Enhanced activity of the GmarMT1 promoter from the mycorrhizal fungus Gigaspora margarita at limited carbon supply. Fungal Genetics and Biology. 44:877-885.

Balestrini R., Gomez-Ariza J., Lanfranco L., Bonfante P. (2007) Laser microdissection reveals that transcripts for five plant and one fungal phosphate transporter genes are contemporaneously present in arbusculated cells. Molecular Plant-Microbe Interactions 20(9):1055-1062.

Type of the role in the search: Researcher
Total cost in the proposal: 76140

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National insurance number: BNFPLA47E47L219Z
Gender: Female
Date of birth: 1947-05-07

Nazionality: ITALIAN
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Province: TO
City: TORINO
Address: Viale Mattioli
Number: 25
CAP: 10125
Telephone: 0116705965
Fax: 0116705962
Mobile: 3493131231
Organization type: Università degli Studi di Torino
Role: Full Professor or research directors
Deparment name: (Università degli Studi di Torino) Dipartimento di Biologia Vegetale Università di Torino
Education: University of Torino, Biology (Laurea) 1970

Fellowship in Mycology Centro Studio sulla Micologia del terreno del CNR 1970-1973

Post-doc period at the Ecole Normale Superieure, Paris 1980

Researcher Centro di Studio sulla Micologia del terreno del CNR 1973-1984
Work experience in the last 5 years: 2006—Present: head of the Department of Plant Biology, University of Torino

2002-Present: Responsible of the CNR-Group of Soil Mycology-Torino

2000-Present: Co-ordinator of the Ph.D School in Biology and Biotechnology of Fungi

1995—Present: Leader group of a team devoted to basic research in microbe/plant interactions

1985-Present: Full Professor of Plant Biology, University of Torino
Technical, organizational and social skills: Group leader of a research team, 8 out of them with a full position, 3 post-docs, 7 Ph.D students.

Coordination activities first as Director of Centro di Studio sulla Micologia del Terreno,CNR (1995-2000), then as responsible of the Torino group inside the Plant protection Institute.

Teacher at first level (Plant biology); second level (Plant and Environmental responses); third level (Plant-Microbe interactions). Instructing undergraduate students, Ph.D students and scientists in plant/microbe interactions with special attention to mycorrhizal fungi and their endobacteria. Takes part of consortia for three genome sequencing projects

Scientific Committee of the European project COST 838, and of the European meeting on Mycorrhizae

Organizer of symposia, workshops and meetings on mycorrhizas and symbiotic fungi

Associated Editor of Mycological Research and Microbiological research

Board member in the following journals
• Protoplasma,
• European Journal of Histochemistry,
• New Phytologist
• Applied Environmental Microbiology (from 2004)

Referee for papers concerning mycorrhizas for different journals and for scientific European and American Agencies

Invited speakers in many international congresses of Mycology, Microbiology, Botany, Biotechnology, Plant Pathology.

Invited to be External examiner (Opponent) for more than 12 French Ph.D.

Dissertations in Lyon, Dijon, Toulouse, Nancy, Paris and 1 in Switzerland

Organizing committee of the next MPMI meeting, and of 8th International Congress of Plant Pathology

Awards Fellow of Academy of Sciences of Torino (2000), Academy of Agriculture of Torino (2000).
Skills to achieve some searches with companies: Plant microbe interactions have important applications in the field of agro-biotechnologies. For these reasons there have been a number of positive contacts with companies: CAFFARO in a national PRIN project devoted to the use of mycorrhizas in biocontrol; a long standing collaboration with ISAGRO (2003-2006) on similar topics; collaboration with Rockwood for pigment analysis; collaboration with BIORIZE, a French company to produce microbial inocula (2002-2006). The value of mycorrhizas has stimulated a group of our Ph.D students to organize a small company(DYNAMYCODE) in the frame of the University-Region activities to promote industrial incubators. This new company will work in close association with our research group.
Loans managed for the last 5 years: 2003
Bioremediation Project- CRT € 60.000
National Project PRIN € 80.000
CNR projects (IPP-Torino responsible) 85.000
Local Projects – University € 20.000

2004
European project INTEGRAL € 200.336
Genome Project- Compagnia San Paolo € 100.000
Biodiversity CNR project (National responsible) € 166.000
CebioveM € 115.000

2005
European project TRACEAM € 174.070
Biodiversity CNR project (National responsible) € 274.000
CebioveM 115.000

2006
National Project SOILSINK € 240.00
Biodiversity CNR project (National responsible) € 145.000
Cebiovem € 140.000
Compagnia di San Paolo €195.000

National Prin €80.000
2007
Progetti Regione/Tuber €50.000
Publications for the last 5 years, licences or other products of research: Abbà, S., Balestrini, R., Benedetto, A., Rottensteiner, H., De Lucas, J.R., Bonfante, P. (2007). The role of the glyoxylate cycle in the symbiotic fungus Tuber borchii: expression analysis and subcellular localization. Current Genetics 52 159-170.

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C. Anderson, F. Barbanera and M. Dezani-Ciancaglini. Alias and Union Types for Delegation, Annals Of Mathematics, Computing and Teleinformatics, 1:1--18, 2003.

C. Anderson, F. Barbanera, M. Dezani-Ciancaglini and S. Drossopoulou. Can Addresses be Types? (a case study: Objects with Delegation), WOOD'03, ENTCS, volume 82(8), pages 1--22, 2003, Elsevier.

F. Barbanera, M. Bugliesi, M. Dezani-Ciancaglini and V. Sassone. A Calculus of Bounded Capacities, Asian'03, LNCS, volume 2896, pages 205-223, 2003, Springer.

M. Coppo, M. Dezani-Ciancaglini, E. Giovannetti and I. Salvo. M3: Mobility Types for Mobile Processes in Mobile Ambients, CATS 2003, ENTCS, volume 78, pages 1--34, 2003.

M. Dezani-Ciancaglini, F. Honsell and F. Alessi. A Complete Characterization of Complete Intersection-Type Preorders, ACM TOCL, 4(1):120--147, 2003.

M. Dezani-Ciancaglini, P. Severi and F.J. de Vries. Infinitary Lambda Calculus and Discrimination of Berarducci Trees, Theoretical Computer Science, 298(2):275-302, 2003.

M. Dezani-Ciancaglini and S. Ghilezan. Lambda Models Characterizing Computational Behaviours of Terms, Schedae Informaticae, 12:35-49, 2003.

M. Dezani-Ciancaglini and S. Ghilezan. Two Behavioural Lambda Models, TYPES'02, LNCS, volume 2246, pages 127--147, 2003, Springer.

M. Dezani-Ciancaglini and S. Ronchi della Rocca, editors. Mathematical Structures in Computer Science 13(1), Special Issue on “Intersection Types and Applications”. Cambridge, 2003.
Role in proposal: Researcher
Total cost for partecipant: 12868

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Organization name: (Università degli Studi di Torino) Dipartimento di Informatica
Education: Ph.D. in Computer Science
Work experience in the last 5 years:

- Ph.D. student in Computer Science (Università di Pisa): from Jan/03 to Aug/06.
- Postdoc at LIX (École Polytechnique) and LSV (ENS Cachan): from Sep/06 to Sep/07.
- Assistant Professor (Università di Torino): since Oct/07.

Technical, organizational and social skills: His research interests range over:
- Formal Description Techniques of Concurrent Systems;
- Modeling and Verification of Real-Time and Probabilistic Systems;
- Foundations of Security Analysis and Design;
- Systems Biology.

He has contributed on the developement of the Calculus of Looping Sequences.
He is the organizer of the ICE'08 workshop (http://ice08.dimi.uniud.it/).

Skills to achieve some searches with companies:

Loans managed for the last 5 years:

Publications for the last 5 years, licences or other products of research: He is coauthor of more than 20 papers appeared in the last 5 years in international journals and in the proceedings of international conferences. Among them, relevant to the topics of this project, the following deserve to be mentioned.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"Bisimulations in Calculi Modelling Membranes"
Formal Aspects of Computing, to appear.

R. Lanotte, A. Maggiolo-Schettini, A. Troina
"Parametric Probabilistic Transition Systems for System Design and Analysis"
Formal Aspects of Computing, vol. 19, pp. 93-109, 2007.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"The Calculus of Looping Sequences for Modeling Biological Membranes"
Invited at the 8th Workshop on Membrane Computing (WMC8), Springer LNCS 4860, pp. 54-76, 2007.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"A Calculus of Looping Sequences for Modelling Microbiological Systems"
Fundamenta Informaticae, vol. 72, pp. 21-35, 2006.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"Bisimulation Congruences in the Calculus of Looping Sequences"
3rd Int. Colloquium on Theoretical Aspects of Computing (ICTAC'06), Springer LNCS 4281, pp. 93-107, 2006.

R. Barbuti, S. Cataudella, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"A Probabilistic Model for Molecular Systems"
Fundamenta Informaticae, vol. 67, pp. 13-27, 2005.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"A Calculus of Looping Sequences for Modelling Microbiological Systems"
14th Int. Workshop on Concurrency Specification and Programming (CS&P'05), Warsaw University 511/2005, pp. 29-40, 2005.

R. Barbuti, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"An Alternative to Gillespie's Algorithm for Simulating Chemical Reactions"
3rd Int. Workshop on Computational Methods in Systems Biology (CMSB'05), pp. 167-178, 2005.

R. Barbuti, S. Cataudella, A. Maggiolo-Schettini, P. Milazzo, A. Troina
"A Probabilistic Calculus for Molecular Systems"
13th Int. Workshop on Concurrency Specification and Programming (CS&P'04), Humboldt-Univeristaet, Informatik-Berichte 170, pp. 202-216, 2004.
Role in proposal: Researcher
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Work experience in the last 5 years: Associate professor of Computer Science at the Università of Torino since 31/10/2002.
Reviewer for AMS Mathematical review since 1999.
Technical, organizational and social skills: Active participation to the set up of national and international research projects.
Guest editor with G. Restivo, and S. Ronchi Della Rocca for the volume Theoretical Computer Science - 7th Italian Conference (ICTCS 2001), volume 2202 of Lecture Notes in Computer Science. Springer Verlag, October 2001.
Skills to achieve some searches with companies: Knowledge about methodologies and techniques for the development of transitional and decisional data bases.
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research: *) Elaine Pimentel, Simona Ronchi Della Rocca, and Luca Roversi. Intersection types: a proof-theoretical approach. In Proc. of STRUCTURES AND DEDUCTION - ICALP Workshop, Lisbon July 16-17, pages 189 - 204, July 2005. Presented at the workshop Structures and Deduction (SD'05).
*) M. Baldoni, C. Baroglio, C. Grandi, and L. Roversi. Live! I-Learn @ Home. In M. Scotto and G. Succi, editors, Proc. of 1st International Conference on Open Source Systems, OSS 2005, pages 294 - 295, Genova, July 2005. ECIG Edizioni Culturali Internazionali Genova.
*) U. Dal Lago, S. Martini, and L. Roversi. Higer-order linear ramified recurrence. In Proceedings of TYPES'04, volume 3085 of Lecture Notes in Computer Science, pages

178 - 193. Springer Verlag, December 2004.
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Work experience in the last 5 years: Associate professor of Computer Science at the University of Torino (since October 2005).
Researcher of Computer Science at the University of Torino (since November 1995).
Technical, organizational and social skills: Member or the Organizing Committees of the international conferences TYPES 2008 (http://types2008.di.unito.it/) and TYPES 2003 (http://www.di.unito.it/~stefano/types2003/).

Member or the Program Committees of the international conferences ICTCS 2007 (http://www.disp.uniroma2.it/ictcs07/), OOPS@SAC 2007 (http://oops.disi.unige.it/OOPS07/), OOPS@SAC 2006 (http://oops.disi.unige.it/OOPS06/), ITRS@ICALP/LICS 2004 (http://itrs04.di.unito.it/).

Co-editor of the proceedings of TYPES 2003 and ITRS 2004.

Active participation to the set up and to the activity of the international reserch projects DART (http://www.macs.hw.ac.uk/DART/) and TYPES (http://www.cs.chalmers.se/Cs/Research/Logic/Types/) and of the national research projects EOSDUE (http://bart.disi.unige.it/EOS2/www_static_pages/index.html) EOS (http://bart.disi.unige.it/EOS/), Network Aware Programming: Objects, Languages, Implementations (Cofin'01), Constructive Methods in Topology, Algebra, and Program Analysis (Cofin'00),
Abstract interpretation, type systems, and control-flow analysis (Cofin'00),
Theory of Concurrency, Higher Order, and Types (Cofin'99).

Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research: D. Ancona, C. Anderson, F. Damiani, S. Drossopoulou, P. Giannini and E. Zucca. A provenly correct translation of Fickle into Java. ACM Transactions On Programming Languages and Systems, 29(2), Article No. 13 (67 pages).

V. Bono, F. Damiani and E. Giachino. Separating Type, Behavior, and State to Achieve Very Fine-grained Reuse. Electronic proceedings of Workshop FTfJP'07 (http://www.cs.ru.nl/ftfjp/).

F. Damiani. Rank 2 Intersection for Recursive Definitions. Fundamenta Informaticae, 77(4), 451-488.

F. Damiani, E. Giachino, P. Giannini, N. Cameron and S. Drossopoulou. A State Abstraction for Coordination in Java-like Languages. Electronic proceedings of Workshop FTfJP'06 (http://www.cs.ru.nl/ftfjp/).

F. Damiani, E. Giachino, P. Giannini and E. Cazzola. On state classes and their dynamic semantics
In proceedings of ICSOFT'06 (http://www.icsoft.org), Volume 1, pages 5-12, INSTICC press.

D. Ancona, F. Damiani, S. Drossopoulou and E. Zucca. Polymorphic Bytecode: Compositional Compilation for Java-like Languages. In proceedings of POPL'05, pages 26-37, 2005, ACM.

M. Coppo and F. Damiani. International Workshop on Intersection Types and Related Systems (ITRS 2004)
Conference Proceedings. ENTCS, volume 136, Elsevier.

F. Damiani. Rank-2 Intersection and Polymorphic Recursion. In proceedings of TLCA'05, LNCS 3461, pages 146-161, Springer.

D. Ancona, F. Damiani, S. Drossopoulou and E. Zucca. Even More Principal Typings for Java-like Languages.
Electronic proceedings of Workshop FTfJP'04 (http://www.cs.ru.nl/ftfjp/).

S. Berardi, M. Coppo and F. Damiani. Types for Proofs and Programs (International Workshop TYPES'03, Selected Papers). LNCS, volume 3085, Springer.

F. Damiani, M. Dezani-Ciancaglini and P. Giannini. On Re-classification and Multithreading, Journal of Objectc Technology (www.jot.fm), 3(11):5-30, 2004.

F. Damiani, M. Dezani-Ciancaglini and P. Giannini. Re-classification and Multithreading: FickleMT, OOPS track at SAC'04, volume 2, pages 1297--1304, 2004, ACM.

F. Damiani. A conjunctive type system for useless-code elimination. Mathematical Structures in Computer Science, 13:157-197.

F. Damiani and P. Giannini. Alias types for ``environment-aware'' computations. In proceedings of Workshop WOOD'03, ENTCS, volume 82.8, Elsevier.

F. Damiani. Rank 2 intersection types for local definitions and conditional expressions. ACM Transactions On Programming Languages and Systems, 25(4):401-451.

F. Damiani. Rank 2 intersection types for modules.
In proceedings of PPDP'03, pages 67-78, ACM.

F. Damiani, S. Drossopoulou and P. Giannini. Refined Effects for Unanticipated Object Re-classification: Fickle3 (Extended Abstract).
In proceedings of ICTCS'03, LNCS 2841, pages 97-110, Springer.
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Work experience in the last 5 years: Director of the master in "Comunicazione scientifica" of the University of Torino (2003-2004). Member of the Scientific Commitee of the master in "Bioinformatica" of the University of Torino.
Technical, organizational and social skills: National coordinator and administrative responsible of the PRIN projects "PROTOCOLLO" (2002-2004) and FOLLIA (2004-2006), and of the
PROGETTO “RETE ITALO-FRANCESE DI RICERCA IN LOGICA E GEOMETRIA DELLA COMPUTAZIONE” , Internazionalizzazione MIUR, piano triennale 2004-2006.
Chair of the Program Committee of the conference "TLCA 07", Paris, July 2007.
Editor of the Journal TOCL (ACM Transactions on Computational Logic).
Chair of the Scientific and Organizing Committee of the Doctoral Shool "Semantics", in collaboration between the Universities of Torino and Chambery.

Skills to achieve some searches with companies: as director of the master in "Comunicazione scientifica" of the University of Torino (2003-2004), I

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Publications for the last 5 years, licences or other products of research: 1. Marco Gaboardi, Jean-Yves Marion and Simona Ronchi Della Rocca,"A Logical Account of PSPACE", 35th ACM SIGPLAN-SIGACT POPL 08, pp.121-132.
2. GABOARDI M, RONCHI DELLA ROCCA S. (2007). A Soft Type Assignment System for lambda-Calculus. LECTURE NOTES IN COMPUTER SCIENCE. vol. 4646, pp. 253-267 ISSN: 0302-9743. CSL 07.
3. Mariangiola Dezani-Ciancaglini and Simona Ronchi Della Rocca,"Intersection and Reference Types",in Reflections on Type Theory, Lambda Calculus, and the Mind,Radboud University Nijmegen, 2007, pp. 77--86.
4. RONCHI DELLA ROCCA S. (2007). Typed Lambda Calculi and Applications, 8th International Conference, TLCA 2007, Paris, France, June 26-28, 2007, Proceedings. (editor).
5. L. PAOLINI, E. PIMENTEL, RONCHI DELLA ROCCA S. (2006). An Operational Characterization of Strong Normalization. LECTURE NOTES IN COMPUTER SCIENCE. vol. 3921, pp. 367-381 ISSN: 0302-9743. FOSSACS'06.
6. COPPOLA P., DAL LAGO U., RONCHI DELLA ROCCA S. (2005). Elementary affine logic and the call by value lambda calculus. LECTURE NOTES IN COMPUTER SCIENCE. vol. 3461, pp. 131-145 ISSN: 0302-9743. TLCA'05.
7. COPPOLA P., RONCHI DELLA ROCCA S. (2005). Principal Typing for Lambda Calculus in Elementary Affine Logic. FUNDAMENTA INFORMATICAE. vol. 65, pp. 87-112 ISSN: 0169-2968.
8.LIQUORI L., RONCHI DELLA ROCCA S. (2005). Towards an intersection typed system a la Church. ELECTRONIC NOTES IN THEORETICAL COMPUTER SCIENCE. vol. 136 C, pp. 43-56 ISSN: 1571-0661.
9. PAOLINI L., PIMENTEL E., RONCHI DELLA ROCCA S. (2005). Lazy strong normalization. ELECTRONIC NOTES IN THEORETICAL COMPUTER SCIENCE. vol. 136 C, pp. 103-116 ISSN: 1571-0661.
10. PIMENTEL E., RONCHI DELLA ROCCA S., ROVERSI L. (2005). Intersection Types: a proof theoretical approach. Structures and Deduction. Electronic proceedings at the address: http://web.inf.tu-dresden.de/Fak/berichte.html.
11. PAOLINI L., RONCHI DELLA ROCCA S. (2004). Parametric Parameter Passing Lambda Calculus. INFORMATION AND COMPUTATION. vol. 186, pp. 87-106 ISSN: 0890-5401.
12. PAOLINI L., RONCHI DELLA ROCCA S. (2004). Lazy logical semantics. ELECTRONIC NOTES IN THEORETICAL COMPUTER SCIENCE. vol. 104, pp. 235-251 ISSN: 1571-0661.
13. RONCHI DELLA ROCCA S., PAOLINI L. (2004). The Parametric lambda -Calculus: a Metamodel for Computation. Texts in Theoretical Computer Science: An EATCS Series. Springer-Verlag, Berlin,.
14. COPPOLA P, RONCHI DELLA ROCCA S. (2003). Principal Typing in Elementary Affine Logic. LECTURE NOTES IN COMPUTER SCIENCE. vol. 2701, pp. 90-104 ISSN: 0302-9743. TLCA 03.
15. DEZANI-CIANCAGLINI M., RONCHI DELLA ROCCA S. (2003). Intersection Types. MATHEMATICAL STRUCTURES IN COMPUTER SCIENCE. vol. 13 (1) ISSN: 0960-1295. (editors).

Role in proposal: Researcher
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1995: D.E.A. de Matématiques Discrètes et Fondements de l'Informatique, Université d'Aix-Marseille, France.

1999: PhD in Computer Science (Dottorato di Ricerca in Informatica), Università degli Studi di Torino.
Work experience in the last 5 years: 2003-2005: Lecturer (Ricercatore), Dipartimento di Informatica dell'Università degli Studi di Torino.

2005-2008: Associate Professor (Professore Associato), Dipartimento di Informatica dell'Università degli Studi di Torino.
Technical, organizational and social skills: Program Committe Member of FOOL 9 (International Workshop on Foundations of Object-Oriented Languages), MFCS 2006 (International Symposium on Mathematical Foundations of Computer Science), MFCS 2008.

Program co-Chair of WOOD 2003 (Workshop on Object-Oriented Development), WOOD 2004.

Steering Committee Member of FOOL.

Co-editor of the proceedings of WOOD 2003 and WOOD 2004.

PhD co-Supervisor of Silvia Likavec (2002-2005), Università degli Studi di Torino-École Normale Supérieure de Lyon.

Phd co-Supervisor of Jarek Kusmierek (2007-), Warsaw University, Poland.

Active participation to the set up and to the activity of the international reserch projects DART (http://www.macs.hw.ac.uk/DART/) and TYPES (http://www.cs.chalmers.se/Cs/Research/Logic/Types/) and of the national research projects EOSDUE (http://bart.disi.unige.it/EOS2/www_static_pages/index.html) EOS (http://bart.disi.unige.it/EOS/).

Skills to achieve some searches with companies:

Loans managed for the last 5 years:

Publications for the last 5 years, licences or other products of research: Articles on journals

L. Bettini, V. Bono, S. Likavec. Safe and Flexible Objects with Subtyping. JOURNAL OF OBJECT TECHNOLOGY, 4(10), ISSN: 1660-1769, 2005.

L. Bettini, V. Bono, B. Venneri. MoMi - A Calculus for Mobile Mixins. ACTA INFORMATICA, 42(2/3); 143-190, ISSN: 0001-5903, 2005.

Monografies

R. K. Meyer, Y. Motohama, V. Bono. Truth Translations of Relevant Logics. CAMBRIDGE: College Publications, p. 59-84, ISBN: 1-904987-19-2, 2006.

Proceedings

V. Bono, F. Damiani, E. Giachino. Separating Type, Behavior, and State to Achieve Very Fine-grained Reuse. In: Electronic proceedings of FTfJP'07 (http://www.cs.ru.nl/ftfjp/), 2007.

V. Bono, J. Kusmierek. Modularizing constructors. In: Proc. of TOOLS 2007, ZURICH: ETH Zurich, 2007.

V. Bono, J. Kusmierek. FJMIP: A Calculus for a Modular Object Initialization. In: Proc. of FCT 2007, Springer, 4639, 2007.

J. Kusmierek, V. Bono. Hygienic methods - Introducing HygJava. In: Proc. of TOOLS 2007, ZURICH: ETH Zurich, 2007.

L. Bettini, V. Bono, S. Likavec. Safe and Flexible Objects. In: Proc. of ACM Symposium on Applied Computing (SAC 2005)ACM Press, 2005.

L. Bettini, V. Bono, S. Likavec. Safe object composition in the presence of subtyping. In: Proc. of ICTCS 2005, Springer, 3701, 128-142, 2005.

L. Bettini, V. Bono and S. Likavec. A Core Calculus of Higher-Order Mixins and Classes, International Workshop TYPES'03 (Selected Papers), LNCS, volume 3085, 2004, Springer-Verlag.

L. Bettini, V. Bono and S. Likavec. A Core Calculus of Higher-Order Mixins and Classes [Poster Abstract], PL track at SAC 2004, 2004, ACM Press.

L. Bettini, V. Bono and S. Likavec. A Core Calculus of Mixin-Based Incomplete Objects, FOOL 11, 2004.

L. Bettini, V. Bono and S. Likavec. A Core Calculus of Mixins and Incomplete Objects, The OOPSLA Companion, 2004, ACM Press.

L. Bettini, V. Bono and B. Venneri. O'Klaim: a coordination language with mobile mixins, COORDINATION'04, LNCS, volume 2949, pages 20-37, 2004, Springer-Verlag.

L. Bettini, V. Bono and B. Venneri. Subtyping-Inheritance Conflicts: The Mobile Mixin Case, Third IFIP International Conference on Theoretical Computer Science (TCS 2004), 2004, Kluwer Academic Publishers.

V. Bono, J. Tiuryn and P. Urzyczyn. Type Inference for Nested Self Types (Extended Abstract), International Workshop TYPES'03 (Selected Papers), LNCS, volume 3085, 2004, Springer-Verlag.

L. Bettini, V. Bono and B. Venneri. Subtyping Mobile Classes and Mixins, FOOL 10,

2003.

L. Bettini, V. Bono, R.D. Nicola, G. Ferrari, D. Gorla, M. Loreti, E. Moggi, R. Pugliese, E. Tuosto and B. Venneri. The Klaim Project: Theory and Practice, Global Computing - Programming Environments, Languages, Security and Analysis of Systems, LNCS, volume 2874, 2003, Springer-Verlag.

V. Bono. Extensible Objects: a Tutorial, Global Computing - Programming Environments, Languages, Security and Analysis of Systems, LNCS, volume 2874, 2003, Springer-Verlag.

Edited volumes (curatele)

V. Bono and M. Bugliesi Editor(s). Workshop on Object-Oriented Developments (WOOD 2003), ENTCS, volume 82, number 2, 2003, Elsevier.

V. Bono, M. Bugliesi, S. Drossopoulou Editor(s). Proc. of Workshop on Object-Oriented Developments (WOOD 2004). Elsevier Vol. 138(2), 2005.

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Role: Full Professor or research directors
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Education: Master degree (Laurea) in Electronic engineering
Work experience in the last 5 years: Ful professor of Computer Science, Turin University since 1987.
Member or Chair of some international conferences and workshops.
Editor of some conference proceedings and journal special issue.
Member of the Italian chapter of the European Association of Theoretical Computer Science

Technical, organizational and social skills: Head of the Computer Science Department (Direttore del Dipaartimento di Informatica) of Torino University since 2004.
Coordinator of the Computer Science Degree (Presidente CCL in Informatica) of Torino University from 1989 to 1995.
Organizer of some international conferences and workshops.
Editor of some conference proceedings and journal special issues.

Skills to achieve some searches with companies: Collaboration as key researcher with France Telecom inside the
IST-2001-32222 Project Mobile Calculi based on Domains - Mikado
(http://mikado.di.fc.ul.pt/)

Loans managed for the last 5 years: Responsible of the Turin site in the PRIN project "Types and models for resource analysis in mobile systems." (PRIN 2005).

Publications for the last 5 years, licences or other products of research: M. Coppo, M. Dezani-Ciancaglini, and E. Giovannetti. Types for ambient and process mobility. Math. Str. Comp. Sci., 2008. To appear.

S. Drossopoulou, M. Dezani-Ciancaglini, and M. Coppo. Amalgamating the session types and the object oriented programming paradigms. InProc. MPOOL '07, 2007

S. Capecchi, M. Coppo, M.Dezani, S. Drossopoulou and E. Giachino. Amalgamating Sessions and Methods in Object Oriented Languages with Generics, Internal report, University of Turin, 2007 (Submitted)

M. Coppo, M. Dezani-Ciancaglini and N. Yoshida. Asynchronous Session Types and Progress for Object-Oriented Languages, FMOODS'07, LNCS. In Marcello Bonsangue and Einar Broch Johnsen ed(s)., volume 4468, 2007, Springer.

M. Coppo, E. Lodi, and G.M. Pinna, editors. Theoretical Computer Science, ICTCS 2005, volume 3701 of LNCS. Springer, 2005.

M. Coppo and F. Damiani, editors. Proc. ITRS '04, volume 136C of ENTCS. Elsevier, 2005.

M. Coppo, F. Cozzi, M. Dezani-Ciancaglini, E. Giovannetti, and R. Pugliese. A mobility calculus with local and dependent types. In Processes, Terms and Cycles: Steps on the Road to Infnity, volume 3838 of LNCS, 2005.

M. Coppo, M. Dezani-Ciancaglini, E. Giovannetti, and R. Pugliese. Dynamic and local typing for mobile ambients. In Proc. IFIP TCS '04, 2004.

S. Berardi, M. Coppo, and F. Damiani, editors. Types for Proofs and Programs, TYPES 2003, volume 3085 of LNCS. Springer, 2004.

M. Coppo, M. Dezani-Ciancaglini, E. Giovannetti, and I. Salvo. M3: Mobility types for mobile processes in mobile ambients. In Proc. CATS '03, volume 78 of ENTCS, pages 1{34, 2003.

F. Cardone and M. Coppo. Decidability properties of recursive types. In Proc. ICTCS '03, 2003.

M. Coppo and M. Dezani-Ciancaglini. A fully abstract model for mobile ambients. In Proc. TOSCA '01, volume 62 of ENTCS, 2002.

M. Coppo and M. Dezani-Ciancaglini. A fully abstract model for higher-order mobile ambients. In Proc. VMCAI '02, number 2294 in LNCS, 2002.

M. Coppo, F. Damiani, and P. Giannini. Strictness, totality, and non-standard type inference. Theor. Comp. Sci., 272(1-2), 2002.
Role in proposal: Deputy responsible
Total cost for partecipant: 36090

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Role: Lab technician with master's degree or superior qualification
Organization name: (Università degli Studi di Torino) Dipartimento di Informatica
Education: Master degree in physics science at the Università di Torino
Work experience in the last 5 years: Class D2 Technician at the Departement of Computer Science, Università di Torino, until 29.12.2006 and after Class EP1 Technician at the same Departement.
Technical, organizational and social skills:
Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:
Role in proposal: Researcher
Total cost for partecipant: 20868

Adjuntive proponent

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Participant for adjuntive proponent

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Organization type: Università degli Studi di Torino
Role: Researcher
Organization name: (Università degli Studi di Torino) Dipartimento Colture arboree
Education: ACADEMIC QUALIFICATIONS
07/92 Masters of Science with honours degree (110/110 cum laude),
Turin University
11/93 Italian State qualifying examination in Biology
07/97 Awarded Doctor of Philosophy degree in Biology (Corso di Dottorato in Biologia e Biotecnologia dei Funghi)

STAGES
“Statistical analysis of biological data” Bioinformatics school 2006 - Fondazione per le Biotecnologie, 12-14/06/06 Turin
“Abiotic stresses in the soil-plant system” SICA 25/02-01/03/2002 Portoferraio (LI)
"Plant responses to biotic and abiotic stress: molecular mechanisms and implications for agriculture” NATO-Advanced Study Institute, FEBS, NSF 15-27/05/00 Roscoff (France)

Work experience in the last 5 years: Researcher, Plant Pathology; DiVaPRA, Turin Univ.
Member of the scientific board, PhD School in Biology and Biotechnology of Fungi
Teaching experience:
“Biotechnologies in Phytopathology” University of Turin, Faculty of Agronomy, CdL interfacoltà Biotecnologie Agrarie Vegetali (V.O.)
“Plant Physiopathology” Master of Science in Sustainable Crop Protection with International Curriculum in Agroecology
“Patologia Vegetale II” (Plant Physiopathology), CdL Specialistica Agroecologia
Technical, organizational and social skills: TECHNICAL SKILLS
• Biochemistry:
- protein purification by chromatography and electrophoresis
- recombinant proteins expression and purification
- enzymatic activity tests
- Western blotting, ELISA test and other immunological techniques
• Molecular biology:
- DNA and RNA extraction
- Northern and Southern blotting
- cDNA library screening, cloning, PCR
- recombinant DNA technology
- two-hybrid system
• Bioassays on cell suspensions and whole plants
• Use of plant protoplasts for transient and stable transformation assays, mutant analysis
• Localization studies of FP-tagged proteins
• Gaschromatography
• Sterile working, culturing and classification of fungi
• Light microscopy and electron microscopy principles (SEM, TEM)

Use of graphics, word- and data-processing software. Use of databases and programs for sequence analysis

Very good knowledge of French, English and German, scholastic knowledge of Spanish

ORGANIZATIONAL SKILLS
Member of the XIII MPMI Congress scientific board and local organizing committee (http://www.mpmi2007.com/index.php)
Management of laboratory staff:
Supervision of experimental work by Master Diploma students (7 so far + 2 ongoing; Plant Biotechnology and Biological Sciences).
Scientific and experimental supervision of PhD students (1 so far + 3 ongoing; Biology and Biotechnology of Fungi). One is co-supervised by Prof. M.T. Esquerré-Tugayé, Centre de Biologie et Physiologie Végétales, Université Paul Sabatier, Toulouse (France)
Skills to achieve some searches with companies: She coordinated the activities of the Plant Physiopathology group and its relations with the industrial partner (Nanovector Srl) within the CIPE 2003 project (“New low-impact and high efficacy formulations of phytochemicals through SLN nanovectors”)
Loans managed for the last 5 years: PRIN 2006 (Protocol 2006052897_002, Area 5) Unit coordinator (Title: "Perception of mycorrhizal fungi in host and non-host plants: role of active defence mechanisms and signaling in the confinement or exclusion of the symbiont")
CIPE 2003 (Environment, Health and medical Sciences, Food quality and safety. Title: New low-impact and high efficacy formulations of phytochemicals via SLN nanovectors)

AA 2004-2005: Wissenschaftlich-Technischen Zusammenarbeit Österreich-Italien Project 13/2004 (Biotecnology sector, Title “Protein phosphorylation in pathogen stress response”; austrian partner Dr. I. Meskiene)
AA 2006-2007: Galileo Project, Università Italo-Francese (Title: Modulation of plant-microorganisms interactions by biotic factors)
Publications for the last 5 years, licences or other products of research: D Francia, D Demaria, O Calderini, S Arcioni, L Ferraris, D Valentino, G Tamietti, F Cardinale* (2007). Wounding induces resistance to pathogens with different lifestyles in tomato: role of ethylene in cross-protection. Plant Cell & Environment 30: 1357–1365

A Schweighofer, V Kazanaviciute, E Scheikl, M Teige, R Doczi, H Hirt, M Schwanninger, F Mauch, A Buchala, F Cardinale, I Meskiene (2007) The PP2C-type phosphatase AP2C1, which negatively regulates MPK4 and MPK6, modulates innate immunity, jasmonic acid and ethylene levels in Arabidopsis. Plant Cell 19:2213-2224

F Cardinale, L Ferraris, D Valentino, G Tamietti (2006) Induction of systemic resistance by a hypovirulent Rhizoctonia solani isolate in tomato. Physiological and Molecular Plant Pathology 69:160–171

A Fammartino, F Cardinale* (1° coautore), C Göbel, L Mène-Saffrané, J Fournier, I Feussner, M-T Esquerré-Tugayé (2006) Characterisation of a divinyl ether biosynthetic pathway specifically associated with pathogenesis in Nicotiana tabacum. Plant Physiology 143:378-388

L Ferraris, F Cardinale, D Valentino, P Roggero, G Tamietti (2004) Immunological discrimination of Phytophthora cinnamomi from other Phytophthorae pathogenic on chestnut. Journal of Phytopathology, 152: 193-199

F Cardinale, I Meskiene, F Ouaked, H Hirt (2002) Convergence and divergence of stress-induced MAPK signaling pathways at the level of two distinct MAP kinase kinases. Plant Cell, 14(3): 703-711
Role in proposal: Researcher
Total cost for partecipant: 38180

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Organization type: Università degli Studi di Torino
Role: Extraordinary Professor
Organization name: (Università degli Studi di Torino) Dipartimento Colture arboree
Education: 1979: Laurea in Agricultural Sciences at the University of Torino with full marks cum laude, discussing a thesis titled 'Researches on vesicular-arbuscular mycorrhiza in the grapevine'
1982: Specialization Diploma in Viticulture and Enology at the same University.

Work experience in the last 5 years: 1998-2005 Associate Professor in Plant Physiology at the School of Biotechnology – Faculty of Agriculture – University of Torino
2002: Coordinator of the Degree Course in Viticulture and Enology – University of Torino
2006: Full Professor in Plant Physiology at the University of Torino
Member of the Italian Society of Plant Physiology and of the American Society of Plant Biology
Author or co-author of 167 communications, 29 on internationally refereed journals.

Technical, organizational and social skills: Coordination of the research group in Plant Physiology at University of Torino - faculty of Agriculture, with presently three permanent staff, three PhD students and two post-docs, involved in basic and applied studies on fruit ripening and abiotic stress at the molecular and physiological level.
Leader of several scinetific projects integrating the activity of different participating research groups and Istitutions, and private companies in the agriculaturae and food production sector.
Coordinator of a University 1st degree (BSc level) in Viticulture and oenology with 250 students and two student tutors, based in Alba (CN)
Skills to achieve some searches with companies: Collaboration with Italian and international private companies in the agriculture and food sector within research projects, teaching, and University course organization.
Loans managed for the last 5 years: EU CRAFT Elaboration of biological substrates for improving growth and health of micropropagate plants 2000-2002
Piedmont Region Irrigation of vineyards in Piedmont 2004-2006
MIUR-PRIN Italian Ministry of Education Isolation and expression of genes and proteins involved in flavonoid biosynthesis in grape 2005-2006
Italy-Spain Cooperation Limitations to CO2 diffusion by soil drying 2004-2006
Piedmont Region Functional genomics of the grapevine 2006-2009
Publications for the last 5 years, licences or other products of research: Guidoni S., Allara P., Schubert A., 2002. Cluster thinning affects the berry skin anthocyanin composition of Vitis vinifera cv. Nebbiolo. American Journal of Enology and Viticolture 53:224-226

Lovisolo C., Hartung W., Schubert A., 2002. Whole-plant hydraulic conductance and root-to-shoot flow of ABA are independently affected by water stress in the grapevine. Functional Plant Biology 29:1349-1356

Lovisolo C., Schubert A., Sorce C., 2002. Are xylem radial development and hydraulic conductivity in downwardly-growing grapevine shoots influenced by perturbed auxin metabolism? New Phytologist 156:65-74

Schubert A., Allara P., Morte A., 2004. Cleavage of sucrose in roots of soybean (Glycine max) colonized by an arbuscular mycorrhizal fungus. New Phytologist 161:495-501

Devecchi M., Scariot V., Schubert A., 2005. The use of traditional and alternative antifreeze salts on herbaceous and shrub species for urban decoration: experimental

results. Advances in Horticoltural Science 19:86-93

Lovisolo C., Schubert A., 2006. Mercury hinders recovery of shoot hydraulic conductivity during grapevine rehydration: evidence from a whole-plant approach. New Phytologist 172:469-478

Carra A., Gambino G., Schubert A., 2007. A cetyltrimethylammonium bromide-based method to extract low-molecular-weight RNA from polysaccharide-rich plant tissues. Analytical Biochemitry 360:318-320

Secchi F., Lovisolo C., Uehlein N., Kaldenhoff R., Schubert A. 2007. Isolation and functional characterization of three aquaporins from olive (Olea europaea L.). Planta 225:381-392

Secchi F., Lovisolo C., Schubert A., 2007. Hydraulic resistance and expression of a PIP2 aquaporin gene in Olea europaea L. shoots under drought stress and recovery. Annals of Applied Biology 150:163-167

Lovisolo C., Secchi F., Nardini A., Salleo S., Buffa R., Schubert A., 2007. Expression of PIP1 and PIP2 aquaporins is enhanced in olive dwarf genotypes and is related to root and leaf hydraulic conductance. Physiologia Plantarum 130:543-551

Giribaldi M., Perugini J., Sauvage FX., Schubert A., 2007. Analysis of protein changes during berry ripening by 2-D electrophoresis and MALDI-TOF. Proteomics 7:3154-3170.
Role in proposal: Researcher
Total cost for partecipant: 13230

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Organization type: Università degli Studi di Torino
Role: Researcher
Organization name: (Università degli Studi di Torino) Dipartimento Colture arboree
Education: 1990: 2nd level Degree in agricultural Sciences (final thesis: water management planning in a mountain area);
1992: European Master in Environmental Engineering (Polytechnics of Turin);
1996: Ph D in Ecophysiology of woody crops (thesis: Role of hydraulic conductivity in

water transport of grapevines submitted to abiotic stress).
Work experience in the last 5 years: 1998-2001: Technical assistant in the Plant Physiology lab of the Pomology Dept at Turin University;
2001-2002: Post-doc 12-month fellowship on the role of aquaporins in water and CO2 transport in plants, by Prof. Ralf Kaldenhoff, Dept Plant Physiology & Biophysics, Würzburg, Germany;
since 2002: Assistant professor in Plant Physiology, Department of Arboriculture and Pomology - University of Turin; holder of lectures and practices in Plant Physiology and Ecophysiology in three 50-hour Courses of the Agricultural Faculty of Turin University.
Technical, organizational and social skills: Claudio Lovisolo has participated to several local, national and international research projects on molecular and physiological aspects of woody plants. He participated in technology transfer by giving seminars and practical demonstrations of the use of instruments.
Skills to achieve some searches with companies: Claudio Lovisolo cooperates with several Italian and international public and private institutions. Applied aspects of his research are linked to the grape and wine world, were a strong connexion exists between public research and private entrepreneurial class. Moreover, he keeps contacts with several private high tech companies to test and/or develop sensors and apparatus for ecophysiological measurements.
Loans managed for the last 5 years: PRIN MIUR 2003: euros 22000.00
PRIN MIUR 2005: euros 11500.00
Publications for the last 5 years, licences or other products of research: Siefritz F, Tyree MT, Lovisolo C, Schubert A, Kaldenhoff R. 2002. PIP1 plasma membrane aquaporins in tobacco: from cellular effects to function in plants. Plant Cell 14 (4): 869-876.

Lovisolo C, Schubert A, Sorce C. 2002. Are xylem radial development and hydraulic conductivity in downwardly-growing grapevine shoots influenced by perturbed auxin metabolism? New Phytologist 156 (1): 65-74.

Lovisolo C, Hartung W, Schubert A. 2002. Whole-plant hydraulic conductance and root-to-shoot flow of abscisic acid are independently affected by water stress in grapevines. Functional Plant Biology 29 (11): 1349-1356.

Uehlein N, Lovisolo C, Siefritz F, Kaldenhoff R. 2003. The tobacco aquaporin NtAQP1 is a membrane CO2 pore with physiological functions. 2003. Nature 425: 734 – 737.

Angeles G, Bond B, Boyer JS, Brodribb T, Brooks JR, Burns MJ, Cavender-Bares J, Clearwater M, Cochard H, Comstock J, Davis SD, Domec JC, Donovan L, Ewers F, Gartner B, Hacke U, Hinckley T, Holbrook NM, Jones HG, Kavanagh K, Law B, Lopez-Portillo J, Lovisolo C, Martin T, Martinez-Vilalta J, Mayr S, Meinzer FC, Melcher P, Mencuccini M, Mulkey S, Nardini A, Neufeld HS, Passioura J, Pockman WT, Pratt RB, Rambal S, Richter H, Sack L, Salleo S, Schubert A, Schulte P, Sparks JP, Sperry J, Teskey R, Tyree M. 2004. The Cohesion-Tension theory. New Phytologist 163 (3): 451-452.

Lovisolo C, Schubert A. 2006. Mercury hinders recovery of shoot hydraulic conductivity during grapevine rehydration: evidence from a whole-plant approach. New Phytologist 172 (3): 469-478.

Secchi F , Lovisolo C, Uehlein N, Kaldenhoff R, Schubert A. Isolation and functional characterization of three aquaporins from olive (Olea europaea L.) Planta 2007, 225 (2): 381-392.

Secchi F , Lovisolo C, Schubert A. Expression of OePIP2.1 aquaporin gene and water relations of Olea europaea L. twigs during drought stress and recovery. Annals of Applied Biology 2007, 150 (2): 163–167.

Lovisolo C, Secchi F, Nardini A, Salleo S, Buffa R, Schubert A. Expression of PIP1 and PIP2 aquaporins is enhanced in olive dwarf genotypes and is related to root and leaf hydraulic conductance. Physiologia plantarum 2007, 130: 543–551.

Lovisolo C, Tramontini S, Flexas J, Schubert A.
Mercurial inhibition of root hydraulic conductance in Vitis spp. rootstocks under water stress. Environmental and Experimental Botany 2008, in press.
Role in proposal: Researcher
Total cost for partecipant: 28212

Adjuntive proponent

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Participant for adjuntive proponent

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Mobile:
Organization type: Università degli Studi di Torino
Role: Associate Professor or senior researcher
Organization name: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
Education: University Degree in Biology
PhD in Fungal Biology and Biotechnology
Work experience in the last 5 years: 2005-Present: Member of the teaching board of the PhD School in Fungal Biology and Biotechnology.
2006-present: Associate Professor of Organic Chemistry, University of Turin
Technical, organizational and social skills: Instructing undergraduate and PhD students. Teacher at first level (Organic Chemistry), secon level (Advanced methods in Organic Synthesis). Supervisor of graduating and PhD Thesis; Referee for different European and American Scientific journals;
Speaker in national and international congresses and seminars in Organic Synthetic Chemistry.
Skills to achieve some searches with companies: Synthetic organic methods represent a fundamental tool for the production of new synthetic compounds and/or the modification of natural derivatives with important applications and innovative properties in the field of drugs and farmaceutical discovery. For these reasons our research group has undertaken since 2005 a collaborative contact with CREABILIS therapeutics and with HMGBiotech in order to prepare new biopharmaceuticals, and to devolop new synthetic strategies for obtaining such target compounds.
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:

C. Prandi, P. Venturello, A. Deagostino, P. Balma-Tivola “A New Palladium-Catalyzed Synthesis of 1,1-Dialkylbuta-1,3-Dienes via Organoboron Intermediates” J. Chem. Soc., Chem. Comm.2001, 1536-1537.

C. Prandi, P. Venturello, A. Deagostino, P. Balma-Tivola “Lithium-Potassium Superbases As Key Reagents For The Base-Catalysed Isomerisation Of Some Terpenoids” J. Chem. Soc. Perkin-Trans 1, 2001 2856-2860.

C. Prandi, P. Venturello, A. Deagostino, P. Balma-Tivola “A New Synthesis Of Butadienyl- and Styrylboronic Esters: Highly Reactive Intermediates For Suzuki Cross-Coupling” Org. Lett., 2002, 1275-1277.

E. G. Occhiato, C. Prandi, A. Ferrali, A. Guarna, A. Deagostino, P. Venturello “Synthesis of a-Acyl-Functionalized Azacycles by Pd-Catalyzed Cross-Coupling Reactions of a-Alkoxyboronates with Lactam- Derived Vinyl Triflates” J. Org. Chem. 2002, 67, 7144-7146.

M. Coppa, M. Laus, L. Piscopo, C. Prandi “Uniformly Sized Molecurarly Imprinted Polymers (Mips) For 17 b-Estradiol” Macromol Chem. Physic 2002, 1532-1538.

Deagostino, C. Prandi, P. Venturello “a,b-Unsaturated Acetals in Synthesis” Current Organic Chemistry, 2003, 7, 821-839.

Deagostino. C. Prandi, P. Venturello, C. Zavattaro “Palladium Catalyzed C-C Bond Formation: Synthesis of 1,1-Dialkylbuta-1,3-dienes and a-Phenylstyrenes via Organoboron Intermediates” Eur. J. Org. Chem. 2003, 2612-2616.

Deagostino, C. Prandi, P. Venturello “Palladium Catalyzed Heck Reaction on 1-Alkoxy-1,3-Dienes: A Regioselective g-Arylation Of a,b-Unsaturated Carbonyl Compounds” Org. Lett. 2003, 3815-3817.

E. G. Occhiato, C. Prandi, A. Ferrali, A. Guarna, P. Venturello “ New Synthetic Approach To Cyclopenta-Fused Heterocycles Based Upon A Mild Nazarov Reaction” J. Org. Chem. 2003, 9728-9741.

E. G. Occhiato, C. Prandi, A. Ferrali, A. Guarna, P. Venturello “ New Synthetic Approach To Cyclopenta-Fused Heterocycles Based Upon A Mild Nazarov Reaction. 2. Further Study On Torquoselectivity” J. Org. Chem. 2004, 7705-7709.

Deagostino, M. Migliardi, E. G. Occhiato, C. Prandi, C. Zavattaro, P. Venturello “Lickor Promoted Formation of Conjugate Dienes as Useful Building Blocks in Palladium Catalyzed Synthesis” Tetrahedron, 2005, 61, 3429-3436.

E. G. Occhiato, C. Prandi, A. Ferrali, A. Guarna “Remote Stereocontrol in the Nazarov Reaction: a New Approach to the Core of Roseophilin” J. Org. Chem., 2005, 70, 4542-4545.

Prandi, A. Deagostino, M. Migliardi E. G. Occhiato et al. “LIC-KOR promoted formation of conjugated dienes as useful building blocks for palladium-catalyzed syntheses” Tetrahedron, 2005, 61, 3429-3436.

Prandi, E. Gabano, C. Cassino, S. Bonetti, “Synthesis and characterisation of estrogenic carriers for cytotoxic Pt(II) fragments: biological activity of the resulting complexes” Organic & Biomolecular Chemistry, 2005, 3, 3531-3539.

Prandi, A. Deagostino, P. Venturello P, et “Stereoselective synthesis of spirocyclic ketones by Nazarov reaction” al.Org. Lett. , 2005, 7, 4345-4348.

S. Allasia, A. Deagostino A, C. Prandi , et al “A new practical synthesis of germylalkoxydienes, acylgermanes and ethynylgermanes from alpha,beta-unsaturated and alpha-phenyl acetals”. Synthesis, 2005, 3627-3631.

Deagostino, V. Farina, C. Prandi et al “New metal-catalyzed synthesis of quinoline and chromene skeletons”. Eur. J. Org. Chem. 2006, 3451-3456.

Deagostino, C. Prandi ,C. Zavattaro C, et al “Functionalized 1-alkoxy-1,3-dienes: Their preparation and applications in synthetic organic”. Eur. J. Org. Chem. 2006, 2463-2483.

Cavalli, C. Prandi, E.G. Occhiato et a “Density functional studies on the Nazarov reaction

involving cyclic systems” Chemistry, 2006, 2836-2845.

L. Beccaria, A. Deagostino, C. Prandi, C. Zavattaro, P. Venturello “Heck Reaction on 1-Alkoxy-1,3-dienes in Ionic Liquids: A Superior Medium for the Regioselective Arylation of the Conjugated Dienic System, Synlett. 2006, 2989-2992.

Deagostino, C. Prandi, C. Zavattaro, P. Venturello “N-Functionalization of Azoles via Coupling Reactions with Reactions with Alkoxydienyl and Alkoxystyryl Boronic Esters”, 2007, Eur. J. Org. Chem. 1318-1323.

Marco Blangetti, Annamaria Deagostino, Helèna Rosso, Cristina Prandi, Chiara Zavattaro, Paolo Venturello "A Rapid and Easy Access to (E)-1,3-Enynes, 1,3-Diynes and Allenes Starting from Propargylic Acetals, Exploiting the Different Reactivity of Lithium and Mixed Lithium-Potassium Organometallic Reagents" 2007, Eur. J. Org. Chem. 5867-5874.

A. Deagostino, Paolo Larini, Ernesto G. Occhiato, Lorena Pizzuto, Cristina Prandi* and Paolo
Venturello "Synthesis of Weinreb amides via Pd-Catalyzed Aminocarbonylation of Heterocyclic-derived Triflates" 2008, J. Org. Chem. in press.

Role in proposal: Researcher
Total cost for partecipant: 44316

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Role: Researcher
Organization name: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
Education: Degree In Pharmaceutical Chemistry and Technologies
PhD in Chemistry

Work experience in the last 5 years: Researcher in Organic Chemistry

Technical, organizational and social skills: Teacher in first and second level degreee in Chemistry and Industrial Chemistry.
Tutor of graduating students (first and second level degree)

Skills to achieve some searches with companies: Synthetic organic chemistry
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research: Palladium-Catalyzed Cross-Coupling Alkylation of Arenediazonium o-Benzenedisulfonimides. - Barbero M., Cadamuro S., Dughera S. Synlett 2008, in press.
o-Benzenedisulfonimide: A novel and reusable catalyst for acid-catalyzed organic reactions. - Barbero M., Cadamuro S., Dughera S., Venturello, P. Synlett 2007, 2209-2212.
Arenediazonium o-Benzenedisulfonimides as efficient reagents for Heck- type Arylation Reactions. – Artuso E., Barbero M., Degani I., Dughera S., Fochi R - Tetrahedron, 2006, 3146-3157.
Reaction of Dry Arenediazonium o-Benezendisulfonimides with Triorganoindium Compounds - Barbero M., Cadamuro S., Dughera S., Giaveno C. – Eur. J. Org. Chem., 2006, 4884-4890.
Arenediazonium o-Benzenedisulfonimides in Heck-Type Arylation of Allylic Alcohols - Barbero M., Cadamuro S., Dughera S. - Synthesis, 2006, 3443-3452.
Hydrodediazoniation of Dry Arenediazonium o-Benzenedisulfonimides with Hydrogen Peroxide - Barbero M., Degani I., Dughera S., Fochi R. - Synthesis 2004, 2386-2390.
An Improved, General Procedure to S-Aryl Thiol Esters: A New Synthetic Application of Dry Arenediazonium o-Benzenedisulfonimides - Barbero M., Degani I., Dughera S., Fochi R - Synthesis, 2003, 1225.
A General Procedure to Selectively Prepare N-Alkylanilines by an Unexpected Reaction of (Z)-(tert-Butylsulfanyl)(aryl)diazenes with Alkyllithium Reagents - Barbero M., Degani I., Dughera S., Fochi R. – Synthesis, 2003, 742-750.
P. Venturello and M. Barbero, Science of Synthesis, Volume 8b; Compounds of group 1 (Li…Cs); edited by V. Snieckus; Georg Thieme Verlag: Stuttgart, 2006.
8.2.1 Product Subclass 1: Sodium Metal and Sodium –Potassium Alloy pages 880-893
8.2.2 Product Subclass 2: Sodium Hydride pages 894- 923
8.3.1 Product Subclass 1: Potassium Metal pages 1298-1313
8.3.2 Product Subclass 2: Potassium Hydride pages 1314-1343
8.3.4 Product Subclass 4: Potassium Hydroxide and Potassium Alkoxides pages 1360-1385
8.3.6 Product Subclass 6: Potassium Amides and Phosphides pages 1398-1435

Role in proposal: Researcher
Total cost for partecipant: 52443

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Role: Researcher
Organization name: (Università degli Studi di Torino) Dipartimento di chimica generale ed organica applicata
Education: Degree in Chemistry at Facoltà di Scienze M. F. N., Università agli di Torino in 9/12/1993, grade 110/110 e lode.
Ph.D in Chemistry at Dipartimento di Chimica Generale ed Organica Applicata della Facoltà di Scienze M. F. N. dell'Università di Torino.
Post Doctoral Fellowship at Laboratoire Chimie Moléculaire et Thiorganique UMR-CNRS 6507, Institut des Sciences de la Matière et du Rayonnement, ENSI de Caen, Universitè de Caen, December 1997-December 1998, supervisor Prof. Marie-Claire Lasne.

Work experience in the last 5 years: Ricercatore at Dipartimento di Chimica Generale ed Organica Applicata della Facoltà di Scienze M. F. N. dell'Università di Torino since March 1999.
Technical, organizational and social skills: Member of Ph.D in Chemical Science professor board of XIX (from 2003 to 2006) and XX cycle (since 2004).
Skills to achieve some searches with companies: Fellowship at Dipartimento di Chimica Organica della Facoltà di Scienze M. F. N. dell'Università di Padova, June 1994-February 1995, title "Reazioni di Ossidazione catalizzate da Complessi di Manganese" financed from Procter & Gamble, supervisor Prof. Fulvio Di Furia.
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:

A New Synthesis of Butadienyl- and Styrylboronic Esters: Highly Reactive Intermediates for Suzuki Cross-Coupling Paolo Balma Tivola, Annamaria Deagostino, Cristina Prandi e Paolo Venturello Org. Lett. 2002, 4, 1275-1277.
Synthesis of -Acyl-Functionalized Azacycles by Pd-Catalyzed Cross-Coupling Reactions of -Alkoxyboronates with Lactam-derived Vinyl Triflates Ernesto G. Occhiato, Cristina Prandi, Alessandro Ferrali, Antonio Guarna, Annamaria Deagostino e Paolo Venturello J. Org. Chem. 2002, 67, 7144-7146.
,-Unsaturated Acetals in Synthesis Annamaria Deagostino, Cristina Prandi e Paolo Venturello Current Organic Chemistry, 2003, 7, 821-839.
Palladium catalysed C-C bond formation: synthesis of 1,1-dialkylbuta-1,3-dienes and β-phenylstyrenes via organoboron intermediates Annamaria Deagostino, Cristina Prandi, Chiara Zavattaro e Paolo Venturello Eur. J Org. Chem., 2003, 2612-2616.
Palladium-catalyzed Heck Reaction on 1-Alkoxy-1,3-Dienes: a Regioselective γ-Arylation of α,β-Unsaturated Carbonyl Compounds Annamaria Deagostino, Cristina Prandi e Paolo Venturello, Org. Lett., 2003, 5, 3815-3817.
LIC-KOR Promoted Formation of Conjugate Dienes as Useful Building Blocks in Palladium–Catalyzed Syntheses Annamaria Deagostino, Manuele Migliardi, Ernesto G. Occhiato, Cristina Prandi, Chiara Zavattaro e Paolo Venturello Tetrahedron, 2005, 61, 3429-3436.
A New Practical Synthesis of Germylalcoxydienes, Acylgermanes and Ethynylgermanes from α,β-Unsaturated and α-Phenyl Acetals Sara Allasia, Annamaria Deagostino, Cristina Prandi, Chiara Zavattaro e Paolo Venturello, Synthesis, 2005, 3627-3631.

Stereoselective Synthesis of Spirocyclic Ketones by Nazarov Reaction Cristina Prandi, Annamaria Deagostino, Paolo Venturello, ed Ernesto G. Occhiato Org. Lett., 2005, 7, 4345-4348.
Functionalized 1-Alkoxy-1,3-dienes: their Preparation and Applications in Synthetic Organic Chemistry Annamaria Deagostino., Cristina Prandi, Chiara Zavattaro e Paolo Venturello Eur. J. Org. Chem. 2006, 2463-2483.
New Metal Catalyzed Synthesis of Quinoline and Chromene Skeletons Annamaria Deagostino, Vittorio Farina, Cristina Prandi, Chiara Zavattaro e Paolo Venturello, Eur. J. Org. Chem., 2006, 3451-3456.
Heck Reaction on 1-Alkoxy-1,3-dienes in Ionic Liquids: A Superior Medium for the Regioselective Arylation of the Conjugated Dienic System Luca Beccaria, Annamaria Deagostino, Cristina Prandi, Chiara Zavattaro e Paolo Venturello Synlett 2006, 2989-2992.
N-Functionalization of Azoles via Coupling Reactions with Alkoxydienyl and Alkoxystyryl Boronic Esters Annamaria Deagostino, Cristina Prandi, Chiara Zavattaro e Paolo Venturello Eur. J. Org. Chem. 2006, 0000.

Role in proposal: Researcher
Total cost for partecipant: 42309

Adjuntive proponent

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Organization type: Università degli Studi del Piemonte Orientale
Role: Associate Professor or senior researcher
Organization name: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
Education: PhD in Computer Science from University of Milan and Turin, Italy, 1994

Master degree in Mathematics (Laurea in Matematica) from University of Rome "La Sapienza", Italy, 1989.
Work experience in the last 5 years: Associate Professor at the University of Piemonte Orientale since November 2006.
Researcher at the University of Piemonte Orientale from November 1993, till October 2006.

Technical, organizational and social skills: Responsible of the Project "Networks and Security", for the renovation of the computer network of Univ. of Piemonte Orientale, and the improvement of its security level. This involves:
-production, and submission to approval of University Management, of usage and management policies;
-definition of appropriate management structures, with reorganization of the staff's tasks and responsibilities;
-interaction with both management and staff for choices that respect both the management's lines and the staff's skills and inclinations;
-a technical project, evaluation of products;
-production of technical/administrative documents suitable for acquiring the technical material
-interaction with producers and vendors.

Skills to achieve some searches with companies:
Loans managed for the last 5 years:
Publications for the last 5 years, licences or other products of research:
International journals (with review process):
L. Egidi, M. Furini, From Digital Audiobook to Secure Digital Multimedia-book, ACM Computers in Entertainment, Vol. 4, No. 3, July 2006. ACM Computer Press. ISSN: 1544-3574

L. Egidi, P. Terenziani, A mathematical framework for the semantics of symbolic

languages representing periodic time, Annals of Mathematics and Artificial Intelligence, Volume 46, Number 3, 2006, 317 - 347

L. Egidi, M.Furini, Bringing Multimedia Contents into MP3 Files, IEEE Communications Magazine, Volume 43, Issue 5, May 2005, 90 - 97

Contributions on books:
L. Egidi, "La posta elettronica. Considerazioni tecniche", in: A. Villecco, Le notificazioni e le comunicazioni telematiche nel processo civile, Gedit Edizioni, 2007.

International conferences (with review process):
L. Egidi, M. Furini, The digital restyling of audiobooks, Communication Systems and Networks (CSN 2005), 2005.

L. Egidi, P. Terenziani, A flexible approach to userdefined symbolic granularities in temporal databases, 20th ACM Symposium on Applied Computing (SAC'05), 2005.

L. Egidi, P. Lova, G. Porcelli, Decentralized rate-limiting of outbound e-mail, Computer and Communication Networks (CCN 2004), 2004.

L. Egidi, M. Furini, An Architecture to Securely Enrich and Distribute MP3 over the Internet, Computer and Communication Networks (CCN 2004), 2004.

L. Egidi, M. Petrocchi, Modelling a secure agent with team automata, Proc. VODCA 2004, Electr. Notes Theor. Comput. Sci. : (2004)

L. Egidi, P. Terenziani, Orthogonal Operators for User-Defined Symbolic Periodicities. AIMSA 2004, LNAI 3192, 137-147

L. Egidi and P. Terenziani, A mathematical framework for the semantics of symbolic languages representing periodic time, IEEE Proc. of The 11th International Symposium on Temporal Representation and Reasoning (TIME'04), 2004, 21-27.

L. Egidi and P. Terenziani, A lattice of classes of user-defined symbolic periodicities, IEEE Proc. of The 11th International Symposium on Temporal Representation and Reasoning (TIME'04), 2004, 13-20.

L. Egidi, G. Porcelli, Anonymity and certification: e-mail, a case study, 19th ACM Symposium on Applied Computing (SAC'04), 397-403, 2004.

L.Egidi, M.Melato, Authentication and access delegation with user-released certificates, Proceedings of The 18th ACM Symposium on Applied Computing (SAC'03), 2003

Role in proposal: Researcher
Total cost for partecipant: 29544

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Organization type: Università degli Studi del Piemonte Orientale
Role: Extraordinary Professor
Organization name: (Università degli Studi del Piemonte Orientale) Dipartimento di Informatica
Education: Master of Science in Computer Science from Carnegie Mellon University of Pittsburg in 1985.
Master degree in Computer Science (Laurea in Scienze dell'Informazione) from University of Pisa in 1980.
Work experience in the last 5 years: Full Professor of Computer Science at the University of Piemonte Orientale (since December 2004).
Associate professor of Computer Science at the University of Piemonte Orientale (from October 1994 till December 2004).

Technical, organizational and social skills: Member or the Program Committees of the international conferences ICSOFT 2008, 2007, 2006(http://www.icsoft.org/), FTfJP 2007, 2006 (http://cs.nju.edu.cn/boyland/ftjp/), FOOL WOOD 2006 (http://www.research.att.com/~kfisher/FOOL/FOOLWOOD06/participation.html).

Coordinator of the Work package Extensible Object Systems of the international reserch projects DART (http://www.macs.hw.ac.uk/DART/).
Site coordinator of the national research projects PRIN 2006, EOSDUE (http://bart.disi.unige.it/EOS2/www_static_pages/index.html).
Site coordinator of the national research projects PRIN 2004, EOS (http://bart.disi.unige.it/EOS/).
Site coordinator of the national research projects Cofin 2001, NAPOLI (Network Aware Programming: Objects, Languages, Implementations).
Skills to achieve some searches with companies: Partner in a StartUp Company "InfoLearning" (http://www.infolearning.net/site/html/ita/index.htm) offering elearning services.
In the past had research collaborations with the company Software Engeniering Institute (http://www.sei.cmu.edu/) of Pittsurgh.
Loans managed for the last 5 years: Administrative Responsible of a Unit of the project Cofin 2001, NAPOLI.
Administrative Responsible of a Unit of the project PRIN 2004, EOS.
Administrative Responsible of a Unit of the project PRIN 2006, EOS DUE.
Publications for the last 5 years, licences or other products of research: D. Ancona, C. Anderson, F. Damiani, S. Drossopoulou, P. Giannini and E. Zucca. A provenly correct

translation of Fickle into Java. ACM Transactions On Programming Languages and Systems, 29(2), Article No. 13 (67 pages).

P. Giannini, D. Sangiorgi and A. Valente. Safe Ambients: Abstract Machine and Distributed Implementation. Journal of Science of Computer Programming. Volume 59. pages 209 - 249, 2006.

F. Damiani, E. Giachino, P. Giannini, N. Cameron and S. Drossopoulou. A State Abstraction for Coordination in Java-like Languages. Electronic proceedings of Workshop FTfJP'06 (http://www.cs.ru.nl/ftfjp/).

F. Damiani, E. Giachino, P. Giannini and E. Cazzola. On state classes and their dynamic semantics
In proceedings of ICSOFT'06 (http://www.icsoft.org), Volume 1, pages 5-12, INSTICC press.

D. Ancona, F. Damiani, S. Drossopoulou and E. Zucca. Polymorphic Bytecode: Compositional Compilation for Java-like Languages. In proceedings of POPL'05, pages 26-37, 2005, ACM.

C. Anderson, P. Giannini, S. Drossopoulou. Towards Type Inference for JavaScript. In 19th European Conference on Object-Oriented Programming (ECOOP 2005), LNCS 358. page 428-453, 2005, Springer Verlag.

C. Anderson , P. Giannini. Type Checking for JavaScript. In WOOD'05, ENTCS, 2005, Elsevier.

F. Damiani, M. Dezani-Ciancaglini and P. Giannini. On Re-classification and Multithreading, Journal of Objectc Technology (www.jot.fm), 3(11):5-30, 2004.

F. Damiani, M. Dezani-Ciancaglini and P. Giannini. Re-classification and Multithreading: FickleMT, OOPS track at SAC'04, volume 2, pages 1297--1304, 2004, ACM.

F. Damiani and P. Giannini. Alias types for ``environment-aware'' computations. In proceedings of Workshop WOOD'03, ENTCS, volume 82.8, Elsevier.

F. Damiani, S. Drossopoulou and P. Giannini. Refined Effects for Unanticipated Object Re-classification: Fickle3 (Extended Abstract). In proceedings of ICTCS'03, LNCS 2841, pages 97-110, Springer.
Role in proposal: Researcher
Total cost for partecipant: 46305

Adjuntive proponent

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Participant for adjuntive proponent

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Organization type: Ente pubblico di ricerca
Role: Associate Professor or senior researcher
Organization name: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
Education: Valeria Bianciotto is currently Senior Researcher Scientist at the Italian National Council of Research (CNR). Her interest, in the past, has been focused on the study of the biology of the arbuscular mycorrhizal (AM) fungi. She investigated the cell cycle of the AM fungi during her Ph.D in "Fungal Biology and Biotechnology" at the University of Turin (discussed in 1993). In the last ten years her researches were focalized on the study of a population of intracellular bacteria (Candidatus Glomeribacter gigasporarum) of AM fungi and biodiversity of AM fungi in natural and agricultural ecosystems. Since 1999 she is Contract Professor of Plant Biology (Morphology) at Biotechnology School -Agricultural Faculty -University of Torino

EDUCATION
1990 Degree of Natural Sciences: Department of Plant Biology University of Torino
1990 -1993 Ph.D. in Biology and Biotechnology of fungi, University of Turin, Italy Ph.D. Thesis title: “Arbuscular mycorrhizal fungi: morphogenesis and cellular cycle” A period of the phD was spent at the John Innes Institute Norwich, U.K. and Laboratoire de Phytoparasitologie de la Station de Génétique et d'Amélioration des Plantes INRA – Dijon France

APPOINTMENTS
1993- 1996 Postdoc. Res. assistant, Dept. Plant Sciences,University of Turin, UK.
1996 -2000 Researcher Scientist of Centro di Studio sulla Micologia del Terreno di Torino del CNR
2001- now Permanent Researcher Scientist of the CNR (Italian National Council of Research) Group of Soil Mycology - Istituto Protezione Piante –Torino (from 2006 position of Primo ricercatore - Senior Research Scientist)
1999 -2007 Contract Professor of Plant Biology (Morphology)- Biotechnology School - Agricultural Faculty -University of Torino

RESEARCH FIELDS
Biology of AM fungi
AM Fungal-bacterial interactions
Intracellular bacteria of AM fungi
Biodiversity of arbuscular mycorrhizal fungi

Work experience in the last 5 years: - Permanent Researcher Scientist of the CNR (Italian National Council of Research) Soil Mycology IPP Torino 2001-present
- Contract Professor of Biologia Vegetale II (1999-2006), Morfologia e Fisiologia vegetale III (2001-2002) Biotechnology School University of Torino - Italy
- EU Researcher responsible in the frame of European project GENOMYCA devoted to the identification of useful genetic traits
in AM fungi and intracellular bacteria and in the frame of the COST ACTION 821
- National Researcher responsible of local Italian Projects CEBIOVEM (Centro di Eccellenza per la BIOsensoristica VEgetale e MIcrobica)
- Principal investigator with official scientific responsability in project of IPP-CNR devoted to different aspects of mycorrhizal fungi and their intracellular bacteria
- Tutor of undergraduate, PhD students and trainees (Italian and foreign students). Teaching activity for undergraduate students.
- Lecturer for students of the PhD school in ' Produttività delle piante coltivate' . Dipartimento di Biotecnologie Agrarie - Università di Padova - 5/03/2003

SELECTED PROFESSIONAL ACTIVITIES
• Member of Institut Council of Istituto Protezione Piante IPP - Italian National Council of Research (CNR)
• Referee for manuscripts submitted to the journals:
New Phytologist,
Mycological Research,
Mycorrhiza,
Journal of Plant Interaction,
Environmental microbiology,
FEMS Microbiology Ecology,
Plant Biosystem,

Environmental Monitoring and Assessment,
Annals of Microbiology
• Invited speaker in international congresses of Mycology, Microbiology, Biotechnology
• Invited to write review articles/book chapters since 2002
• Member as teacher of the PhD school 'Biologia e Biotecnologia dei funghi' Università diTorino
• Member of the Final Degree Examination Committee for the Degree in Biotecnology (first level) University of Torino (Italy) 2003-2006
• SCIENTIFIC OUTPUT: Refereed articles 30, Book chapters 6, Invited lectures 14, Communications and posters more than 60
Technical, organizational and social skills: Research fields:
-Biology of the rhizosphere
-Biodiversity of arbuscular mycorrhizal fungi -Fungal-bacterial interactions
-intracellular bacteria

Technical expertise. Cellular and molecular biology: sample preparations for electron and optical microscopy, including fluorescence and confocal microscopy; immunolabelling; extraction of nuclei for static and flow cytometry; “in situ” hybridization; DNA extraction from bacteria and fungi; PCR; phylogenetic analysis. Microbiology and plant biology: bacteria and fungi cultures; transformed roots culture; "in vitro" synthesis of mycorrhizae .

Collaboration with research groups from national and international institutions in joined research projects.
Skills to achieve some searches with companies: Experience developed in working with the following companies:
- Isagro Italia
- Azienda Agricola Manenti
and collaboration with associations of local producers and companies in the frame of the project (Tech4Wine)
Loans managed for the last 5 years: - National Researcher responsible (as sub-project leader) of the Italian Projects CEBIOVEM (2003-2006)
- researcher responsible of the Subproject (linea tematica 1) "Analysis of the genetical and functional diversity of mycorrhizal fungi and of associated bacteria" in the frame of the Commessa CNR " Biodiversità di ospiti, patogeni, vettori, organismi nocivi e funghi simbionti della rizosfera" (2005-2010).
- researcher responsible for IPP-CNR (Torino) in EU Network of Excellence (NoE) titled European Network for the DURable Exploitation of crop protection strategies (ENDURE) (2007-2011).
-Researcher responsible for IPP-CNR of a research activity in the project FISR “Cambiamenti Climatici e Sistemi Produttivi Agricoli e Forestali: Impatto sulle Riserve di Carbonio e sulla Diversita’ Microbica del Suolo-acronimo SOILSINK (2006-2009)
-Researcher responsible of an International Joint Project with the Royal Society (UK) titled (2006-2008): ‘Developing genetic markers to test for genetic exchanges in arbuscular mycorrhizae’
-Involved as researcher in the Regional CIPE Project (2007-2010) titled: Integrated tecnology platform supporting the quality and safety of typical wines of Piedmont, Italy (TECK4WINE)

Publications for the last 5 years, licences or other products of research: Bianciotto, V., Lumini, E., Bonfante, P., Vandamme, P. (2003). 'Candidatus Glomeribacter gigasporarum' gen. nov., sp. nov., an endosymbiont of arbuscular mycorrhizal fungi. International Journal of Systematic and Evolutionary Microbiology 53(1) 121-124.

Bonfante P. Bianciotto V. 2003 Auto-organizzazione nelle simbiosi vegetali: un mosaico di cellule e genomi in dialogo Quaderni dell'Accademia Nazionale dei Lincei XXIX 'Evoluzione biologica e i grandi problemi della Biologia ' pp. 73-87.

Bianciotto, V., Genre, A., Jargeat, P., Lumini, E., Becard, G., Bonfante, P. (2004). Vertical transmission of endobacteria in the arbuscular mycorrhizal fungus Gigaspora margarita through generation of vegetative spores. Applied and Environmental Microbiology 70(6) 3600-3608.

Bonfante, P., Genre, A., Bianciotto, V. (2004). The colonisation strategies of arbuscular mycorrhizal fungi: an overview of their cellular interactions with plants and bacteria. In: Frías-Hernández, J. T., Olalde-Portugal, V., Ferrera-Cerrato, R. (eds.), Avance en el conocimiento de la biología de las micorrizas. Universidad de Guanajuato, Guanajuato, México 19-28.

Genre, A., Bianciotto, V., Jargeat, P., Lumini, E., Uetake, Y., Becard, G., Bonfante, P. (2004). Arbuscular mycorrhizal fungi harbor endocellular bacteria. In: Tikhonovich, I., Lugtenberg, B., Provorov, N. (eds.), Biology of Plant-Microbe Interactions, Volume 4: Proceedings of the 11th International Congress on Molecular Plant-Microbe Interactions, St.-Petersburg, Russia, July 18-26, 2003. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 445-447.

Bianciotto, V., Girlanda, M., Lazzari, A., Cappellazzo, G., Perotto, S., Bonfante, P. (2005). Transgenic rhizospheres of crop plants: their impact on indigenous soil fungi. In: Buscot, F., Varma, A. (eds.), Microorganisms in Soils: Roles in Genesis and Functions. Springer, Berlin 280-290.

Romani M., I. Bonin, V. Bianciotto, E. Lumini, G. Beltarre e P. Bonfante. (2005). "Micorrize, un sodalizio utile anche in risicoltura" Terra e Vita (Edagricole). 21:78-82.

Bianciotto, V., Lumini, E., Vallino, M., Bonin, I., Bonfante, P. (2005). Funghi micorrizici arbuscolari e loro endobatteri: analisi molecolare della biodiversità. Informatore Botanico Italiano 37(1, pt. B) 696-697. ISSN:0020-0697

Lumini, E., Ghignone, S., Bianciotto, V., Bonfante, P. (2006). Endobacteria or bacterial endosymbionts? To be or not to be [2]. New Phytologist 170(2) 205-208. ISSN:0028-646X IF:4.245 (JCR year: 2006). Rank in PLANT SCIENCES: 8° su 147

Vallino, M., Massa, N., Lumini, E., Bianciotto, V., Berta, G., Bonfante, P. (2006). Assessment of arbuscular mycorrhizal fungal diversity in roots of Solidago gigantea growing in a polluted soil in Northern Italy. Environmental Microbiology 8(6) 971-983. ISSN:1462-2912 IF:4.630 (JCR year: 2006). Rank in MICROBIOLOGY: 13° su 88

Bonfante, P., Lumini, E., Bianciotto, V., Jargeat, P., Salvioli, A., Genre, A., Blal, B., Novero, M., Faccio, A., Batut, J., Bécard, G. (2006). Endocellular bacteria/Gigaspora margarita/ host plants: experimental evidences of arbuscular mycorrhizas as tripartite interactions. In: Sánchez, F., Quinto, C., Lopez-Lara, I. M., Geiger, O. (eds.), Biology of Plant-Microbe Interactions, Volume 5: Proceedings of the 12th International Congress on Molecular Plant-Microbe Interactions, Mérida, Yucatán, México, December 14-19, 2005. International Society for Molecular Plant-Microbe Interactions, St. Paul, Minn. 552-558.

Da Silva, G.A., Lumini, E., Costa Maia, L., Bonfante, P., Bianciotto, V. (2006).

Phylogenetic analysis of Glomeromycota by partial LSU rDNA sequences. Mycorrhiza 16(3) 183-189. ISSN:0940-6360 IF:1.813 (JCR year: 2006). Rank in MYCOLOGY: 8° su 17

Ligrone, R., Carafa, A., Lumini, E., Bianciotto, V., Bonfante, P., Duckett, J.G. (2007). Glomeromycotean associations in liverworts: a molecular, cellular and taxonomic analysis. American Journal of Botany 94(11) 1756-1777. ISSN:0002-9122 IF:2.969 (JCR year: 2006). Rank in PLANT SCIENCES: 16° su 147

Lumini, E., Bianciotto, V., Jargeat, P., Novero, M., Salvioli, A., Faccio, A., Bécard, G., Bonfante, P. (2007). Presymbiotic growth and sporal morphology are affected in the arbuscular mycorrhizal fungus Gigaspora margarita cured of its endobacteria. Cellular Microbiology 9(7) 1716-1729. ISSN:1462-5814 IF:5.070 (JCR year: 2006). Rank in CELL BIOLOGY: 36° su 156; rank in MICROBIOLOGY: 12° su 88

Bianciotto V, Girlanda M, Lazzari A, Cappellazzo G, Perotto S, Bonfante P. (2005) Transgenic rhizospheres of crop plants: their impact on indigenous soil fungi. in Microorganisms in soil: roles, ingenesis and function, Chapter 13. (F. Buscot, A. Varma, eds) Springer Verlag, Heidelberg.

Alguacil M.M., E Lumini., A Roldan., J.R Salinas-Garcia., P Bonfante and V. Bianciotto. (2008) The Impact of tillage practices on AM fungal diversity in crop fields under subtropical conditions. Ecological Applications In press

Role in proposal: Researcher
Total cost for partecipant: 30216

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City: TORINO
Address: Viale Mattioli
Number: 25
CAP: 10125
Telephone: 0116502927
Fax:
Mobile:
Organization type: Ente pubblico di ricerca
Role: Researcher
Organization name: (Ente pubblico di ricerca) Consiglio Nazionale delle Ricerche - Istituto Protezione Piante
Education: 1991 Degree in Biological Sciences - University of Torino - Italy.

1991-1992 CNR grant for research activity in the field of mycorrhizal interactions at Centro di Studio sulla Micologia del Terreno di Torino.

1993-1995 Ph.D in "Biology and Biotechnology of Fungi", discussed in 1996 with a thesis entitled "Cellular and molecular interaction between symbiotic fungi and plants: in situ identification of cell wall components".

1996- 1998 Post-doc Research assistant, Dept. of Plant Biology, University of Torino, Italy

1998- 14th December 2001 Researcher Scientist (temporary position) at the Italian National Council of Research (CNR) – Soil Mycology – Institution of Plant Protection (IPP).

Stages at the University of Konstanz, Germany (8-13/12/1991 and 22-25/03/1993 in the frame of the CEE project Cost Action 810 "Vesicular Arbuscular Mycorrhizae").
Stages at the Department of Molecular Genetics, CSIC, Barcelona, Spain (15/06-03/07/1992,18-30/10/1993, 6-16/05/1996).
Course on “In situ hybridization in plants” from 26th September to 5th October 1996 at the Plant Breeding Institute – University of Perugia, Italy.
Course on "Bioinformatica - accesso alle banche dati" at the Biotechnology School - University of Torino, 31st October 2000.
Course on "Analisi del Proteoma" from 29th January to 1st February 2001 at the CNR laboratories – ISPA, Biondustry Park, Colleretto Giacosa, Italy.
2005: training in the use of the AS LMD laser microdissector.
International workshop “Gene Silencing” organized by Fondazione per le Biotecnologie at Villa Gualino – 11 November 2005, Torino, Italy.
Course on “Statistica per l’analisi dei dati di interesse biologico” organized by Fondazione per le Biotecnologie at Villa Gualino – 27-29 september 2006, Torino, Italy.
International workshop “ The world of small non coding RNAs from science to applied science” at the Accademia dei Lincei - 11-12 June 2007, Roma, Italy.
Work experience in the last 5 years: December 2001 – present
Permanent Researcher at the Italian National Council of Research (CNR) – Soil Mycology - Institution of Plant Protection (IPP).

Principal investigator with official scientific responsibility in projects of Plant Protection Institute:
2003-2004. “Expression of significant genes during the interactions between plants and mycorrhizal fungi” (project inserted in the macroline 3 of IPP).
Responsible for the worpackage 3 in the project funded by Regione Piemonte (CIPE 2006) “Integrated technology platform supporting the quality and safety of typical wines of Piedmont – Italy” (2007-2010).
Involved in European and National project (Truffle Projects, Functional genomics in Plant-Microbes) devoted to different aspects of mycorrhizal fungi.
Member, as CNR researcher, of the CEBIOVEM (Centro di Eccellenza per la BIOsensoristica VEgetale e Microbica) staff.
Tutor of undergraduate, PhD students and trainees (Italian and foreign students).
Teaching activity for undergraduate students.
2005-2006:
Involved (also during its preparation) in the Regione Piemonte project: B 63 - Analisi genetico-molecolare per la qualità e sicurezza del prodotto “tartufo” (Ricerca Scientifica Applicata 2004 nel Settore: Qualità e Sicurezza Alimentare)-approved in December 2005.
Involved in the preparation of the pre-proposal, for the PNR 2005-2007,: "Prodotti freschi: sistemi innovativi per garantire serbevolezza, sicurezza, identità e qualità dalla

produzione al consumo (PROFSICURI II)".
Lecture for students of the PhD in “Biology and Biotechnology of Fungi”: “Morphological and molecular aspects of cell walls in plant/mycorrhizal interactions”. 11th April 2005, Department of Plant Biology, University of Torino.
Lecturer at the INTEGRAL Workshop on cell biology applied to plant microbe interactions 7-10 June 2006, Department of Plant Biology, University of Torino
Lecturer at the Summer school “Tecniche di microscopia d’avanguardia come strumento di analisi cellulare e tissutale in organismi vegetali” Sabaudia 16 –19 October 2006
Referee for the University of Siena (Italy) of a project presented as “Progetto d’Ateneo” in 2005.
Referee for the following journals:
New Phytologist
Journal of Plant Physiology
Plant Biosystems
Biocontrol Science and Technology
Plant Growth Regulation
Molecular Biology Reports
Supervisor of a Spanish student during his training (Leonardo grant from May to October 2006) in the frame of a study aimed to verify the presence of cell-type specific transcripts in arbuscular mycorrhizal symbiosis by using laser microdissection.
Activity for public administrations:
2006 and 2007: member of evaluation committees for the temporary hiring of young research personnel.
Technical, organizational and social skills: Research fields of interest:
cellular and molecular interactions between plants and mycorrhizal fungi, with particular attention to: cell surfaces, cell wall biogenesis, gene expression changes; Functional genomics in mycorrhizal fungi. During my Ph.D I studied some cellular and molecular aspects during the interactions between plants and mycorrhizal fungi. My researches focus on the study of the expression and the location of cell wall molecules during the interaction plant/fungus and the applications of in situ of hybridization in this field. Other interest is the application of laser microdissection technology during plant/fungus interactions. Collaboration with research groups from national and international institutions in joined research projects.
Scientific Production
Papers published in refereed journals with Impact Factor: 32
Journal without IF, Proceedings, Book chapters: 4
Communications and Posters: more than 50
Technical expertise - Cellular and molecular biology: sample preparations for electron and optical microscopy, including confocal microscopy (paraffin and resin embedding, use of ultramicrotome, rotatory microtome, vibratome and cryostat for cutting sections); affinity techniques; immunogold; preparation of enzyme/gold and lectin/gold complexes; use of transmission electron microscopy; “in situ” hybridization; proteins extraction; SDS-PAGE and non-denaturating gels; Western blotting; DNA and RNA extraction from plants and fungi; Southern and Northern blotting; RT-PCR; Real-time PCR; use of laser microdissection; RNA extraction from microdissected cells; genomic and cDNA libraries screening; sequence analysis. Microbiology and plant biology: bacteria and fungi cultures; transformed roots culture; "in vitro" synthesis of mycorrhizae (ecto and endo).
Informatic skills: office suite in Windows and MAC environment, sequences analysis (CLUSTALW, BLAST), primers design (Primer3), sequences annotation (ARTEMIS).
Co-organizer of an INTEGRAL Workshop (Summer school) on cell biology applied to plant microbe interactions 7-10 June 2006, Department of Plant Biology, University of Turin. Teaching activity on the application of laser microdissection to plant materials in the same workshop.

Teaching activity at the Summer school “Tecniche di microscopia d’avanguardia come strumento di analisi cellulare e tissutale in organismi vegetali” organized by Società Botanica Italiana, Sabaudia 16 –19 October 2006.

Skills to achieve some searches with companies: Collaboration with associations of local producers and companies in the frame of a joined project (Tech4Wine).
Loans managed for the last 5 years: 2005-2007. Principal investigator responsible of “Genomic and Functional Genomics in Plant-Mycorrhizal Fungi Interactions” project inserted in the Commessa CNR “Interazione ospite-organismo-ambientale: biologia, epidemiologia e genomica funzionale”.

Responsible for the worpackage 3 in the project funded by Regione Piemonte (CIPE 2006) “Integrated technology platform supporting the quality and safety of typical wines of Piedmont – Italy” (Tech4Wine, 2007-2010).
Publications for the last 5 years, licences or other products of research: - Abbà, S., Balestrini, R., Benedetto, A., Rottensteiner, H., De Lucas, J.R., Bonfante, P. (2007). The role of the glyoxylate cycle in the - symbiotic fungus Tuber borchii: expression analysis and subcellular localization. Current Genetics 52 159-170.

- Balestrini, R., Gómez-Ariza, J., Lanfranco, L., Bonfante, P. (2007). Laser microdissection reveals that transcripts for five plant and one fungal phosphate transporter genes are contemporaneously present in arbusculated cells. Molecular Plant-Microbe Interactions 20 1055-1062.

- Siciliano, V., Genre, A., Balestrini, R., deWit, P.J.G.M., Bonfante, P. (2007). Pre-penetration apparatus formation during AM infection is associated with a specific transcriptome response in epidermal cells. Plant Signaling & Behavior 2 533-535.

- Siciliano, V., Genre, A., Balestrini, R., Cappellazzo, G., deWit, P.J.G.M., Bonfante, P. (2007). Transcriptome analysis of arbuscular mycorrhizal roots during development of the prepenetration apparatus. Plant Physiology 144 1455-1466.

- Balestrini, R., Lanfranco, L. (2006). Fungal and plant gene expression in arbuscular mycorrhizal symbiosis. Mycorrhiza 16 509-524.

- Montanini, B., Viscomi, A.R., Bolchi, A., Martin, Y., Siverio, J.M., Balestrini, R., Bonfante, P., Ottonello, S. (2006). Functional properties and differential mode of regulation of the nitrate transporter from a plant symbiotic ascomycete. Biochemical Journal 394 125-134.

- Balestrini, R., Bonfante, P. (2005). The interface compartment in arbuscular mycorrhizae: A special type of plant cell wall?. Plant Biosystems 139 8-15.
- Balestrini, R., Cosgrove, D.J., Bonfante, P. (2005). Differential location of alpha-expansin proteins during the accommodation of root cells to an arbuscular mycorrhizal fungus. Planta 220 889-899.

- Bonfante, P., Abbà, S., Balestrini, R., Faccio, A., Gabella, S., Mello, A., Miozzi, L., Murat, C., Vizzini, A. (2005). Il contributo delle biologia molecolare alla comprensione della diversità genetica e funzionale del tartufo. Informatore Botanico Italiano 37 700-701.

- Miozzi, L., Balestrini, R., Bolchi, A., Novero, M., Ottonello, S., Bonfante, P. (2005). Phospholipase A2 up-regulation during mycorrhiza formation in Tuber borchii. New Phytologist 167 229-238.

- Liso, R., De Tullio, M.C., Ciraci, S., Balestrini, R., La Rocca, N., Bruno, L., Chiappetta, A., Bitonti, M.B., Bonfante, P., Arrigoni, O. (2004). Localization of ascorbic acid, ascorbic acid oxidase, and glutathione in roots of Cucurbita maxima L. Journal of Experimental Botany 55 2589-2597.

- Montanini, B., Betti, M., Márquez, A.J., Balestrini, R., Bonfante, P., Ottonello, S. (2003). Distinctive properties and expression profiles of glutamine synthetase from a plant symbiotic fungus. Biochemical Journal 373 357-368.

- Tagu, D., Palin, B., Balestrini, R., Gelhaye, E., Lapeyrie, F., Jacquot, J.P., Sautière, P.E., Bonfante, P., Martin, F. (2003). Characterization of a symbiosis- and auxin-regulated glutathione-S-transferase from Eucalyptus globulus roots. Plant Physiology and Biochemistry 41 611-618.
Role in proposal: Researcher
Total cost for partecipant: 23418

Coproponent

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I.C.O. code: Imprese produttive
Enterprise type: Small enterprise
Industrial research in the project (%): 5
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Participant for coproponent

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Education:
Work experience:
Skills to achieve some searches / research and development experiences:
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Representative
Total cost of participant: 5000

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Education:
Work experience:
Skills to achieve some searches / research and development experiences:
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:

Role in proposal: Researcher
Total cost of participant: 13800

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Document number: 1086186AA
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Fax: 0165/775774
Mobile: 3357511430
Organization: CENTRO COLTURE SPERIMENTALI VALLE D'AOSTA S.R.L.
Education:
Work experience:
Skills to achieve some searches / research and development experiences:
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 14400

Coproponent

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Number of employees: 1
ATECO 2002 code: 73.10.0
I.C.O. code: Società con meno di 20 addetti
Enterprise type: Small enterprise
Industrial research in the project (%): 40
Localized office in Piedmont
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Organization: GEOL SAS DI CIBRARIO OTTAVIO E C.
Education: Laurea in chimica pura Università di Torino relatore prof. Franco Ricca,1975
Post Doc Weizmann Institute of Science, Israel,Protein Structure and Biocomputing,prof. Ada Yonath 1979-1980
EU Fellowship at Dep. Chimie Organique et Supramoleculaire, Université de Strasbourg, France, prof. J.M. Lehn, 1984
Work experience: 1975-1976 Fellow of Accademia dei Lincei
1976-1987 Scientist at Montedison Research Center, Istituto Donegani, NOVARA
1988-2004 Senior Research Scientist at ENICHEM Research Center, NOVARA
2005- Scientific Advisor for DELOS, Milano
2006- Scientific Advisor for GEOL s.a.s
Skills to achieve some searches / research and development experiences:
Publications since 1997 and relevant to the field of computational chemistry and structural biology:
EXPRESSION AND CHARACTERIZATION OF PS. AERUGINOSA CYTOCHROME C551 AND TWO SITE DIRECTED MUTANTS: ROLE OF TRP56 IN THE MODULATION REDOX PROPERTIES,
F Cutruzzolà, I Ciabatti, G Rolli, S Falcinelli, M Arese, G Ranghino, A Anselmino, E Zennaro, and M C Silvestrini
Biochem. Jour., 322,35, 1997,55
COVALENT COMPLEX OF MICROPEROXIDASE WITH A 21 -RESIDUE SYNTHETIC PEPTIDE AS MINI MAQUETTE FOR LOW-MOLECULAR-MASS REDOX PROTEINS,
Ippoliti, Picciau, Santucci,G. Antonini,M. Brunori, G.Ranghino,

Biochem. Jour.,328,833,1998
3D STRUCTURE OF MICROPEROXIDASE-11 BY NMR AND MOLECULAR DYNAMICS STUDIES,
L.Mondelli,L.Scaglioni, Mazzini, G.Bolis,G.Ranghino,
Magn. Res. in Chem., 38,2000, 229
STOICHIOMETRIC AND SODIUM-DOPED TITANIUM SILICATE MOLECULAR SIEVE CONTAINING ATOMICALLY DEFINED -OTiOTiO- CHAINS BEHAVING AS LINEAR QUANTUM WIRES,
Bordiga, Turnes Palomino, Lamberti, Giamello, Zecchina, Ranghino,
J.Chem. Phys.,112 (2000), 3859
QUANTUM MECHANICAL INTERPRETATION OF NITRATE REDUCTION BY CYTOHROME cd1NITRATE REDUCTASE FROM Thiosphaera pantotropha LMD 92.63,
G. Ranghino, I. Scorza, P.Williams,T. Sjogren, M.Ricci, J. Hajdu
Biochemistry, 2000, 39, 10958
DEOXYCEPHALOSPORIN C SYNTHASE FROM STREPTOMYCES CLAVULIGERUS,
I.Andersson,A.Terwisscha Van Scheltinga,G.Ranghino, K.Valegard,
Handbook of metalloproteins, vols 1&2,Ed by Messerschmidt et al.,
John Wiley & Sons,Chichester, 2001,
PSEUDOMONAS AERUGINOSA CYTOCHROME C551;PROBING THE ROLE OF THE HYDROPHOBIC PATCH IN ELECTRON TRANSFER,
F.Cutruzzola,F. Arese,G. Ranghino, van Pouderoyen, Canters & M. Brunori
J. Inorg Biochem 2002, 88:3-4:353
AN ESR STUDY OF TITANIUM- SILICALITE IN PRESENCE OF H2O2,
L. Bonoldi, C.Busetto, A.Congiu, G.Marra, G.Ranghino, M.Salvalaggio, Spanò and E.Giamello, Spectroch. A5 8 (6) (2002) 1143
XPS DETECTION OF SOME REDOX PHENOMENA IN CU-ZEOLITES,
L.Meda,G.Ranghino,M.Moretti,Cerofolini,
Surface and interface analysis, 33,6, 2002.
THE STRUCTURAL BASIS OF CEPHALOSPORIN FORMATION IN A MONONUCLEAR FERROUS ENZYME
K. Valegard, A.TERWISSCHA Van Scheltinga, Dubus,G. Ranghino,L. Öster, J.Hajdu & I. Andersson
Nature-Structural Biology,2004, 11, No 1,95-101
POLYMERIC NANOCOMPOSITES: MOLECULAR MODELLING ASSESSMENT OF ORGANOPHILIC MOIETIES IN LAYERED SILICATES ,
G. Ranghino, G. Giannotta, G.Marra and R. Po
Reviews on Advanced Materials Science,5,2004,413-419
EPOXIDATION OF PROPYLENE ON ZN-TREATED TS-1 CATALYST
V.Arca,A.BoscoloBoscoletto,N.Fracasso,L.Meda,G.Ranghino
Journal of Molecular Catalysis A, 243,(2005),264-277
STUDY OF THE OXIDATIVE HALF-REACTION CATALYZED BY A NON-HEME FERROUS CATALYTIC CENTER BY MEANS OF STRUCTURAL AND COMPUTATIONAL METHODOLOGIES
G.Cicero, C.Carbonera,K. Valegard, J.Hajdu, I.Andersson, G.Ranghino
International Journal of Quantum Chemistry,107,2007,
GPR17: MOLECULAR MODELING AND DYNAMICS STUDIES OF THE 3D STRUCTURE AND PURINERGIC LIGAND BINDING FEATURES IN COMPARISON WITH P2Y RECPTORS
C.Parravicini, G.Ranghino,M.P.Abbracchio,P.Fantucci
BMC Bioinformatics, 2008, accepted,

(Loans managed for the last years / project management experiences: 1990-1995
Responsible for the Montedison and then EniChem activities of National research plan

(PNR)in Biolelectronics
1995-1998 Member of EU project of the FP4 for Structural Biology (Coordinated by Oxford University)
1995-2004 Working budget of industrial projects

Technical, organizational and social skills: External Expert for the European Commission (FP5)
Role in proposal: Representative
Total cost of participant: 210000

Coproponent

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Number of employees: 14
ATECO 2002 code: 72.22.0
I.C.O. code: Società con meno di 20 addetti
Enterprise type: Small enterprise
Industrial research in the project (%): 30
Localized office in Piedmont
Address:
Telephone
Fax:
Email:
Responsible
Name: CESARE
Surname: ACCOMAZZO
National Insurance Number: CCMCSR49L17G505Y
Work address: Strada S. Brigida;37;10024;Moncalieri;TO
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Participant for coproponent

Name: CESARE
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Gender: Male
Date of birth: 1949-07-17
Nazionality: ITALIAN
Document number: AM3924964

Passaport number:
Work address
Province: TO
City: TORINO
Address: Corso Unione Sovietica
Number: 612/3A
CAP: 10135
Telepphone: 0113473506
Fax:
Mobile:
Organization: ETICA srl
Education: Master degree in Electronic Engineering
Work experience: 3 years at European Center for Nuclear Research (CERN)as researcher and technician; 8 years at machinery firm (DEA) as software and systems developer; 8 years at system house (ITP) as consultant and subsidiary chief officer; 14 years at software house (ETICA) as CEO
Skills to achieve some searches / research and development experiences: More than 20 years experience as manager in Research and Development software departments./. Research and systems development for ISR (Intersection Storage Rings) at CERN in the 70's; various international projects and partecipation to international CAM-I organisation in the 80's at DEA; partecipation to european FASP project (Flexible Automation for Ship Prefabrication) in the 90's at ITP; partecipation to innovative projects with Torino Wireless organisation in 2007-2008 at ETICA
(Loans managed for the last years / project management experiences: Integrated System for Quality Control in DOCUP 2000-2006 Regional Financing. Tele-assistance and Tele-monitoring projects for Torino Wireless./. Management of various CIM (Computer Integrated Manufacturing) projects for italian big companies such as Ansaldo, Alenia, Fincantieri integrating mechanical, electronical and informatic technologies
Technical, organizational and social skills: Electronic and software skill for complex systems development, management of italian and european groups of up to 40 technicians
Role in proposal: Representative
Total cost of participant: 20100

Name: ALESSANDRA
Surname: BROSIO
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National Insurance Number: BRSLSN71M69L219K
Gender: Female
Date of birth: 1971-08-29
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Number: 612/3A
CAP: 10135
Telepphone: 0113473506
Fax: 0113283203
Mobile: 3484901842

Organization: ETICA srl
Education: Master degree in Electronic Engineering
Work experience: 3 years at CSELT, Telecom Research Center as researcher and technician; 8 years at software house (ETICA) as software analist and developer
Skills to achieve some searches / research and development experiences: 6 years experience as researcher in Research and Development software departments./. Partecipation as team leader in Integrated System for Quality Control project at ETICA in 2004-2005.Partecipation to innovative projects with Torino Wireless organisation in 2007-2008 at ETICA
(Loans managed for the last years / project management experiences: Management of various software projects for electronic monitoring and diagnosys for a big Track company. Management of a project for an e-commerce system
Technical, organizational and social skills: Strong technical skill in software research and development; attitude in team working; experience in social jobs in particular with children.
Role in proposal: Researcher
Total cost of participant: 33000

Coproponent

Name: Isagro Ricerca Srl
National Insurance Number Organization: 11218240155
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Address: Via Caldera; 21; 20153; Milano; MI
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Web address:
Number of employees: 71
ATECO 2002 code: 73.10.0
I.C.O. code: Imprese produttive
Enterprise type: Big enterprise
Industrial research in the project (%): 100
Localized office in Piedmont
Address: Via Fauser; 4; 28100; Novara; NO
Telephone +39 0321 693660
Fax: +39 0321 693887
Email: isagroricerca@isagroricerca.it
Responsible
Name: LUCIO
Surname: FILIPPINI
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Participant for coproponent

Name: FRANCO
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National Insurance Number: PLLFNC52R31I690A
Gender: Male
Date of birth: 1952-10-31
Nazionality: ITALIAN
Document number: AM 2270971
Passaport number:
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Province: NO
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Address: via Fauser
Number: 4
CAP: 28100
Telepphone: 0321 693617
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Mobile: +39 0321 693887
Organization: Isagro Ricerca Srl
Education: post graduate course in Medicinal Chemistry University of Kent 1989; post graduate school in Synthesis and Analytical Technologies Politecnico of Milan 1989; BSc in Chemistry University of Milan 1982
Work experience: Head of Innovation Area Isagro Ricerca Srl 2007
Chief Scientific Officer of MacroImmune SA (CH) 2007
Director and Site Manager of the Pharmaceutical Discovery Center of Taverne (CH) Inpharzam Ricerche SA 2000-2007.
Head of the Medicinal Chemistry Department of Zambon Group SpA 1997-2000
Skills to achieve some searches / research and development experiences: experience in managing collaborative research projects in the life science field between industrial partners, biotech companies and universities.
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 119280

Name: FRANCO
Surname: BETTARINI
Email: fbettarini@isagroricerca.it
National Insurance Number: BTTFNC49M28B269U
Gender: Male
Date of birth: 1949-08-28
Nazionality: ITALIAN
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Number: 4
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Telepphone: +39 0321 693711
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Mobile:
Organization: Isagro Ricerca Srl
Education: BSc Chemistry (Laurea in chimica)
Work experience: Research in the field of agrochemical products (insecticides, herbicides, fungicides) for over 30 years managing a group of chemists (lately about 20 chemists)including patent conception and writing and patent analysis. At present, head of Intelligence Technology and Intellectual Property Protection Unit in Isagro Ricerca
Skills to achieve some searches / research and development experiences: Patent and Scientific Documentation, Organic compound synthesis
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 120675

Name: CARLO
Surname: GARAVAGLIA
Email: cgaravaglia@isagroricerca.it
National Insurance Number: GRVCRL49H08D198S
Gender: Male
Date of birth: 1949-06-08
Nazionality: ITALIAN
Document number: AN 2534324
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City: NOVARA
Address: via G. Fauser
Number: 4
CAP: 28100
Telepphone: +39 0321 693660
Fax: responsible of biological Research in Isagro Ricerca and in 1993 Head of Biological and Agronomy Dep
Mobile:
Organization: Isagro Ricerca Srl
Education: Degree in "Scienze Biologiche " University of Milan
Work experience: Doctor of biological sciences at Milan University in 1973, joined former Montedison Group at the pesticide Research Center (Linate, Milan) in 1976 as Group Leader of Mode of Action studies, appointed head of the Fungicide Biological Research in 1981, subsequently head oo special projects in Isagro Spa
Skills to achieve some searches / research and development experiences: Definition and coordination of experimental programmes. Contacts with italian and foreign Universities. Main competences: discovery and development of new fungicides and herbicides
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 113775

Name: ANNA
Surname: TANCORRA
Email: atancorra@isagroricerca.it

National Insurance Number: TNCNNA74D65L736C
Gender: Female
Date of birth: 1974-04-24
Nazionality: ITALIAN
Document number: AK8124932
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Address: Fauser
Number: 4
CAP: 28100
Telepphone: +39 0321 693 631
Fax: +39 0321 693 887
Mobile:
Organization: Isagro Ricerca Srl
Education: University of Venezia
Faculty of Industrial Chemistry
Graduated on 2000 With 107/110
2001: Master for Marketing and Communication at the University of Bocconi (Mi

Work experience: RIVOIRA (2002) Marketing Department
CESALPINIA (2003-2005) Company operating in the manufacturing of surfactants.
Technician of Formulation Laboratory.
ISAGRO RICERCA (2005-today) Company operating in the field of Agrochemicals.
Technician of Formulation Laboratory.

Skills to achieve some searches / research and development experiences:
Experiences in:
- development of surfactant for agrochemical products
- research of new formulations

(Loans managed for the last years / project management experiences:
Technical, organizational and social skills: Formulation work
Role in proposal: Researcher
Total cost of participant: 42273

Name: IVAN
Surname: BONDONI
Email: ibondoni@isagroricerca.it
National Insurance Number: BNDVNI77M31B157H
Gender: Male
Date of birth: 1977-08-31
Nazionality: ITALIAN
Document number: AM9671150
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City: NOVARA
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Number: 4
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Telepphone: +39 0321 693 660
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Mobile:
Organization: Isagro Ricerca Srl
Education: Degree in agronomy, specialization in plant protection
Work experience: Experience as laboratory technician for CNR (University of Milan), and now working for Isagro Ricerca as responsable of the Herbicide Evaluation Unit
Skills to achieve some searches / research and development experiences: Skill to plan and manage specific kind of greenhouse tests aimed at evaluating herbicidal activity in PRE and POST application on the most common crop (Maize, Soybean, Barley, Wheat, Rice, Cotton Sugar beet and Rape).
Project technical actions to evaluate new herbicides compounds in field trial conditions.

(Loans managed for the last years / project management experiences:
Technical, organizational and social skills: Evaluation of the efficacy and selectivity of new herbicide compound by request of following companies: Dupont, Staehler, Agrimix.
Projecting tests to evaluate degradation of herbicides on several kind of soil.
Projecting laboratory tests to evaluate mode of action of herbicides.
Skill to coordinate the Herbicides Evaluation Unit and to project technical actions.
Skill to conduct field and greenhouse trials carried out to assess the efficacy of herbicides against specific targets (24 weeds-several mono and dicots) in comparison with commercial products.
Skill to plan tests to evaluate activity of several formulation of the same product.
Skill to elaborate the results of the trials with most common statistical methods.

Role in proposal: Researcher
Total cost of participant: 31020

Name: GIOVANNI
Surname: MEAZZA
Email: gmeazza@isagroricerca.it
National Insurance Number: MZZGNN57C22F205E
Gender: Male
Date of birth: 1957-03-22
Nazionality: ITALIAN
Document number: AN 9617292
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Address: Via G. Fauser
Number: 4
CAP: 28100
Telepphone: 0321693616
Fax: 0321693887
Mobile:
Organization: Isagro Ricerca Srl
Education: Visiting scientist at Oxford University (MS) USA
BCs in Chemistry University of Milan (Dctor in Chemistry) 1982
Work experience: Long standing experience in synthesis of agrochemical compounds, SAR evaluation as well as design of agrochemical compounds. Study on scale -up of

chemical synthesis. Study of the mechanism of action of HPPD fungicides (Oxford University (MS)), chemical laboratory head ,responsible of erbicide projects(Isagro Ricerca).
Skills to achieve some searches / research and development experiences: organic synthesis, SAR studies, scale-up, evaluation of costs of production.
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 79680

Name: ISABELLA
Surname: VENTURINI
Email: iventurini@isagroricerca.it
National Insurance Number: VNTSLL58C47B157K
Gender: Female
Date of birth: 1957-03-22
Nazionality: ITALIAN
Document number: AM9573847
Passaport number:
Work address
Province: NO
City: NOVARA
Address: Via G. Fauser
Number: 4
CAP: 28100
Telepphone: 0321693622
Fax: 0321693887
Mobile:
Organization: Isagro Ricerca Srl
Education: BCs in Chemistry University of Milan (Dctor in Chemistry) 1982
Work experience: Long standing experience in synthesis of agrochemical compounds, SAR evaluation as well as design of agrochemical compounds. Chemical laboratory head ,responsible of different projects(Isagro Ricerca).
Skills to achieve some searches / research and development experiences:
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 51260

Name: DANIELE
Surname: FORGIA
Email: dforgia@isagroricerca.it
National Insurance Number: FRGDNL81B06E020S
Gender: Male
Date of birth: 1981-02-06
Nazionality: ITALIAN
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City: NOVARA

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Number: 4
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Telepphone: 0321693658
Fax:
Mobile:
Organization: Isagro Ricerca Srl
Education: Degree from OMAR chemical high school
Work experience: Chemical synthesis on a lab scale for different projects
Skills to achieve some searches / research and development experiences: chemical synthesis
(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 26433

Name: GABRIELE
Surname: PIAZZON
Email: gpiazzon@isagroricerca.it
National Insurance Number: PZZGRL83T13F952A
Gender: Male
Date of birth: 1983-12-13
Nazionality: ITALIAN
Document number: AJ1188005
Passaport number:
Work address
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City: NOVARA
Address: Via G. Fauser
Number: 4
CAP: 28100
Telepphone: +39 0321 693648
Fax:
Mobile:
Organization: Isagro Ricerca Srl
Education: Agriculturist diploma
Work experience: Experience as farmer for 5 years, and now working for Isagro Ricerca as laboratory technician in Herbicide Evaluation Unit
Skill to manage specific kind test aimed to evaluate herbicide activity in PRE and POE application on the most common crop (Maize, Soybean, Barley, Wheat, Rice, Cotton, Sugarbeet and Rape).

Skills to achieve some searches / research and development experiences: Skill to conduce greenhouse trials carried out to assess the efficacy of herbicides against specific targets (24 weeds-several mono and dycots) by comparison with commercial products.
Skill to plan tests to evaluate activity of several formulation of the same product.

(Loans managed for the last years / project management experiences:
Technical, organizational and social skills:
Role in proposal: Researcher
Total cost of participant: 27555