



# **UNIPHARMA-GRADUATES PROJECTS**







Projects co-financed by the European Commission under the Leonardo da Vinci Programme

Promoted by the Noopolis Foundation

Coordinated by Sapienza University of Rome

in cooperation with the Universities of Rome "Tor Vergata" and "Roma Tre"



Placements in Pharmaceutical, Chemical and Biotechnological Research Centres for Top Italian MSc Graduates in Chemistry, Biology, Pharmacy and Biotechnologies

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Cambridge – Phico Therapeutics	
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Liverpool- Unilever Research and Development	
Newcastle Upon Tyne – NewCHEM Technologies	

# Abstract

#### Who

The non profit Foundation Noopolis and Sapienza University of Rome participate in the European Program "Leonardo da Vinci" since 2003. All projects have been developed in co-operation with the Italian Universities of Rome Tor Vergata and Roma Tre and in partnership with over forty leading Research Centres in 8 European countries, offering every year about 100 work programmes to the participants.

The projects are conducted under the scientific supervision of Prof. Luciano Saso, Faculty of Pharmacy, Sapienza University of Rome.

What

- 6 mobility projects
- 50 placements per year
- 240 trainees since 2003
- Duration of each project: 18 months
- Duration of the placements: 24 weeks



We have promoted until now six mobility projects offering every year fifty 24-week placements in other European countries to recent Master's degree graduates in pharmacy, chemistry, biology and biotechnologies.

#### How

Applicants are selected through a competitive call open to MSc graduates of all Italian universities, based on CV and English language skills, tested by an independent centre.

Selected trainees are allowed to choose their host centre; on the other hand, the research centres are free to request further information, to interview the candidates, to meet them (by paying for travel expenses) and to reject applications if not satisfied.

#### Why

The aim of the Unipharma-Graduates projects is to provide an excellent scientific experience to some of the



top Italian MSc graduates in the chemical, pharmaceutical and biotechnological field. They offer financial support to young and talented people willing to start an excellent scientific career in basic research in these domains. In this regard, participation to other European mobility programs such as Erasmus or Marie Curie is highly encouraged.

Our final goal is to foster a new generation of excellent Italian scientists who will spend a significant portion of their career in other European countries and, also thanks to the use of English as a common language, will become real European citizens.

**Financial contribution** 

Trainees were provided with a scholarship covering a round-trip ticket, board and accommodation expenses during their stay abroad, and the reimbursement of an intensive English course before their departure. In addition, some of the research centres hosting the trainees offered a small salary or other facilities.

#### Intellectual property rights

The research centres are allowed to request the candidates to sign a secrecy agreement at the beginning of the placement. Promoters did not and will never claim any intellectual property right on the results obtained by the trainees. However, at the end of the placement, they are requested to prepare a sound scientific report not containing any confidential data. After the placement, the trainees are free to accept any position offered by the hosting institution (Ph.D. scholarships, etc.).

#### **Results**

In most cases both the trainees and their tutors were highly satisfied about the results. The trainees gave their time and enthusiasm and got experience and memories for life in return. They experienced a stimulating environment and were directly involved in research projects carried out by the hosting institutions, in close contact with a qualified staff of scientists: the degree of satisfaction of the participants about the improvement of their competences during their placement was 8,4 and 94,1 percent of them would repeat it again if they had the chance.

Thanks to these Leonardo da Vinci projects most trainees managed to enter selective Ph.D. programs or to obtain work or research positions in Italy and abroad.

#### Awards

One of the projects was shortlisted in 2006 as one of the five Leonardo da Vinci actions which best developed the criteria of quality as established by the "European Quality in Mobility Award 2006".

The projects Unipharma-Graduates were cited among the "Examples for best practises of Mobility Projects" on the European Commission web site.



Laura Brossico and Luciano Saso receiving the "European Quality in Mobility Award 2006" attestation

# The Italian team

The Scientific Coordinator - Prof. Luciano Saso



The **Scientific Coordinator** of the projects is Luciano Saso of the School of Pharmacy of Sapienza University of Rome.

Holder of a PhD in Pharmaceutical Sciences, at the beginning of his scientific career he spent 3 years in the laboratories of the Population Council in New York. He is the author of over 70 articles in JCR<sup>®</sup> international journals (<u>www.pubmed.com</u>).

Since 2005 he is a member of the International Relations Commission of the University Sapienza University of Rome. He is a founding member of the non profit organization Noopolis. In 2001-2002, he was the tutor of some Leonardo da Vinci trainees; after this experience, he started up the project *UniRoma-Pharma-Training* and the following *Unipharma-Graduates* projects.

Web site: http://w3.uniroma1.it/fisiofarm/docenti/saso.pdf

#### The Promoter -Noopolis Foundation

The Coordinating Institution: Sapienza University of Rome

Other national partners

Italian partners websites **Noopolis** is an Italian non profit organization founded in Rome in 1985. One of its main achievements is the creation and management since 1986 of a database containing information about Italian and international scholarships. It also offers scholarships to talented young people and researchers: over 170 young people have received a total of more than 1.600.000 euro in the last 18 years.

Noopolis is responsible for the financial management of the Unipharma-Graduates projects.

**Sapienza University of Rome** is at present the largest university in Europe, with over 150.000 students, 21 Faculties and regional sites in other cities. Sapienza University of Rome maintains cultural and scientific agreements with many foreign Universities. Under the Llp/Erasmus Programme, it has stipulated around 600 bilateral agreements with other EU Universities. Student mobility has increased in the last years: the percentage of incoming exchange students has increased with 12% per year and outgoing exchange students with 7.5% (1997-2001). Sapienza University of Rome is also member of several inter-university networks, such as UNICA, CUM, UNIMED, RULE, UNINET-ECA, EUA, Italian Council for Research and Cooperation in Science, Technology, Humanities and Social Sciences, etc.

The Office for International Relations of La Sapienza is responsible for the selection and preparation of the participants to the Unipharma-Graduates projects.

The **Universities of Rome "Tor Vergata" and "Roma Tre"** have co-operated to the projects participating to the activities of diffusion and to the dissemination of their results.

- ✓ Noopolis Foundation: www.noopolis.eu
- ✓ Sapienza University of Rome: <u>www.uniroma1.it/internazionale/</u>
- ✓ University of Rome Tor Vergata: <u>www.uniroma2.it</u>
- ✓ University of Rome Roma Tre: <u>www.uniroma3.it</u>

# **Transnational partnership**

The European partnership of the Unipharma-Graduates projects has enlarged since 2003 and includes at present **over 40 leading private and public Research Centres in 8 European countries**, offering every year about 100 work programs to selected candidates.



See the presentation of all the European partners at page 22



# Distribution of the host centres by country

# Selection of the participants

The selections are carried out through a public call for applications open every year from December to the end of March based upon competitive criteria and addressed to recent Master's degree graduates from any Italian University complying with the following requirements:



Many actions of information addressed to potential beneficiaries are carried out, in particular through e-mail *alerts* to about 6.000 potential beneficiaries every year (using the Alma Laurea service - <u>www.almalaurea.it</u>) and the organisation of several informative meetings in the concerned Faculties of different Italian Universities. Some beneficiaries of former Unipharma-Graduates projects participate to these events and share their experience with the future trainees.

The 50 final beneficiaries are selected among a large number of applications (320 in 2008). The applications are evaluated by a Commission composed by representatives of the partner Universities and by the Scientific Coordinator on the basis of the following criteria:

# **SELECTION CRITERIA**

- mark of the final thesis;
- average marks of passed examination;
- knowledge of English (tested by Shenker Institute of Rome through an oral and written test);
- Number of publications;
- Former national/international experiences (Erasmus, etc).

# **Preparation of the trainees**

The projects provide participants with linguistic and cultural-pedagogical preparation before their departure for the host countries.

Most of them attend an intensive course of English before starting their traineeship. Proficiency in English (and in some cases in a second European language) is obtained by most trainees during the mobility period; nevertheless the course before their departure succeed in supporting them in the initial period of their stay abroad.

The partner Universities and the Scientific Coordinator (Prof. Luciano Saso) offer participants detailed information about the scientific and formative contents of their traineeship, as well as about its practical aspects.

The activities of cultural and pedagogical preparation are carried out through the organisation of over 30 informative meetings every year; the selected candidatates also have the possibility to contact the participants to former Unipharma-Graduates projects. Furthermore, the promoters assure a constant service of counselling and support to the trainees before, during and after their placement.

# **Placement method**

- 1. Detailed work programmes requested in advance to the hosting laboratories
- 2. Selective but well disseminated call for applications
- 3. 5 motivated choices requested to the top 50 candidates (who are allowed to get in touch with the former trainees by e-mail)

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4. Final decision based on the scientific and technical skills of the candidate



# Best possible match between CVs and work programs

Selected candidates receive the detailed work programs offered by all the hosting institutions and are invited to express up to 5 preferences, well-motivated on the basis of their CV.

Their choices are satisfied on the basis of their ranking but also evaluating the consistency between their preparation and the formative contents of the work program to be carried out in the host country on one hand, and the compliance with specific requirements by the hosting centres on the other.

The CVs are then submitted to the hosting centres which, after evaluating them, communicate their acceptance of the candidates.

# The trainees

240 Italian Master's degree graduates have experienced a research period in other European countries thanks to the Unipharma-Graduates projects from 2003 to 2008



# **HIGH PROFILE CANDIDATES**

The large number of applications and the selections based upon competitive criteria allowed to select high profile trainees: **90% of them had a degree thesis mark of 110/110 (75% cum laude).** 



# **HIGH PARTICIPATION OF WOMEN**

The participation of women to all the projects was very relevant (78%). This data is only partially influenced by the

gender composition of the Master's degree graduates from the Faculties concerned.

The high participation (over 50%) of candidates coming from Universities located in Central and Southern Italy, where problems of unemployment are particularly felt among young people, was another important achievement of the projects.

This percentage is even higher taking into

account their place of residence, independently from the University where they obtained their degree.

# **Results of the projects**

# **Scientific Reports**

The research activities performed during the training period result in a detailed scientific report prepared by each trainee with the assistance of his/her tutor and signed by the responsible of the hosting centres. The reports are structured as follows:



- $\checkmark$  Introduction
- $\checkmark \quad \mathsf{Aim of the work}$
- ✓ Materials and Methods
- ✓ Results
- ✓ Discussion and References

#### **Titles of the Scientific Reports**

#### Austria - Baxter BioScience, Vienna

Carrieri Claudia	Development of monoclonal antibody against proinflammatory cytokine for treatment of experimental induced colitis in mouse.
Guglietta Silvia	The immunogenicity of biopharmaceutical products and genetically engineered mice as model for its evaluation

#### Austria - Joanneum Research, Graz

Bucca Maurizio	Extraction and analysis for polyphenols in grape seeds and cinnamon
Frascione Daniela	Utilization of different waste products on Biogas Fermentation, impact of hydrogen and concomitant gas analysis
Grandi Eleonora	Evaluation of the antibacterial effects of the roots of Phragmites australis
Perinu Cristina	Extraction and analysis of compounds from different kind of plants
Roveda Laura	Extraction and characterisation of compounds from different plants

#### Belgium - Laboratory for Organic and Microwave Assisted Chemistry, Leuven

	<u> </u>		
Cavalluzzo Claudia	Application of	microwave irradiation for the synthesis of oligopeptides	

#### Denmark - LeoPharma, Ballerup (Copenhagen)

Galgano Annalisa	Calcium homeostasis, hyperparathyroisism and calcimimetic agents

# France - Ecole Normale Supérieure, Lyon

Montanari Claudia	Characterization of CKIP-1/ ARPC1A interaction domains

# France - HumProther Laboratory, Grenoble

Cuppini Lucia	Development of Protein Transduction Vectors for Antitumor Protein Therapies
Veratti Eugenia	Delivery of antigenic proteins using the Dodecahedra system: an in vivo approach
Zagari Francesca	Threshold antigen expression level after Type Three Secretion System (TTSS) mediated multiepitope vaccination against the mice B16 melanoma.

# France - IBCP - Institut de Biologie et Chimie des Protéines, Lyon

Carulli Sonia	Production and characterization of recombinant proteins in mammal cells
Sardo Alessia	The breast cancer resistant protein BCRP/ABCG2 responsible for multidrug resistance
	in cancer cells: purification of the recombinant transporter and modification of ligand
	interaction by R482T hot-spot mutation.

# France - INRA - Institut National de la Recherche Agronomique, Nantes

Simula Giuseppina	Characterization of protein and allergen contents of 12 wheat species or cultivars
Scanu Michela	Titrations of A/WSN/33 Influenza A Virus and Study of Antiviral Activity of Beta- Lactoglobulin
Sommella Andrea	Cloning and expression of atg8 and atg4, the wheat autophagy master genes
Torchetti Enza Maria	Analysis of allergenic epitopes on caseins and reduction of their allergenicity

# France - Institut Cochin, Paris

Frizzarin Martina	"Role of the adaptors Lnk and APS in B cell development"
Lili Simone	Transforming potential analysis of C-SH3 domain mutants of Vav1 proto-oncogene in mouse fibroblasts

# France - Institut Curie, Paris

Ciocca Alice	Thymic Stromal Lymphopoietin and its cell targets
Ghirelli Cristina	Role of GM-CSF in pDC (plasmacytoid dendritic cells) maturation in vitro.
Steri Veronica	Role of Invariant Chain in DC migration

# France - Laboratoire de Physiologie Céllulaire et Moléculaire, Amiens

Parodi Federica	IGF-I induces a diminution of the reticular stress provoked by Tamoxifen. A new
	approach to understand the resistance of breast cancer cells to the hormono-therapy

# France - Necker Research Center, Paris

Marcantoni	Mutagenesis analysis of human prolactin receptor
Emanuela	

France - University of Paris Descartes, Paris

Federico Fabiola	Effects of minocycline on cerebral edema, neurological outcomes and matrix metalloproteinases' activation following traumatic brain injury
Toccafondi Mirco	Clonaggio singolo e doppio del dominio b1 della Neuropilina1 (NRP-1 b1) e della porzione 33KD della Semaforina3A (SEMA-3A 33KD), espressione e purificazione

# Germany - Bayer CropScience AG, Monheim

Celona Annamaria	"Substituted 4-oxo-4,5-dihydrofuran-2-carboxylic acids as new building blocks for agrochemicals"
Chesini Irene	Biochemical mechanisms of resistance in Meligethes aeneus and Cimex lectularius, two
Matilde	insect pests suspected to develop resistance to some classes of insecticides
Formato Gianluca	Interazione funzionale tra Fusicoccina ed il Peroxisome Proliferator-Activated Receptor
	α: possibile ruolo delle 14-3-3 nel regolare l' espressione genica mediata dai PPARs
Giri Nicola	Asymmetric total re-synthesis of the 1-epi-aglycon of the Cripowellins A and B.
Landi Felicetta	Synthesis of analogues of the aglycon portion of the Cripowellins A and B
Tibuzzi Daria	"Study on the formation of pyridilic-hydrazones, scope and limitations"
Vanzan Laura	Evaluation of insecticide resistance and biochemical mechanisms in some important pest species

# Germany - Bayer CropScience GmbH, Frankfurt

Candido Margherita	The production of compund libraries using combinatorial chemistry techniques
Cerbone Michela	Optimization of two herbicidal hit classes
Rescigno Francesca	Optimization of a herbicidal hit class
Visalli Letteria	Optimization of a herbicidal hit class
Capasso Elisabetta	Optimization Chemistry: d-lactam and piruvate derivatives synthesis
Feliciello Giancarlo	Identification of point mutation sites in herbicide tolerant crop mutants

# Germany - Forschungszentrum Karlsruhe

Basili Serena	Accuracy of binding mode prediction using an interaction based scoring function
Meliciani Irene	Modelling Receptor/Ligand Interactions for Chemokines

# Germany - Fraunhofer Institute, Hannover

Poerio Angela	Effect of novel Si compounds on lung cancer cell lines
Ritorto Maria Stella	Proteomic analysis of liver tissue and serum samples from c-myc transgenic mice
Spezialetti Ilaria	Effect of novel camptothecin, podophyllotoxin, thiocolchicine, cephalomanine derivatives on lung cancer cell lines

# Germany - Institute of Environmental Resarch, Aachen

Tortora Sonia	Generation and screening a Sphingomonas sp. Strain TTNP3 genomic libray in order to
	isolate and study gene/s involved in production of the nonylphenol degrading enzyme

#### Germany - Max Planck Institute, Berlin

Lucca Tecla Caratterizzazione dei siti di legame n	elle proteine tramite grafi
	-   <b>- -</b>

# Germany - Sanofi Aventis, Frankfurt

Cremonesi Alex	Synthesis of C- and N- Derivatives of 2,3-Dihydro-1h-indoles as New Drug-Like Scaffolds
Falco Claudia	Isolamento di metaboliti secondari da estratti di piante
Fiore Walter	Isolation of secondary metabolites from plants and fungi
Ghizzoni Massimo	New methods for synthesizing fluorinated compounds
Piccinini Elia	Research in natural products towards improvements in productivity of griselimycin derivatives and the understanding of the metabolic pathway of a novel antibiotic
Sanchini Silvano	Synthesis of functionalized bromomethyl arylketones

# Germany - UFZ - Helmholtz Centre for Environmental Research, Leipzig

Menichetti	Extraction of pharmaceuticals and other emerging pollutants from water by silicome
Valentina	rod
Speranza Davide	Evaluation of the action of selected environmental chemicals to initiate drifting of macroinvertebrates in a model stream
Ugolini Fabio	Study of microbial diversity population in MCB in situ microcosms and Expression of bssA and bcrA in T. aromatica under oxic/anoxic conditions

#### Ireland - PR euroCHEM Ltd, Cork

Macaluso M. Rita	Synthesis of pharmaceutical intermediates
Parini Mauro	Synthesis of pharmaceutical intermediates
Romussi Alessia	Synthesis of pharmaceutical intermediates

#### Spain - Centre de Regulació Genòmica, Barcellona

Bennardo Sara	Generation of lentiviruses to knockdown Dicer an Drosha, two key enzymes in microRNA biogenesis
Bossi Alice	Construction of an integrated human protein interaction network - Costruzione di un network integrato di interazione tra proteine umane
Di Tullio Alessandro	Reprogramming of mouse B cells into macrophages: a bioinformatic approach
Diani Erika	Interference of hisone H1 variants in brest cancer cells uncovers specific roles in chromatin structure, cell proliferation and gene expression

Farinelli Giada	Translational regulation of dosage compensation in Drosophila melanogaster:
	characterisation of UNR cofactors

# Spain - CIC BioGUNE, Bilbao

laboni Margherita	Regolation of retinoic acid-responsive genes in human mammary epithelial cells

# Spain - Noscira SA (ex Neuropharma), Madrid

Locchi Federica	"Acetylcholinesterase and Butyrylcholinesterase: a target in the Alzheimer's Disease therapy"
	Conthesis of angle and a financial manduate on a startic labor of an al-hairman diagonal"
Manfredi Federico	Synthesis of analogues of marine products as potential drugs for alzheimer disease
Serio Carmela	Marine Natural products as source of new treatments for Alzheimer disease
Simona	

# Spain - Universitat de Barcelona

Aquilini Eleonora	Genetic characterization of the genes encoding enzymes involved in core LPS biosynthesis in four <i>Proteus</i> spp. strains selected on the basis of their peculiarities in core LPS chemical structure
Brunaccini Elisa	Unusual oxidation of strained fused cycloalkenes
Pernice Massimo Ciro	Purification of recombinant Arabidopsis thaliana FPS1S and FPS2 isoforms expressed in E.coli
Saiani Barbara	Identification of new enzyme responsible of the oleic acid
Vegliante Maria Carmela	Electron Microscopy and Genomics: Units compared

# Sweden - Karolinska Institutet, Stoccolma

Bianchi Marta	Effect of arachidonic acid on Ca2+ signalling in pancreatic beta cells.
Muraro Lucia	Adp-ribose increases intracellular calcium concentration acting trough p2y1 receptors
Rebellato Paola	TRPV1 agonists trigger a [Ca <sup>2+</sup> ] <sub>i</sub> increase in pancreatic beta cells

# Sweden - Protista Biotechnology AB, Lund

Cornelio Lisa	Production and characterization of fibrinogen-gelatin macroporous hydrogels (MHs) for skin tissue engineering
De Seta Elena	Preparation and characterization of supermacroporous monolithic gels prepared at subzero tempratues
Musolino Isabella	Cryogel-cell culture plates for high throughput drug screening
Pignetti Dino	Synthesis and characterization of polyethylene glycol-based macroporous gels for tissue engineering

# The Netherlands - Cell Biology and Immunology Group, Wageningen

Paolucci Silvia	Biological activity of carp (Cyprinus carpio L.) IL-10 produced in Flp-In CHO CELL LINE

# The Netherlands - Centre for Pharmacy, University of Groningen

Melillo Elena	Identification of a putative UDP-glucose glycosyltransferase responsible for the glucosylation of coniferyl alcohol to coniferin
Moscato	Analysis of biomarkers for Cervical Cancer
Valentina	

# The Netherlands - Organon NV, Oss

Acone Chiara	The potential of the demixing potential
Campana Mario	Influence of the particle velocity on the quality of coating made in a fluidized bed coater
Landi Elisa	Influence of granules composition and process parameters on granule breakage behaviour
Lolli Jessica	Influence of the drying rate and storage RH on the Oxygen Permeability
Roscioni Sara	Investigation of the relationship between crystal hardness and morphology
Rusmini Federica	Studies on granules behaviour in fluid bed drying by use of near infrared spectroscopy

# The Netherlands - Philips Electronics Nederland BV, Netherlands

Amadio Jessica	Magnetic biosensors for sensitive diagnostics (titolo del progetto)

# The Netherlands - Plant Research International, Wageningen

Morabito	Analyses of MADS box Transcription Factor Complexes in Arabidopsis thaliana
Pompei Giulio	Analysis of the Arabidopsis MADS box transcription factors AGL24 and SVP

# The Netherlands - UniLever R&D, Vlaardingen

Amadio Daniele	Optimisation of automated comprehensive LCxGC for characterisation of oil and fat sample
Occhipinti Paola	Design of a procedure for extraction and GC-MS analysis of phenolic acids in human blood plasma

The Netherlands – Van't Hoff Institute for Molecular Sciences, Amsterdam		
Peroni daniela	EVALUATION OF COLUMN COUPLING-DEVICES FOR COUPLED-COLUMN AND	
	MULTIDIMENSIONAL GAS CHROMATOGRAPHY	

# The Netherlands – Wageningen University

Maltoni Grandoni	Generation of stable Flp-In EPC host cell line
Carlotta	

#### United Kingdom - Alpha Biologics, Cambridge

Guariglia Giorgia	EGF production using E.coli as expression system

# United Kingdom - Babraham Institute, Cambridge

Cambuli	Screening for demethylase activity in mammalian cells
Francesco	
Carta Valentina	Regulation of TRPM channels during growth and development oin Drosophila Melanogaster
Ferrari Anna	Studies on mHC and the residual llocus in SL- / -k- / -l- / - mice
Mallardo maria	Functional characterisation of the Ino80 complex in S.pombe
Varano gabriele	CXCR4 is involved in T cell development during Thymic selection

# United Kingdom - CTM BioTech LTD, Cambridge

De Prato Greta	Approaching the world of protein expression

# United Kingdom - GlaxoSmithKline, Stevenage

Di Rosa Marta	Local translation in the mouse olfactory system
Ferraro Vincenzo	Further characterisation of the Rat basophilic leukaemia degranulation assay
Gullo Francesca	Use of Animal Models in Translational Medicine: the Murine Rhinitis Model
Luraghi Paolo	A kinetic assay for the characterisation of Syk activity and inhibition
Nalesso Giovanna	New findins in Ligands/CCR4 interaction: a pharmacological study
Perelli Francesco	Evaluation of serum mast cell protease as a readout of mast cell activation in a rat allergic rhinitis model

# United Kingdom - Innova Biosciences Ltd, Cambridge

Minetto Silvia	Development of a Lightning Link Fluorescein kit
Draghi Annamaria	Development of LifeXtend <sup>™</sup> HRP Conjugate Stabilizer

# United Kingdom - Institute of Food Research, Norwich

Gelli Ilaria	Study of cellular and molecular events during the challenge with	probiotic or
	pathogenic bacteria in the gut mucosa	

# United Kingdom - Neutec Pharma, Manchester

Pisani Cinzia	Valutazione su macrofagi RAW 264 della genotossicità di particolato atmosferico
	ultrafine caratterizzato mediante XPS (X – Ray Photoelectron Spectroscopy)

# United Kingdom - NewChem Technologies Ltd, New Castle U/T

Antonucci Lara	Solid-State Proton Conductor Assembly by Inorganic Electrolyte and Polymeric Organic Membrane
D'Ambrosio	Studies on salts of DRUG and potential prodrug of DRUG
Francesco	

Lombardi Elisa	Microbial fuel cell fed with wastewater
Medda Federico	New synthetic routes to the fluorinated amino acid Difluoromethylornithine
Melini Valentina	Isolation and characterization of ellagic acid and derivatives thereof in Barbadian plants
Rizzo Aurora	Microfluidic fuel cells and perfluorinated fluids for oxygen storage

# United Kingdom - Phico Therapeutics Ltd., Cambridge

Santone Celeste	Small Acid Soluble Proteins, a new approach against Clostridium difficile	
Sheriff Mariana Alessia	Identification of the proteins involved in host cell binding of Clostridium Diffifile's phages	

# United Kingdom - UniLever Port Sunlight, Liverpool

Franzò Daniela	Tooth wear studies
Olimpieri Chiara	Tooth wear studies
Toteda M. Rosaria	Tooth whitening studies

# United Kingdom - Zyentia Ltd., Cambridge

-	
Luciani Antonella	Parkinson's and Alzheimer's Disease Development of Therapeutics

# The projects evaluated by the trainees

At the end of the placement, a questionnaire was distributed to all trainees in order to have their feed-back on the different aspects of the projects and about the sending institution and the hosting centres. Main results are summarised as follows:



Feedback from the participants showed that the main positive aspects of the mobility experience were the following:



# **Certification of the placement**



# **Europass-Mobility**

All partner Universities adopted Europass-Mobility, a document which certifies the accreditation of the training period of each beneficiary as an integral part of her/his vocational training. It ensures its compliance with the formative purposes of the project by clearly identifying the training content of each placement. Europass finally improves the acknowledgment of the professional training abroad in the labour market.

# **Hosting centre reports**

All hosting centres drafted a report which certified the formative period, described the training program carried out by each participant and provided a synthetic evaluation of the trainee and of the results she/he attained.

# Follow-up after the placement

The Leonardo da Vinci traineeship has proved to be very useful for the participants who, thanks to the new professional skills acquired during their placement abroad, have enhanced their curriculum and succeeded in entering Ph.D. programs or in obtaining research contracts or work positions in Italy or abroad. The available results are summarised below:



# **Evaluation by partner institutions**

The projects allowed to improve the cooperation between the Promoter, the partner Universities and the European hosting centres, with important benefits for all partners involved.

The experience of the Promoter in educational guidance was very important in the planning and the implementation of all formative activities.

On the other hand, the wide international experience of the partner Universities played a key role, as well as their capacity to organise and coordinate the activities related to cultural, pedagogical and linguistic preparation and the support and counselling of the beneficiaries before during and after the placements.

The relationships with the hosting centres greatly improved, laying the basis for the development of further Leonardo da Vinci projects. The hosting centres shared the scientific content and the purposes of the project and appreciated the management and the organisation adopted by the Promoter and the partner Italian Universities.

Most of the hosting centres have confirmed their interest for this programme by joining in the following proposals.

The tutors and the responsibles at the hosting centres were largely satisfied of the scientific preparation of the Italian students who participated to the projects as well as of their human qualities and their ability to adapt to the new environment.

Their degree of satisfaction was also tested through questionnaires submitted to the tutors of each participants, whose main results are summarized below:



# **Hosting Centres of the Unipharma-Graduates Projects**

#### AUSTRIA

#### **Graz - Joanneum Research Centre**

# Website: www.joanneum.at

The 14 research units make Joanneum Research one of the largest non-university research institutions in Austria. The role as an innovative partner for business and administration is reflected in the company's wide range of services: apart from applied research and development for small and medium-sized enterprises Joanneum Research offers custom-designed technical business consulting and vast expertise in interdisciplinary management of complex research contracts at a national and international level.

The Joanneum Research - Institute of Sustainable Techniques and Systems (JOINTS) provides the expertise required for the goal of Sustainable Development by developing sustainable production technologies based on renewable raw materials and selectively deploying ecologically efficient environmental technologies aimed to minimise pollution.

The researchers of the division Chemical and Technical Plant Utilization (CTP) draw up feasibility studies from cultivation to industrial processing of plants, developing new production methods for complete use of plants, and elaborating innovative implementation strategies for the deployment of renewable raw materials. An important part of the work is to develop analytical methods and to produce extracts from plant material.

#### BELGIUM

# Leuven - Laboratory for Organic and Microwave Assisted Chemistry (LOMAC) Website: <u>www.kuleuven.be</u>

The primary aim of the laboratory is to perform basic and applied research in the area of MICROWAVE CHEMISTRY (Microwave-Assisted Organic Synthesis – MAOS). The application of this technique is evaluated in different areas of organic synthesis:

- Transition metal catalysis for the synthesis of natural product analogues:

- 3-Benzazepines:

- Buflavine analogues:

- Click chemistry:

- Steganacin analogues:

- Heterocyclic chemistry:

- 2-aminoimidazoles:

- Solid Phase Organic Synthesis (SPOS):
  - 2(1H)-pyrazinones:
- Solid Phase Peptide Synthesis (SPPS) and peptidomimetics:
- cyclic oligopeptides.

For futher information please look at http://www.kuleuven.be/cv/u0007655e.htm

#### GERMANY

# Frankfurt - BayerCropScience GmbH

#### Website: www.bayercropscience.com

Bayer CropScience is an internationally leading enterprise working in the areas of plant protection and plant production. The Bayer CropScience Research Centre in Frankfurt has its focus on Herbicide Research and is coordinating the worldwide Herbicide Research activities.

The main activities in Frankfurt are:

Chemistry	Discovery Chemistry, High Throughput
	Chemistry, Lead Exploration and
	Optimization Chemistry, Scientific
	Computing, Analytical Chemistry
Biology	Ultra High Throughput Vivo Screening,
	Biochemistry, Screening & Safeners,
	Profiling & Support
Product Technology	Process Research (early phase Process
	Development), Product Analytics, Quality
	Control

About 350 Researchers are working together in modern laboratories and glasshouses. We have continual training programs for foreign students (mainly Great Britain and France for the moment) and postdocs.

#### Frankfurt - Sanofi-Aventis

# Website: www.sanofi-aventis.de - www.sanofi-aventis.com

Sanofi-Aventis is the world's third largest pharmaceutical company and number one in Europe. Based on outstanding pharmaceutical research, Sanofi-Aventis has built leading positions in seven core therapeutic areas: cardiovascular, thrombosis, oncology, diabetes/metabolism, central nervous system, international medicine an vaccines. In Germany, Sanofi-Aventis has sales of approximately 3.8 billion Euro and employs 10.000 associates in research, production, distribution, marketing and sales.

**Department of Medicinal Chemistry.** The key responsibility of Medicinal chemistry is designing and synthesizing bioactive compounds, mostly small molecule heterocycles. It is the responsibility of the medicinal chemists together with the computational chemists and the structural biologists to rationally guide the drug discovery process. It is the responsibility of the organic chemists and again the medicinal chemists to highly effectively synthesize chemical compounds in amounts ranging from several milligrams to several hundred grams.

Medicinal Chemistry is involved early in the drug discovery process. After a disease relevant biological target is identified and a biological assay system is in place, chemistry supports the lead identification process. New lead compounds are either identified by screening large compound collections (High Throughput Screening) or by focused lead identification programs. In the next step the interdisciplinary project teams endeavour to progress the lead compound into a drug candidate. All the relevant properties of a lead compound are carefully and iteratively optimised.

For optimal performance the chemistry department is equipped with state-of-the-art technology for designing and synthesizing bioactive compounds, ranging from robotic synthesis workstations over automatic chromatography laboratories to high performance computer systems.

# **Department of Chemical Sciences**

The research center is located in the west of Frankfurt as part of the Industrial Park Hoechst.

Training within the Leonardo da Vinci project is offered in the Natural Products Science (NPS) section. NPS aims to identify novel compounds from natural resources (plants, bacteria) that are suitable as lead structures in drug discovery.

# Hannover - Fraunhofer Institute of Toxicology and Experimental Medicine Website: www.item.fraunhofer.de

At the Fraunhofer Institute of Toxicology and Experimental Medicine (ITEM), expertise in various disciplines in toxicology, human and veterinary medicine, biology, biochemistry, chemistry and physics forms the basis for comprehensive research work and services, including drug research, consumer and environmental protection.

The activities of the department Drug Research and Medical Biotechnology are focused on preclinical studies for the chemical and pharmaceutical industry. The object is to detect causal relationships between dose and effect of pharmaceuticals. In addition to molecular-biological methods, numerous pharmacological in vivo and in vitro methods are available for investigating molecular mechanisms at molecular, cell or organ levels and in animal models.

# Karlsruhe – Forschungszentrum Karlsruhe

#### Website: www.fzk.de/biostruct

The research centre Karlsruhe is one of Germanys premier National Laboratories, presently, employing over 3500 people in many different scientific fields. It basic mission is to develop and provide the infrastracture for challenging scientific problems facing the German society. Through cooperation with German universities, the Research Centre Karlsruhe support vigorous *Ph.D. programmes* in a variety of scientific disciplines.

The Institute for Nanotechnology (INT) is one of the premier research centres in Germany focusing on the development of a wide array of key technologies for the development of nanotechnology.

The biomolecular simulation group at the INT focuses on the development of computational tools for denovo protein folding and in-silico drug design. We have developed forcefields and simulation methods that permit all-atom protein folding for small proteins on the basis of the amino acid sequence. We have also developed FlexScreen, a tool for high-throughput in-silico screening for rational drug design.

# Leipzig - UFZ – Centre for Environmental Research

# Website: www.ufz.de

The UFZ, Centre for Environmental Research, Germany, was established in 1991 as the first and only centre in the Helmholtz Association of National Research Centres (HGF) to be exclusively devoted to environmental research in a great variety of fields. It currently employs around 700 people. Founded in response to the severe pollution prevailing in Central Germany, the UFZ has already become a world-wide acknowledged centre of expertise in the remediation and renaturation of contaminated landscapes, as well as the preservation of natural landscapes. Since its foundation in 1991 the UFZ has participated in 87 EU-projects, co-ordinating 38 of them. Within the Fifth Framework Programme the UFZ has launched 22 projects co-ordinating 7 of them. In Framework six UFZ is up to now involved in 30 projects co-ordinating two Integrated Projects, one STREP, two EST, one OIF, one EIF, one IIF, and three TOK.

# Monheim - Bayer CropScience AG

#### Website: www.bayercropscience.com

Research Biology Insecticides is a department within Research of the agrochemical/crop protection company Bayer CropScience AG. The group interested to join the program is working in the field of insect toxicology (physiology) and resistance. We are doing research on the mode of action (biochemically and biologically) and mechanisms of resistance of active ingredients used to control pest insects and spider mites. The laboratory is well equipped with state-of-the-art technologies (biology, biochemistry, electrophysiology and molecular biology) and is actively involved in cutting-edge research especially in the field of insectcide and acaricide resistance with numerous external contacts. The group consists of technicians, MSc and PhD students as well as occasional visiting scientists.

Chemistry Insecticides is a department within Research of the agrochemical/crop protection company Bayer CropScience AG. The group interested to join the program is working in the field of Natural Product Synthesis.

The influence of synthetic compound agrochemicals having a natural origin is remarkable. The laboratory is actively involved in the utilization of natural products as lead structures in the design of simplified synthetic analogs.

The laboratory is well equipped with state-of-the-art technologies (syntheses from 5 mg to 50 g, analytical and preparative HPLC). Our chemical work is supported by modern NMR and LC-MS labs as well as by a molecular modeling group.

SPAIN

# Barcelona - Centro de Regulació Genòmica

# Website: <u>www.crg.es</u>

The Centre for Genomic Regulation (CRG) in Barcelona is a new interdisciplinary research institute, founded in 2000 by the Catalan Government and the University Pompeu Fabra (UPF) of Barcelona. Its aim is to promote basic research in biomedicine, focusing in particular on the study of the human genome, its role in the regulation of the development and functioning of the organism, and the application of the results in diagnosing, preventing and treating disease.

The CRG is integrated in the Biomedical Research Park of Barcelona (PRBB), that includes several other biomedical research institutions, such as the Department of Health and Life Sciences of the UPF, Municipal Institute of Medical Research (Institut Municipal d'Investigació Mèdica, IMIM), and Barcelona Centre for Regenerative Medicine (CMRB). This research park -whose setting-up involved an investment of approximately 80 million euros- has a total surface of more than 55.000 m2 and was officially inaugurated in 2006. Once fully operational, it will house more than 1000 people working in up to 80 research groups. Furthermore, the building houses several state-of-the-art technology platforms, and the largest and technologically most advanced animal facility in entire Spain, with a total capacity for the housing of up to 70.000 mice and 50.000 zebrafish.

The CRG, currently employing more than 250 individuals, is organised into six scientific programmes, each coordinated by a scientific coordinator and made up of independent research groups each led by young scientists. Presently existing scientific programmes comprise: 1. Gene Regulation (coordinator: Miguel Beato); 2. Differentiation and Cancer (coordinator: Thomas Graf); 3. Cellular and Developmental Biology (coordinator: Vivek Malhotra); 4. Bioinformatics and Genomics (coordinator: Roderic Guigó); 5. Systems Biology (coordinator: Luis Serrano), 6. Genes and Diseases (coordinator: Xavier Estivill). Since the creation of a new partnership in 2006 supported by the Spanish Minister of Education and Science, the Systems Biology Laboratory (EMBL). A large fraction of the CRG staff is made of internationally recruited top scientists, who are subjected to regular evaluations by an external Scientific Advisory Board formed by ten internationally renowned scientific leaders.

# Barcelona – Institute for Research in Biomedicine (IRB)

#### Website: www.irbbarcelona.org

**IRB Barcelona** is an independent, non-profit research institution engaged in basic and applied biomedical science that aims to improve quality of life by applying advances in this field. IRB Barcelona is a very young research institution that was founded in October 2005 by the Government of Catalonia (Generalitat de Catalunya), the University of Barcelona (UB) and the Barcelona Science Park (Parc Científic de Barcelona). The Institute aims to promote multidisciplinary research of excellence at the interface between biology,

chemistry and medicine, to foster collaborations with local organisations and international research institutes, and to provide high-level training in the biomedical sciences to staff, students and visitors. IRB Barcelona is located in the Barcelona Science Park (www.pcb.ub.es) in the Pedralbes Campus of the University of Barcelona, a centre in which first-class public research converges with the private sector in a stimulating, vanguard scientific environment. Researchers at IRB Barcelona have the opportunity to use first class technology offered either by their own IRB Barcelona Core Facilities and Services or by the PCB Technological Facilities. In addition, PCB building also harbours the Scientific and Technical Services from the University of Barcelona (www.sct.ub.es) which are also available to IRB members.

# Barcelona - Parc Científic de Barcelona

# Website: www.pcb.ub.cat

The Parc Científic de Barcelona (PCB) is a cornerstone of the innovation system developed by the University of Barcelona. The convergence of multidisciplinary research groups from public and private sectors and a wide range of state-of-the -art technological facilities make the PCB a pioneering point of reference in the promotion of knowledge and technology transfer and the setting up of new technology-based companies. The PCB hosts over 45 companies, three large public research centres and a bioincubator for technologybased companies, all of which are involved in cutting-edge basic and applied research. As an institution devoted to research, development and innovation, the PCB runs its own technological platforms, which provide services to customers and participates in research projects. These platforms cover such a wide array of areas as combinatorial chemistry, transcriptomics, proteomics, high throughput crystallography, toxicology and nanotechnology. The PCB also hosts a first-rate animal facility, which offers tailored solutions to researchers' projects. All these activities take place in a 24.000 m2 laboratory building, and within the next three years the PCB will expand to double the available laboratory space. The main focus of the international multidisciplinary research groups and companies within the Park is biomedical. This includes research into understanding the biological aspects of disease, as well as into the biochemical and pharmacological strategies to treat it. A part of the research at the PCB revolves around bioengineering, and particularly the nanotechnology approach to solving biological problems. This experimental activity is complemented by on-site research in human and the social sciences. This strategy of open priorities enables the PCB to remain at the forefront of new technology and to respond to the economic cycles which characterize technologically advanced sectors.

# Barcelona – University of Barcelona

# Website: http://www.ub.edu

The University of Barcelona (UB) was founded in 1450. Today it boasts of a student body of 74,000 and a teaching staff of 4,150 members. The UB is structured in related areas of teaching, twenty university schools, 96 departments and 71 degree courses. Postgraduate and graduate school programs are also offered, as well as a large number of continuing education courses. UB students have access to an extensive range of services. Ten thousand bachelor's degrees and 400 PhDs are awarded each year. Nowadays the university has four campuses in different parts of the city.

The UB is the largest of the six universities of Barcelona and of the ten in Catalonia. The UB is ranked the first Spanish university, and the twenty third European institution, in scientific quality and productivity. The UB manages about 150 European projects per year, for an amount of about 19.3 million €. In addition, the UB has implemented a quality program aiming fundamentally to design mid and long term strategies in order to evaluate and improve teaching and research in public higher education.

The faculties and the Scientific and Technical Services (SCT) of the University of Barcelona offering work programmes under the Unipharma-Graduates projects are housed on the Pedralbes campus: <a href="http://www.ut.edu/mapes/campus\_diagonal.htm">http://www.ut.edu/mapes/campus\_diagonal.htm</a>

<u>mtp.//www.ut.euu/mapes/campus\_utagonal.m</u>

Bilbao - CICbioGUNE Website: <u>www.cicbiogune.es</u> The CIC bioGUNE (Centre for Cooperative Research in Biosciences) is a research centre committed to high quality research at the international cutting edge of science and technology, based on state-of-the-art equipment and tools, and using technological platforms that will help to improve quality of life. Our research team constitutes the laboratory of "Stem Cells and Breast Cancer" within the Cell Biology and Stem Cells Unit that is formed by three laboratories that share space and scientific interests. In addition other major areas of research in the centre are organised in the main areas of functional genomics, proteomics, metabolomics and bioinformatics. Furthermore, there are common services for proteomic studies, an animal house, and a platform for genetic silencing.

This is a new centre within a new building and very well equipped. At the same time, all the research laboratories are formed by young and enthusiastic people of varied nationalities providing a stimulating environment for the formation of a motivated young researcher. The weekly seminars are in English, as well as our Data and Journal Clubs, contributing to the international atmosphere.

# Madrid – Noscira S.A. (ex Neuropharma)

#### Website: <u>www.noscira.com</u>

NeuroPharma is a company 75% financially supported for the chemical industry holding ZELTIA and 25% by private investors, which was born in May 2000. Our mission is to research, develop and commercialise new drugs active for CNS. In this first step of our company we have created a potent R&D department and we have focused our research to the future therapy of Alzheimer's disease. As source of biodiversity in our assays we used extracts of marine organism as well as directed drug design programs.

We have now 1.800 m2 of laboratories with basic equipment for molecular biology, cell cultures (including primary cell cultures), biochemistry, organic and bioanalytical analysis, organic synthesis, natural products isolation and pharmaceutical development. We have a broad high technology equipment such NMR (400 MHz), LC-MS, LC-MS/MS, HPLC (analytical and semi-preparative), microwave organic synthesis reactor, ELISA equipments, fluorimeters, fluorescence microscopy, scintillation counter, etc. Up to date, we are 42 researchers in staff from biology, chemistry and pharmaceutical areas.

We have five main projects in different state of development each of it. In these projects we are focused on specific targets relevant for Alzheimer's disease with the aim of finding new drugs that act as disease-modifying agents and that could interfere with the main histological hallmarks of the pathology: beta-amyloid and tau protein.

We develop our own screening assays. The cell-based ones are selected if it possible for the specific target. In this moment we have a very efficient platform for primary and secondary screening in the five projects in course. That allow us to select with high efficacy candidates for further development.

In the chemistry department, we have a potent research group in natural products that proceed to the bioassay guided isolation of the positives. After chemical elucidation of the hit, two programs born in parallel: the total synthesis of the marine natural product and the medicinal chemistry programs of analogs that allow to define the pharmacophore.

At the same time ADME properties are considering in this step, and further modifications to structure were done in order to obtain oral bioavailable compounds and to improve the cross of BBB. Preliminary pharmacokinetic screening is also performed in our laboratories and so the bioanalytical methods should be developed.

#### FRANCE

#### **Grenoble - HumProther Laboratory**

Website: http://www-sante.ujf-grenoble.fr/GREPI/phoxnox/accueil.htm

The GREPI (Groupe de Recherche et d'Etude du Phénomène Inflammatoire) is under the administrative supervision of Joseph Fourier University (U.J.F.). The Joseph Fourier University, one's of the country's largest, academic, non-profit research and university organisations, has rapidly achivied the status as one of the top institutions in France for higher education and research. From its history (the first university was built in

1339), the Joseph Fourier University has always stood at the forefront of higher education and fundamental research. The Joseph Fourier University's staff includes more than 1300 faculty members (85% Ph.D holders) and 960 administrative and support personnel. The total current campus enrollment is over 17.200 students including 60% in Sciences and Medicine/Pharmacy and more than 23% in Engineering sciences and technologies. Over 400 foreign students are hosted under international exchange programmes and 200 foreign researchers are invited each year. The Joseph Fourier University has become internationally recognized for its pioneering projects in nanobiotechnologies and bio-engineering. The university is located in an outstanding scientific environment including several European research centres such as the Laue Langevin Institute (ILL), the European Synchrotron Radiation Facility (ESRF) and the European Molecular Biology Laboratory (EMBL).

The North Hospital of Grenoble (« Centre Hospitalo-Universitaire, CHU de Grenoble ») is home to one of the Joseph Fourier University's medical laboratory, known as GREPI. The GREPI is divided into 2 departments including a clinical investigation laboratory (Enzymology laboratory) which is involved into the biochemical analysis of samples from patients and a basic research laboratory on Cellular Ageing and Inflammatory Response. The excellence and the strength of the GREPI is emphasized through the daily interactions between both departments. The Enzymology laboratory is one's of the leading laboratory in Europe for the diagnostic of orphan human diseases such as chronic granulomatous disease (CGD) and cystic fibrosis. The research laboratory on Cellular Ageing and Inflammatory Response housed 4 research units: fundamental studies of the NADPH oxydase complex (co-directed by Pr F. Morel and Pr P. Gaudin), the CGD diagnostic department (directed by Dr. MJ. Stasia); cellular therapy and vaccination (co-directed by Pr. B. Polack and Dr. B. Toussaint) and the HumProTher laboratory (directed by JL Lenormand). The GREPI's staff includes more than 8 professors or associate professors, 4 postdoctoral fellows, 5 Ph.D students (including 2 chinese), 5 laboratory technicians, 2 undergraduates students and 5 administrative and support personnel. Rather than isolating faculty members and research domains into separate and distincts fields, Pr. F. Morel, the director of the GREPI, has encouraged and stimulated a collaborative spirit. While the level of scientific investigation is intense, the atmosphere is collegial and technicians, graduates students and administrative staff all are considered part of the team to serve the best interests of research and clinical studies. The pursuit of scientific excellence is paramount and all efforts are directed toward that end. Consequently, the GREPI scientists have currently contributed to more than 20 scientific publications to the medical literature these last 4 years.

# Grenoble - Unit of Virus Host Cell Interactions UVHCI

#### Website: www2.ujf-grenoble.fr/pharmacie/laboratoires/gdrviro/

The "Unit of Virus Host Cell Interactions (UVHCI) UMR 5233 UJF-EMBL-CNRS" is a collaboration between the Université Joseph Fourier, the EMBL Grenoble outstation and the CNRS. The UVHCI shares the Carl-Ivar Brändén building located on the research campus of the ILL, the ESRF and the EMBL Grenoble Outstation together with the PSB(Partnership for Structural Biology). The viruses studied are adenovirus, Epstein-Barr virus, vaccinia virus, hepatitis C virus and negative strand RNA viruses, in particular influenza virus. We concentrate on biophysical studies as well as X-ray crystallography of the interactions between viral and host cell proteins.

#### Lyon - Ecole Normale Superieure

#### Website: www.ens-lyon.fr

The Ecole Normale Supérieure de Lyon is one of the top academic research institutions of France. The Laboratory of molecular and cellular Biology has state of the art facilities for world class biological research ranging from standard laboratory to microscopy, genomics and proteomics platforms to name but a few of the resources. There is a a diversity of expertise in biology, easily accessible in the open format of the laboratory but also technologies at the interface of biology, chemistry, physics and materials science, in the Joliot-Curie laboratories. Over 250 scientists in three research units – Virology, plant science, molecular and cellular biology train over 40 graduates and post-doctoral fellows at any given time, offering an ideal ratio of

seasoned scientists to graduates. There is significant incentive to innovate as illustrated by the nimber of high tech start-ups that have emerged from the labs in several areas in addition to Biology.

# Lyon - Institut de Biologie et Chimie de Protéines (IBCP)

#### Website: <u>www.ibcp.fr</u>

The Institute for the Biology and Chemistry of Proteins (IBCP), a research unit (UMR 5086) administered jointly by the CNRS and by Lyon University, is located in Lyon (France) in the Gerland area, at the confluence of the Rhone and the Saone rivers. It is one of several research units making up the Federated Research Institute (IFR 28) "Biosciences Lyon Gerland". It constitutes the "Protein Science" department. The current building dates from 1992 (phase 1), and was extended in 1997 (phase 2, North West wing) and again in 2003 (phase 3, two additional floors), making a current surface area of 4500 m2 distributed over 5 floors.

In general, the aim of the research carried out at the IBCP is the study of proteins in their biological context. Approaches used include integrative cellular (cell culture, various types of microscopies) and molecular techniques, both experimental (including biocrystallography and nuclear magnetic resonance) and theoretical (structural bioinformatics).Research at the IBCP is organised into three main departments, bringing together 13 groups working on topics such as cancer, extracellular matrix, tissue engineering, membranes, cell transport and signalling, bioinformatics and structural biology. Altogether, it includes about 160 people (researchers, university academic staff, technicians, administrative staff), representing 9 nationalities, of which half have tenured positions. The IBCP houses the Lyon-Gerland site of the Rhone-Alpes Bioinformatics Centre (PRABI).

#### Marseille - Developmental Biology Institute of Marseille-Luminy (IBDML)

#### Website: <u>http://www.ibdm.univ-mrs.fr/index\_gb.php</u>

The Developmental Biology Institute of Marseilles (IBDML) hosts twenty three independent research teams working in developmental biology and on pathologies associated with developmental anomalies.

Our research effort is aimed at unravelling the molecular mechanisms regulating animal embryonic development, in particular the definition of axial polarity, the regionalisation of the embryo, the control of morphogenetic processes, the cellular interactions which control the different stages of organ development, including the development and the plasticity of the nervous system, and somite and heart development. In addition to carrying out basic research, the IBDML promotes projects of a more applied nature, aimed at the development of therapeutic molecules.

These questions are addressed using Drosophila, ascidians, Xenopus, chick, rat and mouse. These model organisms were chosen for their own advantages in the study of different aspects of development and for the complementarity of the experimental approaches they allow.

The Institute is endowed with high end technical platforms in Imaging, Bioinformatics and in high throughput studies. One of the key objectives of the IBDML is to encourage interactions with different disciplines – in particular mathematics, physics and chemistry - in order to develop new experimental approaches.

Finally, the Institute hosts a large number of foreigners and several teams hold their group meetings in English. Speaking French is thus not a prerequisite for working at the IBDML.

# Nantes - Institut National de la Recherche Agronomique

#### Website: www.inra.fr

Centre of INRA in Nantes employs over 200 scientists and technicians devoted mostly to the studies of:

- ✓ Biopolymers, their structure and interactions
- ✓ Animal and public health, epidemiological analysis, comparative animal physiopathology
- ✓ Human nutrition

#### Paris – Institut Cochin

#### Website: www.cochin.inserm.fr

The Cochin Institute is an institution dedicated to biological and medical research. Its mission is to federate and co-ordinate a broad spectrum of research projects which share biomedical applications. It operates in

interaction with a medical school (Paris 5) and a major hospital centre, the Groupe Hospitalier Cochin - Saint Vincent de Paul - La Roche-Guyon.

The Cochin Institute operates under the authority of Inserm (U 567), of the CNRS (UMR 8104), and the Université René Descartes Paris 5. It is a member of the Institut Fédératif de Recherche Alfred Jost. Research at the Cochin Institute ranges from basic researches at cell and molecular level through clinical research. It is mainly structured around 6 main themes: Endocrinology/Metabolisme and Cancer, Cellular biology, Genetics and Development, Hematology, Immunology, and Infection diseases. It also possess 8 common technical facilities: Transgenics, Microscopy, Sequencing, Histology and Pathology, Cytometry, Microsurgery, Mass spectrometry, Animal facility.

The institute has 600 staff members distributed in 47 teams, common services, and administration with a total 12,000 m2 of laboratory space. The institute regularly hosts workshops, conferences and symposiums on biological and medical topics.

#### Paris – Institut Curie

#### Website: www.curie.fr

Founded by Marie Curie and Claudius Régaud, the Curie Institute is an internationally renowned tumor and cell biology institute, private non-profit foundation, accredited as a public service since 1921. For over 80 years the Institute has been pursuing two connected goals in the fight against cancer: patient management and oncology research. Over 1,700 people currently work for the curie Institute's hospital and research centre. Interdisciplinary cooperation between clinicians and scientists is at the heart of the Institute's culture and know-how, aiming to make the most recent progress in cancer research available to patients as quickly as possible. The research centre is made up of number of laboratories associated with CNRS or INSERM, furthering our understanding of how normal and cancerous cells work in order to improve the prevention, diagnosis and treatment of cancer.

#### Paris – Laboratory of Molecular and Cellular Pharmaco-chemistry

#### Website: www.biomedicale.univ-paris5.fr

The laboratory is attached to the IFR 95 "Biomedicale-Saints Pères", gathering 12 laboratories recognized by the French research organizations. This research center includes two poles, "pharmacology, toxicology, cancerology" and "neurosciences" and our laboratory is attached to the first of these two poles. We are located in full center of Paris (district of Saint Germain des Pres), at the Faculty of Medicine Paris 5 (Hospitals Necker, Cochin and Broussais). The laboratory of Molecular and Cellular Pharmacochemistry includes 35 people including 20 statutory members and 10 PhD students.

The objectives of our laboratory are to characterize and validate new protein targets implied in the deregulations of cell signaling in association with pathologies and more particularly in cancerology.

A second phase consists in the development of inhibitors of these proteins with a pharmacological aim and to test their in vitro effects and on cellular models. Our multi-field approach associates the techniques of molecular and cellular biology, chemistry and molecular modeling in silico and the physicochemical and enzymatic tests. Our targets are located in the ways of transduction induced by the tyrosine kinase receptors (Grb2, Grb7, RasGAP, STAT3) and in the cellular cycle (CDC25, Cdk) or are kinases like focal adhesion kinase FAK and the VEGF receptor.

#### Paris – Laboratory of Pharmacology

#### Website: www.pharmacie.univ-paris5.fr/

The faculty of Pharmacy is located in the heart of Paris with several laboratories focused on the different fields.

The research projects are conducted in the laboratory of pharmacology (EA2510), in the group of "Traumatic brain injury". Our laboratory is interested in the evaluation of neuroprotective stragtegies that are capable to reduce the post-traumatic neuroinflammation.

# Amsterdam - van't Hoff Institute for Molecular Sciences

Website: http://www.science.uva.nl/hims/object.cfm

The objective of the Polymer-Analysis Group of the HIMS institute (Faculty of Sciences, University of Amsterdam) is to generate novel, or greatly improved techniques and methods for the analysis of natural and synthetic polymers. The Group is headed by prof. Peter Schoenmakers and has two part-time professors, Prof.dr. Hans-Gerd Janssen and Prof. Dr. Sjoerd van der Wal.

Our main focus is on polymer separations. Separations are essential to characterize the many distributions (molecular mass, cross-link density, chemical composition, etc.) that are present in the macromolecules we study (proteins, peptides, polysaccharides and synthetic polymers).

We try to reach our objective by:

- developing a sound understanding of chromatographic and spectroscopic techniques;
- critically assessing the potential and limitations of various methodologies;
- establishing a high-quality experimental program;
- combining analytical tools with chemometrics;
- creating a productive network of people and organizations who (i) need new methods of polymer analysis or (ii) can help us fill these needs.

In particular we focus on multidimensional chromatographic methods and coupled systems for chromatography - mass spectrometry either or not in combination with chemometrics to obtain:

- chemical composition distributions;
- functionality (functional-group and end-group) distributions;
- branching and cross-link distributions.

We use either high-pressure pumps or high-voltage power supplies to drive these systems. Finally, the separated polymers are detected by a suitable device (which lately more and more is mass spectrometry).

# **Groningen - Biomolecular Sciences and Biotechnology Institute**

# Website: www.rug.nl/gbb

The Groningen Biomolecular Sciences and Biotechnology Institute (GBB) is a research institute and graduate school of the Faculty of Mathematics and Natural Sciences at the University of Groningen. GBB has the ambition to perform research of the highest standard in the field of biomolecular sciences in order to understand the structure and dynamics of proteins in relation to: i) their function and (catalytic) activity, ii) their regulation, role and behavior in living cells, and iii) to obtain insight in their fundamental properties relevant for applications in medicine and biotechnology. GBB provides an attractive research and training environment for graduate- and Ph.D. students, as well as post-doctoral fellows by maintaining a modern infrastructure within the participating research groups from the departments of Biochemistry and Biophysical Chemistry (5 groups located in the Chemistry Building, Groningen), as well as groups from the departments of Microbiology, Genetics, Bioinformatics, and Biology of Plants (8 groups located in the Biological Centre, Haren). GBB also is an attractive partner for collaborative and/or contract research and many collaborations with Life Sciences Industries exist.

**GBB Research Strategy**: Due to collaborative and multidisciplinary research, GBB internationally has achieved a strong reputation in molecular biology, microbiology, (membrane) protein analysis, enzyme engineering and protein structure determination. These general areas form the basis for various specialized research programs:

**Functional genomics and proteomics.** GBB plays a key role in functional genomics of microorganisms with the integration of theoretical- and computational models (bioinformatics) with experimental results, such as those obtained by DNA-microarray technology, mass spectrometry and high-throughput (metabolic) screening. Through these areas, GBB's expertise in membrane proteomics and bioinformatics contribute to

the larger research programs of the Netherlands Proteomics Centre and Netherlands Bioinformatics Centre, respectively.

**Structure and function of membrane proteins**. A major challenge of GBB is to unravel the structure and function of membrane proteins - in particular enzymes and transporters of the protein secretion and targeting pathways, multiple drug resistance systems and ABC-transporters - using biophysical methods (such as X-ray protein crystallography and high resolution microscopical methods) combined with molecular and biochemical methods (genetic tools, reconstitution experiments, kinetic analysis) and mass spectrometry.

**Complex cellular processes.** To understand the complex assemblies of proteins, nucleic acids, organelles, membranes, etc. in a living cell, a detailed insight in the regulatory mechanisms is required. Here, the research on the intricate underlying networks, transport and targeting machinery's, and signal transduction pathways is essential. Therefore, GBB studies the role of various macromolecular components and their interaction, using methods that include construction of transgenic organisms, cell biological methods, proteomics approaches, and spectroscopic tools.

**Protein structure, dynamics and engineering**. Using structure-based or random methods with highthroughput analysis, protein engineering has a tremendous potential for obtaining new enzymes and proteins for biotechnological and medicinal application. For reliable predictions and applications a detailed insight is required into relationships of structure and function as well as structure and reactivity. The atomiclevel resolution of the structure of proteins and detailed analysis of their dynamics are at the cornerstone of GBB's protein engineering research. GBB's research on engineering enzymes, metabolic pathways and microorganisms are embedded in larger research programs in the areas of green chemistry and white biotechnology.

# **GBB's Competence statistics:**

- Very high research quality according to the recent assessment (2005) at the level of very good to excellent with an average score 4.6 on a scale of 1-5 (for detailed info see GBB home page: www.rug.nl/gbb)
- 31 full time employed scientific staff.
- 180 temporally full time employed scientists (mainly Ph.D. students)
- 20 full time employed technicians
- 12 full time employed supporting staff
- ~ 12-13 M€ annual resources (30% University, 50% Dutch funding agencies, 20% EU + contract research)
- Average output 170 peer-reviewed papers, several patents
- Average enrollment: 20 Ph.D. Students/yr
- Average 20 Ph.D. degrees awarded

# **Groningen - Centre for Pharmacy**

# Website: www.rug.nl/farmacie

The University Centre for Pharmacy belongs to the Faculty of Mathematics and Natural Sciences (FMNS) of the University of Groningen (RUG). At the centre, fundamental and applied research is carried out and education is given in pharmacy and in pharmaceutical sciences. Pharmacy takes a central position in life sciences.

The University Centre for Pharmacy consist of eleven research groups. The largest part of the research is organized in the Groningen Research Institute of Pharmacy (GRIP). This research institute participates in the graduate school Groningen University Institute for Drug Exploration (GUIDE), in which also groups from the University Medical Centre Groningen (UMCG). The research group Molecular Pharmacology is embedded in two research institutes: the Groningen Research Institute of Asthma and COPD (GRIAC), like GRIP also part of GUIDE, and the Centre for Behaviour and Neurosciences (CBN). CBN is part of the interfaculty graduate school of Behavioral and Cognitive Neurosciences (BCN), in which also groups from the UMCG participate.

Pharmaceutical research is multidisciplinary and has a central position in life sciences. It bridges medical sciences on the one side and chemistry, biology and physics on the other side. The interaction of

pharmaceutical sciences in Groningen with medical sciences, through participation in the graduate schools GUIDE and BCN, offers excellent possibilities for cutting edge research. Next to local collaboration there is successful collaboration on a national and international level with other universities, industries and governmental bodies.

Research in pharmaceutical sciences at the University of Groningen includes the following themes:

- ✓ Molecular aspects of drug design and drug action
- ✓ Unraveling of drug signal transduction routes, in relation to pathophysiology;
- Development of relevant in vitro disease models;
- ✓ In vitro technologies for the evaluation of human drug metabolism and toxicity;
- ✓ Drug discovery on the basis of medicinal chemistry (synthesis of drugs) and natural products;
- ✓ Biotechnological production of drugs, including protein engineering and gene engineering;
- ✓ Protein analysis and medical proteomics;
- ✓ Pharmaceutical, biomacromolecular and toxicological analysis;
- ✓ Bioanalytical and biosensoring techniques, including biomonitoring and microdialysis;
- ✓ Advanced technologies for programmed drug delivery and drug absorption;
- ✓ Cell selective (pro)drug and gene targeting research;
- ✓ Pharmaceutical manipulation of gene expression;
- Pharmaceutical technology for the development of innovative drug dosage forms and their production process;
- ✓ Pharmacoepidemiology, pharmacoeconomics and drug use studies;
- ✓ Social pharmacy and patient information;
- ✓ Pharmacotherapy and pharmaceutical patient care.

# Groningen - Department of Organic Chemistry, Stratingh Institute

# Website: www.rug.nl/fwn

The department of Organic Chemistry, Stratingh Institute, University of Groningen, is internationally recognized as a leading institute for organic chemistry with key expertise in stereochemistry, synthesis, supramolecular chemistry, new materials and nanosystems and catalysis. The research programs in the host research group (Feringa) are embedded in two top research schools: Materials Sciences Institute (MSC+) and National Research School Catalysis (NRSCC), both assigned national centres of excellence in the Netherlands. Furthermore the research programs are executed in the context of the BioMade research institute focussing on the integration of molecular biology, organic synthesis and nanotechnology. Inspired by Nature's principles of molecular assembly, recognition, transport, motion and catalysis our goal is to exploit the full potential of synthetic chemistry to create new structures and functions. Over the years a unique expertise in stereochemistry has been acquired making the group one of the leaders in this field. A major part of the research is directed towards nanotechnology and novel functional materials. The Feringa research group is embedded in the Department of Chemistry. Currently the group comprises 48 researchers (23 of non-Dutch origin, the group meetings, lectures and discussions are all in English) including postdocs, 4 senior technicians and one lecturer and is situated in a state of the art laboratory. Each researcher has a dedicated lab-space, fume cupboards, dedicated writing area equipped with modern PC's. The group has excellent equipped modern synthesis laboratories, several instrument rooms with hands -on access to the students for high field NMR (200, 300, 400, 500, 600 MHz), HRMS, ES-MS, HPLC- and GC-MS facilities, state of the art chiral HPLC and GC apparatus including preparative instruments (12 different machines including robot controlled for automated fast screening), LC equipment, Microscopes, Gloveboxes for handling air sensitive materials, DSC, X-ray and UV/Vis, FT-IR, EPR, Electrochemical equipment, ORD,CD equipment, molecular graphics facilities, High pressure facilities, robottics for parallel and combinatorial synthesis and a dedicated microanalysis laboratory. There are comprehensive library facilities with full electronic literature access and data base searching facilities. The Feringa group is member of the Materials Sciences Institute (MSC+) and the BioMade institute. This provides modern facilities for scanning probe techniques (STM, AFM), high speed computing for molecular dynamics studies, state of the art electron microscopy (EM) facilities, clean rooms for device fabrication, spincoating, a variety of equipment for surface

studies and an ultrafast laser (femtosecond) laboratory. This infrastructure is indispensable for fabrication of nanomaterials and systems and the MSC+ institute is a world renowded centre with extensive facilities available to the researcher in the current project. In the coming year a new device laboratory with state of the art clean rooms and nanofabrication facilities will be installed.

For the current project all facilities needed are available in the institute and the students have access to all equipment. Important is to note that there is day-to-day support by a team of technicians and expert scientists on all facilities which will also provide the proper training to the young researchers.

#### Oss – Organon N.V.

#### Website: <u>www.organon.com</u>

Organon creates and markets prescription medicines that improve the health and quality of human life. Through a combination of independent growth and business partnerships, Organon strives to become or remain one of the leading pharmaceutical companies in each of its core therapeutic fields: reproductive medicine, mental health and anesthesia.

At the department of Pharmaceutics the first steps on developing a drug product are taken after development of the active substance. New chemical entities are formulated into a delivery form (tablet, injection) which should fulfil quality criteria with regards to biopharmaceutical aspects, technological feasibilities and customer satisfaction. Analytical methods are developed and validated that are able to quantify the active components and it's degradation products in the developed formulation and that can detect the sometimes minimal differences within products. The department has employees with backgrounds in: pharmacy, chemical technology, physical chemistry, engineering, analytics, bio-chemistry, amongst other expertises.

In 2004 the Food and Drug Administration launched the initiative of Process Analytical Technology (PAT). PAT is a system for designing, analyzing and controlling manufacturing processes. Process analytical technologies are developed to enhance process understanding, process efficiency. Critical process steps are identified and followed in-line to ensure sufficient process control and product quality during the process. Quality of a pharmaceutical product is currently mostly defined by its end-quality standards. At Organon PAT is developed within several departments. At the department of Pharmaceutics process analytical technology is implemented in product development and product analysis. Innovative production processes and analytical methods are developed to ensure optimal process understanding and product quality. Real-time, in-line, on-line and at-line analytical methods are developed to follow the critical process steps.

#### Wageningen - Cell Biology and Immunology Group

#### Website: www.cbi.wur.nl

The *Cell Biology & Immunology (CBI) group* at the Department of Animal Sciences of the Wageningen University is the only laboratory working on the carp (fish) immune system in Europe. The CBI group is applying specific cellular and molecular techniques in an evolutionary approach to immunology and for a further improvement of strategies in fish health control. The group is equipped with all facilities necessary for cellular and molecular immunology research. The CBI group combines fundamental research on the regulation of the immune response with strategic research on disease resistance and vaccination. Central research issues are the ontogeny of the immune system, the stress response and molecular characterization of molecules of key importance for genetic disease resistance. These immune factors are studied in the context of disease models, focusing on parasite-host interactions. The CBI group consists of 4 permanent scientific staff members, 6 technicians, 2 post-docs, 7 PhD students and some 12 MSc students (on an annual basis). The scientist in charge, Dr. Wiegertjes has wide experience in studying host-parasite interactions as a model for immunological research. His group is highly international and he has experience with both Marie Curie, Erasmus and Leonardo student placements.

Wageningen - Plant Research International Website: <u>http://www.pri.wur.nl/UK/</u> Plants are the basis of life. They convert sunlight into an inexhaustible supply of food and renewable raw materials. In addition, plants play a stabilising role in agriculture and natural ecosystems. They also perform an essential landscape function and have enormous ornamental value. Quite simply, people cannot survive without plants. Plant Research International recognises the opportunities provided by plants, makes these capabilities applicable and increases the potential still further by finding new insights into the way plants function within their environment.

The research facilities at Plant Research International are among the most modern in the world. They range from laboratories with robotic genomics equipment to greenhouses and growing rooms that are customised to research requirements. The research projects are both fundamental and applied.

#### SWEDEN

#### Lund - Protista Biotechnology

#### Website: http://www.protista.se/

Protista Biotechnology AB is a start up company founded in 2004 and having 5 employees at the moment. The company objective is to develop new polymeric materials, namely macroporous hydrogels for the purposes of bioseparation.

The company is doing active R&D in the production of macroporous hydrogels using a proprietary technological platform of cryogelation i.e. the formation of macroporous hydrogels in a semi-frozen state when ice crystals perform as porogen. In parallel an active research is going on the new applications of macroporous hydrogels in biotechnology and especially in bioseparation. The developed macroporous have been successfully used for the processing of particulate containing foods like fermentation broths and cell homogonates; the selective isolation of microbial and mammallian cell lines using macroporous gels has been demonstrated; macroporous hydrogels were proven to be highly biocompatible and usable as carriers for cultivation of mammalian cells and scaffolds for tissue engineering.

Protista Biotechnology AB operates in close collaboration with the Department of Biotechnology, Lund University. The expertise and equipment available at the Department are available for the research carried out at the company.

#### Stockholm - Karolinska Institutet

#### Website: <u>http://www.ki.se/sos/</u>

Karolinska Institutet is one of Europe's largest medical universities. It is also Sweden's largest medical university accounting for 30% of medical education and 40% of academic medical research in the country. It offers 19 different education programs and a number of continuing education and free courses. Research at the Karolinska Institutet ranges from basic researches at cell and molecular level through clinical research and research in nursing. Karolinska Institute is known among others for its role in the award to Nobel Prize in physiology and medicin. Of the Eight Swedish Nobel laureates, five comes from the Karolinska Institute.

#### UNITED KINGDOM

#### Cambridge – Alpha Biologics

#### Website: www.alphabiologics.com

Alpha Biologics is situated on the Babraham Research Campus, which forms part of the Babraham Institute site. The Babraham Institute (<u>www.babraham.ac.uk</u>), is a world famous research centre in the field of cell biology and hosts many graduate students studying for post-graduate degrees from all across Europe. Alpha Biologics is an independent company based on this site. In all there are approx. 20 such companies at this location. Alpha's cGMP facility is based on the Penang Biotech Park in Malaysia and is managed by staff with extensive experience of the contract manufacturing business.

The group that the successful applicant will join is the process development group comprising of a highly skilled team based in Cambridge, UK.

This group provide services from cell line generation, including stability and optimisation studies, cell banking and upstream and process development and work with bacterial, yeast and mammalian cell lines.

#### Cambridge –Babraham Institute

#### Website: www.babraham.ac.uk

The Babraham Institute is an independent charitable life sciences Institute, sponsored by the Biotechnology and Biological Sciences Research Council (BBSRC), carrying out world-leading innovative research and advanced training with relevance to the biomedical, biotechnological, pharmaceutical and healthcare communities. About 200 research scientists work at the site.

Babraham Bioscience Technologies Limited (BBT), the Institute's wholly-owned trading subsidiary, manages all commercial activities on the Babraham Research Campus, including technology and knowledge transfer. BBT provides full business, scientific and technical mentoring to help biotechnology start-up companies achieve success and also promotes and negotiates research partnerships with the pharmaceutical and healthcare biotechnology sectors. Babraham's Bioincubator currently hosts around 30 bioscience ventures.

#### **Cambridge - Colonix Medical**

# Website: www.colonixmedical.com

Colorectal cancer (CRC) causes the second largest number of cancer-related deaths in the developed world. One in 20 persons in the Western world develops CRC in the course of their lifetime. Globally, about 655,000 people die each year from this disease; over 1,000 deaths a week occur in the US alone. The European Commission has defined CRC as one of the major uprising health issues. Early detection of CRC not only increases survival rates to reach up to 95% but also reduces the significant treatment costs. Screening programmes to detect the disease early are therefore widely discussed and have been implemented in several countries. Colonix is an innovation medical technology/diagnostics company aiming to reduce mortality and treatment costs of CRC by developing a new diagnostic and screening method. Detection of the disease at an early stage will enable health and insurance providers to redistribute financial resources no longer needed for CRC treatment. Colonix has developed a sampling device ("Colonix Cell Sampling device") and an economically viable laboratory procedure providing an early pre-colonoscopy test for CRC and other colorectal diseases. Eventually a test for the CRC screening market based on the same platform as the precolonoscopy test will be finalised. The first pilot clinical trials have successfully validated the approach. The project has now expanded to an international multi centre study with the aim of achieving clinical acceptance.

#### Cambridge – Innova BioSciences

#### Website: www.babraham.ac.uk

Innova Biosciences Ltd is a small biotechnology company located on the Babraham Institute campus, close to the historic University City of Cambridge, UK. It develops innovative research products for the pharmaceutical, diagnostic and academic sectors. Recently Innova received further investment from Aitua Ltd (see <a href="http://www.aitua.com/news/articles/013.asp">http://www.aitua.com/news/articles/013.asp</a>) and is rapidly expanding its range of products. In 2006 the company introduced its revolutionary bioconjugation system Lightning-Link<sup>™</sup>, which massively simplifies and accelerates the production of protein conjugates. The company currently has three full time staff and several consultants.

#### **Cambridge – Phico Therapeutics**

#### Website: www.phicotherapeutics.co.uk

Phico Therapeutics Ltd is an early stage biotechnology company developing novel antibiotics for use against all bacteria, including superbugs such as MRSA. Phico's technology is based on using a protein, known as SASP, which has broad spectrum antibacterial activity. This protein binds to the bacterial DNA and changes the conformation of the DNA halting replication and transcription. Phico uses modified bacterial viruses to deliver the gene encoding SASP to selected pathogenic bacteria, such as MRSA and *Clostridium difficile*. Phico has its first product against MRSA in pre-clinical trials and plans a first human clinical trial at the end of 2007. The second product currently being developed is aimed at the gut bacterium, *C. difficile*.

Phico is based on a Research Campus near to Cambridge, where it has laboratories and offices. There is good public transport from the centre of Cambridge to the Campus. Phico employs 11 people, including 9 post-doctoral scientists, a part time laboratory technician and an administrator. There are two main laboratories but all research staff have benches together in one of the labs so there is constant and very good interaction between all the researchers. The second laboratory is used for production of Phico's products and work with anaerobic bacteria. The company has its own tea room and meeting room and a computer room with several computers. The main laboratory an the computer room have air conditioning. The Babraham Research Campus is a large site providing a canteen, cafe facilities, and gardens. It also provides a service of mass spec, protein sequencing etc. The campus has its own stores facility where stationary and consumables are stored such as enzymes and kits etc.

#### Cambridge – Zyentia Ltd

#### Website: <u>www.zyentia.com</u>

Zyentia was founded in 2002 in Cambridge (UK) with technology licensed from the University of Oxford. During its five years of existence, Zyentia has focused its work in developing innovative approaches to protein misfolding that could have an impact in the treatment of human disease or in generating improved polypeptide drugs to overcome issues such as immunogenicity or drug efficacy and that could improve the quality of life of patients, specially those undergoing chronic treatments. Zyentia's mission, therefore, is to provide solutions to protein misfolding and aggregation in human disease and in the improvement of biopharmaceuticals. Zyentia considers scientific innovation as cornerstone of innovation and tries to nurture collaborations with reputed research groups across the world. Zyentia maintains a very close relationship with the University of Cambridge with collaborations involving the generation of computational tools to characterize and prevent protein aggregation, and the evaluation of some of our lead compounds in invertebrate models of neurodegeneration.

Protein misfolding and aggregation is of aetiological importance to a number of diseases characteristic of aging and may be of central importance to the aging process itself. Diseases caused by protein aggregation (amyloid diseases) include type 2 diabetes, Alzheimer's and Parkinson's diseases as well as prion diseases.

Zyentia has three **active drug discovery** programmes **in type 2 diabetes**, Alzheimer's disease and **Parkinson's disease**, targeting the formation of toxic oligomeric species that underlie these degenerative conditions. Zyentia is developing specific antibodies against proprietary targets involved in the cytotoxic pathway described for some of these disorders. In addition, the Company is using proprietary tools (AggreSolve<sup>™</sup> platform) to successfully design highly-specific compounds able to block the aggregation process itself, overcoming important issues such as Brain-Blood Barrier or intra-cellular delivery. These three programs are at the moment in discovery or pre-clinical development. Some of our lead compounds are currently being tested in relevant disease models that we either run in house or in collaboration with other groups in the Netherlands, Italy, Spain and the United Kingdom. Most of our current efforts are being directed to the optimization of our lead compounds to improve their efficacy, bioavailability and PK/PD properties. It is expected that the preclinical lead optimization will be finalized during year 2007 and some of our compounds might enter clinical trials in 2009.

Zyentia is also applying its core proprietary AggreSolve<sup>™</sup> technology and extensive know-how on protein misfolding and aggregation to the development of improved biologics (polypeptide drugs), offering a variety of solutions to Pharmaceutical and Biotechnology companies actively engaged in the development of biotherapeutics. We have an internal pipeline that includes the optimization of existing biopharmaceuticals currently being used for diverse therapeutic conditions, which have aggregation and immunogenicity problems. Zyentia's platform identifies those regions of the protein susceptible to initiate or mediate the aggregation process and suggests changes that are compatible with the maintenance of the thermodynamic stability, structural integrity and biological activity of the protein. Zyentia applies a number of proprietary software technologies that explore the effect of conformational preferences in the aggregation process and facilitates either the generation of new protein variants by protein engineering or the generation of specific aggregation inhibitors to be used in formulations or as stabilizers.

Zyentia's laboratories are based at the Babraham Research Campus, as part of Babraham's Bioincubator, which currently hosts more than 20 biotechnology companies, most of them at an early stage. The Babraham Research Campus, is located about 8 km south of Cambridge and hosts The Babraham Institue, a research institue sponsored by the Biotechnology and Biological Sciences Research Council (BBSRC), carrying out world-leading innovative research and advanced training with relevance to the biomedical, biotechnological, pharmaceutical and healthcare communities. Babraham Campus and Institute, with its close ties with the biotechnology industry and Cambridge University provide an extraordinary environment for scientific research and innovation.

#### Cambridge – Zoragen Biotechnologies LLP

#### Website: in development

Zoragen Biotechnologies LLP is a small early stage biotechnology company based on the site of the Babraham Research Institute, which is located about 8 km south of Cambridge and hosts The Babraham Institute, a research institute sponsored by the Biotechnology and Biological Sciences Research Council (BBSRC), carrying out world-leading innovative research and advanced training with relevance to the biomedical, biotechnological, pharmaceutical and healthcare communities. Babraham Campus and Institute, with its close ties with the biotechnology industry and Cambridge University provide an extraordinary environment for scientific research and innovation. Zoragen currently employs 2 people, a Chief Executive Officer (CEO), with a background as a Plastic Surgeon, who is based in our Head Office in London, and a Project Leader, with a background as a Geneticist, who is based in our laboratories in Cambridge. As we share laboratory space with our sister company Colonix Medical Limited, the number of people employed by both companies is about 15. Zoragen has secured a significant patent to develop a diagnostic test for Down syndrome and other prenatal genetic disorders. Our test is based on the use of maternal plasma to purify cell free fetal (cff) DNA, and using quantitative Taqman PCR to measure gene copy number. The current Gold standard test, amniocentesis, which involves karyotyping fetal cells from amniotic fluid, is both invasive and time consuming. A test based on cff DNA would be accurate, less invasive, not time consuming, and is likely to be of significant benefits to patients. Our test is currently been developed by the Project Leader, with clinical trials planned to begin in October 2008. Our air conditioned laboratories are new and well equipped.

# Liverpool- Unilever Research and Development

#### Website: www.Unilever.com

Unilever is one of the world's most successful consumer good companies; dedicated to meeting the everyday needs of people everywhere. Globally, a quarter of a million people work to generate a turnover of Euro 42.0 billion (2003). Our foods and home and personal care brands reach consumers in all corners of the globe helping people feel good, look good and get more out of life. In fact someone, somewhere reaches for a Unilever product 150 million times a day.

Unilever R&D Port Sunlight: Globally Unilever invests approximately 2.5% of its turnover in research and development each year, and is the UK's fourth biggest investor. This investment is a measure of Unilever's commitment to science and technology and the pivotal role that science and technology plays in Unilever's competitive edge. Every product Unilever makes and sells results from the application of science. Unilever's scientists enjoy the best of both worlds – being at the cutting edge of technology and also seeing their innovations deliver practical results every day to the consumer.

Unilever R&D Port Sunlight is the leading site for research and development into the companies home and personal care brands. Over 850 scientists work to combine understanding in areas such as material, physical, biological, and process sciences with the best consumer insight to give innovative branded products ready to be sold on the world's supermarket shelves. The global brands our scientists innovate for include Dove, Sunsilk, Lynx, Cif, Omo, Mentadent and Comfort.

# Newcastle Upon Tyne – NewCHEM Technologies

# Website: www.newchemtechnologies.com

**NewChem Technologies** was established to maximise a unique blend of technologies in a number of key market sectors. The company's core technologies are electrochemistry and organic chemistry together with chemical engineering know-how.

NewChem Technologies offers a comprehensive range of Contract R&D Services for the development of new products and processes and also, for problem solving.

The specific major market sectors for NewChem's business are:

- Fine Chemicals and Catalysts
- Pharmaceutical Intermediates and Products
- Water Purification
- Fuel Cell Technologies

The company also develops its own technologies in these market sectors for licensing and for establishing commercial joint ventures.

The company is based in the North East of England with its headquarters in Durham and its main operations at the University in Newcastle upon Tyne. Road and rail transport links to Durham and Newcastle are excellent: Newcastle International Airport is within 20 minutes from the centre of Newcastle.

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