

**UNIVERSITY OF GENOVA**

*Doctorate School of Sciences and Technologies  
of Chemistry and Materials*

**XXV CYCLE YEARBOOK**

The Doctorate School in Sciences and Technologies of Chemistry and Materials was born in the spring of 2005, when the Ministry of Education and Research has urged all the universities to better rationalise and organize the doctorate courses. Although the guidelines given by the Ministry were not very precise, in my personal opinion the Doctorate Schools should be dedicated to the organization and supervision of different doctorate courses in areas affine from the scientific point of view. They should establish general rules common to all students and organize the coursework as a whole (whereas in the past the course work has been organized and regulated independently by each doctorate course).

For this reason, this School, instead of trying to gather together teachers belonging to the same Faculty, preferred to assemble scientists who can share similar scientific interests, irrespective to the Faculty or Department they belong to. The School spans all the subjects related to chemistry (including medicinal chemistry, food and cosmetic chemistry, environmental chemistry, industrial and polymer chemistry, but excluding biochemistry) plus material science (with contributions from chemists, physics and engineers). Accordingly, the school has activated three discrete doctorate courses:

- Chemical Sciences and Technologies
- Pharmaceutical, Food and Cosmetic Science
- Material Science and Technology

The School begun its activity on January 1, 2006 and thus the XXV cycle was the fifth one to be organized by it.

**From 2011 the Doctorate School holds the ECTN Chemistry Doctorate EUROLABEL®**

At the end of December 2012, 15 out of the 16 students of the XV cycle of the School have finished their program. One of them postponed the final exam.

The remaining 15 students have passed the final defense on February 6 or 8, acquiring the degree of "Research Doctor". Furthermore, on February 8, a student from previous cycle (Paola Zito, XXIII cycle) acquired the degree too.

During an official ceremony held on February, 8, I had the honour and the pleasure to deliver to all these 16 students a final certificate, reporting all their activities during the doctorate. As already done in the last years, I have now put together all these certificates, adding some general informations about the School.

I hope that this "yearbook" could remain for the new Doctors as a memory of these three years dedicated to the advancement of science, and, I am sure of that, also to the improvement of their own scientific skills and human merits.

To all of them I would like to present my best wishes for a successful and gratifying career!



Luca Banfi  
Director of the School

## MANAGEMENT COUNCILS OF THE SCHOOL

The school is governed by a **Board of Professors**, formed by 12 members, who elect a Director. For the XXV cycle the board of professors was formed by:

- Luca Banfi (director), DCCI, Organic Chemistry
- Giovanni Carlo Alfonso, DCCI, Industrial Chemistry
- Alessandro Balbi, DIFAR, Medicinal Chemistry
- Gabriella Borzone, DCCI, Inorganic Chemistry
- Guido Busca, DICCA, Industrial and Technological Chemistry
- Alessandra Gliozzi, DIFI, Applied Physics
- Gabriele Caviglioli, DIFAR, Analytical Chemistry
- Emanuele Magi, DCCI, Analytical Chemistry
- Franco Merlo, DCCI, Physical Chemistry
- Angelo Ranise, DIFAR, Medicinal Chemistry
- Saverio Russo, DCCI, Industrial Chemistry
- Carla Villa, DIFAR, Pharmaceutical technologies

Each doctorate course has a coordinator and a specific **Board of Professor**. For the XXV cycle the boards of professors were formed by:

### *Chemical Sciences and Technologies*

- Luca Banfi (coordinator), DCCI, Organic Chemistry.
- Enrico Franceschi, DCCI, Physical Chemistry
- Rodolfo Lavilla, Parc Cientific de Barcelona
- Emanuele Magi, DCCI, Analytical Chemistry
- Enrico Marsano, DCCI, Industrial Chemistry
- Franco Merlo, DCCI, Physical Chemistry
- Maria Rosa Pinasco, DCCI, Metallurgy
- Manfred Rogl, Wien University
- Saverio Russo, DCCI, Industrial Chemistry
- Adriana Saccone, Inorganic Chemistry
- Sergio Thea, DCCI, Organic Chemistry

### *Medicinal, Food, and Cosmetic Sciences*

- Alessandro Balbi (coordinator), DIFAR, Medicinal Chemistry
- Annamaria Bassi, DIMES, General Pathology
- Raffaella Boggia, DIFAR, Food Chemistry
- Gabriele Caviglioli, DIFAR, Analytical Chemistry
- Francesco Lucchesini, DIFAR, Pharmaceutical Technologies
- Angelo Ranise, DIFAR, Medicinal Chemistry
- Bruno Tasso, DIFAR, Medicinal Chemistry
- Carla Villa, DIFAR, Pharmaceutical Technologies

### *Material Science and Technology*

- Gabriella Borzone (coordinator), DCCI, Inorganic Chemistry
- Giovanni Carlo Alfonso, DCCI, Industrial Chemistry
- Antonello Barbucci, DICCA, Chemistry Foundations of Technologies

- Guido Busca, DICCA, Industrial and Technological Chemistry
- Maurizio Canepa, DIFI, Experimental Physics
- Maurizio Ferretti, DCCI, Physical Chemistry
- Elisabetta Finocchio, DICCA, Chemistry Foundations of Technologies
- Enrico Galleani, DIFI, Experimental Physics
- Alessandra Gliozzi, DIFI, Applied Physics
- Herbert Ipser, Wien University

The **Scientific Committee**, formed by experts outside the university of Genova, has the function of evaluating the activity of the school and to propose recommendations for its improvement. It must issue a report at the start of each cycle, containing possible suggestions, and an evaluation report at the end of each cycle. For the XXIV cycle it was formed by:

- Jean-Pierre Bros, universit  Aix-Marseille 1 (France)
- Giovanni Camino (Politecnico di Torino ad Alessandria)
- Fabio Comin, ESRF, Grenoble (France)
- Cristina Emanuel (L'Oreal, Milano)
- Sergio Fera (ILVA, Genova)
- Stephen Hanessian, Universit  de Montr al (Canada), and University of California, Irvine (USA).
- Alberto Modelli, ST Microelectronics, Agrate Brianza (MI)
- Angelo Nora (FACI, Carasco)
- Daniele Piomelli (IIT, Genova and UC, Irvine)
- Bernard Testa, Universit  Lausanne (Switzerland)
- Antonio Triolo, Menarini Ricerche (Firenze)

### **RESEARCH ACTIVITY**

The total number of credits achieved in 3 years is 180. The research activity is the most important part of the doctorate course. Therefore the School has decided that this activity must correspond to a minimum of 150 credits and a maximum of 160 credits.

The research and course activities of the School are held in the followings Departments: Dep. of Chemistry and Industrial Chemistry (DCCI), Dep. of Pharmaceutical Sciences (DISCIFAR), Dep. of Chemistry and Pharmaceutical and Food Technologies (DICTFA), Department of Chemical and Process Engineering "G.B. Bonino" (DICheP), Department of Physics (DIFI).

At the end of each year, the students presented a written report and an oral presentation on their activity, which were evaluated by the Board of Professor of the specific doctorate.

### **COURSEWARE**

The remaining 20 to 30 credits are divided into these categories:

- Type A credits: short courses (4-6 hours) given by experts external to the university of Genova. Each course will have a value of 1 credit.
- Type B credits: courses given by the faculty of the School. 1 credit will correspond to 7 hours of lessons. The courses will be either of 2 or 3 credits.
- Type C credits: attendance to seminars held at the Departments involved (or in special cases also elsewhere). 1 credit corresponds to 8 seminars.
- Type D credits: participation to national or international schools for Ph.D. students. Typically a week school will count as 2 credits.
- Type E credits: the student will prepare (also through a bibliographic search) and present a seminar on a particular subject (different from its own research work). A seminar of this kind will correspond to 2 credits.

- Type F credits: only in particular cases, when the student must fill an important gap in disciplines necessary for his/her research work, the student can be invited by the Board of Professors to attend courses activated inside one of the "master" laureas related to the subjects of the school.

Each student has chosen the distribution of these credits according the specific rules independently established by each doctorate course.

During the three-year period spanned by the XXV cycle, the School has activated **21 type A Courses** and **24 type B courses specific for the doctorate (for a total of 55 credits)**, plus other 7 courses in common with the master degrees. The School has informed of about 80 seminars given at the University of Genova and related to the subjects of the School. The courses, schools, workshops and seminars followed by each student are listed in the following certificates.

### **STUDENTS OF XXV CYCLE**

*Students who completed in due time the Doctorate Programme*

- Maurizio Bergamino (STM)
- Valeria Bongiorno (STC)
- Riccardo Carlini (STM)
- Sara Castellaro (SFAC)
- Chiara Costa (STM)
- Daniele Duce (STC)
- Emanuela Giacomelli (SFAC)
- Oleksandr Holovenko (STC)
- Dario Massabò (STM)
- Fabio Morana (STC)
- Dion Nole (STM)
- Elisa Pastore (STM)
- Massimo Rocca (SFAC)
- Chiara Toccafondi (STM)
- Stefania Zappia (STC)

*Students from previous cycles who underwent the defense in 2013*

- Paola Zito (STC)

**PICTURES OF FINAL PROCLAMATION**





UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



***(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)***

PH.D. CERTIFICATE *OF*  
**MAURIZIO BERGAMINO**



**Doctorate Course:**

*Materials Science and Technology*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Ranieri Rolandi*

**Thesis Title:**

*Spectroscopy tools to study biological systems*

**Defense Date:**

*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Maurizio Bergamino has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF MAURIZIO BERGAMINO,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the University of Genova (Department of Physics and Department of Neurosciences, Ophthalmology, and Genetics). However the student **spent a research period of 8 months abroad**, at the Krasnow Institute for Advanced Study, George Mason University, Fairfax, Virginia, USA under the supervision of prof. Giorgio A. Ascoli.

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Bergamino, M.; Saitta, L.; Castellan, L.; Zona, G.; Bartolini, B.; Spaziante, R.; Roccatagliata, L., Cerebral Aneurysms Database, a New Free Database for Intracranial Aneurysms, *Neuroinformatics*, **2011**, 9, 427-430. IMPACT FACTOR (2010): 3.027
- 2) Gallina, A.M., Bisignano, P., Bergamino, M.; Bordo, D. PLI: a web-based tool for the comparison of protein-ligand interactions observed on PDB structures, *Bioinformatics*, **2012**, in press. Doi: 10.1093/bioinformatics/bts691. IMPACT FACTOR (2011): 5.468

Original publications on non ISI Journals:

- 1) Hamilton, D.J.; Bergamino, M.; DeFelipe, J.; Le Nove`re, N.; Shepherd, G.M.; Witter M.P.; Ascoli, G.A., Machine-Readable Description of Neuron Types and Properties, *Front. Neuroinform.*, in press, doi: 10.3389/conf.fninf.2011.08.00102.

## *Communications at Conferences*

Oral Communications

- 1) Bergamino, M., "Interazione rame- $\beta$ 2 microglobulina: uno studio di spettroscopia in fluorescenza ed EXAFS", Miniworkshop e Convegno CIMIN – Misfolding proteico e amiloidosi V, Genova, 28-29/5/2010.

Posters

- 2) Bergamino, M.; Relini, A.; Gliozzi, A.; Ardelli, F.B.; Bellotti, V.; Rolandi, R., "Extended X-Ray Adsorption Fine Structure Spectroscopy of  $\beta$ 2-microglobulin in the presence of  $\text{Cu}^{2+}$ ", 18th SILS congress (Società Italiana Luce di Sincrotrone), Padova, 24-26/6/2010.

## *Congresses Attended*

- 1) "Risonanza Magnetica in Medicina: dalla ricerca tecnologica avanzata alla pratica clinica.", Milano, 4-5/2/2010.
- 2) 18th SILS congress (Società Italiana Luce di Sincrotrone), Padova, 24-26/6/2010.
- 3) Italian mri/mrs users' meeting, Torino, 21/7/2010.
- 4) IV European Conference of Medical Physics: Advanced in High Field Magnetic Resonance Imaging, Udine, 23-25/9/2010.
- 5) "Chem4Life", Genova, 18/1/2012.

## *Courseware*

During his doctorate, Maurizio Bergamino has acquired 19.5 credits of Courseware.

## *Courses attended and passed (11 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Surface Science (3 credits) (2010)
- 2) Optical Properties of Materials (3 credits) (2010)
- 3) Applications of RAMAN spectroscopy to materials (2 credits) (2010)

*Courses Given by invited experts:*

- 1) Approaches to Synthesis and Characterization of Metal Oxide Magnetic Nanomaterials (Lorenza Suber, C.N.R., Roma) (2010) (1 credit).
- 2) Polymer Assisted Solution Phase Combinatorial Synthesis (Luca Raveglia, NiKem, Bollate (MI))(2010) (1 credit).
- 3) Use of neutrons in Material Science (Claudia Mondelli, Institut Langevin, Grenoble, France) (2011) (1 credit).

## *National and International Schools or Workshops (4.5 credits)*

- 1) *Miniworkshop e Convegno CIMIN – Misfolding proteico e amiloidosi V*, Genova, 28-29/5/2010 (1 credit).
- 2) *Refresh Course organised by AIFM Medical Physics School "Caldirola" and ESMRMB in Advanced in High Field Magnetic Resonance*, Udine 22-25/9/2010 (2 credits)



- 3) *Tecniche avanzate in RM: Diffusione e Spettroscopia*, Milano, 10/11/2011 (0.5 credits).
- 4) *Mininorkshop su Misfolding Proteico e Amiloidosi e Convegno del Consorzio Interuniversitario delle Malattie Neurodegenerative*, Genova, 4-5/5/2012 (1 credit).

### **Seminars Given (2 credits)**

The student presented 3 seminars as final test for the 3 attended courses given by internal lecturers (see above).

### **Seminars Attended (2 credits)**

- 1) 27/1/2010, Dept. of Earth Sciences and Territory, "Quasicristalli Naturali: Un nuovo "stato della materia" in natura", Dr. Luca Bindi, Università di Firenze.
- 2) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 3) 16/2/2010, Dept. of Physics, "Inquinamento atmosferico, cambiamenti climatici e fisica nucleare", Prof. Paolo Prati, INFN, Genova.
- 4) 27/4/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Sistemi innovativi per la veicolazione di acidi nucleici", Elias Fattal, Université de Paris Sud, UMR CNRS 8612 Physico-Chimie - Pharmacotechnie – Biopharmacie.
- 5) 3/5/2010, Dept. of Biology, "Effetto Metabolico delle Iodotironine", Prof.ssa Gabriella Gallo, Università di Genova.
- 6) 18/5/2010, Dept. of Physics, "Comprendere un catalizzatore eterogeneo tramite misure di diffrazione di raggi-x in situ", Roberto Felici, European Synchrotron Radiation Facility, Grenoble, France.
- 7) 8/6/2010, Dept. of Chemistry and Industrial Chemistry, "L'opzione nucleare in Italia", Dr. Stefano Maggiolo, Agenzia Regionale per la Protezione dell'Ambiente Ligure (A.R.P.A.L.).
- 8) 16/6/2010, Dept. of Chemistry and Industrial Chemistry, "Magnetic frustration, a way to new exotic phases", Prof. Julian G. Sereni, Lab. Bajas Temperaturas, CAB - CNEA, 8400 S.C. de Bariloche, Argentina.
- 9) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 10) 14/7/2010, Dept. of Experimental Medicine, "Possibile ruolo energetico della mielina. Prospettive nello studio del sonno e delle malattie neurodegenerative", Prof. A. Morelli, Università di Genova.
- 11) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritsky, University of Florida, Gainesville.
- 12) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 13) 14/10/2010, Dept. of Physics, "Growing semiconductor nanostructures with an AFM tip", Marco Rolandi, University of Washington, Seattle, WA (USA).
- 14) 10/11/2010, Lavagna, villa Grimaldi, "Nuove applicazioni RM nel grading tumorale", Laura Saitta, Ospedale San Martino di Genova
- 15) 10/11/2010, Lavagna, villa Grimaldi, "L'utilità clinica dell'imaging RM pesato in diffusione", Luca Roccatagliata, Università di Genova.
- 16) 24/11/2010, Lavagna, villa Grimaldi, "Il ruolo della risonanza magnetica nelle demenze ", Luca Roccatagliata, Università di Genova.
- 17) 7/2/2011, George Mason University, Fairfax (VA) (USA), "From ADD to Alzheimer's Use of Brain SPECT Imaging to Heal and Nurture the Brain Throughout the Lifespan", Joseph A. Annibali, M.D. Chief Psychiatrist. Amen Clinics.
- 18) 21/3/2011, George Mason University, Fairfax (VA) (USA), "Interacting Brain Systems for Learning in Humans: Evidence from Neuroimaging and Patient Research", Daphne Shohamy, Assistant Professor, Department of Psychology, Columbia University.
- 19) 21/7/2011, Krasnow Institute for Advanced Study, GMU, Fairfax, VA, USA, "Computational Modeling and Brain Aneurysms, Prof. Juan Cebral, George Mason University).
- 20) 12/09/2011, Dept. of Chemistry and Industrial Chemistry, "Polymeric nanocomposites: an overview from science to technology", Masami Okamoto, Toyota Technological Institute, Nagoya, Japan.
- 21) 20/10/11, Dept. of Chemistry and Industrial Chemistry, "Formation of hybrid compounds of interest in cultural heritage monitored by neutron scattering", Claudia Mondelli, Institut Langevin, Grenoble, France.
- 22) 05/06/2012, Dept. of Physics, "Biomolecular Recognition is Regulated Within Dense DNA Self-Assemblies", Dr. Matteo Castronovo (Centro di Riferimento Oncologico (CRO), Experimental and Clinical Pharmacology Unit, Aviano, Pordenone, Italy and Temple University, Department of Biology, Philadelphia, PA, USA).

### **Teaching Assistance**

- 1) Assistance to the module "Physics Laboratory" (Bachelor Degree in Biological Sciences) (2009/2010): 32 hours.
- 2) Assistance to the module "Physics Laboratory" (Bachelor Degree in Biological Sciences) (2011/2012): 32 hours.



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PH.D. CERTIFICATE OF  
**VALERIA BONGIORNO**



**Doctorate Course:**

*Chemical Sciences and Technologies*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Paolo Piccardo*

**Thesis Title:**

*Study, exploitation and conservation of metallic artworks  
belonging to Cultural Heritage of Liguria*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Valeria Bongiorno has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

HAS APPROVED THE THESIS OF VALERIA BONGIORNO,  
CONFERRING ON HER THE TITLE OF

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Valeria Bongiorno **has also spent research periods of 4 months abroad** carrying out researches for 1 month at the Departamento de Ciencia y Tecnología de Materiales y Fluidos of Zaragoza University (Spain) (from 20/1/2012 to 20/2/2012) and for 3 months at the Laboratoire de Dynamique, Interactions et Réactivité, Université Pierre et Marie Curie, Paris (France) (from 10/4/2012 to 9/7/2012).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Bongiorno, V.; Campodonico, S.; Caffara, R.; Piccardo P.; Carnasciali, M.M., Micro-Raman spectroscopy for the characterization of artistic patinas produced on copper-based alloys", *J. Raman Spectrosc.*, **2012**, *43*, 1617-1622. IMPACT FACTOR (2011): 3.087.
- 2) Piccardo, P.; Mödinger, M.; Ghiara, G.; Campodonico, S.; Bongiorno, V., Investigation on tentacle like corrosion features on prehistoric tin bronze objects, *Journal of Applied Physics A*, in press. IMPACT FACTOR (2011): 2.168.

Book Chapters:

- 1) Piccardo, P.; Bongiorno, V.; Campodonico, S., Artistic patinas on ancient bronze statues, in *Corrosion and conservation of cultural heritage artefacts*, Dillmann, P.; Adriens, A.; Angelini, M. Editors, Dave Watkinson, EFC, (in press).
- 2) Piccardo, P.; Bongiorno, V., Antiche genti del Tigullio a Chiavari dalla necropoli ligure al Medioevo, Atti del convegno "Effetto del rogo d'incinerazione su armille e borchie a campanella della necropoli di Chiavari", Chiavari, 24-25/9/2010 (in press).

## *Communications at Conferences*

Oral communications:

- 1) Bongiorno, V.; Piccardo, P.; Sborgi, F., "Diagnostica su monumenti ed elementi d'arredo metallici del Cimitero Monumentale di Staglieno", 33° Convegno Nazionale AIM, Brescia, 10-12/11/2010.
- 2) Bongiorno, V.; Piccardo, P.; Lahoz, R.; Lertora, E.; Bellot-Gurlet, L., "Prove di pulitura laser su campioni in bronzo patinati artificialmente ed invecchiati", 34° Congresso Nazionale dell'Associazione Italiana di Metallurgia (AIM), Trento, 7-9/11/2012.

Posters

- 3) Bongiorno, V.; Bruzzone, R.; Frassoni, L.; Parodi, E., "Il Bucintoro al molo di Venezia il giorno della Sensa: non-invasive and micro-invasive diagnostic analyses", 1st International Congress "Chemistry for cultural heritage (ChemCH)", Ravenna, 30/6-3/7/2010
- 4) Bongiorno, V.; Frassoni, L.; Campodonico, S.; Piccardo, P., "Micro-Raman, SEM-EDS and LOM-DF investigations on a Cu-based reparation plug from a bronze monument subjected to laser ablation", 4<sup>th</sup> Intensive School on Conservation Science, Teruel (Aragona) (Spagna), 19-30/7/2010.
- 5) Frassoni, L.; Bongiorno, V.; Marazza, R.; Piccardo, P.; Nicula, S., "Characterization of Cultural Heritage Materials: TERRA a portable XRD and XRF instrument", 4<sup>th</sup> Intensive School on Conservation Science, Teruel (Aragona) (Spagna), 19-30/7/2010.

## *Congresses Attended*

- 1) Chemistry for cultural heritage (ChemCH), Ravenna, 30/6-3/7/2010.
- 2) 33° Convegno Nazionale AIM, Brescia, 10-12/11/2010.
- 3) Workshop "Orizzonte sonoro del mondo antico", Trento, 15/2/2011.
- 4) Incontro, in occasione dell'Anno Internazionale della Chimica, presso il Liceo Cantonale di Lugano (Svizzera), 16-17/2/2011.
- 5) "French bronzes: materials and techniques of bronze sculpture (16th - 18th c.)", Paris (France), 9-12/6/2012.
- 6) 'Le Giornate del restauro: Artisti e Restauratori a confronto: L'Arte Contemporanea e il problema della conservazione', Sarzana (SP), 20/9/2012.
- 7) 34° Congresso Nazionale dell'Associazione Italiana di Metallurgia (AIM), Trento, 7-9/11/2012

## *Courseware*

During her doctorate, Valeria Bongiorno has acquired 47.5 credits of Courseware.

## *Courses attended and passed (33 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Fundamentals of scanning and transmission electron microscopy (3 credits) (2010)
- 2) Instrumental techniques for trace elements determination in pharmaceuticals, food products and environmental samples (2 credits) (2010)

- 3) Applications of RAMAN spectroscopy to materials (2 credits) (2010)
- 4) Macromolecular chemistry (4 credits) (2010)
- 5) Amorphous metallic materials and composite materials (3 credits) (2011)
- 6) Instrumental techniques in organic chemistry (4 credits) (2011)
- 7) Metallurgy (7 credits) (2011)
- 8) Metallurgy of non-ferrous metals (4 credits) (2011).

*Courses Given by invited experts:*

- 1) Soft Tissue Mechanics (Gerrit W.M. Peters, Eindhoven University of Technology, Mechanical Engineering Materials Technology) (2010) (1 credit)
- 2) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 3) Defects in solids (Peter Rogl, Wien University) (2011) (1 credit)
- 4) An introduction to the basic of research and innovation in industry (Claudio Boffito, University of Milano)(2011) (1 credit)

***National and International Schools or Workshops (8.5 credits)***

- 1) *Training course on "Micro invasive and non invasive spectroscopic techniques for cultural heritage"*, Ravenna, 27-29/6/2010 (1 credit).
- 2) *4<sup>th</sup> Intensive School on Conservation Science*, Teruel (Aragona) (Spagna), 19-30/7/2010 (4 credits).
- 3) *La microscopia digitale e le nuove tecniche analitiche*, Genova, 29/6/2011 (0.5 credits).
- 4) *1<sup>st</sup> Thematic School on Metallic Materials for Cultural Heritage*, Genova, 2-8/9/2011 (2 credits).
- 5) *Applicazione della Spettroscopia Raman alla Scienze della Terra*, Siena, 11-12/10/2011 (1 credit).

***Seminars Given (4 credits)***

- 1) 16-17/2/2011, Liceo Cantonale di Lugano (Switzerland), "Archeometria e metallurgia: la chimica applicata al patrimonio culturale in metallo".
- 2) 29/10/2011, Cimitero di Staglieno, Genova, "Conoscere la materia per conservarne la memoria".
- 3) 29/3/2012, Facoltà di Lettere, Genova, "Stato dell'arte e nuove prospettive nella diagnostica e il restauro di opere monumentali in bronzo".
- 4) 16/10/2012, Dept. of Chemistry and Industrial Chemistry, "Problemi e soluzioni nello studio dell'alterazione a combustibile SOFC".

***Seminars Attended (2 credits)***

- 1) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 2) 16/2/2010, Dept. of Physics, "Inquinamento atmosferico, cambiamenti climatici e fisica nucleare", Prof. Paolo Prati, INFN, Genova.
- 3) 17/2/2010, Dept. of Chemistry and Industrial Chemistry, "Chimica e Colore", Prof. Paolo Piaggio, Università di Genova.
- 4) 23/2/2010, Facoltà di Lettere, Genova, "Il ruolo del controllo chimico nell'intervento di restauro", Dr. Marco Nicola, Nicola Restauri (AT)
- 5) 9/3/2010, Facoltà di Lettere, Genova, "Degrado e interventi sui metalli", Dr. Paolo Piccardo, Università di Genova.
- 6) 16/3/2010, Dept. of Physics, "I numeri della musica. I rapporti tra musica, matematica e fisica da Pitagora ai tempi moderni, Prof. R. Musenich e G. Dillon, Università di Genova.
- 7) 23/4/2010, Dept. of Earth Sciences and Territory, "Mappatura degli edifici di rilevanza storico-artistica", Prof. Marco Lezzerini, Dipartimento di Scienze della Terra, Università di Pisa.
- 8) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 9) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 10) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Clusters in composti intermetallici", Monika Skrobanska.
- 11) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 12) 22/06/2011, Dept. of Chemistry and Industrial Chemistry, "Identification and characterization of unknown compounds in urine of neuroblastoma patients", Carlo Scapolla, Università di Genova.
- 13) 20/07/2011, Dept. of Chemistry and Industrial Chemistry, "Organic and hybrid solar cells: fundamentals and recent advances", Luiz Carlos Pimentel Almeida, Universidade Estadual de Campinas, Sao Paulo, Brasil.
- 14) 20/10/11, Dept. of Chemistry and Industrial Chemistry, "Formation of hybrid compounds of interest in cultural heritage monitored by neutron scattering", Claudia Mondelli, Institut Langevin, Grenoble, France.
- 15) 21/10/2011, Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society", Gérard Férey, Université de Versailles, France

- 16) 26/10/2011, Dept. of Chemistry and Industrial Chemistry, "Catalysis by hydrotalcites and related materials", Wishwanath Kalyani.
- 17) 09/11/2011, Dept. of Chemistry and Industrial Chemistry, "Degradation of glass at the interface with metals", E. Greiner-Wrona, Wroclaw University, Poland.
- 18) 29/03/2012, Facoltà di Lettere Genova, "Stato dell'arte e nuove prospettive nella diagnostica e il restauro di opere monumentali in bronzo", Dr. Patrick Storme (Università di Anversa), Derek Biront (Restauratore di Anversa)
- 19) 16/10/2012, Dept. of Chemistry and Industrial Chemistry "X-rays", Oleksandr Holovenko.
- 20) 15/11/2012, Dept. of Chemistry and Industrial Chemistry "Copper base alloy metallurgy in the Near East: the case of Bronze Age Levant", Ziad El Morr (Université Bordeaux 3 – Francia).

### *Teaching Assistance*

- 1) Assistance to the module "Characterization of materials for restoration" (Master Degree in Methodologies for Preservation and Restoration of Cultural Heritage) (2009/2010).
- 2) Assistance to the module "Metallurgy applied to cultural heritage" (Master Degree in Methodologies for Preservation and Restoration of Cultural Heritage) (2010/2011): 16 hours.



UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



*(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)*

PH.D. CERTIFICATE OF  
**RICCARDO CARLINI**



**Doctorate Course:**

*Materials Science and Technology*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Gilda Zanicchi*

*Dr. Francesco Rosalbino*

**Thesis Title:**

*Synthesis and characterization of intermetallic  
compounds for thermoelectric applications*

**Defense Date:**

*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Riccardo Carlini has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF RICCARDO CARLINI,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## Research Activity

The research activity was nearly entirely carried out at the Department of Chemistry and Industrial Chemistry and at the Department of Physics (University of Genova), apart from a series of journeys to Torino (Polytechnic) for performing special measurements.

## Scientific Publications

Original publications on ISI Journals:

- 1) Carlini, R.; Artini, C.; Borzone, G.; Masini, R.; Zanicchi, G.; Costa, G. A., Synthesis and characterisation of the compound CoSbS, *Journal of Thermal Analysis and Calorimetry*, **2011**, 103, 23-27. IMPACT FACTOR (2011): 1.604
- 2) Carlini, R.; Zanicchi, G.; Borzone, G.; Parodi, N.; Costa, G. A., Synthesis and characterization of the intermetallic compound NiSbS, *Journal of Thermal Analysis and Calorimetry*, **2012**, 108, 793-797. IMPACT FACTOR (2011): 1.604
- 3) Rosalbino, F.; Carlini, R.; Parodi, R.; Zanicchi, G., Effect of silicon and germanium alloying additions on the passivation characteristics of Fe<sub>3</sub>Al intermetallic in sulphuric acid solution, *Electrochimica Acta*, **2012**, 62, 305-312. IMPACT FACTOR (2011): 3.832.
- 4) Rosalbino, F.; Carlini, R.; Soggia, F.; Zanicchi, G.; Scavino, G., Influence of rare earth metals addition on the corrosion behaviour of copper in alkaline environment, *Corrosion Science*, **2012**, 58, 139-144. IMPACT FACTOR (2011): 3.734.
- 5) Rosalbino, F.; Zanicchi, G.; Carlini, R.; Angelini, E.; Marazza, R., Electrochemical corrosion behaviour of Sn-Ag-Cu (SAC) eutectic alloy in a chloride containing environment, *Materials and Corrosion-Werkstoffe Und Korrosion*, **2012**, 63, 492-496. IMPACT FACTOR (2011): 1.173.
- 6) Carlini, R.; Macciò, D.; Pani, M.; Parodi, N.; Zanicchi, G.; Costa, G.A., Synthesis and thermal properties of NiSbS-As doped phase", R. Carlini, D. Macciò, M. Pani, N. Parodi, G. Zanicchi, G. A. Costa, *Journal of Thermal Analysis and Calorimetry*, **2012**, dec., 1-5. DOI 10.1007/s10973-012-2841-1. IMPACT FACTOR (2011): 1.604
- 7) Rosalbino, F.; Carlini, R.; Zanicchi, G.; Scavino, G., Microstructural characterization and corrosion behaviour assessment of tellurides for thermoelectric applications, *Journal of Alloys and Compounds*, in press. IMPACT FACTOR (2011): 2.289.

Original publications on non ISI Journals:

- 1) Carlini, R.; Carnasciali, M.M., La fiamma: una fucina di idee, *CNS-Chimica nella Scuola*, **2012**, 5.
- 2) Carlini, R., Progetto Lauree Scientifiche: conoscere per sapere, *CNS-Chimica nella Scuola*, **2012**, 1, 52-57.
- 3) Cardinale, A.M.; Carlini, R.; Maccagno, M.; Mosconi, R.; Petrillo, G.; Ricco, L., "Scienza: dalla storia al futuro", *CNS-Chimica nella Scuola*, **2012**, 3, ....

## Communications at Conferences

Posters

- 1) Carlini, R.; Rosalbino, F.; Zanicchi, G.; Marazza, R., "Electrochemical corrosion study of Cu<sub>90</sub>Er<sub>10</sub> alloys (r = Ce, Nd, Gd, Er, Y) in NaOH solution", 3° Forum nazionale dei giovani ricercatori di scienza e tecnologia dei materiali, Padova, 22-24/03/2010.
- 2) Carlini, R.; Rosalbino, F.; Zanicchi, G.; Marazza, R.; Mazzone, D.; Riani, P.; Puzo, E., "Electrochemical corrosion study of eutectic Sn-Ag-Cu solder alloy in NaCl solution", Giornate Italo-Francesi della chimica - GIFC 2010. Genova, 26-27/04/2010.
- 3) Carlini, R.; Marré, D.; Sicco, A.; Marazza, D.; Zanicchi, G., "Synthesis and thermoelectric properties of (Zn<sub>1-x</sub>Al<sub>x</sub>)<sub>4</sub>Sb<sub>3</sub> and (Zn<sub>1-x</sub>Ag<sub>x</sub>)<sub>4</sub>Sb<sub>3</sub> compounds", VIII Convegno Nazionale Sulla Scienza e Tecnologia dei Materiali – Aci Castello (CT) 26-29/6/2011.
- 4) Carlini, R.; Borzone, G.; Zanicchi, G.; Rosalbino, F.; Marazza, R., "Study of RCd<sub>6</sub> (R= rare earth) compounds for thermoelectric applications", 8<sup>th</sup> European Conference on Thermoelectrics - ECT 2010, Como, 22-24/09/2010.
- 5) Carlini, R.; Odella, C.; Parodi, N., "Rappresentazione di modelli microscopici in diversi livelli di istruzione", XXIV Congresso della Società Chimica Italiana, Lecce 11-16/9/2011.
- 6) Carlini, R.; Rosalbino, F.; Parodi, R.; Zanicchi, G., "Effect of Si and Ge alloying addition on the electrochemical behaviour of the Fe<sub>3</sub>Al intermetallic compound", XXIV Congresso della Società Chimica Italiana, Lecce, 11-16/9/2011.
- 7) Rosalbino, F.; Carlini, R.; Parodi, R.; Zanicchi, G., Effect of Si and Ge alloying additions on the passivation characteristics of Fe<sub>3</sub>Al intermetallic compound in NaCl solution, Journées Franco-Italiennes de Chimie 2012 Marseille, 16-17/04/2012
- 8) Carlini, R.; Rosalbino, F.; Zanicchi, G., Synthesis, microstructural and electrochemical characterization of tellurides for thermoelectric applications, 4° Forum nazionale dei giovani ricercatori di scienza e tecnologia dei materiali, Padova, 28-30/05/2012.
- 9) Carlini, R.; Marré, D.; Pallecchi, I.; Ricciardi, R.; Zanicchi, G., Effects of Al and Ag doping on thermoelectric properties of Zn<sub>4</sub>Sb<sub>3</sub> intermetallic compound, Third international symposium on green chemistry for environment, health and development, Skiathos Island, Greece, 3-5/10/2012.

- 10) Carlini, R.; Carnasciali, M.M; Soggia, F.; Campodonico, S.; Zanicchi, G., Microraman And Icp-Aes Corrosion Behaviour Investigation On  $Zn_4Sb_3$  And Al, Ag Doped Phase In Sodium Chloride Solution, Syntheses and Methodologies in Inorganic Chemistry. Chemistry for Life Sciences and Renewable Energy, Brixen/Bressanone (Bz, Italy) 2-6/12/2012.

### ***Congresses Attended***

- 1) 3° Forum nazionale dei giovani ricercatori di scienza e tecnologia dei materiali, Padova, 22-24/03/2010.
- 2) Giornate Italo-Francesi di chimica - GIFC 2010, Genova, 26-27/04/2010.
- 3) 8<sup>th</sup> European Conference on Thermoelectrics - ECT 2010, Como, 22-24/09/2010.
- 4) VIII Convegno INSTM, Aci Castello (Catania), 26-29/6/2011.
- 5) XXIV Congresso Nazionale Della Società Chimica Italiana, Lecce, 11-16/9/2011
- 6) Journées Franco-Italiennes de Chimie 2012, Marseille, 16-17/04/2012.
- 7) 4° Forum nazionale dei giovani ricercatori di scienza e tecnologia dei materiali. Padova, 28-30/05/2012
- 8) Third international symposium on green chemistry for environment, health and development, Skiathos Island, Greece, 3-5/10/2012.
- 9) Syntheses and Methodologies in Inorganic Chemistry. Chemistry for Life Sciences and Renewable Energy, Brixen/Bressanone (Bz, Italy) 2-6/12/2012.

### ***Courseware***

During his doctorate, Riccardo Carlini has acquired 16.5 credits of Courseware.

### ***Courses attended and passed (12 credits)***

*Courses Given by Teachers of the University of Genova:*

- 1) Corrosion and protection of materials (5 credits) (2010)
- 2) Synthesis, structure, and functional properties of intermetallic materials (2 credits) (2010).
- 3) Amorphous metallic materials and composite materials (3 credits) (2011)

*Courses Given by invited experts:*

- 1) Clathrates: Formation, Crystal Chemistry, Phase Relations and Properties (Peter Rogl, Wien University) (2010) (1 credit).
- 2) Defects in solids (Peter Rogl, Wien University) (2011) (1 credit)

### ***National and International Schools or Workshops (0.5 credits)***

- 1) *Workshop "L'Evoluzione della microscopia dal 2D al 3D"*, Genova, 29/06/2011 (0.5 credits).

### ***Seminars Given (2 credits)***

The student *presented* 2 seminars as final test for 2 of the attended courses given by internal lecturers (see above).

### ***Seminars Attended (2 credits)***

- 1) 27/1/2010, Dept. of Earth Sciences and Territory, "Quasicristalli Naturali: Un nuovo "stato della materia" in natura", Dr. Luca Bindi, Università di Firenze.
- 2) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 3) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 4) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 5) 8/7/2010, Dept. of Chemistry and Industrial Chemistry, "Linear Rigid-Rod Polyelectrolytes: High Conductivity at Low Relative Humidity Due to "Frozen-in" Free Volume. Applications to Fuel Cell Technology", Prof. Morton Litt, Dept. Macromolecular Sciences and Engineering, Case Western University, Cleveland OH, USA.
- 6) 14/10/2010, Dept. of Physics, "Growing semiconductor nanostructures with an AFM tip", Marco Rolandi, University of Washington, Seattle, WA (USA).
- 7) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 8) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 9) 6/5/2011, Dept. of Chemistry and Industrial Chemistry, "Approcci analitici innovativi per caratterizzare i materiali organici in dipinti", Maria Perla Colombini, Università di Pisa.



- 10) 22/06/2011, Dept. of Chemistry and Industrial Chemistry, "Identification and characterization of unknown compounds in urine of neuroblastoma patients", Carlo Scapolla, Università di Genova.
- 11) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Effetti di processing meccanico su materiali termoelettrici", Carlo Fanciulli, IENI-CNR, Lecco.
- 12) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Impiego dei moduli termoelettrici", Dr. Matteo Codecasa, IENI-CNR, Lecco.
- 13) 20/07/2011, Dept. of Chemistry and Industrial Chemistry, "Organic and hybrid solar cells: fundamentals and recent advances", Luiz Carlos Pimentel Almeida, Universidade Estadual de Campinas, Sao Paulo, Brasil.
- 14) 21/10/2011, Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society", Gérard Férey, Université de Versailles, France.
- 15) 09/11/2011, Dept. of Chemistry and Industrial Chemistry, "Degradation of glass at the interface with metals", E. Greiner-Wrona, Wroclaw University, Poland.
- 16) 25/11/2011, Dept. of Chemistry and Industrial Chemistry, "Materiali per lo stoccaggio dell'idrogeno in stato solido: recenti risultati e possibili sviluppi", Giovanni Principi, Università di Padova).
- 17) 20/06/2012, Dept. of Chemistry and Industrial Chemistry, "Materiali avanzati per la sostenibilità energetica: superconduttori e termoelettrici", Paolo Mele (Institute for Sustainable Sciences and Development, Hiroshima University, Japan).

### *Teaching Assistance*

- 1) Assistance to the module "General and Inorganic Chemistry with Laboratory" (Bachelor Degree in Biological Sciences) (2009/2010).
- 2) Assistance to the module "General and Inorganic Chemistry with Laboratory" (Bachelor Degrees in Geology and Material Sciences) (2010/2011).



UNIVERSITÀ DEGLI STUDI DI GENOVA  
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PH.D. CERTIFICATE OF  
**SARA CASTELLARO**



**Doctorate Course:**

*Pharmaceutical, Food and Cosmetic Sciences*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Marco Pucci*

**Thesis Title:**

*Macromolecular systems with complex architecture  
for applications in nanomedicine*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Pharmacy, Sara Castellaro has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Daniela Barlocco, University of Milano
- Prof. Paolo Crotti, University of Pisa
- Prof. Alessandro Balbi, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF SARA CASTELLARO,  
CONFERRING ON HER THE TITLE OF**

**RESEARCH DOCTOR IN  
PHARMACEUTICAL, FOOD AND COSMETIC SCIENCES**

The commission has evaluated the thesis and the overall activity of Dr. Sara Castellaro as  
**EXCELLENT**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Alessandro Balbi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Pharmaceutical and Food Technologies (now Department of Pharmacy) (University of Genova). However, Sara Castellaro has also **spent a 3.5 months period abroad**, at the "Institute of Child Health", University College, London (05/03/2012-15/06/2012). Moreover, she spent a 2 months period working at the Laboratorio di Manipolazione Cellulare Terapeutica "M. Cavaliere", Dipartimento di Oncologia, dei Trapianti e delle Nuove Tecnologie in Medicina, Pisa Hospital (under the supervision of Prof. M. Petrini) (october-november 2012).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Pocci, M.; Alfei, S.; Lucchesini, F.; Castellaro, S.; Bertini, V., "Synthesis and NMR investigation of styrene glycopolymers containing D-galactose units functionalized with 4-(4-hydroxybutoxy)benzylamine residues", *Polymer Chemistry*, **2013**, *4*, 740-751. IMPACT FACTOR (2011): 5.321.

## *Communications at Conferences*

Oral communications:

- 1) Castellaro, S., Macromolecular Systems with Complex Architecture for Applications in Nanomedicine, XXXVII Scuola di Sintesi Organica "A.Corbella", Gargnano (BS), 18-22/6/2012

Posters:

- 1) Lucchesini, F.; Pocci, M.; Alfei, S.; Castellaro, S.; Bertini, V., "Synthesis and NMR investigation of model molecules for glycosylation reactions of glycopolymers", XXXIII Convegno Nazionale della Divisione di Chimica Organica della Società Chimica Italiana, S. Benedetto del Tronto, 12-16/9/2010.

## *Congresses Attended*

- 1) XXXIII Convegno Nazionale della Divisione di Chimica Organica della Società Chimica Italiana, S. Benedetto del Tronto, 12-16/9/2010.
- 2) "Nuovi Orientamenti nella Sintesi Organica", Milano, 15/11/2010.

## *Courseware*

During her doctorate, Sara Castellaro has acquired 25.7 credits of Courseware.

## *Courses attended and passed (19 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patents (2 credits) (2010).
- 2) Innovative pharmaceutical dosage forms: preparation and control methods (2 credits) (2010).
- 3) Dendritic macromolecules: synthesis and reactivity (2 credits) (2011).
- 4) Diversity Oriented Synthesis (2 credits) (2011)
- 5) In vitro tests for evaluation of toxicity and biological action of chemical compounds (2 credits) (2011).
- 6) NMR spectroscopy in the characterization of synthetic polymers (2 credits) (2011).

*Courses Given by invited experts:*

- 1) The LC-MS toolbox for structural elucidation of trace compounds: applications in drug discovery and development (Antonio Triolo, Menarini)(2010) (1 credit)
- 2) Scale-up of Oral Solid Dosage Forms Manufacturing Processes – Technological and Regulatory Key Facts (Paolo Gatti)(2010) (1 credit).
- 3) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 4) Polymer Assisted Solution Phase Combinatorial Synthesis (Luca Raveglia, NiKem, Bollate (MI))(2010) (1 credit).
- 5) The application of transition metal catalysis in multicomponent and domino reactions (Thomas Müller, Düsseldorf University, Germany) (2011) (1 credit).
- 6) "Nucleic acids in medicinal chemistry: targets or drugs?" (Claudia Sissi, Università di Padova) (2011) (1 credit).
- 7) Basic aspects and new trends in mass spectrometry (Pietro Traldi, C.N.R., Padova)(2012) (1 credit).

## *National and International Schools or Workshops (4.7 credits)*

- 1) XXXVI Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 13-17/6/2011 (2 credits).
- 2) L'evoluzione della microscopia dal 2D al 3D, Istituto Italiano della Saldatura, Genova, 29/06/2011 (0.5 credits).
- 3) XXXVII Scuola di Sintesi Organica "A.Corbella", Gargnano (BS), 18-22/6/2012 (2 credits).
- 4) Computational Chemistry and Life Science Software of Fujitsu, Genova, 05/07/2012 (0.2 credits).

### ***Seminars Given (2 credits)***

- 1) 04/12/2012, Dept. of Pharmacy, "Scaffolds per Ingegneria Tissutale".

### ***Seminars Attended (2 credits)***

- 1) 25/2/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Optimization methods in chromatography", Prof. Rafael Cela, Universidad de Santiago di Compostela.
- 2) 27/4/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Sistemi innovativi per la veicolazione di acidi nucleici", Elias Fattal, Université de Paris Sud, UMR CNRS 8612 Physico-Chimie - Pharmacotechnie – Biopharmacie.
- 3) 8/6/2010, Dept. of Chemistry and Industrial Chemistry, "L'opzione nucleare in Italia", Dr. Stefano Maggiolo, Agenzia Regionale per la Protezione dell'Ambiente Ligure (A.R.P.A.L.).
- 4) 8/7/2010, Dept. of Chemistry and Industrial Chemistry, "Linear Rigid-Rod Polyelectrolytes: High Conductivity at Low Relative Humidity Due to "Frozen-in" Free Volume. Applications to Fuel Cell Technology", Prof. Morton Litt, Dept. Macromolecular Sciences and Engineering, Case Western University, Cleveland OH, USA.
- 5) 16/07/2010, Dept. of Chemistry and Industrial Chemistry, "Formation of Multiple Stereocenters via Organocatalysis", Dott. Marco Bella, Dipartimento di Chimica, Università La Sapienza.
- 6) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Organic Synthesis "on water"", Valentina Cerulli
- 7) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Self-assembly and crystallization in block copolymers", Dario Cavallo
- 8) 16/07/2010, Dept. of Chemistry and Industrial Chemistry, "Formation of Multiple Stereocenters via Organocatalysis", Dott. Marco Bella, Dipartimento di Chimica, Università La Sapienza.
- 9) 22/11/2010, Dept. of Pharmaceutical Sciences, "Combinatorial Chemistry", Laura Buffa.
- 10) 22/11/2010, Dept. of Pharmaceutical Sciences, "Le micotossine nelle colture e nei prodotti alimentari", Silvia Mannino.
- 11) 22/11/2010, Dept. of Pharmaceutical Sciences, "Molecular Dynamic Simulation: an updated overview on Prion Protein", Gerolamo Vettoretti.
- 12) 11/3/2011, Dept. of Chemistry and Pharmaceutical and Food Technologies, "L'organizzazione della industria farmaceutica secondo le GMP", Dr. Raffaella Pintus, Bruschetini S.r.l.
- 13) 22/11/2011, Dept. of Chemistry and Industrial Chemistry, "Synthesis as an enabling Science: from Concept to Practice", Stephen Hanessian, Université de Montreal and Irvine University.
- 14) 2/12/2011, Dept. of Pharmaceutical Sciences, "Blood brain barrier", P. Cirrincione.
- 15) 2/12/2011, Dept. of Pharmaceutical Sciences, "Fungicidi chimici usati in agricoltura: impatto sociale, patogeni target ed evoluzione", A.P. Lanteri.
- 16) 2/12/2011, Dept. of Pharmaceutical Sciences, "Click chemistry, an interesting tool in pharmaceutical sciences", F. Musumeci.
- 17) 2/12/2011, Dept. of Pharmaceutical Sciences, "Processi di estrazione assistiti da microonde", G. Priarone
- 18) 2/12/2011, Dept. of Pharmaceutical Sciences, "Rare diseases and orphan drugs", C. Rotolo.
- 19) 04/12/2012, Dept. of Pharmacy, "Raman Spectroscopy", Massimo Rocca.
- 20) 04/12/2012, Dept. of Pharmacy, "Introduction to Plants Metabolomics", Emanuela Giacomelli.

### ***Teaching Assistance***

- 1) Assistance to the module "Laboratory of drug analysis" (Master Degree in Chemical and Pharmaceutical Technologies) (2010/2011): 37 hours.
- 2) Assistance to the module "Organic Chemistry" (Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies) (2010/2011): 20 hours.
- 3) Assistance to the module "Pharmaceutical technology, socioeconomy and law" (Master Degree in Chemistry and Pharmaceutical Technologies) (2012/2013): 20 hours.
- 4) Organic Chemistry tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2010): 37 hours.
- 5) Organic Chemistry tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2011): 56 hours.
- 6) Organic Chemistry tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2012): 52 hours.



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**PH.D. CERTIFICATE OF  
CHIARA COSTA**



**Doctorate Course:**  
*Materials Science and Technology*  
**Start of the Doctorate Program:**  
*January 1<sup>st</sup>, 2010*  
**End of the Doctorate Program:**  
*December 31<sup>st</sup>, 2012*  
**Advisors:**  
*Prof. Gabriella Borzone*  
**Thesis Title:**  
*Protective coatings for high temperature  
and aggressive sea environment*

**Defense Date:**  
*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Chiara Costa has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF CHIARA COSTA,  
CONFERRING ON HER THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

The commission has evaluated the thesis and the overall activity of Dr. Chiara Costa as  
**EXCELLENT**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Chiara Costa **has also spent research periods of 6 months abroad** carrying out researches at EMPA (Swiss Federal Laboratories for Material Science and Technology), Dübendorf (Switzerland) under the supervision of Prof. Dr. J. Janczak-Rusch. (from 01/02/2012 to 30/06/2012 and from 31/08/2012 to 28/09/2012).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Costa, C.; Barbareschi, E.; Guarnone, P.; Borzone, G., Phase evolution in an MCrAlY coating during high temperature exposure", *Journal of Mining and Metallurgy, Section B*, **2012**, *48*, 359-365. IMPACT FACTOR (2011): 1.317

## *Communications at Conferences*

Posters

- 1) Costa, C.; Delsante, S.; Borzone, G., "An investigation on diffusion coatings for turbine blade", XVI Scuola Nazionale di Scienza Dei Materiali, Bressanone-Brixen, 27/9-3/10/2010.
- 2) Costa, C.; Barbareschi, E.; Borzone, G.; Novakovic, R., "Thermodynamic modelling of bulk and surface properties of liquid Co-Cr-Ni alloys", VIII Convegno Nazionale INSTM sulla Scienza e Tecnologia dei Materiali, 26-29/6/2011.

## *Congresses Attended*

- 1) COST - NANOALLOY ACTION, Scientific Kickoff Meeting, 18-20/10/2010, Genova.
- 2) COST Action: MP0602, Meeting title: Working Group 3: "Multiscale simulation of heterogeneous materials and coupling of thermodynamic models" 12-14/1/2011, Leuven (Belgium).
- 3) VIII Convegno Nazionale INSTM sulla Scienza e Tecnologia dei Materiali, 26-29/6/2011, Acicastello - Catania.

## *Courseware*

During her doctorate, Chiara Costa has acquired 41 credits of Courseware.

## *Courses attended and passed (23 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Fundamentals of scanning and transmission electron microscopy (3 credits) (2010)
- 2) Corrosion and protection of materials (5 credits) (2010)
- 3) Chemometric strategies and algorithms and their applications (3 credits) (2011).

*Courses Given by invited experts:*

- 1) Clathrates: Formation, Crystal Chemistry, Phase Relations and Properties (Peter Rogl, Wien University) (2010) (1 credit).
- 2) Approaches to Synthesis and Characterization of Metal Oxide Magnetic Nanomaterials (Lorenza Suber, C.N.R., Roma) (2010) (1 credit).
- 3) Nanomagnetism and magnetic recording. (Prof. Marco Affronte, Università di Modena) (2010) (1 credit).
- 4) Defects in solids (Peter Rogl, Wien University) (2011) (1 credit)
- 5) An introduction to the basic of research and innovation in industry (Claudio Boffito)(2011) (1 credit)
- 6) Use of neutrons in Material Science (Claudia Mondelli, Institut Langevin, Grenoble, France) (2011) (1 credit).

*Other Courses:*

- 1) Corrosione e protezione dei metalli, Milano (2011) (3 credits).
- 2) Career Planning, Monika Clausen (2012), attended at Dübendorf (0.5 credits)
- 3) Publishing in Science (2012), attended at Dübendorf (0.5 credits)

## *National and International Schools or Workshops (14 credits)*

- 1) *Scuola di Chemiometria* 2010, Genova, 24-27/5/2010 (2 credits).
- 2) *SERP-IP-10 Summer School*, Genova, 31-5/11-6/2010 (3 credits)
- 3) *School of Experimental Design*, 6-10/9/2010, Genova (2 credits)
- 4) *XVI Scuola Nazionale di Scienza dei Materiali*, 27-9/2-10/2010, Bressanone (BZ) (2 credits)
- 5) *Workshop on "Multiscale simulation of heterogeneous materials and coupling of thermodynamic models"*, Leuven (Belgium) 12-14/1/2011 (1.5 credits).
- 6) *Scuola di metodi chemiometrici per il monitoraggio di processo*, Modena 14-16/3/2011 (1.5 credits).
- 7) *MATGEN-IV- "Materials for Generation IV nuclear reactors"*, 19-23/9/2011, Lerici (La Spezia) (2 credits).

### ***Seminars Given (2 credits)***

The student presented 3 seminars as final test for the 3 attended courses given by internal lecturers (see above).

### ***Seminars Attended (2 credits)***

- 1) 27/1/2010, Dept. of Earth Sciences and Territory, "Quasicristalli Naturali: Un nuovo "stato della materia" in natura", Dr. Luca Bindi, Università di Firenze.
- 2) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 3) 17/2/2010, Dept. of Chemistry and Industrial Chemistry, aula 3, "Chimica e Colore", Prof. Paolo Piaggio, Università di Genova.
- 4) 13/5/2010, Dept. of Chemistry and Industrial Chemistry, "High temperature lead-free soldering and experimental thermodynamics of intermetallic systems", Hans Flandorfer, Department for Inorganic Chemistry / Materials Chemistry Vienna University.
- 5) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 6) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 7) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Clusters in composti intermetallici", Monika Skrobanska.
- 8) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 9) 2/11/2010, Dept. of Physics, "Dynamics of reactions at surfaces", Gerhard Ertl, Max Planck Gesellschaft, Berlin.
- 10) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 11) 28/3/2011, Dept. of Physics, "Nanoscale Science with Peptides, Proteins and viruses", Dr. Alexander Bittner, CIC nanoGUNE Consolider, Nanoscience Cooperative Research Center, San Sebastian, Spain.
- 12) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 13) 9/6/2011, CNR-IENI, Genova, "Between superconductors and cutting tools". Dr. Cristina Artini, National Research Council– Institute for Energetics and Interphases (CNR-IENI).
- 14) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Effetti di processing meccanico su materiali termoelettrici", Carlo Fanciulli, IENI-CNR, Lecco.
- 15) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Impiego dei moduli termoelettrici", Dr. Matteo Codecasa, IENI-CNR, Lecco.
- 16) 26/9/2011, CNR-IENI, Genova, "Radiation damage-tolerant nanostructured materials via atomic scale design of interfaces". Prof. Dr. J. A. Caro – Materials Science and Technology Division Los Alamos National Laboratory (New Mexico, USA).
- 17) 21/10/2011 Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society". Prof. Gérard Férey – Académie des Sciences et Institut Lavoisier, Université de Versailles, Versailles (Francia).
- 18) 09/11/2011, Dept. of Chemistry and Industrial Chemistry, "Degradation of glass at the interface with metals", E. Greiner-Wrona, Wroclaw University, Poland.
- 19) 21/12/2011 Dept. of Chemistry and Industrial Chemistry, "Neutron diffraction in the study of materials " Alessia Provino.
- 20) 2012, Dübendorf, "Developments of new self-healing polymer coatings combined with green corrosion inhibitors for active/passive corrosion protection of metals", H. Terry (Vrije Universiteit Brussel (VUB), Belgium & TU Delft, The Netherlands).

### ***Teaching Assistance***

- 1) Assistance to the module "Inorganic Chemistry 2" (Bachelor Degree in Chemistry and Chemical Technologies) (2010/2011): 24 hours.
- 2) Assistance to the module "Inorganic Chemistry 2" (Bachelor Degree in Chemistry and Chemical Technologies) (2011/2012): 24 hours.



UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



***(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)***

**PH.D. CERTIFICATE OF  
DANIELE DUCE**



**Doctorate Course:**

*Chemical Sciences and Technologies*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Massimo Ottonelli*

**Thesis Title:**

*Quantum chemical study of molecular and  
supramolecular properties of  $\pi$ -conjugated organic systems*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Daniele Duce has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF DANIELE DUCE,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)



# ACTIVITY REPORT

## *Research Activity*

The research activity was totally carried out at the Department of Chemistry and Industrial Chemistry (University of Genova).

### *Scientific Publications*

Original publications on ISI Journals:

- 1) Ottonelli, M.; Piccardo, M.; Duce, D.; Thea, S.; Dellepiane, G., Tuning the photophysical properties of pyrene-based systems: a theoretical study, *J. Phys. Chem. A*, **2012**, *116*, 611-630. IMPACT FACTOR (2011): 2.946.
- 2) Duce, D.; Ottonelli, M.; Thea, S.; Dellepiane, G., The influence of terminal group on the poly(para-phenylenevinylene) charge transfer integrals, *J. Nanosci. Nanotechnol.*, in press. IMPACT FACTOR (2011): 1.563.

Original publications on non ISI Journals:

- 1) Duce, D.; Ottonelli, M.; Alloisio, M.; Thea, S.; Dellepiane, G., A TD-DFT study of the spectroscopic properties of hollow silver cluster, *e-J. Surf. Sci. Nanotech*, **2012**, *10*, 530-534.
- 2) Ottonelli, M.; Piccardo, M.; Duce, D.; Thea, S.; Dellepiane, G., Koopmans' transfer integral calculation: a comparison between the Hartree-Fock and the Density Functional results, *Energy Procedia*, in press.

### *Communications at Conferences*

Posters:

- 1) Duce, D.; Ottonelli, M.; Piccardo, M.; Thea, S.; Dellepiane, G., "A theoretical study on the spectroscopical effects of rhodamine B and noble metals nanoparticles interactions", EUCMOS 2010, Firenze, 29/08-3/10/2010.
- 2) Piccardo, M.; Ottonelli, M.; Duce, D.; Thea, S.; Dellepiane, G., "Tuning the photophysical properties of pyrene-based systems: a theoretical study", EUCMOS 2010, Firenze, 29/08-3/10/2010.
- 3) Ottonelli, M.; Piccardo, M.; Duce, D.; Thea, S.; Dellepiane, G., "Koopmans' transfer integral calculation: a comparison between the Hartree-Fock and the Density functional results", E-MRS Spring Meeting 2011, Nice (France), 9-13/05/2011.
- 4) Duce, D.; Ottonelli, M.; Alloisio, M.; Thea, S.; Dellepiane, G., "First-principles study of silver nanocage clusters", VI Giornate Italo-Francesi della Chimica, Marseille (France), 16-17/04/2012.
- 5) Duce, D.; Ottonelli, M.; Thea, S.; Dellepiane, G., "The influence of terminal group on the poly(para-phenylenevinylene) charge transfer integrals", E-MRS Spring Meeting 2012, Strasbourg (France) 14-18/05/2012.
- 6) Duce, D.; Ottonelli, M.; Alloisio, M.; Thea, S.; Dellepiane, G., "A TD-DFT study of the spectroscopic properties of hollow silver cluster" 16<sup>th</sup> International Conference on Solid Films and Surfaces (ICSFS), Genoa (Italy), 1-6/07/2012.
- 7) Duce, D.; Ottonelli, M.; Alloisio, M.; Thea, S.; Dellepiane, G., "Intermolecular charge transfer in conjugated systems: effects of terminal groups" FUTURMAT 2 - Second International Meeting on the Organic Materials for a Better Future, Carovigno (Brindisi, Italy), 16-20/09/2012

### *Congresses Attended*

- 1) 30<sup>th</sup> European Congress of Molecular Spectroscopy, Firenze 29-8/3-9/2010.
- 2) E-MRS 2011 Spring Meeting (European Materials Research Society), Nice (France), 9-13/5/2011.
- 3) Kick-off meeting del PRIN 2009, Milano 13-14/12/2011.
- 4) VI Giornate Italo-Francesi della Chimica 2012, Marseille (France), 16-17/4/2012.
- 5) European Materials Research Society (EMRS-2012), Strasbourg (France), 14-18/5/2012.
- 6) International Conference on Solid Films and Surfaces, Genova, 1-6/7/2012.
- 7) FUTURMAT 2 "Second International Meeting on Organic Materials for a Better Future", Carovigno (Brindisi), 16-20/9/2012.

### *Courseware*

During his doctorate, Daniele Duce has acquired 25 credits of Courseware.

### *Courses attended and passed (19 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Mathematical methods for chemistry (2 credits) (2011).
- 2) Topics in solid state physics (3 credits) (2010).
- 3) Surface Science (3 credits) (2010).
- 4) Applications of RAMAN spectroscopy to materials (2 credits) (2010)
- 5) Organic Material for Electronics, Optoelectronics and Photonics (2 credits) (2010)
- 6) Optical properties of materials (3 credits) (2010)

*Courses Given by invited experts:*

- 1) Approaches to Synthesis and Characterization of Metal Oxide Magnetic Nanomaterials (Lorenza Suber, C.N.R., Roma) (2010) (1 credit).
- 2) Nanomagnetism and magnetic recording (Marco Affronte, University of Modena) (2010) (1 credit).
- 3) An introduction to the basic of research and innovation in industry (Claudio Boffito, University of Milano)(2011) (1 credit).
- 4) Basic aspects and new trends in mass spectrometry (Pietro Traldi, C.N.R., Padova)(2012).

***National and International Schools or Workshops (2 credits)***

- 1) 5° Scuola Nazionale di Introduzione alla Fotochimica, Bologna, 13-17/9/2010 (2 credits).

***Seminars Given (2 credits)***

- 1) 9/10/2012, Dept. of Chemistry and Industrial Chemistry, "Modelli di calcolo in dinamica molecolare".

***Seminars Attended (2 credits)***

- 1) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 2) 17/2/2010, Dept. of Chemistry and Industrial Chemistry, aula 3, "Chimica e Colore", Prof. Paolo Piaggio, Università di Genova.
- 3) 18/5/2010, Dept. of Physics, "Comprendere un catalizzatore eterogeneo tramite misure di diffrazione di raggi-x in situ", Roberto Felici, European Synchrotron Radiation Facility, Grenoble, France.
- 4) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 5) 8/6/2010, Dept. of Chemistry and Industrial Chemistry, "L'opzione nucleare in Italia", Dr. Stefano Maggiolo, Agenzia Regionale per la Protezione dell'Ambiente Ligure (A.R.P.A.L.).
- 6) 8/7/2010, Dept. of Chemistry and Industrial Chemistry, "Linear Rigid-Rod Polyelectrolytes: High Conductivity at Low Relative Humidity Due to "Frozen-in" Free Volume. Applications to Fuel Cell Technology", Prof. Morton Litt, Dept. Macromolecular Sciences and Engineering, Case Western University, Cleveland OH, USA.
- 7) 1/10/2010, Dept. of Chemistry and Industrial Chemistry, "TOPOS vs. Intermetallics", Prof. Vladislav A. Blatov, Department of Chemistry, Samara State University (Russia).
- 8) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Clusters in composti intermetallici", Monika Skrobanska.
- 9) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Molecular Modeling in Drug Design: Ligand-based drug design and Structure-based drug design", Paola Zito.
- 10) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 11) 14/10/2010, Dept. of Physics, "Growing semiconductor nanostructures with an AFM tip", Marco Rolandi, University of Washington, Seattle, WA (USA).
- 12) 3/12/2010, Dept. of Chemistry and Industrial Chemistry, "Magnetic properties of nanoparticles: the effect of particle size and beyond...", Davide Peddis, C.N.R., Istituto di Struttura della Materia, Roma
- 13) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 14) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 15) 22/06/2011, Dept. of Chemistry and Industrial Chemistry, "Identification and characterization of unknown compounds in urine of neuroblastoma patients", Carlo Scapolla, università di Genova
- 16) 20/07/2011, Dept. of Chemistry and Industrial Chemistry, "Organic and hybrid solar cells: fundamentals and recent advances", Dr. Luiz Carlos Pimentel Almeida, Universidade Estadual de Campinas, Sao Paulo, Brasil.
- 17) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "L'imaging iperspettrale, un emergente strumento analitico per il controllo di qualità e di processo alimentare ed ambientale.", L. Bagnasco.
- 18) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "Analytical methods for anti-doping control in sport", A. Bignasca.
- 19) 09/10/2012 Dept. of Chemistry and Industrial Chemistry, "Nanoparticles and cancer: from diagnosis to therapy" S. Zappia.

### *Teaching Assistance*

- 1) Assistance to the module "Physical Chemistry 1 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2010/2011): 60 hours.
- 2) Assistance to the module "Physical Chemistry 1 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2011/2012): 40 hours.
- 3) Assistance to the module "Physical Chemistry 1 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2012/2013): 40 hours.



UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



***(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)***

PH.D. CERTIFICATE OF  
**EMANUELA GIACOMELLI**



**Doctorate Course:**

*Pharmaceutical, Food and Cosmetic Sciences*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Angela Bisio*

**Thesis Title:**

*Isolation of bioactive compounds from aromatic plants to be acclimatized in Ligurian coastal areas*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Pharmacy, Emanuela Giacomelli has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Daniela Barlocco, University of Milano
- Prof. Paolo Crotti, University of Pisa
- Prof. Alessandro Balbi, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF EMANUELA GIACOMELLI,  
CONFERRING ON HER THE TITLE OF**

**RESEARCH DOCTOR IN  
PHARMACEUTICAL, FOOD AND COSMETIC SCIENCES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Alessandro Balbi)

# ACTIVITY REPORT

## Research Activity

The research activity was mainly carried out at the Department of Chemistry and Pharmaceutical and Food Technologies (now Department of Pharmacy) (University of Genova). However, Emanuela Giacomelli has also **spent a 7 months period abroad**, at the Université de Genève, Faculté des Sciences, Section des Sciences Pharmaceutique, under the supervision of Prof. Jean-Luc Wolfender (1/1/2011-4/3/2011, 1/12/2011-3/2/2012, 20/8/2012-30/11/2012).

## Scientific Publications

Original publications on ISI Journals:

- 1) Bisio, A.; Fraternali, D.; Giacomini, M.; Giacomelli, E.; Pivetti, S.; Russo, E.; Caviglioli, G.; Romussi, G.; Ricci, D.; De Tommasi, N., Phytotoxicity of *Salvia* spp. exudates, *Crop Protection*, **2010**, 29,1434-1446. IMPACT FACTOR (2011): 1.402.
- 2) Bisio, A.; Damonte, G.; Fraternali, D.; Giacomelli, E.; Sails, A.; Romussi, G.; Cafaggi, S.; Ricci, D.; De Tommasi, N., Phytotoxic clerodane diterpenes from *Salvia miniata* Fernald (Lamiaceae), *Phytochemistry*, **2011**, 72, 265-275. IMPACT FACTOR (2011): 3.351.
- 3) Schito, A. M.; Piatti, G.; Stauder, M.; Bisio, A.; Giacomelli, E.; Romussi, G.; Pruzzo, C., Effects of demethylfruticuline A and fruticuline A from *Salvia corrugata* Vahl. on biofilm production in vitro by multiresistant strains of *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Enterococcus faecalis*, *International Journal of Antimicrobial Agents*, **2011**, 37, 129-134. IMPACT FACTOR (2011): 4.128
- 4) Giampieri, L.; Bucchini, A.; Bisio, A.; Giacomelli, E.; Romussi, G.; Ricci, D., Total Phenolic Content and Antioxidant Activity of *Salvia* spp. Exudates, *Natural Product Communications*, **2012**, 7, 201-202. IMPACT FACTOR (2011): 1.242

Original publications on non ISI Journals:

- 1) Giacomini, M.; Bisio, A.; Giacomelli, E.; Pivetti, S.; Bertolini, S.; Fraternali, D.; Ricci, D.; Romussi, G.; De Tommasi, N., Data collection and advanced statistical analysis in phytotoxic activity of aerial parts exudates of *Salvia* spp, *Revista Brasileira De Farmacognosia-Brazilian Journal of Pharmacognosy*, **2011**, 21, 856-863.
- 2) Bisio, A.; Damonte, G.; Giacomini, M.; Fraternali, D.; Giacomelli, E.; Mele, G.; Romussi, G.; De Tommasi, N., Attività fitotossica di estratti di specie di *Salvia*, in "Le piante aromatiche tra ambiente ed attività produttive - Les plantes aromatiques, entre environnement et activité productive", Ruffoni B., Mercuri A., Cervelli C. Eds., Edizioni CRA-FSO, **2011**, p. 21.
- 3) Bisio, A.; Damonte, G.; Giacomelli, E.; Mele, G.; Romussi, G.; De Tommasi, N., Nuovi metaboliti estratti da *Salvia miniata*, in "Le piante aromatiche tra ambiente ed attività produttive - Les plantes aromatiques, entre environnement et activité productive", Ruffoni B., Mercuri A., Cervelli C. Eds., Edizioni CRA-FSO, **2011**, p. 15.

## Communications at Conferences

Oral communications:

- 1) Bisio, A.; Fraternali, D.; Damonte, G.; Giacomini, M.; Giacomelli, E.; Salis, A.; Russo, E.; Cafaggi, S.; Ricci, D.; Romussi, G.; De Tommasi, N., "Attività fitotossica di specie di *Salvia*", FITOMED 2010, IV Congresso Intersocietà sulle Piante Medicinali. Cagliari, 23-26/6/2010.
- 2) Giacomelli, E., "Attività fitotossica di specie di *Salvia* L. coltivate in Liguria", Scuola di Fitochimica "P. Ceccherelli" 2010, "Antiossidanti di origine naturale", Tirrenia (PI), 30/9-2/10/2010.
- 3) Giacomelli, E., "Attività fitotossica di specie di *Salvia* L.", Workshop "Les plates aromatiques, entre environnement et activité productive - Le piante aromatiche tra ambiente ed attività produttive", Antibes (France), 16/11/2010.
- 4) Giacomelli E., Bisio A, Damonte G., Salis A., Fraternali D., Ricci D.,Romussi G., Cafaggi S., De Tommasi N.2011. A new prostaglandin-like compound from *Salvia adenophora* Fernald. SIF 2011, Congresso Nazionale S.I.F. 2011, Roma, 28/6-2/7/2011.
- 5) Giacomini, M.; Bertolini, S.; Orlandi, I.; Giacomelli, E.; Mele, G.; Romussi, G.; Pittaluga, A.; De Tommasi. N.; Bisio, A., "Pyrgy EU project: a website for the divulgation of knowledge of Ligurian medicinal plants and masterpieces", Congresso Interdisciplinare sulle Piante Medicinali. Cetraro (CS) 31/5-2/6/2012.

Posters:

- 1) Bisio, A.; Fraternali, D.; Damonte, G.; Giacomelli, E.; Salis, A.; Russo, E.; Cafaggi, S.; Ricci, D.; Romussi, G.; De Tommasi, N., "Nuovi diterpenoidi clerodanici dall'essudato delle parti aeree di *Salvia miniata* Fernald", FITOMED 2010. IV Congresso Intersocietà sulle Piante Medicinali. Cagliari, 23-26/6/2010.
- 2) Schito, A.; Piatti, G.; Pruzzo, C.; Bisio, A.; Giacomelli, E.; Russo, E.; Cafaggi, S.; Romussi, G., Effects of demethyl fruticuline A and fruticuline A from *Salvia corrugata* Vahl. (Lamiaceae) on biofilm production in vitro by multiresistant strains of *Staphylococcus aureus* and *S. epidermidis*, 7<sup>th</sup> Tannin Conference/58<sup>th</sup> International Congress and Annual Meeting of the Society-for-Medical-Plant-and-Natural-Product-Research, Berlin (D), 29/8-2/9-2010. *Planta Medica*, **2010**, 76, 1301-1301.
- 3) Russo, E.; Parodi, B.; Caviglioli, G.; Bisio, A.; Giacomelli, E.; Romussi, G.; Schito, A.; Cafaggi, S., Preparation and characterization of PLGA nanoparticles containing demethylfruticuline A from *Salvia corrugata* Vahl. (Lamiaceae), 7<sup>th</sup>

- Tannin Conference/58th International Congress and Annual Meeting of the Society-for-Medical-Plant-and-Natural-Product-Research, Berlin (D), 29/8-2/9-2010. *Planta Medica*, **2010**, 76, 1319-1319.
- 4) Bisio, A.; Damonte, G.; Fraternali, D.; Giacomelli, E.; Salis, A.; Russo, E.; Cafaggi, S.; Ricci, D.; Romussi, G.; DeTommasi, N., New clerodane diterpenoids from *Salvia adenophora* Fernald (Lamiaceae), 7<sup>th</sup> Tannin Conference/58th International Congress and Annual Meeting of the Society-for-Medical-Plant-and-Natural-Product-Research, Berlin (D), 29/8-2/9-2010. *Planta Medica*, **2010**, 76, 1274-1274.
  - 5) Bertolini, S.; Pivetti, S.; Bisio, A.; Giacomelli, E.; Romussi, G.; De Tommasi, N.; Fraternali, D.; Ricci, D.; Giacomini, M., The use of self-organizing maps in the study of phytotoxic activity of *Salvia* species (Lamiaceae), 7<sup>th</sup> Tannin Conference/58th International Congress and Annual Meeting of the Society-for-Medical-Plant-and-Natural-Product-Research, Berlin (D), 29/8-2/9-2010. *Planta Medica*, **2010**, 76, 1237-1237.
  - 6) Bisio, A.; Fraternali, D.; Damonte, G.; Giacomelli, E.; Salis, A.; Ricci, D.; Cafaggi, S.; Romussi, G.; De Tommasi, N., "Diterpenoidi clerodanici dall'essudato di parti aeree di *Salvia chamaedryoides* Cav". SILAE, XIX Congresso italo-latinoamericano di etnomedicina "Fernando Cabieses Molina", Villasimius (CA), 6-10/9/2010.
  - 7) Bisio, A.; Fraternali, D.; Giacomini, M.; Damonte, G.; Giacomelli, E.; Romussi, G.; Cafaggi, S.; Ricci, D.; De Tommasi, N., "Preliminary results of phytotoxic activity of *Salvia adenophora* Fernald (Lamiaceae)", 83° convegno nazionale "Ambiente, Salute, Nutrizione", Genova 21-23/10/2010.
  - 8) Giacomini M., Bertolini S., Bisio A., Giacomelli E., De Tommasi N. 2011. Un nuovo metodo per la classificazione qualitativa di attività fitotossica. SIF 2011, Congresso Nazionale S.I.F. 2011. Roma, 28 giugno-2 luglio 2011. Comunicazione poster
  - 9) Schito, A.M.; Piatti, G.; Bisio, A.; Giacomelli, E.; Romussi, G.; Pruzzo, C., "Activity of several *Salvia* species against vancomycin-resistant enterococci" SIF 2011, Congresso Nazionale S.I.F. 2011. Roma, 28/6-2/7/2011.
  - 10) Bisio, A.; Giacomelli, E.; Damonte, G.; Salis, A.; Fraternali, D.; Ricci, D.; Romussi, G.; Cafaggi, S.; De Tommasi, N., "A new clerodane diterpenoid from the aerial part exudate of *Salvia chamaedryoides* Cav.", International PSE Symposium on Phytochemicals in nutrition and Health 27-30/9/011- Giovinazzo (Bari), Italy.
  - 11) Schito; A.M., Piatti; G.; Bisio, A.; Giacomelli, E.; Romussi, G.; Pruzzo, C., "Activity of compounds extracted from *Salvia aurea* against methicillin-resistant Staphylococci", International PSE Symposium on Phytochemicals in nutrition and Health 27-30/9/2011, Giovinazzo (Bari), Italy.
  - 12) Bisio, A.; Damonte, G.; Giacomelli, E.; Mele, G.; Fraternali, D.; Ricci, D.; Romussi, G.; De Tommasi, N., "Oxylipin compounds from the aerial part exudate of *Salvia adenophora* Fernald", Phytochemical Society of Europe Congress on Bio-communication. Semiochemicals involving plants. Cadiz (Spain), 10-12/9/2012.
  - 13) Bertolini, S.; Bisio, A.; Rauch, G.; Giacomelli, E.; Mele, G.; Giacomini, M.; De Tommasi, N., "Advanced statistical analysis of *Salvia* exudates", Phytochemical Society of Europe Congress on Bio-communication. Semiochemicals involving plants. Cadiz (Spain), 18-22/9/2012.
  - 14) Bisio, A.; Giacomelli, E.; Mele, G.; Damonte, G.; Fraternali, D.; Romussi, G.; Ricci, D.; De Tommasi, N., "Phytotoxic activity and a new clerodane diterpenoid from the exudate of the aerial parts of *Salvia buchananii* Hedge", 107° Congresso SBI Onlus, Benevento 18-22/9/2012.

### **Congresses Attended**

- 1) IV Congresso Intersocietà (SIF, SIPHAR, SBI e SISE) sulle Piante Medicinali (FITOMED 2010), Cagliari, 23-26/6/2010.
- 2) 58th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research, Berlin, Germany, 29/8-2/9/2010.
- 3) XIX Congresso italo-latinoamericano di etnomedicina "Fernando Cabieses Molina", Villasimius (CA), 6-10/9/2010.
- 4) 83° convegno nazionale "Ambiente, Salute, Nutrizione", Genova 21-23/10/2010.
- 5) Congresso Nazionale SIF 2011, Roma 30/6-2/7/2011.
- 6) International PSE Symposium on Phytochemicals in nutrition and Health 27-30/9/2011- Giovinazzo (Bari), Italy.
- 7) Meeting del progetto europeo BAMMBO, Savona, 14/2/2012 (0.5 credits).
- 8) Annual BAMMBO Meeting, Santiago de Compostela (Spagna), 29-30/3/2012
- 9) Congresso Interdisciplinare sulle Piante Medicinali. Cetraro (CS) 31/5/-2/6/2012.
- 10) Congress on Natural Product Research. New York (USA) 28/7-2/8/2012.
- 11) 27ème Séminaire en Sciences Pharmaceutiques-Programme Doctoral en Sciences Pharmaceutiques- Drugs from Nature: from Discovery to Clinic, Zermatt 03-07/09/2012.
- 12) Phytochemical Society of Europe Congress on Bio-communication. Semiochemicals involving plants. Cadiz (Spain), 10-12/9/2012.
- 13) 107° Congresso della Società Botanica Italiana - SBI Onlus, Benevento 18-22/9/2012.

### **Courseware**

During her doctorate, Emanuela Giacomelli has acquired 33.25 credits of Courseware.

### **Courses attended and passed (22 credits)**

*Courses Given by Teachers of the University of Genova:*

- 1) Innovative pharmaceutical dosage forms: preparation and control methods (2 credits) (2010).
- 2) Main plants used in phytocosmesis and their constituents (2 credits) (2010).

- 3) NMR spectroscopy in the characterization of synthetic polymers (2 credits) (2011).
- 4) Bioinformatics (3 credits) (2011)
- 5) Microwave Technology Applied to Chemical Processes (2 credits) (2011)
- 6) Pharmaceutical Botany (6 credits) (2011).

*Courses Given by invited experts:*

- 1) Soft Tissue Mechanics (Gerrit W.M. Peters, Eindhoven University of Technology, Mechanical Engineering Materials Technology) (2010) (1 credit)
- 2) The LC-MS toolbox for structural elucidation of trace compounds: applications in drug discovery and development (Antonio Triolo, Menarini)(2010) (1 credit)
- 3) Scale-up of Oral Solid Dosage Forms Manufacturing Processes – Technological and Regulatory Key Facts (Paolo Gatti)(2010) (1 credit).
- 4) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 5) "Nucleic acids in medicinal chemistry: targets or drugs?" (Claudia Sissi, Università di Padova) (2011) (1 credit).

***National and International Schools or Workshops (7.25 credits)***

- 1) *Scuola di Fitochimica "P. Ceccherelli" 2010, "Antiossidanti di origine naturale", Tirrenia (PI), 30/9-2/10/2010 (1.5 credits).*
- 2) *Les plantes aromatiques, entre environnement et activité productive - Le piante aromatiche tra ambiente ed attività produttive, Antibes (France), 16/11/2010 (0.5 credits).*
- 3) *Piante medicinali di area Mediterranea, Genova 26/11/2010 (0.5 credits).*
- 4) *Quality Safety and Efficacy of Herbal Medicinal Products and Botanical Food Supplements in EC: an up-to-date view, Firenze, 20/12/2010 (0.5 credits).*
- 5) *Sostanze bioattive da piante Aromatiche, Genova, 26/4/2011 (0.5 credits).*
- 6) *Le piante alimentari, aromatiche e medicinali: potenzialità e motivazioni all'uso, Bologna, 8/9/2011 (0.5 credits).*
- 7) *Antica cultura farmaceutica e moderna farmacologia nel cuore del Mediterraneo, Genova, 25/10/2011 (0.25 credits).*
- 8) *Scuola di Fitochimica "P. Ceccherelli" 2011, Roma 2/7/2011 (0.5 credits).*
- 9) *Aroma, Antibes (Francia), 8/2/2012 (0.5 credits).*
- 10) *MNOVA User Meeting and Workshop, Milano, 22/2/2012 (0.25 credits).*
- 11) *"Computational Chemistry and Life Science Software of Fujitsu", Genova, 05/07/2012 (0.25 credits).*
- 12) *Scuola di Fitochimica "P. Ceccherelli" 2012, Paestum (SA) 05-07/10/2012 (1.5 credits).*

***Seminars Given (2 credits)***

- 1) 04/12/2012, Dept. of Pharmacy, "Introduction to Plants Metabolomics".

***Seminars Attended (2 credits)***

- 1) 26/2/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Le sostanze bioattive dei licheni: natura, vie sintetiche ed aspetti applicativi", Prof. P. Modenesi, Università di Genova.
- 2) 25/2/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Optimization methods in chromatography", Prof. Rafael Cela, Universidad de Santiago di Compostela.
- 3) 23/4/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Le origini filologico-semantiche della botanica farmaceutica", Prof. S. Di Meglio, liceo D'Oria, Genova.
- 4) 27/4/2010, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Sistemi innovativi per la veicolazione di acidi nucleici", Elias Fattal, Université de Paris Sud, UMR CNRS 8612 Physico-Chimie - Pharmacotechnie – Biopharmacie.
- 5) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritsky, University of Florida, Gainesville.
- 6) 20/5/2011, Dept. of Pharmaceutical Sciences, "Le proteine STAT come potenziali target per nuovi antitumorali" Daniela Barlocco.
- 7) 22/06/2011, Dept. of Chemistry and Industrial Chemistry, "Identification and characterization of unknown compounds in urine of neuroblastoma patients", Carlo Scapolla, Università di Genova.
- 8) 21/10/2011, Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society", Gérard Férey, Université de Versailles, France
- 9) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "L'imaging iperspettrale, un emergente strumento analitico per il controllo di qualità e di processo alimentare ed ambientale.", L. Bagnasco.
- 10) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "Analytical methods for anti-doping control in sport", A. Bignasca.
- 11) 25/10/2011, Palazzo Tursi, Genova, "Fitoterapia: dall'unità d'Italia ad oggi, verso il domani", Roberto Della Loggia, Università di Trieste.
- 12) 25/10/2011, Palazzo Tursi, Genova, "Fitoderivati, bersagli biomolecolari e utilizzo in terapia", Nunziatina De Tommasi, Università di Salerno.
- 13) 2/12/2011, Dept. of Pharmaceutical Sciences, "Blood brain barrier", P. Cirrincione.

- 14) 2/12/2011, Dept. of Pharmaceutical Sciences, "Fungicidi chimici usati in agricoltura: impatto sociale, patogeni target ed evoluzione", A.P. Lanteri.
- 15) 2/12/2011, Dept. of Pharmaceutical Sciences, "Click chemistry, an interesting tool in pharmaceutical sciences", F. Musumeci.
- 16) 2/12/2011, Dept. of Pharmaceutical Sciences, "Processi di estrazione assistiti da microonde", G. Priarone
- 17) 2/12/2011, Dept. of Pharmaceutical Sciences, "Rare diseases and orphan drugs", C. Rotolo.
- 18) 9/3/2012, Dept. of Chemistry and Pharmaceutical and Food Technologies, "Ambiente e salute: attività e competenze sul territorio ligure", Dr. Bertolotto (ARPAL).
- 19) 23/05/2012, Dept. of Pharmaceutical Sciences, "Selective Phosphodiesterase Inhibitors: A Promising Target for Cognition Enhancement?", Jos PRICKAERTS, Department of Psychiatry and Neuropsychology, School for Mental Health and Neuroscience, Maastricht University-The Netherlands.
- 20) 04/12/2012, Dept. of Pharmacy, "Raman Spectroscopy", Massimo Rocca.
- 21) 04/12/2012, Dept. of Pharmacy, "Scaffolds per Ingegneria Tissutale", Sara Castellaro.

### *Teaching Assistance*

- 1) Assistance to the module "Drug Analysis" (Master Degree in Chemistry and Pharmaceutical Technologies) (2010/2011): 42 hours.
- 2) Assistance to the module "Pharmaceutical technology, socioeconomy and law II" (Master Degree in Pharmacy) (2010/2011): 40 hours.
- 3) Assistance to the module "Pharmaceutical technology, socioeconomy and law II" (Master Degree in Chemistry and Pharmaceutical Technologies) (2012/2013): 20 hours.
- 4) Biochemistry tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2012): 52 hours.





UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



**(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)**

PH.D. CERTIFICATE OF  
**OLEKSANDR HOLOVENKO**



**Doctorate Course:**

*Chemical Sciences and Technologies*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Adriana Saccone*

*Prof. Maria Rosa Pinasco*

**Thesis Title:**

*Characterisation and optimisation of advanced  
high-strength steels for the automobile industry*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Oleksandr Holovenko has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF OLEKSANDR HOLOVENKO,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Oleksandr Holovenko **also spent a research period of 4 months abroad** (1/4/2012-30/7/2012), at the University of Oxford, Department of Engineering Science.

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Pastore, E.; Holovenko, O.; De Negri, S.; Ienco, M. G.; Maccio, D.; Pinasco, M. R.; Saccone, A.; De Sanctis, M.; Valentini, R., Microstructural and mechanical characterization of a silicon and molybdenum Q&P steel, *La Metallurgia Italiana*, **2012**, 33-42. IMPACT FACTOR (2011): 0.053.
- 2) Holovenko, O.; Ienco, M.G.; Pastore, E.; Pinasco, M. R.; Matteis, P.; Scavino, G.; Firrao, D., Caratterizzazione strutturale e meccanica di giunti saldati in acciai altoresistenziali innovativi, *La Metallurgia Italiana*, **2013**, in press. IMPACT FACTOR (2011): 0.053.

## *Communications at Conferences*

Oral communications:

- 1) Holovenko, O.; Pastore, E.; De Negri, S.; Ienco, M.G.; Saccone, A.; Pinasco, M.R., Actis, M.; Scavino, G.; Rosalbino, F.; Matteis, P.; Firrao, D., Microstructural and electrochemical characterisation of thermally treated TWIP steels, 23° Convegno Nazionale Trattamenti Termici, Verona 19-21/10/2011.
- 2) Holovenko, O.; Ienco, M.G.; Pastore, E.; Pinasco, M. R.; Matteis, P.; Scavino, G.; Firrao, D., Caratterizzazione strutturale e meccanica di giunti saldati in acciai altoresistenziali innovativi, 34° Congresso Nazionale dell'Associazione Italiana di Metallurgia (AIM), Trento, 7-9/11/2012.

Posters:

- 3) Pastore, E.; De Negri, S.; Holovenko, O.; Ienco, M.G.; Pinasco, M.R., Low carbon quenched and partitioned steel: structural and mechanical characterisation, "Euromat 2011. European Congress on Advanced Materials and Processes", Montpellier (France), 12-15/9/2011.
- 4) Holovenko, O.; Pastore, E.; De Negri, S.; Ienco, M.G.; Saccone, A.; Pinasco, M.R., Actis, M.; Scavino, G.; Rosalbino, F.; Matteis, P.; Firrao, D., Microstructural and electrochemical characterisation of thermally treated TWIP steels, 23° Convegno Nazionale Trattamenti Termici, Verona 19-21/10/2011.

## *Congresses Attended*

- 1) Convegno "Super high strength steels", Peschiera del Garda (VR), 17-20/10/2010.
- 2) Galvatech, Genova, 21-24/6/2011.
- 3) "Euromat 2011. European Congress on Advanced Materials and Processes", Montpellier (France), 12-15/9/2011.
- 4) 23° Convegno Nazionale Trattamenti Termici, Verona 19-21/10/2011.
- 5) XL Congresso nazionale della Divisione di Chimica Inorganica della Società Chimica Italiana, Sestri Levante, 9-13/9/2012.
- 6) 34° Congresso Nazionale dell'Associazione Italiana di Metallurgia (AIM), Trento, 7-9/11/2012.

## *Courseware*

During his doctorate, Oleksandr Holovenko has acquired 23.5 credits of Courseware.

## *Courses attended and passed (20 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Synthesis, structure, and functional properties of intermetallic materials (2 credits) (2010).
- 2) Amorphous metallic materials and composite materials (3 credits) (2011)
- 3) Fundamentals of scanning and transmission electronic microscopy (3 credits) (2011).
- 4) Mathematical methods for chemistry (2 credits) (2011).

*Courses Given by invited experts:*

- 1) Clathrates: Formation, Crystal Chemistry, Phase Relations and Properties (Peter Rogl, Wien University) (2010) (1 credit).
- 2) Defects in solids (Peter Rogl, Wien University) (2011) (1 credit).
- 3) An introduction to the basic of research and innovation in industry (Claudio Boffito, University of Milano)(2011) (1 credit).
- 4) Nanomedicine - tinny "big players" in the future of medicine (Silke Krol, Neurologic Institute "Carlo Besta", Milano) (2012) (1 credit).

*Other courses*

- 1) "Metallografia", Milano (2010) (3 credits)

- 2) Trattamenti Termici", Milano (2011) (3 credits).

### ***National and International Schools or Workshops (0 credits)***

#### ***Seminars Given (2 credits)***

- 1) 16/10/2012, Dept. of Chemistry and Industrial Chemistry, "X-rays".

#### ***Seminars Attended (1.5 credits)***

- 1) 13/5/2010, Dept. of Chemistry and Industrial Chemistry, "High temperature lead-free soldering and experimental thermodynamics of intermetallic systems", Hans Flandorfer, Department for Inorganic Chemistry / Materials Chemistry Vienna University.
- 2) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 3) 8/6/2010, Dept. of Chemistry and Industrial Chemistry, "L'opzione nucleare in Italia", Dr. Stefano Maggiolo, Agenzia Regionale per la Protezione dell'Ambiente Ligure (A.R.P.A.L.).
- 4) 16/6/2010, Dept. of Chemistry and Industrial Chemistry, "Magnetic frustration, a way to new exotic phases", Prof. Julian G. Sereni, Lab. Bajas Temperaturas, CAB - CNEA, 8400 S.C. de Bariloche, Argentina.
- 5) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 6) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 7) 14/10/2010, Dept. of physics, "Growing semiconductor nanostructures with an AFM tip", Marco Rolandi, University of Washington, Seattle, WA (USA).
- 8) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopia non Lineari (LENS), Università di Firenze.
- 9) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Effetti di processing meccanico su materiali termoelettrici", Carlo Fanciulli, IENI-CNR, Lecco.
- 10) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "L'imaging iperspettrale, un emergente strumento analitico per il controllo di qualità e di processo alimentare ed ambientale.", L. Bagnasco.
- 11) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "Analytical methods for anti-doping control in sport", A. Bignasca.
- 12) 25/11/2011, Dept. of Chemistry and Industrial Chemistry, "Materiali per lo stoccaggio dell'idrogeno in stato solido: recenti risultati e possibili sviluppi", Giovanni Principi, Università di Padova.
- 13) 16/10/2012, Dept. of Chemistry and Industrial Chemistry, "Problemi e soluzioni nello studio dell'alterazione di pile a combustibile SOFC", V. Bongiorno.

### ***Teaching Assistance***

- 1) Assistance to the module "Metallurgy" (Bachelor Degree in Chemistry and Chemical Technologies) (2011/2012): 20 hours.

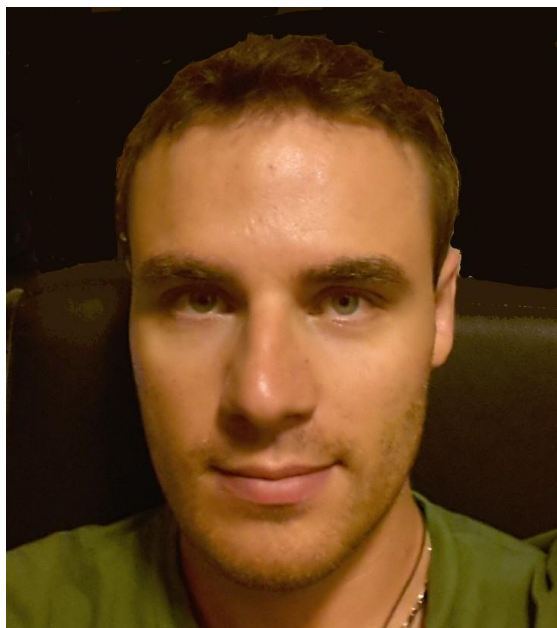


UNIVERSITÀ DEGLI STUDI DI GENOVA  
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PH.D. CERTIFICATE OF  
**DARIO MASSABÒ**



**Doctorate Course:**

*Materials Science and Technology*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Paolo Prati*

**Thesis Title:**

*An optical set-up for the multi-wavelength  
characterization of carbonaceous particulate matter*

**Defense Date:**

*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Dario Massabò has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

HAS APPROVED THE THESIS OF DARIO MASSABÒ,  
CONFERRING ON HIM THE TITLE OF

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Physics(University of Genova). However, Dario Massabò **has also spent short research periods abroad**, carrying out researches at the University of Madrid (23-26/11/2010) and participating in a series of campaigns on various coastal mediterranean cities (Barcelona, Marseille, Palma de Mallorca, Savona, Malta, Palermo, Civitavecchia) to collect samples of particulate matter.

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Cuccia, E.; Bernardoni, V.; Massabò, D.; Prati, P.; Valli, G.; Vecchi, R., An alternative way to determine the size distribution of airborne particulate matter, **2010**, *Atmospheric Environment*, 44, 3304-3313. IMPACT FACTOR (2011): 3.465.
- 2) Cuccia, E.; Massabò, D.; Prati, P., Black Carbon determination in particulate matter deposited on standard Teflon filters, *Nuovo Cimento Della Societa Italiana Di Fisica B-Basic Topics in Physics*, **2010**, 125, 633-642. IMPACT FACTOR (2011): 0.243
- 3) Cuccia, E.; Piazzalunga, A.; Bernardoni, V.; Brambilla, L.; Fermo, P.; Massabò, D.; Molteni, U.; Prati, P.; Valli, G.; Vecchi, R., Carbonate measurements in PM10 near the marble quarries of Carrara (Italy) by infrared spectroscopy (FT-IR) and source apportionment by positive matrix factorization (PMF), *Atmospheric Environment*, **2011**, 45, 6481-6487. IMPACT FACTOR (2011): 3.465.
- 4) Bernardoni, V.; Cuccia, E.; Calzolari, G.; Chiari, M.; Lucarelli, F.; Massabò, D.; Nava, S.; Prati, P., Valli, G.; Vecchi, R., ED-XRF set-up for size-segregated aerosol samples analysis, *X-Ray Spectrometry*, **2011**, 40, 79-87. IMPACT FACTOR (2011): 1.445.
- 5) E. Cuccia, D. Massabò, V. Ariola, M.C. Bove, P. Fermo, A. Piazzalunga, P. Prati, Size-resolved comprehensive characterization of airborne particulate matter, *Atmospheric Environment*, **2013**, 67, 14-26. IMPACT FACTOR (2011): 3.465.

## *Communications at Conferences*

Oral communications:

- 1) Massabò, D.; Cuccia, E.; Prati, P.; Ariola, V.; Parodi, F., "Un sistema ottico automatico per la determinazione del contenuto di Black Carbon in filtri standard per la raccolta del particolato atmosferico", PM2010, (Congresso biennale della Società Italiana di Aerosol), Venezia, 18-20/5/2010.
- 2) Cuccia, E.; Bernardoni, V.; Calzolari, G.; Chiari, M.; La Gaccia, L.; Lucarelli, F.; Massabò, D.; Nava, S.; Prati, P.; Valli, G.; Vecchi, R., "Analysis of aerosol samples collected by multi-stage cascade impactors by ED-XRF", European Conference On x-ray Spectrometry, 20-25/6/2010, Figueira da Foz, Coimbra, Portugal.
- 3) Massabò, D.; Cuccia, E.; Prati, P.; Ariola, V.; Parodi, F., "Un sistema ottico automatico per la determinazione del contenuto di Black Carbon in filtri standard per la raccolta del particolato atmosferico", XCVI Congresso Nazionale della Società Italiana di Fisica, Bologna, 20-24/9/2010.
- 4) Massabò, D.; Bove, M.C.; Cuccia, E.; Prati, P.; Bernardoni, V.; Valli, G.; Vecchi, R., "Un sistema ottico per la caratterizzazione della frazione carboniosa del PM", PM2012, (Congresso biennale della Società Italiana di Aerosol), Perugia 16-18/5/2012.
- 5) Massabò, D.; Bove, M.C.; Cuccia, E.; Prati, P.; Bernardoni, V.; Valli, G.; Vecchi, R., "An optical set-up for the multi-wavelength characterization of carbonaceous particulate", European Aerosol Conference 2012 (EAC 2012), Granada, 2-7/9/2012.

Posters

- 6) Massabò, D.; Ariola, V.; Cuccia, E.; Prati, P., "Caratterizzazione delle sorgenti di PM2.5 e PM10 nell'area urbana genovese", PM2010, (Congresso biennale della Società Italiana di Aerosol), Venezia, 18-20/5/2010.
- 7) Massabò, D.; Cuccia, E.; Canepa, P.; Abate, C.; Piazzalunga, A.; Prati, P. "One year of characterization of the PM2.5 and PM10 sources in the urban area of Genoa (Italy)", International Aerosol Conference, 29/8-3/9/2010, Helsinki.
- 8) Massabò, D.; Bove, M.C.; Cuccia, E.; Prati, P., "An automatic set-up for the measurement of Black Carbon collected on filters and impaction media", 10<sup>th</sup> International Conference on Carbonaceous Particles in the Atmosphere 26-29/06/2011, Wien, Austria.

## *Congresses Attended*

- 1) PM2010 (Congresso biennale della societa' italiana di aerosol), Venezia, 18-20/5/2010.
- 2) European Conference on X Ray Spectrometry, Figueira da Foz, Portugal, 20-25/6/2010.
- 3) International Aerosol Conference 2010 (IAC 2010), Helsinki, 29/8-3/9/2010.
- 4) Gli accordi interregionali e i piani di azione per il miglioramento della qualità dell'aria nelle province della pianura padana, Torino, 26/10/2010.
- 5) XCVI Congresso Nazionale della Società Italiana di Fisica, Bologna, 20-24/9/2010.
- 6) 10<sup>th</sup> International Conference on Carbonaceous Particles in the Atmosphere 26-29/06/2011, Wien, Austria.

- 7) PM2012, Perugia 16-18/5/2012
- 8) European Aerosol Conference 2012 (EAC 2012), Granada, 2-7/9/2012.

### *Courseware*

During his doctorate, Dario Massabò has acquired 20 credits of Courseware.

#### *Courses attended and passed (14 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Fundamentals of scanning and transmission electron microscopy (3 credits) (2010)
- 2) Instrumental techniques for trace elements determination in pharmaceuticals, food products and environmental samples (2 credits) (2010)
- 3) Nuclear and Sub-nuclear Physics (6 credits) (2010).

*Courses Given by invited experts:*

- 1) An introduction to the basic of research and innovation in industry (Claudio Boffito, University of Milano)(2011) (1 credit)
- 2) Imperfections in Crystals (Peter Rogl, Wien University) (2012) (1 credit)
- 3) Materials selection (Luis Felipe Malheiros, Porto University, Portugal) (2012) (1 credit).

#### *National and International Schools or Workshops (2 credits)*

- 1) *Workshop sui modelli a recettore per lo studio dell'inquinamento atmosferico*, Ispra (VA), 3-5/11/2010.
- 2) *Workshop "Black Carbon and Organic Carbon"*, Bologna, 26-27/09/2011
- 3) *School "Climate, Aerosols and the Cryosphere"* Valsavarenche, Valle d'Aosta (Italy), 20-28/6/2012.
- 4) *Workshop "La determinazione di OC ed EC tramite la tecnica termo-ottica: limiti e prospettive - Combustione della legna e qualità dell'aria"*, Bergamo, 25-26/10/2012

#### *Seminars Given (2 credits)*

The student presented 2 seminars as final test for 2 attended courses given by internal lecturers (see above).

#### *Seminars Attended (2 credits)*

- 1) 10/2/2010, Dept. of Chemistry and Industrial Chemistry, "Invisibility. Camouflage techniques.", Prof. Maria Gazda, Faculty of Applied Physics & Mathematics, Gdansk University of Technology, Danzig, Poland.
- 2) 16/2/2010, Dept. of Physics, "Inquinamento atmosferico, cambiamenti climatici e fisica nucleare", Prof. Paolo Prati, INFN, Genova.
- 3) 2/11/2010, Dept. of Physics, "Dynamics of reactions at surfaces", Gerhard Ertl, Max Planck Gesellschaft, Berlin.
- 4) 21/10/2011, Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society", Gérard Férey, Université de Versailles, France
- 5) 21/11/2011, Dept. of Physics, "Synthesis of metal nanoparticles at the surface and embedded in polymeric matrix by ion beam irradiation", Prof. Jai Prakash (CCS University, New Delhi – India).
- 6) 22/11/2011, Dept. of Chemistry and Industrial Chemistry, "Synthesis as an enabling Science: from Concept to Practice", Stephen Hanessian, Université de Montreal and Irvine University.
- 7) 03/04/2012, Dept. of Chemistry and Industrial Chemistry, "The moving future of polymer composites", Prof. Adriaan Beukers (Delft University).
- 8) 23/05/2012, Palazzo delle Scienze – Genova, "Dalle Biotecnologie alle Nanotecnologie: una possibile applicazione alla cura dei tumori tramite nanoparticelle veicolanti farmaci", Prof. Damiano Gustavo Mita (Ist. Naz. Biostrutture e Biosistemi, Roma).
- 9) 23/05/2012, Dept. of Pharmaceutical sciences, "Selective Phosphodiesterase Inhibitors: A Promising Target for Cognition Enhancement", Prof. Jos Prickaerts (School for Mental Health and Neuroscience, Università di Maastricht)
- 10) 31/05/2012, Dept. of Chemistry and Industrial Chemistry "Poly(lactic acid) Nanocomposites and Blends", Prof.ssa Peggy Cebe (Tufts University, MA, USA).
- 11) 30/05/2012, Dept. of Physics "Time-dependent transport through interacting quantum systems: adiabatic pumping and noise", Dr. Roman Riwar (Institute of Physics, RWTH Aachen University).
- 12) 05/06/2012, Dept. of Physics, "Biomolecular Recognition is Regulated Within Dense DNA Self-Assemblies", Dr. Matteo Castronovo (Centro di Riferimento Oncologico (CRO), Experimental and Clinical Pharmacology Unit, Aviano, Pordenone, Italy and Temple University, Department of Biology, Philadelphia, PA, USA)
- 13) 20/06/2012, Dept. of Chemistry and Industrial Chemistry, "Materiali avanzati per la sostenibilità energetica: superconduttori e termoelettrici", Dr. Paolo Mele (Hiroshima University, Japan)
- 14) 15/11/2012, Dept. of Chemistry and Industrial Chemistry, "Copper base alloy metallurgy in the Near East: the case of Bronze Age Levant", Dr. Ziad El Morr (Université Bordeaux 3 – Francia).
- 15) 12/12/2012, Dept. of Chemistry and Industrial Chemistry, "Thermophysical properties of metallic melts", Dr. Stefano Amore, Institute for Energetics and Interphases – National Research Council CNR – IENI, Genova

## *Teaching Assistance*

- 1) Assistance to the module "Applied Physics" (Bachelor Degree in Material Sciences) (2011/2012).



UNIVERSITÀ DEGLI STUDI DI GENOVA  
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CHEMISTRY AND MATERIALS*



**(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)**

**PH.D. CERTIFICATE OF  
FABIO MORANA**



**Doctorate Course:**  
*Chemical Sciences and Technologies*  
**Start of the Doctorate Program:**  
*January 1<sup>st</sup>, 2010*  
**End of the Doctorate Program:**  
*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Luca Banfi*

**Thesis Title:**

*Preparation of optically active building blocks via  
asymmetric organocatalysis and their application  
in innovative synthetic strategies*

**Defense Date:**  
*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Fabio Morana has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF FABIO MORANA,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

The commission has evaluated the thesis and the overall activity of Dr. Fabio Morana as  
**EXCELLENT**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)



# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Fabio Morana **has also spent a research period of 8 months abroad**, carrying out researches at Aarhus University (Denmark) under the supervision of Prof. Karl Anker Jørgensen (from 1/7/2011 to 1/3/2012).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Albrecht, A.; Morana, F.; Fraile, A.; Jørgensen, K. A., Organophosphorus Reagents in Organocatalysis: Synthesis of Optically Active  $\alpha$ -Methylene- $\delta$ -lactones and  $\delta$ -Lactams, *Chemistry-a European Journal*, **2012**, *18*, 10348-10354. IMPACT FACTOR (2011): 5.925.
- 2) Jensen, K. L.; Poulsen, P. H.; Donslund, B. S.; Morana, F.; Jørgensen, K. A., Asymmetric Synthesis of  $\gamma$ -Nitroesters by an Organocatalytic One-Pot Strategy, *Organic Letters*, **2012**, *14*, 1516-1519. IMPACT FACTOR (2011): 5.862
- 3) Morana, F.; Basso, A.; Bella, M.; Riva, R.; Banfi, A., Organocatalytic Asymmetric Synthesis of  $\beta$ -Aryl- $\beta$ -isocyanoesters, *Advanced Synthesis & Catalysis*, **2012**, *354*, 2199-2210. DOI: 10.1002/adsc.201200140. IMPACT FACTOR (2011): 6.048.
- 4) Jensen, K. L.; Weise, C. F.; Dickmeiss, G.; Morana, F.; Davis, R. L.; Jørgensen, K. A., Selective Access to Both Diastereoisomers in an Enantioselective Intramolecular Michael Reaction by Using a Single Chiral Organocatalyst and Application in the Formal Total Synthesis of (-)-Epibatidine, *Chemistry-a European Journal*, **2012**, *18*, 11913-11918. IMPACT FACTOR (2011): 5.925.
- 5) Morana, F.; Basso, A.; Riva, R.; Rocca, V.; Banfi, L., The *homo*-PADAM Protocol: Stereoselective and Operationally Simple Synthesis of  $\alpha$ -Oxo or  $\alpha$ -Hydroxy- $\gamma$ -acylaminoamides and Chromanes, *Chemistry-a European Journal*, **2013**, in press. DOI: 10.1002/chem.201300023. IMPACT FACTOR (2011): 5.925.

## *Communications at Conferences*

Oral communications:

- 1) Morana, F.; Basso, A.; Bella, M.; Riva, R.; Banfi, L., "Organocatalytic Asymmetric Synthesis of  $\beta$ -Aryl- $\beta$ -isocyanoesters", Giornate Italo-Francesi della Chimica 2012, Marseille (France), 16-17/4/2012.

Posters:

- 2) Albrecht, A.; Morana, F.; Fraile, A.; Jørgensen, K. A., "Organophosphorus Reagents in Organocatalysis: Synthesis of Optically Active  $\alpha$ -Methylene- $\delta$ -lactones and  $\delta$ -Lactams", IASOC 2012, Ischia (Italy), 22-26/9/2012.

## *Congresses Attended*

- 1) CATAFLUOR, Bologna, 24-25/3/2011.
- 2) Giornate Italo-Francesi della Chimica 2012, Marseille (France), 16-17/4/2012.

## *Courseware*

During his doctorate, Fabio Morana has acquired 26 credits of Courseware.

## *Courses attended and passed (16 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Pharmaceutical biotechnologies (3 credits) (2010)
- 2) Bioorganic Chemistry (2 credits) (2010)
- 3) Innovative pharmaceutical dosage forms: preparation and control methods (2 credits) (2010).
- 4) Diversity Oriented Synthesis (2 credits) (2011)
- 5) Stereoselective Synthesis (2 credits) (2011)
- 6) In vitro tests for evaluation of toxicity and biological action of chemical compounds (2 credits) (2011).

*Courses Given by invited experts:*

- 1) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 2) Polymer Assisted Solution Phase Combinatorial Synthesis (Luca Raveglia, NiKem)(2010) (1 credit).
- 3) Imperfections in Crystals (Peter Rogl, Wien University) (2012) (1 credit).

## *National and International Schools or Workshops (6 credits)*

- 1) XXXV Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 14-18/6/2010 (2 credits).
- 2) "X Laboratorio di Metodologie Sintetiche in Chimica Farmaceutica", Siena, 13-17/2/2011 (2 credits).
- 3) Ischia Advanced School of Organic Synthesis (IASOC) 2012, Ischia (NA), 22-26/9/2012 (2 credits).

### ***Seminars Given (2 credits)***

- 1) 09/10/2012, Dept. of Chemistry and Industrial Chemistry, "Frustrated Lewis Pairs: making the most of frustration!"

### ***Seminars Attended (2 credits)***

- 1) 16/7/2010, Dept. of Chemistry and Industrial Chemistry, "Formation of Multiple Stereocenters via Organocatalysis", Dr. Marco Bella, Dip. Chimica, Università "La Sapienza" Roma
- 2) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritzky, University of Florida, Gainesville.
- 3) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Molecular Modeling in Drug Design: Ligand-based drug design and Structure-based drug design", Paola Zito.
- 4) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Organic Synthesis "on water"", Valentina Cerulli
- 5) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "La combinazione della catalisi di metalli di transizione e organocatalisi", Anna Piatek.
- 6) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "Diversity oriented synthesis of heterocyclic compounds exploiting isocyanides and alkynes in multicomponent reactions", Fabio De Moliner.
- 7) 29/8/2011, Aarhus University, "Magical Power of Transition Metals: Past, Present and Future", E.-I. Negishi.
- 8) 9/9/2011, Aarhus University, "Opportunities for Materials Science, and Nanotechnology in Energy", G. Whitesides.
- 9) 13/10/2011, Aarhus University, "Utilization of Asymmetric Organocatalysis in One-pot and Cascade Reactions for the Synthesis of Optically Active Building Blocks", Gustav Dickmeiss (PhD defense)
- 10) 13/10/2011, Aarhus University, "Organocatalysis in Asymmetric Synthesis: a Shortcut to Chemical Diversity", Hao Jiang (PhD defense)
- 11) 09/10/2012, Dept. of Chemistry and Industrial Chemistry "Nanoparticles and cancer: from diagnosis to therapy", S. Zappia.
- 12) 09/10/2012, Dept. of Chemistry and Industrial Chemistry, "Modelli di Calcolo in Dinamica Molecolare" D. Duce.
- 13) 04/12/2012, Dept. of Pharmacy, "Raman Spectroscopy", Massimo Rocca.
- 14) 04/12/2012, Dept. of Pharmacy, "Introduction to Plants Metabolomics", Emanuela Giacomelli.
- 15) 04/12/2012, Dept. of Pharmacy, "Scaffolds per Ingegneria Tissutale", Sara Castellaro.

### ***Teaching Assistance***

- 1) Assistance to the module "Organic Chemistry 2 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2010/2011): 40 hours.
- 2) Assistance to the module "Organic Chemistry with Laboratory" (Bachelor Degree in Biotechnology) (2011/2012): 30 hours.
- 3) Assistance to the module "Organic Chemistry 2 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2012/2013): 20 hours.



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***(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)***

**PH.D. CERTIFICATE OF  
DION NOLE**



**Doctorate Course:**  
*Materials Science and Technology*  
**Start of the Doctorate Program:**  
*January 1<sup>st</sup>, 2010*  
**End of the Doctorate Program:**  
*December 31<sup>st</sup>, 2012*  
**Advisors:**  
*Prof. Enrico Franceschi*  
**Thesis Title:**  
*Protobhistoric vitreous materials  
from Ancient Liguria:  
a non-destructive archaeometric study*

**Defense Date:**  
*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Dion Nole has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF DION NOLE,  
CONFERRING ON HIM THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

Genova, February 6<sup>th</sup>, 2013

**The Director of the Doctorate School  
(Prof. Luca Banfi)**

**The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)**

# ACTIVITY REPORT

## *Research Activity*

The research activity was entirely carried out at the Department of Chemistry and Industrial Chemistry (University of Genova).

### *Scientific Publications*

Original publications on non ISI Journals:

- 1) Franceschi, E.; Nole, D.; Sfrecola, S.; Troiano, D.; Vassallo, S.; Verrocchio, V., Nuovi dati sulla produzione ceramica di Anversa degli Abruzzi (AQ) fra XVI e XVII secolo, *Azulejos. Rivista di Studi ceramici*, **2010**, 5, 33-108.
- 2) Franceschi, C.; Franceschi, E.; Nole, D.; Vassallo, S.; Glozheni, L., Two Byzantine Albanian icons: a non-destructive archaeometric study, *Archaeological and Anthropological Sciences*, **2011**, 3, 343-355.
- 3) Franceschi, E.; Nole, D.; Vassallo, S., Archaeometric non-invasive study of a Byzantine Albanian icon, *Journal of Scientific Research and Reports*, **2013**, 2(1), 17-34.

Book chapters

- 1) Franceschi, E.; Nole, D.; Vassallo, S., Tecnica e conservazione dei dipinti murali di Giovanni Battista Carlone a Gavi, in *L'oratorio dei Bianchi di Gavi. Il restauro degli affreschi del Carlone e dell'organo Serassi*, Gavi, **2012**, pp.81-93.

Proceedings

- 1) Franceschi, E.; Nole, D.; Vassallo, S., Icone albanesi post-bizantine: un approccio archeometrico, in *Scienza e Beni Culturali*, in *Atti del VI Congresso Nazionale dell'ALAr*, Pavia 15-18 II 2010, Riccardi, M.P.; Basso, E. Eds., Patron Ed., Bologna, pp. 1-13.
- 2) Franceschi, E., Nole, D.; Vassallo, S., The combined use of archaeometric techniques for non-invasive analysis of paintings: the study of Albanians icons by Onufri, in *Proceedings of 3<sup>rd</sup> Balkan Symposium on Archaeometry*, Bucharest 29-30 X 2012, Bucharest, **2012**, 35-44.

### *Communications at Conferences*

Posters

- 1) Franceschi, E., Nole, D., "Metalli pre-protostorici in Liguria: contributo dell'archeometria, in *Antiche genti del Tigullio a Chiavari*", Dalla necropoli ligure al medioevo, Chiavari 24-25/9/2010.
- 2) Nole, D.; Vassallo, S.; Franceschi, E., "Indagini archeometriche su materiali vitrei liguri dell'età del Ferro", Giornate Italo-Francesi di Chimica, Marseille (France), 16-17/4/2012.

### *Congresses Attended*

- 1) Chem4life, Convegno di Divulgazione Scientifica, Genova, 18/01/2012.
- 2) Giornate Italo-Francesi di Chimica, Marseille (France), 16-17/4/2012.
- 3) XVI Giornate Nazionali di Studio sul Vetro "Il vetro in età protostorica in Italia", Adria, 12-13/05/2012.

## *Courseware*

During his doctorate, Dion Nole has acquired 22 credits of Courseware.

### *Courses attended and passed (10 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Fundamentals of scanning and transmission electron microscopy (3 credits) (2010)
- 3) Applications of RAMAN spectroscopy to materials (2 credits) (2010)
- 3) Chemometric strategies and algorithms and their applications (3 credits) (2011).

*Courses Given by invited experts:*

- 1) The application of transition metal catalysis in multicomponent and domino reactions (Thomas Müller, Düsseldorf University, Germany) (2011) (1 credit).
- 2) Use of neutrons in Material Science (Claudia Mondelli, Institut Langevin, Grenoble, France) (2011) (1 credit).

### *National and International Schools or Workshops (8 credits)*

- 1) *Colorimetria*, Milano, 11/3/2010 (0.25 credits).
- 2) *Workshop "Anfore"*, Bologna, 23/4/2010 (0.5 credits).
- 3) *Workshop "Materiali, tecniche e diagnostica nei beni culturali"*, Genova, 29-30/4/2010 (0.75 credits).
- 4) *Workshop "L'apporto della tecnologia laser alla conservazione dei Beni Culturali"*, Torino, 1/10/2010 (3 ore). 0,25 credits).

- 5) *Workshop "Nanotecnologie e Beni Culturali"*, Torino, 2/10/2010 (3 ore) (0,25 credits).
- 6) *Scuola di Chemiometria*, Genova, 24-27/01/2011 (2 credits).
- 7) *Regularization Methods for High Dimensional Learning*, Genova, 6-10/06/2011 (2 credits)
- 8) *1<sup>st</sup> Thematic School on Metallic Materials for Cultural Heritage*, Genova, 2-8/09/2011 (2 credits).

### ***Seminars Given (2 credits)***

- 1) Nole, D., "La pittura murale di Lazzaro Tavarone nel Salone "Fasti di Alessandro Farnese": un approccio archeometrico" XII settimana della cultura, Genova 16-25/4/2010.
- 2) The student presented 2 seminars as final test for the 3 attended courses given by internal lecturers (see above).

### ***Seminars Attended (2 credits)***

- 1) 28/05/2010, Faculty of Pharmacy, "Caratteristiche chimico-fisiche, tecnologia, applicazioni e normativa del vetro ad uso farmaceutico", Eric Lebossé.
- 2) 17/06/2010, Polytechnic of Torino, Alessandria, "La corretta interpretazione dei tracciati termoanalitici".
- 3) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritsky, University of Florida, Gainesville.
- 4) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Organic Synthesis "on water"", Valentina Cerulli
- 5) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Self-assembly and crystallization in block copolymers", Dario Cavallo
- 6) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Splitting fotocatalitico dell'acqua", Alessio Rindi
- 7) 14/01/2011, Dept. of Chemistry and Industrial Chemistry, "Il laboratorio in classe per un apprendimento consapevole", Andrea Bartolommeoni
- 8) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 9) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 10) 11/04/2011, Palazzo Lomellini, Genova, "Approccio metodologico primario: l'esame dello stato conservativo in relazioni a materiali e tecniche utilizzate con l'apporto delle fonti storiche".
- 11) 12/04/2011, Museo di Palazzo Reale, Genova, "Restauro della Grande Aquila degli Alpini", Orietta Doria, Enrico Franceschi, Caterina Olcese
- 12) 14/04/2011, Museo di Archeologia Ligure, Genova, "Percorso sulle problematiche di restauro di materiali e manufatti archeologici".
- 13) 15/04/2011, Faculty of Architecture, Genova, "Il restauro degli affreschi nelle catacombe romane di S. Tecla, cronache di una scoperta", Alma Ortolan
- 14) 16/05/2011, Faculty of Literature and Philosophy, Genova, "Caravaggio con il naturale davanti. Disegno e costruzione dell'immagine pittorica", Pietro Roccacessa
- 15) 26/5/2011, Dept. of Chemistry and Industrial Chemistry, "Approcci analitici innovativi per caratterizzare i materiali organici in dipinti", Maria Perla Colombini, Università di Pisa.
- 16) 16/10/2012, Dept. of Chemistry and Industrial Chemistry, "X-rays", Oleksandr Holovenko.
- 17) 16/10/2012, Dept. of Chemistry and Industrial Chemistry, "Problemi e soluzioni nello studio dell'alterazione di pile a combustibile SOFC", Valeria Bongiorno.

### ***Teaching Assistance***

- 1) Assistance to the module "Physico-chemical methodologies for cultural heritage" (Bachelor Degree in Preservation of Cultural Heritage) (2009/2010): 10 hours.
- 2) Assistance to the module "Chemistry for the preservation of cultural heritage" (Master Degree in Chemical Sciences) (2010/2011): 8 hours.



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***(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)***

**PH.D. CERTIFICATE OF  
ELISA PASTORE**



**Doctorate Course:**

*Materials Science and Technology*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Maria Giuseppina Ienco*

*Prof. Massimo De Sanctis*

**Thesis Title:**

*Innovation in metallurgy: new concepts  
for the design of high-strength steels*

**Defense Date:**

*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Elisa Pastore has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF ELISA PASTORE,  
CONFERRING ON HER THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

The commission has evaluated the thesis and the overall activity of Dr. Elisa Pastore as  
**EXCELLENT**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Elisa Pastore **has also spent research periods of 3 months abroad** carrying out researches at the Delft University of Technology (Netherlands). (from 01/03/2012 to 31/05/2012). Moreover, Elisa Pastore has carried out researches for 20 days (from 7 to 19/6/2010 and from 6 to 10/6/2011) at the University of Pisa, Department of Chemical Engineering, Industrial Chemistry and Material Science.

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Pastore, E.; De Negri, S.; Fabbreschi, M.; Ienco, M. G.; Pinasco, M. R.; Saccone, A.; Valentini, R., Experimental investigation on low-carbon quenched and partitioned steel, *Metallurgia Italiana*, **2011**, vol. 9, 25-34. IMPACT FACTOR (2011): 0.053.
- 2) Pastore, E.; Holovenko, O.; De Negri, S.; Ienco, M.G.; Macciò, D.; Pinasco, M.R.; Saccone, A.; De Sanctis, M.; Valentini, R., Caratterizzazione microstrutturale e meccanica di un acciaio Q&P al Silicio e Molibdeno, *La Metallurgia Italiana*, **2012**, vol. 4, 33-41. IMPACT FACTOR (2011): 0.053.
- 3) Holovenko, O.; Ienco, M.G.; Pastore, E.; Pinasco, M. R.; Matteis, P.; Scavino, G.; Firrao, D., Caratterizzazione strutturale e meccanica di giunti saldati in acciai altoresistenziali innovativi, *La Metallurgia Italiana*, **2013**, in press. IMPACT FACTOR (2011): 0.053.

Original publications on non ISI Journals:

- 1) Ghidini, A.; Gerosa, R.; Silva, G.; Rivolta, B.; Pinasco, M.R.; Ienco, M.G.; Pastore, E.; Firrao, D., Experimental investigation of microstructural and mechanical properties of new steels for large blooms, *Journal of ASTM International*, **2011**, 9, Paper ID JAI1032224.

## *Communications at Conferences*

Oral communications:

- 1) Pastore, E.; De Negri, S.; Fabbreschi, M.; Ienco, M.G.; Pinasco, M.R.; Saccone, A.; Valentini, R., "Experimental investigation on low – carbon quenched and partitioned steel", 2<sup>nd</sup> International Conference of Super-High Strength Steels, Peschiera del Garda (VR), 17-20/10/2010.
- 2) Pastore, E.; Holovenko, O.; De Negri, S.; Ienco, M.G.; Macciò, D.; Pinasco, M.R.; Saccone, A.; De Sanctis, M.; Valentini, R., " Caratterizzazione microstrutturale e meccanica di un Acciaio Q&P al Silicio e Molibdeno", XXIII Convegno Nazionale Trattamenti Termici, Verona, 19-21/10/11.
- 3) Pastore, E.; Holovenko, O.; Ienco, M.G.; Pinasco, M.R.; De Negri, S.; Macciò, D.; Valentini, R., "Influenza di differenti cicli termici sulle caratteristiche microstrutturali e meccaniche di acciai Q&P", XXXIV Convegno Nazionale AIM, Trento, 07-09/10/12.

Posters

- 4) Pastore, E.; De Negri, S.; Holovenko, O.; Ienco, M.G.; Pinasco, M.R., "Low – Carbon Quenched and Partitioned steel: structural and mechanical characterization", Euromat 2011, Montpellier (Francia), 11-16/09/11

## *Congresses Attended*

- 1) 2<sup>nd</sup> International Conference of Super-High Strength Steels, Peschiera del Garda (VR), 17-20/10/2010.
- 2) XXXIII Convegno Nazionale AIM, Brescia, 10-12/11/2010.
- 3) Galvatech 2011, Genova, 21-24/06/11.
- 4) Euromat 2011, Montpellier (Francia), 12-15/09/11.
- 5) XXIII Convegno Nazionale Trattamenti Termici, Verona, 19-21/10/11
- 6) XXXIV Convegno Nazionale AIM, Trento, 07-09/11/2012.

## *Courseware*

During her doctorate, Elisa Pastore has acquired 32.5 credits of Courseware.

## *Courses attended and passed (21 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Fundamentals of scanning and transmission electron microscopy (3 credits) (2010)
- 2) Applications of RAMAN spectroscopy to materials (2 credits) (2010)
- 3) Synthesis, structure, and functional properties of intermetallic materials (2 credits) (2010).
- 4) Functional Magnetic Materials (2 credits) (2010)

#### *Courses Given by invited experts:*

- 1) Clathrates: Formation, Crystal Chemistry, Phase Relations and Properties (Peter Rogl, Wien University) (2010) (1 credit).
- 2) Approaches to Synthesis and Characterization of Metal Oxide Magnetic Nanomaterials (Lorenza Suber, C.N.R., Roma) (2010) (1 credit).
- 3) Nanomagnetism and magnetic recording. (Prof. Marco Affronte, Università di Modena) (2010) (1 credit).
- 4) Defects in solids (Peter Rogl, Wien University) (2011) (1 credit)
- 5) Materials selection (Luis Felipe Malheiros, Porto University, Portugal) (2012) (1 credit).

#### *Other Courses:*

- 1) "Le prove non Distruttive della produzione siderurgica", Milano (2010) (1 credit).
- 2) "Tenacità e faticadei materiali metallici", Milano (2010) (1 credit)
- 3) "Trattamenti termici", Milano (2011) (3 credits).
- 4) "Corrosione e protezione dei metalli" Milano (2011) (2 credits).

#### **National and International Schools or Workshops (6.5 credits)**

- 1) *Tenacità degli acciai e affidabilità*, 11/2/2010, Milano. (0.5 credits).
- 2) *Deformazione e variazione di forma permanente. Cause e tecniche per la gestione nel processo*, 20/04/2010, Piacenza (AIM course) (0.5 credits).
- 3) *Reattori Nucleari di IV generazione: quali problematiche sui materiali?* (AIM course), 17/2/2011, Genova (0.5 credits).
- 4) *Risposta al trattamento termico e scelta dell'acciaio*, 24/2/2011, Milano (0.5 credits).
- 5) S-in Motion day, 31/03/11, Mirafiori Motor Village, Torino (0.5 credits).
- 6) *Metallografia e anomalie di esercizio e fabbricazione*, 03/05/11, Milano (0.5 credits).
- 7) *L'evoluzione della microscopia dal 2D al 3D*, 29/06/11, Istituto Italiano della Saldatura, Genova (0.5 credits).
- 8) *1<sup>st</sup> Thematic School on Metallic Materials for Cultural Heritage*, Genova DCCI, 02-08/09/11 (2 credits).
- 9) *"Gleeble", European Users Workshop*, Delft (NL), 24-25/04/12 (1 credit).

#### **Seminars Given (2 credits)**

The student presented 4 seminars as final test for the 4 attended courses given by internal lecturers (see above).

#### **Seminars Attended (3 credits)**

- 1) 27/1/2010, Dept. of Earth Sciences and Territory, "Quasicristalli Naturali: Un nuovo "stato della materia" in natura", Dr. Luca Bindi, Università di Firenze.
- 2) 17/2/2010, Dept. of Chemistry and Industrial Chemistry, "Chimica e Colore", Prof. Paolo Piaggio, Università di Genova.
- 3) 16/3/2010, Dept. of Physics, "I numeri della musica. I rapporti tra musica, matematica e fisica da Pitagora ai tempi moderni, Proff. R. Musenich e G. Dillon, Università di Genova.
- 4) 13/5/2010, Dept. of Chemistry and Industrial Chemistry, "High temperature lead-free soldering and experimental thermodynamics of intermetallic systems", Hans Flandorfer, Department for Inorganic Chemistry / Materials Chemistry Vienna University.
- 5) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 6) 21/6/2010, Dept. of Chemistry and Industrial Chemistry, "Materiali per l'energia: risultati recenti su bulk ceramici termoelettrici e film superconduttori a base di Fe", Dr. Paolo Mele, Department of Materials Science and Engineering, Kyushu Institute of Technology.
- 7) 1/10/2010, Dept. of Chemistry and Industrial Chemistry, "TOPOS vs. Intermetallics", Prof. Vladislav A. Blatov, Department of Chemistry, Samara State University (Russia).
- 8) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Clusters in composti intermetallici", Monika Skrobanska.
- 9) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 10) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 11) 6/5/2011, Dept. of Chemistry and Industrial Chemistry, "Approcci analitici innovativi per caratterizzare i materiali organici in dipinti", Maria Perla Colombini, Università di Pisa.
- 12) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Effetti di processing meccanico su materiali termoelettrici", Carlo Fanciulli, IENI-CNR, Lecco.
- 13) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Impiego dei moduli termoelettrici", Dr. Matteo Codecasa, IENI-CNR, Lecco.
- 14) 20/07/2011, Dept. of Chemistry and Industrial Chemistry, "Organic and hybrid solar cells: fundamentals and recent advances", Luiz Carlos Pimentel Almeida, Universidade Estadual de Campinas, Sao Paulo, Brasil.
- 15) 5/10/2011, Dept. of Chemistry and Industrial Chemistry, "Synergic analytical techniques for the study of cultural heritage artefacts", F. Ardini



- 16) 5/10/2011, Dept. of Chemistry and Industrial Chemistry, "Olives and Olive Oil in Health and Disease Prevention", Nguyen, K. T. N.
- 17) 11/10/2011, Dept. of Chemistry and Industrial Chemistry, "Analytical methods for anti-doping control in sport", A. Bignasca.
- 18) 26/10/2011, Dept. of Chemistry and Industrial Chemistry, Genova, "Sviluppo di materiali per l'impiego in impianti a vapore SuperCritici e UltraSuperCritici", Emma Barbareschi.
- 19) 08/03/12, TuDelft, "The role of orientation relationship during nucleation of austenite", Dr. Hermant Sharma, TuDelft.
- 20) 22/03/12, TuDelft, "Challenges in prediction of mechanical properties of hot rolled strip", Dr. Kees Bos, Tata Steel.
- 21) 05/04/12, TuDelft, "Texture evolution after asymmetric rolling and annealing", Dr. Tuan Nguyen Minhwill, TuDelft.
- 22) 03/05/12, TuDelft, "Specimen-Size Effects on the Tensile Behavior of Various Steels" Dr. Hajy Akbary Farideh, TuDelft.
- 23) 10/05/12, TuDelft, "Enhanced corrosion protection by microstructural control of aluminium brazing sheet", Dr. Farid Norouzi Afshar, TuDelft
- 24) 10/05/12, TuDelft, "Phosphorous and boron segregation during welding of advanced high strength steels", Dr. Muru Amirthalingam, TuDelft
- 25) 24/05/12, TuDelft, "Substitution of rare earth alloying elements in Magnesium by ubiquitous elements", Dr. Mehdi Lal Poor, TuDelft.
- 26) 16/10/2012, Dept. of Chemistry and Industrial Chemistry "X-rays" Oleksandr Holovenko.
- 27) 16/10/2012, Dept. of Chemistry and Industrial Chemistry "Problemi e soluzioni nello studio dell'alterazione di pile a combustibile SOFC", Valeria Bongiorno.
- 28) 15/11/2012, Dept. of Chemistry and Industrial Chemistry, "Copper base alloy metallurgy in the Near East: the case of Bronze Age Levant", Ziad El Morr (Université Bordeaux 3 – Francia).

### *Teaching Assistance*

- 1) Assistance to the module "Laboratory of Metallic Materials" (Bachelor Degree in Chemistry and Chemical Technologies) (2009/2010): 12 hours.
- 2) Assistance to the module "Metallurgy" (Bachelor Degree in Chemistry and Chemical Technologies) (2010/2011): 18 hours.



UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



*(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)*

PH.D. CERTIFICATE OF  
**MASSIMO ROCCA**



**Doctorate Course:**

*Pharmaceutical, Food and Cosmetic Sciences*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Olga Bruno*

**Thesis Title:**

*Rational design and synthesis of new therapeutic agents for neuroinflammation and neurodegenerative disorders*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Pharmacy, Massimo Rocca has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Daniela Barlocco, University of Milano
- Prof. Paolo Crotti, University of Pisa
- Prof. Alessandro Balbi, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

HAS APPROVED THE THESIS OF MASSIMO ROCCA,  
CONFERRING ON HIM THE TITLE OF

**RESEARCH DOCTOR IN  
PHARMACEUTICAL, FOOD AND COSMETIC SCIENCES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Alessandro Balbi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Pharmaceutical Sciences (now Department of Pharmacy) (University of Genova). However, Massimo Rocca has also **spent a 3 months period abroad**, at the Faculty of Pharmacy of Université Libre de Bruxelles (january-february and june-july, 2012).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Brullo, C.; Rocca, M.; Fossa, P.; Cichero, E.; Barocelli, E.; Ballabeni, V.; Flammini, L.; Giorgio, C.; Saccani, F.; Domenichini, G.; Bruno, O., Synthesis of new 5,6-dihydrobenzo h quinazoline 2,4-diamino substituted and antiplatelet/antiphlogistic activities evaluation, *Bioorganic & Medicinal Chemistry Letters*, **2012**, 22, 1125-1129. IMPACT FACTOR (2011): 2.554

## *Communications at Conferences*

## *Congresses Attended*

## *Courseware*

During his doctorate, Massimo Rocca has acquired 28 credits of Courseware.

## *Courses attended and passed (16 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patents (2 credits) (2010).
- 2) Bioorganic Chemistry (2 credits) (2010).
- 3) Stereoselective Syntheses (2 credits) (2011)
- 4) Bioinformatics (3 credits) (2011)
- 5) Microwave Technology Applied to Chemical Processes (2 credits) (2011)

*Courses Given by invited experts:*

- 1) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 2) Polymer Assisted Solution Phase Combinatorial Synthesis (Luca Raveglia, NiKem, Bollate (MI))(2010) (1 credit).
- 3) "Nucleic acids in medicinal chemistry: targets or drugs?" (Claudia Sissi, Università di Padova) (2011) (1 credit).
- 4) Basic aspects and new trends in mass spectrometry (Pietro Traldi, C.N.R., Padova)(2012) (1 credit).
- 5) Combining organic-inorganic materials for flexible electronics (L. Mitosieriu, University "Alexandru Ioan Cuza", Iasi, Romania) (2012) (1 credit).

## *National and International Schools or Workshops (8 credits)*

- 1) *Il settore cosmetico: un'opportunità di lavoro per laureati in discipline scientifiche*, Genova, 11/6/2010 (0.5 credits).
- 2) *European School of Medicinal Chemistry (ESMEC)*, Urbino, 4-9/7/2010 (2 credits).
- 3) *Presentazione di SCOPUS*, Genova, 13/10/2010 (0.25 credits).
- 4) *Giornata scientifica in onore del Prof. Fabio Sparatore*, Genova, 22/10/2010 (0,25 credits).
- 5) *Incontro con l'Università, il CNR e l'Industria - VI Edizione*, Milano, 17/2/2011 (0.5 credits).
- 6) *Giornata di studio sulla Spettrofotometria Raman*, Milano, 31/3/2011 (0,5 credits).
- 7) *Summer School of Pharmaceutical Analysis 2011*, Pavia, 18-21/9/2011 (2 credits).
- 8) *Scuola Nazionale Metodologie Analitiche e Bioanalitiche in Spettrometria di Massa*, Parma, 14-18/5/2012 (2 credits).

## *Seminars Given (2 credits)*

- 1) 04/12/2012, Dept. of Pharmacy, "Raman Spectroscopy".

### ***Seminars Attended (2 credits)***

- 1) 21/10/2010, Faculty of Medicine, "Ligandi multisito e multitarget quali potenziali agenti terapeutici nelle malattie neurodegenerative", Angelo Carotti, Università di Bari.
- 2) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "Il rischio sanitario associato alle biotossine algali nei frutti di mare", Giuliana Ottonello.
- 3) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "La combinazione della catalisi di metalli di transizione e organocatalisi", Anna Piatek.
- 4) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "Diversity oriented synthesis of heterocyclic compounds exploiting isocyanides and alkynes in multicomponent reactions", Fabio De Moliner.
- 5) 22/11/2010, Dept. of Pharmaceutical Sciences, "Combinatorial Chemistry", Laura Buffa.
- 6) 22/11/2010, Dept. of Pharmaceutical Sciences, "Le Micotossine nelle colture e nei prodotti alimentari", Silvia Mannino.
- 7) 22/11/2010, Dept. of Pharmaceutical Sciences, "Molecular Dynamics Simulation: an updated overview on Prion Protein", Gerolamo Vettoretti.
- 8) 14/06/2011, IBF-CNR Genova, "Ca activated chloride channels in olfactory sensory neurons: do they play a role in olfactory transduction?", Anna Boccaccio, IBF-CNR, Genova.
- 9) 14/10/2011, Dept. of Chemistry and Industrial Chemistry, "Transition Metal Catalysis as an Entry to Multicomponent Synthesis of Heterocycles, T.J.J. Müller, Heinrich-Heine University Düsseldorf (Germany).
- 10) 22/11/2011, Dept. of Chemistry and Industrial Chemistry, "Synthesis as an enabling Science: from Concept to Practice", Stephen Hanessian, Université de Montreal and Irvine University.
- 11) 2/12/2011, Dept. of Pharmaceutical Sciences, "Blood brain barrier", P. Cirrincione.
- 12) 2/12/2011, Dept. of Pharmaceutical Sciences, "Fungicidi chimici usati in agricoltura: impatto sociale, patogeni target ed evoluzione", A.P. Lanteri.
- 13) 2/12/2011, Dept. of Pharmaceutical Sciences, "Click chemistry, an interesting tool in pharmaceutical sciences", F. Musumeci.
- 14) 2/12/2011, Dept. of Pharmaceutical Sciences, "Processi di estrazione assistiti da microonde", G. Priarone
- 15) 2/12/2011, Dept. of Pharmaceutical Sciences, "Rare diseases and orphan drugs", C. Rotolo.
- 16) 9/3/2012, Dept. of Chemistry and Pharmaceutical and Food Technologie, "Ambiente e salute: attività e competenze sul territorio", R.M. Bertolotto, ARPAL.
- 17) 04/05/2012 IBF-CNR, Genova, "La società ETT da spin off a provider di servizi per neuro ingegneria e neurotossicità in vitro. Presentazione del progetto: NEUROTOX – sviluppo di strumenti in vitro per la valutazione e predizione di effetti neurotossici e neurofarmacologici", G. Verreschi (ETT s.r.l.), A. Novellino (Institute for Health Consumer and Protection, Joint Research Centre, Ispra – VA).
- 18) 23/05/2012, Dept. of Pharmacy, "Selective Phosphodiesterase Inhibitors: A Promising Target for Cognition Enhancement?", Jos Prickaerts, Maastricht University
- 19) 04/12/2012, Dept. of Pharmacy, "Introduction to Plants Metabolomics", Emanuela Giacomelli.
- 20) 04/12/2012, Dept. of Pharmacy, "Scaffolds per Ingegneria Tissutale", Sara Castellaro.

### ***Teaching Assistance***

- 1) Assistance to the module "Instrumental analysis of drugs" (Master Degree in Chemical and Pharmaceutical Technologies) (2009/2010): 60 hours.
- 2) Assistance to the module "Instrumental analysis of drugs" (Master Degree in Chemical and Pharmaceutical Technologies) (2010/2011): 60 hours.
- 3) Assistance to the module "Instrumental analysis of drugs" (Master Degree in Chemical and Pharmaceutical Technologies) (2011/2012): 60 hours.
- 4) Assistance to the module "Laboratory of drug analysis" (Master Degree in Chemical and Pharmaceutical Technologies) (2012/2013): 30 hours.
- 5) Physics tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2010): 40 hours.
- 6) Physics tutoring for the Master Degrees in Pharmacy and in Chemical and Pharmaceutical Technologies (2011): 40 hours.

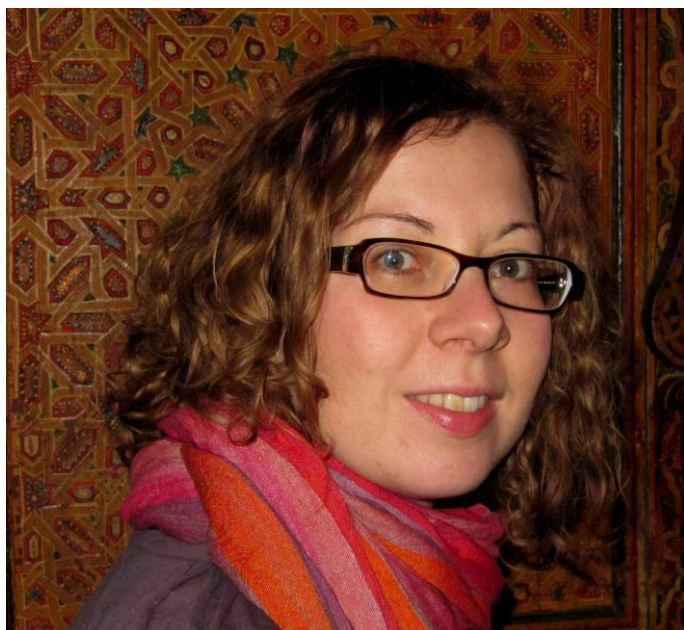


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**CHIARA TOCCAFONDI**



**Doctorate Course:**

*Materials Science and Technology*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisors:**

*Prof. Maurizio Canepa*

**Thesis Title:**

*Ultrathin molecular films on solid substrates  
characterized at the nanoscale: a spectroscopic  
ellipsometry investigation*

**Defense Date:**

*February 6<sup>th</sup>, 2013*

On February 6<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Chiara Toccafondi has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Luca Pasquali (University of Modena and Reggio Emilia)
- Prof. Livio Battezzati (University of Torino)
- Prof. Maurizio Ferretti (University of Genova)

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

**HAS APPROVED THE THESIS OF CHIARA TOCCAFONDI,  
CONFERRING ON HER THE TITLE OF**

**RESEARCH DOCTOR IN  
MATERIALS SCIENCE AND TECHNOLOGY**

The commission has evaluated the thesis and the overall activity of Dr. Chiara Toccafondi as  
**EXCELLENT**

Genova, February 6<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Gabriella Borzone)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Physics (University of Genova). However, Chiara Toccafondi **has also spent research periods of 15 days abroad** carrying out researches at the Institut des Sciences Moléculaires d'Orsay, Université Paris-Sud 11 (from 24/5/2010 to 5/6/2010).

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Toccafondi, C.; Prato, M.; Maidecchi, G.; Penco, A.; Bisio, F.; Cavalleri, O.; Canepa, M., Optical properties of Yeast Cytochrome c monolayer on gold: An in situ spectroscopic ellipsometry investigation, *Journal of Colloid and Interface Science*, **2011**, 364, 125-132. IMPACT FACTOR (2011): 3.070
- 2) Prato, M.; Toccafondi, C.; Maidecchi, G.; Chaudhari, V.; Harish, M. N. K.; Sampath, S.; Parodi, R.; Esaulov, V. A.; Canepa, M., Mercury Segregation and Diselenide Self-Assembly on Gold, *Journal of Physical Chemistry C*, **2012**, 116, 2431-2437. IMPACT FACTOR (2011): 4.805
- 3) Toccafondi, C.; Cavalleri, O.; Bisio, F.; Canepa, M., Yeast Cytochrome C adsorption on SiO<sub>2</sub>/Si substrates studied by in situ UV-VIS spectroscopic ellipsometry, *Thin Solid Films*, in press. IMPACT FACTOR (2011): 1.890.

Original publications on non ISI Journals:

- 1) Toccafondi, C.; Prato, M.; Barborini, E.; Vinati, S.; Maidecchi, G.; Penco, A.; Bisio, F.; Cavalleri, O.; Canepa, M., Yeast Cytochrome C monolayer on flat and nanostructured gold films studied by UV-VIS spectroscopic ellipsometry, *Bionanoscience*, **2011**, 1, 210-217.
- 2) Svaldo-Lanero, T.; Penco, A.; Prato, M.; Toccafondi, C.; Canepa, M.; Rolandi, R.; Cavalleri, O., Aligning Amyloid-Like Fibrils on Nanopatterned Graphite, *Bionanoscience*, **2012**, 2, 75-82. Doi: 10.1007/s12668-012-0038-5.

Book chapters

- 1) Penco, A.; Svaldo-Lanero, T.; Prato, M.; Toccafondi, C.; Rolandi, R.; Canepa, M.; Cavalleri, O., Graphite nanopatterning through interaction with bio-organic molecules, in *GraphIT2011, Carbon Nanostructures series*, **2012**, 221-228.

## *Communications at Conferences*

Oral communications:

- 1) Toccafondi, C., Prato, M.; Maidecchi, G.; Penco, A.; Bisio, F.; Cavalleri, O.; Canepa M., "Yeast Cytochrome C monolayers on gold substrates: an UV-Vis investigation by spectroscopic ellipsometry", European Conference on Organized Films, Sheffield (UK), 17-20/7/2011
- 2) Toccafondi, C., Prato, M.; Maidecchi, G.; Penco, A.; Bisio, F.; Cavalleri, O.; Canepa M., "Yeast Cytochrome C monolayers on gold substrates: an UV-Vis investigation by spectroscopic ellipsometry", Congresso 2011 della Società Italiana di Fisica, L'Aquila, 25-30/9/2011.
- 3) Toccafondi, C.; Prato, M.; Barborini, E.; Vinati, S.; Cavalleri, O.; Bisio, F.; Canepa, M. "Spectroscopic ellipsometry measurements on nano-granular TiO<sub>2</sub> thin films", 7<sup>th</sup> Workshop on Ellipsometry, Leipzig (Germany), 5-7/03/2012
- 4) Toccafondi, C.; Barborini, E.; Cavalleri, O.; Bisio, F.; Canepa, M., "Nano-granular TiO<sub>2</sub> thin films as substrates for protein deposition", NanoSEA2012, S. Margherita di Pula (Italy), 25-29/06/2012
- 5) Toccafondi, C.; Barborini, E.; Cavalleri, O.; Bisio, F.; Canepa, M., "Nano-granular TiO<sub>2</sub> thin films as substrates for protein deposition", International Conference on Organized Molecular Films (ICOMF-LB 14), Paris (France), 10-13/07/2012

Posters

- 6) Toccafondi, C.; Prato, M.; Cavalleri, O.; Maidecchi, G.; Bisio, F.; Canepa, M., "Yeast Cytochrome C adsorption on gold substrates: a spectroscopic ellipsometry investigation" Passion for Knowledge, Donostia-San-Sebastian, 27/09-1/10/2010.
- 7) Toccafondi, C.; Occhi, L.; Castagna, R.; Bertarelli, C.; Comoretto, D.; Canepa, M., "Ellipsometric investigation of photochromic transition in ultrathin films of diarylethene polymers", 7<sup>th</sup> Workshop Ellipsometry, Leipzig (Germany), 5-7/03/2012.
- 8) Toccafondi, C.; Barborini, E.; Cavalleri, O.; Bisio, F.; Canepa, M., "Nano-granular TiO<sub>2</sub> thin films as substrates for protein deposition", International Conference on Solid Films and Surfaces (ICSFS 16), Genova (Italy), 1-6/07/2012.

## *Congresses Attended*

- 1) European Conference on Organized Films, Sheffield (UK), 17-20/7/2011.
- 2) Congresso 2011 della Società Italiana di Fisica, L'Aquila, 25-30/9/2011.
- 3) 7<sup>th</sup> Workshop on Ellipsometry, Leipzig (Germany), 5-7/03/2012
- 4) NanoSEA2012, S. Margherita di Pula (Italy), 25-29/06/2012
- 5) International Conference on Solid Films and Surfaces (ICSFS 16), Genova (Italy), 1-6/07/2012
- 6) International Conference on Organized Molecular Films (ICOMF-LB 14), Paris (France), 10-13/07/2012

## Courseware

During her doctorate, Chiara Toccafondi has acquired 20 credits of Courseware.

### **Courses attended and passed (14 credits)**

*Courses Given by Teachers of the University of Genova:*

- 1) Surface Science (3 credits) (2010)
- 2) Optical Properties of Materials (3 credits) (2010)
- 3) Experimental Physics (4 credits) (2010).

*Courses Given by invited experts:*

- 1) Approaches to Synthesis and Characterization of Metal Oxide Magnetic Nanomaterials (Lorenza Suber, C.N.R., Roma) (2010) (1 credit).
- 2) Nanomagnetism and magnetic recording. (Prof. Marco Affronte, Università di Modena) (2010) (1 credit).
- 3) Nanomedicine - tinny "big players" in the future of medicine (Silke Krol, Neurologic Institute "Carlo Besta", Milano) (2012) (1 credit).
- 4) Combining organic-inorganic materials for flexible electronics (L. Mitoseriu, University "Alexandru Ioan Cuza", Iasi, Romania) (2012) (1 credit).

### **National and International Schools or Workshops (2 credits)**

- 1) *Passion for Interfaces*, Donostia-San Sebastian, 27/09/-1/10/2010 (2 credits)

### **Seminars Given (2 credits)**

The student presented 2 seminars as final test for 2 attended courses given by internal lecturers (see above).

### **Seminars Attended (2 credits)**

- 1) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 2) 14/10/2010, Dept. of Physics, "Growing semiconductor nanostructures with an AFM tip", Marco Rolandi, University of Washington, Seattle, WA (USA).
- 3) 2/11/2010, Dept. of Physics, "Dynamics of reactions at surfaces", Gerhard Ertl, Max Planck Gesellschaft, Berlin.
- 4) 12/1/2011, Dept. of Physics, "From growth studies to devices for electronics and bio-electronics: organic, nano-inorganic and nano-hybrid structure synthesis by kinetic activated processes at surfaces", Dr. Salvatore Iannotta, Director of the Institute of Materials for Electronics and Magnetism (IMEM) Italian National Research Council (CNR).
- 5) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 6) 28/3/2011, Dept. of Physics, "Nanoscale Science with Peptides, Proteins and viruses", Dr. Alexander Bittner, CIC nanoGUNE Consolider, Nanoscience Cooperative Research Center, San Sebastian, Spain.
- 7) 29/3/2011, Dept. of Chemistry and Industrial Chemistry, "La spettroscopia Raman nelle indagini sui beni culturali: stato dell'arte e sviluppi", Emilio Mario Castellucci, Dipartimento di Chimica "Ugo Schiff" e Laboratorio Europeo di Spettroscopie non Lineari (LENS), Università di Firenze.
- 8) 6/5/2011, Dept. of Chemistry and Industrial Chemistry, "Approcci analitici innovativi per caratterizzare i materiali organici in dipinti", Maria Perla Colombini, Università di Pisa.
- 9) 07/06/2011, SPIN-CNR, Genova, "Properties of recent IBAD-MOCVD coated conductors relevant to their high field, low temperature magnet use", Valeria Braccini - SPIN-CNR, Genova.
- 10) 07/06/2011, SPIN-CNR Genova, "Evidence for long range movement of Bi-2212 within the filament bundle on melting and its significant effect on Jc", Andrea Malagoli, SPIN-CNR, Genova.
- 11) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Effetti di processing meccanico su materiali termoelettrici", Carlo Fanciulli, IENI-CNR, Lecco.
- 12) 08/07/2011, Dept. of Chemistry and Industrial Chemistry, "Impiego dei moduli termoelettrici", Dr. Matteo Codecasa, IENI-CNR, Lecco.
- 13) 20/10/11, Dept. of Chemistry and Industrial Chemistry, "Formation of hybrid compounds of interest in cultural heritage monitored by neutron scattering", Claudia Mondelli, Institut Langevin, Grenoble, France.
- 14) 21/10/2011, Dept. of Chemistry and Industrial Chemistry, "From interesting to useful: the contribution of porous solids to the society", Gérard Férey, Université de Versailles, France.
- 15) 21/11/2011, Dept. of Physics, "Synthesis of metal nanoparticles at the surface and embedded in polymeric matrix by ion beam irradiation", Prof. Jai Prakash (Department of Chemistry – CCS University, Meerut e Material Science Division, Inter University Accelerator Centre, New Delhi – India).
- 16) 15/05/2012, Dept. of Chemistry and Industrial Chemistry, "Non obbediscono alla legge (di Bragg): ricercati i nanocristalli!", Dott.ssa Monica Dapiaggi (Dip. di Scienza della Terra, Università di Milano).

- 17) 05/06/2012, Dept. of Physics, "Biomolecular Recognition is Regulated Within Dense DNA Self-Assemblies", Dr. Matteo Castronovo (Centro di Riferimento Oncologico (CRO), Experimental and Clinical Pharmacology Unit, Aviano, Pordenone, Italy and Temple University, Department of Biology, Philadelphia, PA, USA)





UNIVERSITÀ DEGLI STUDI DI GENOVA  
*DOCTORATE SCHOOL IN  
SCIENCES AND TECHNOLOGIES OF  
CHEMISTRY AND MATERIALS*



*(HOLDING THE ECTN CHEMISTRY DOCTORATE EUROLABEL®)*

PH.D. CERTIFICATE OF  
**STEFANIA ZAPPIA**



**Doctorate Course:**

*Chemical Sciences and Technologies*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2010*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2012*

**Advisor:**

*Prof. Giovanni Petrillo*

**Thesis Title:**

*Synthesis and characterization of organic and metallo-organic hybrid materials for sensoristic and photovoltaic applications*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Stefania Zappia has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

HAS APPROVED THE THESIS OF STEFANIA ZAPPIA,  
CONFERRING ON HER THE TITLE OF

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Stefania Zappia **has also spent a research period of 3 months abroad** carrying out researches at the Centro de Investigación en Química Aplicada (CIQA), Saltillo (Mexico) from January 7, 2012 to March 31, 2012.

## *Scientific Publications*

Original publications on non ISI Journals:

- 1) Alloisio, M.; Zappia, S.; Demartini, A.; Ottonelli, M.; Dellepiane, G.; Thea, S., Novel Polydiacetylene-Functionalized Nanostructures for Sensing Applications, *e-J. Surf. Sci. Nanotech.*, **2012**, *10*, 549-552.

## *Communications at Conferences*

Oral communications:

- 1) Thea, S.; Ottonelli, M.; Jadhav, S.A.; Zappia, S.; Cuniberti, C.; Alloisio, M.; Dellepiane, G.; Petrillo, G., "Monostrati autoassemblati di sistemi policoniugati a base diacetenica per l'optoelettronica", Final meeting of PRIN2007 "Materiali organici per dispositivi fotovoltaici ed elettroluminescenti: progettazione, sintesi e valutazione", Roma, 30/11/2010.
- 2) Zappia, S., "Synthesis of metal-organic nanohybrids characterized by long-chain carboxylic acids with fluorescent end-groups", XXXVI Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 13-17/6/2011.
- 3) Alloisio, M.; Zappia, S.; Demartini, A.; Ottonelli, M.; Dellepiane, G.; Thea, S.; Zoppi, A.; Giorgetti, E.; Muniz Miranda M., "Synthesis and characterization of novel highly photoresponsive nanosensors", Giornate Italo-Francesi di Chimica (JFIC), Marseille, 16-17/4/2012.
- 4) Zappia, S.; Alloisio, M.; Arias, E.; de León, A.; Dellepiane, G.; Moggio, I.; Ottonelli, M.; Thea, S., "A novel perylene bisimide/phenyleneethynylene polymer for photovoltaic applications", FUTURMAT 2012, Carovigno (BR), 16-20/9/2012.

Posters:

- 1) Zappia, S.; Alloisio, M.; Demartini, A.; Petrillo, G.; Thea, S., "Acidi carbossilici a lunga catena dotati di gruppi fluorescenti come building block per monostrati autoassemblati su superfici metalliche", XXXV Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 14-18/6/2010.
- 2) Zappia, S.; Alloisio, M.; Demartini, A.; Petrillo, G.; Thea, S., "Sintesi di acidi carbossilici a lunga catena con gruppi terminali fluorescenti per l'allestimento di monostrati autoassemblati su superfici metalliche", 10° SAYCS, Pesaro, 18-20/10/2010.
- 3) Zappia, S.; Alloisio, M.; Demartini, A.; Petrillo, G.; Thea, S., "Synthesis and characterization of long-chain carboxylic acids with fluorescent end-groups as organic building-blocks for self-assembly on noble-metal nanostructures", XXIV Convegno Nazionale della Società Chimica Italiana, Lecce, 11-16/9/2011.
- 4) Alloisio, M.; Arias, E.; Moggio, I.; Petrillo, G.; Thea, S.; Zappia, S., "Synthesis and spectroscopic properties of dendron-like perylene bisimide/phenyleneethynylene polymers for photovoltaic applications", Giornate Italo-Francesi di Chimica (JFIC), Marsiglia, 16-17/4/2012.
- 5) Zappia S., Alloisio M., Demartini A., Ottonelli M., Dellepiane G., Thea S., Muniz Miranda M., "Polydiacetylenes-functionalized nanoparticles as novel highly photoresponsive material". ISMAC 2012, Milano, 15/11/2012.

## *Congresses Attended*

- 1) Giornate Italo-Francesi di Chimica, Genova, 26-27/4/2010.
- 2) Final meeting of PRIN 2007 "Materiali organici per dispositivi fotovoltaici ed elettroluminescenti: progettazione, sintesi e valutazione", Roma, 30/11/2010.
- 3) XXIV Convegno Nazionale della Società Chimica Italiana, Lecce, 11-16/9/2011.
- 4) Kick-off meeting of PRIN 2009, Milano 13-14/12/2011.
- 5) Giornate Italo-Francesi della Chimica 2012, Marseille (France), 16-17/4/2012.
- 6) International Conference on Solid Films and Surfaces, Genova, 1-6/7/2012.
- 7) FUTURMAT 2012, Ostuni (BR), 16-20/9/2012.
- 8) ISMAC 2012, Milano, 15/11/2012.

## *Courseware*

During her doctorate, Stefania Zappia has acquired 24 credits of Courseware.

## *Courses attended and passed (16 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Organic Materials for Electronics, Optoelectronics and Photonics (2 credits) (2010)
- 2) Bioorganic Chemistry (2 credits) (2010)
- 3) Diversity Oriented Synthesis (2 credits) (2011)

- 4) Stereoselective Synthesis (2 credits) (2011)
- 5) Bioinformatics (3 credits) (2011)
- 6) Microwave Technology Applied to Chemical Processes (2 credits) (2011)

*Courses Given by invited experts:*

- 1) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).
- 2) Polymer Assisted Solution Phase Combinatorial Synthesis (Luca Raveglia, NiKem, Bollate (MI))(2010) (1 credit).
- 3) The application of transition metal catalysis in multicomponent and domino reactions (Thomas Müller, Düsseldorf University, Germany) (2011) (1 credit).

***National and International Schools or Workshops (4 credits)***

- 1) XXXV Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 14-18/6/2010. (2 credits)
- 2) XXXVI Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 13-17/6/2011. (2 credits)

***Seminars Given (2 credits)***

- 1) 09/10/2012, Dept. of Chemistry and Industrial Chemistry, "Nanoparticles and cancer: from diagnosis to therapy".

***Seminars Attended (2 credits)***

- 1) 18/5/2010, Dept. of Chemistry and Industrial Chemistry, "Sports materials", Dr. Andy Watson, Institute for Materials Research, University of Leeds (UK).
- 2) 16/7/2010, Dept. of Chemistry and Industrial Chemistry, "Formation of Multiple Stereocenters via Organocatalysis", Dr. Marco Bella, Dip. Chimica, Università "La Sapienza" Roma
- 3) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritzky, University of Florida, Gainesville.
- 4) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Molecular Modeling in Drug Design: Ligand-based drug design and Structure-based drug design", Paola Zito.
- 5) 8/10/2010, Dept. of Chemistry and Industrial Chemistry, "Formation mechanism of silver nanoparticle 1D microstructures and their hierarchical assembly into 3D superstructures", Lorenza Suber, C.N.R., Roma.
- 6) 2/11/2010, Dept. of Physics, "Dynamics of reactions at surfaces", Gerhard Ertl, Max Planck Gesellschaft, Berlin.
- 7) 3/12/2010, Dept. of Chemistry and Industrial Chemistry, "Magnetic properties of nanoparticles: the effect of particle size and beyond...", Davide Peddis, C.N.R., Istituto di Struttura della Materia, Roma
- 8) 17/1/2011, Dept. of Chemistry and Industrial Chemistry, "Opportunities in photocromism: when "light is heavy", Dr. Chiara Bertarelli, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano.
- 9) 22/06/2011, Dept. of Chemistry and Industrial Chemistry, "Identification and characterization of unknown compounds in urine of neuroblastoma patients", Carlo Scapolla, Università di Genova.
- 10) 20/07/2011, Dept. of Chemistry and Industrial Chemistry, "Organic and hybrid solar cells: fundamentals and recent advances", Luiz Carlos Pimentel Almeida, Universidade Estadual de Campinas, Sao Paulo, Brasil.
- 11) 14/10/2011, Dept. of Chemistry and Industrial Chemistry, "Transition Metal Catalysis as an Entry to Multicomponent Synthesis of Heterocycles, T.J.J. Müller, Heinrich-Heine University Düsseldorf (Germany).
- 12) 22/11/2011, Dept. of Chemistry and Industrial Chemistry, "Synthesis as an enabling Science: from Concept to Practice", Stephen Hanessian, Université de Montreal and Irvine University.
- 13) 09/10/2012, Dept. of Chemistry and Industrial Chemistry, "Modelli di Calcolo in Dinamica Molecolare", D. Duce.
- 14) 09/10/2012, Dept. of Chemistry and Industrial Chemistry, "Frustrated Lewis Pairs: Making the Most of Frustration!", F. Morana.
- 15) 12/12/2012, Dept. of Chemistry and Industrial Chemistry, "Thermophysical properties of metallic melts", S. Amore, Institute for Energetics and Interphases – National Research Council, CNR – IENI, Genova.

***Teaching Assistance***

- 1) Assistance to the module "Organic Chemistry with Laboratory" (Bachelor Degree in Biotechnology) (2010/2011): 30 hours.
- 2) Assistance to the module "Organic Chemistry 2 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2011/2012): 40 hours.
- 3) Assistance to the module "Organic Chemistry 2 with Laboratory" (Bachelor Degree in Chemistry and Chemical Technologies) (2012/2013): 20 hours.



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PH.D. CERTIFICATE OF  
**PAOLA MAURA ZITO**



**Doctorate Course:**

*Chemical Sciences and Technologies*

**Start of the Doctorate Program:**

*January 1<sup>st</sup>, 2008*

**End of the Doctorate Program:**

*December 31<sup>st</sup>, 2010*

**Advisor:**

*Prof. Luca Banfi*

**Thesis Title:**

*Synthesis of polyfunctional heterocyclic derivatives  
via multicomponent reactions or  
other diversity-oriented strategies*

**Defense Date:**

*February 8<sup>th</sup>, 2013*

On February 8<sup>th</sup>, 2013, at the Department of Chemistry and Industrial Chemistry, Paola Maura Zito has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Alberto Albinati, University of Milano
- Prof. Marco Bella, University "Sapienza" of Roma
- Prof. Fabio Canepa, University of Genova

The written Dissertation had been previously sent to the Commission members. After careful examination of the Dissertation, of the student's oral presentation, of the overall activity of the student during the three years of doctorate studies, the Commission

HAS APPROVED THE THESIS OF PAOLA MAURA ZITO,  
CONFERRING ON HER THE TITLE OF

**RESEARCH DOCTOR IN  
CHEMICAL SCIENCES AND TECHNOLOGIES**

Genova, February 8<sup>th</sup>, 2013

The Director of the Doctorate School  
(Prof. Luca Banfi)

The Coordinator of the Doctorate Course  
(Prof. Luca Banfi)

# ACTIVITY REPORT

## *Research Activity*

The research activity was mainly carried out at the Department of Chemistry and Industrial Chemistry (University of Genova). However, Paola Maura Zito **has also spent a research period of 6 months abroad** carrying out researches at the Royal College of Surgeons in Ireland, Dublin (Ireland), under the supervision of Prof. Mauro Adamo from January 1, 2010 to June 30, 2010.

## *Scientific Publications*

Original publications on ISI Journals:

- 1) Banfi, L.; Basso, A.; Casuscelli, F.; Guanti, G.; Naz, F.; Riva, R.; Zito, P., Synthesis of Novel Isochromene Derivatives by Tandem Ugi Reaction / Nucleophilic Substitution, *Synlett*, **2010**, 85-88. IMPACT FACTOR (2011): 2.710.
- 2) Riva, R.; Banfi, L.; Basso, A.; Zito, P., A new diversity oriented and metal-free approach to highly functionalized 3H-pyrimidin-4-ones, *Organic and Biomolecular Chemistry*, **2011**, 9, 2107-2122.. IMPACT FACTOR (2011): 3.696.

## *Communications at Conferences*

### *Congresses Attended*

- 1) Congresso SAYCS (Sigma-Aldrich Young Chemists Symposium), Pesaro, 20-22 ottobre 2008.

## *Courseware*

During her doctorate, Paola Maura Zito has acquired 28 credits of Courseware.

### *Courses attended and passed (20 credits)*

*Courses Given by Teachers of the University of Genova:*

- 1) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patent. Free Data Bases and on payment. (2 credits) (2008)
- 2) Bioorganic Chemistry (2 credits) (2009)
- 3) Diversity Oriented Synthesis (2 credits) (2009)
- 4) Stereoselective Synthesis (2 credits) (2009)
- 5) Bioinformatics (3 credits) (2009)
- 6) Microwave Technology Applied to Chemical Processes (2 credits) (2009)

*Courses Given by invited experts:*

- 1) Biotechnological drugs (Barbara Gatto, University of Padova) (1 credit)(2008)
- 2) "Organic synthesis in microreactors" and "Surfaces and microchannel with controlled wettability for new materials and devices (Michele Maggini and Tommaso Carofiglio, University of Padova) (1 credit)(2008).
- 3) Development of dyes in the cosmetic industry: the L'Oreal case (Cristina Emanuel, L'Oreal) (1 credit)(2009)
- 4) Fragment-based drug design (Eduard Felder, Nerviano Medical Sciences) (1 credit)(2009).
- 5) Ionic liquids (Cinzia Chiappe, University of Pisa) (1 credit) (2009).
- 6) The LC-MS toolbox for structural elucidation of trace compounds: applications in drug discovery and development (Antonio Triolo) (1 credit)(2010).
- 7) Issues related to the synthesis, formulation and marketing of generic drugs (Graziano Castaldi, Chemelectiva, Novara)(2010) (1 credit).

### *National and International Schools or Workshops (4 credits)*

- 1) XXXIII Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 23-27/6/2008 (2 credits).
- 2) XXXIV Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 22-26/6/2009 (2 credits).

### *Seminars Given (2 credits)*

- 1) 06/10/2010, Dept. of Chemistry and Industrial Chemistry, "Molecular Modeling in Drug Design: Ligand-based drug design and Structure-based drug design".

### *Seminars Attended (2 credits)*

- 1) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, aula magna, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 2) 6/5/2008, Dept. of Chemistry and Industrial Chemistry, "Metallazione regio- e stereoselettiva di eterocicli: utilità sintetica", Prof. Saverio Florio, Università di Bari.

- 3) 3/7/2008, Dept. of Chemistry and Industrial Chemistry, "Potent XIAP Antagonists by a Fragment-Based MCR Approach", Ilaria Monfardini, DOBIG, Genova.
- 4) 27/10/2008, Dept. of Chemistry and Industrial Chemistry, "Lo Spazio Chimico e la sua Descrizione Matematica", Prof. Roberto Todeschini, Università Bicocca di Milano
- 5) 27/10/2008, Dept. of Chemistry and Industrial Chemistry, "Navigare lo Spazio Chimico per la Biologia e la Medicina". Dr. Antonio Macchiarulo, Università di Perugia.
- 6) 3/11/2008, Dept. of Chemistry and Industrial Chemistry, "La sintesi orientata alla diversità di collezioni di molecole", D.ssa Chiara Ghiron, SienaBiotech.
- 7) 3/11/2008, Dept. of Chemistry and Industrial Chemistry, "Sfruttare la chemiodiversità delle sostanze naturali", Prof. G. Appendino, Università del Piemonte Orientale.
- 8) 27/2/2009, Dept. of Pharmaceutical Sciences, "Chiral chromatography : a mature technology, a scientific challenge", Prof. Christian Roussel, Marseille, France.
- 9) 27/2/2009, Dept. of Pharmaceutical Sciences, "Chemistry derived from N-(o-amino-phenyl) thiazoline-2-thione", Federico Andreoli, Marseille, France.
- 10) 19/3/2009, Dept. of Chemistry and Industrial Chemistry, "Derivati imminici altamente reattivi per la sintesi di composti azotati.", Prof. Marino Petrini, Università di Camerino
- 11) 18/5/2009, Dept. of Chemistry and Industrial Chemistry, "Calcolo dello spettro NMR con metodi DFT: applicazione alla determinazione strutturale di molecole organiche complesse, Prof. Alessandro Bagno, Università di Padova.
- 12) 6/11/2009, Faculty of Medicine, "Targeting beta-amyloid in Alzheimer's Disease: chemical, biochemical and modeling studies", A. Carotti, Università di Bari
- 13) 30/11/2009, Dept. of Chemistry and Industrial Chemistry, aula 2, "Evoluzione della famiglia proteica delle sulfotransferasi. Un'analisi bioinformatico-strutturale", D. Bordo, IST, Genova.
- 14) 16/7/2010, Dept. of Chemistry and Industrial Chemistry, "Formation of Multiple Stereocenters via Organocatalysis", Dr. Marco Bella, Dip. Chimica, Università "La Sapienza" Roma
- 15) 17/9/2010, Dept. of Chemistry and Industrial Chemistry, "Activated Peptides: for Ligation and Large Cyclic Transition States", Prof. A.R. Katritsky, University of Florida, Gainesville.
- 16) 6/10/2010, Dept. of Chemistry and Industrial Chemistry, "Clusters in composti intermetallici", Monika Skrobanska.
- 17) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Organic Synthesis "on water"", Valentina Cerulli
- 18) 12/10/2010, Dept. of Chemistry and Industrial Chemistry, "Self-assembly and crystallization in block copolymers", Dario Cavallo
- 19) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "Il rischio sanitario associato alle biotossine algali nei frutti di mare", Giuliana Ottonello.
- 20) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "La combinazione della catalisi di metalli di transizione e organocatalisi", Anna Piatek.
- 21) 26/10/2010, Dept. of Chemistry and Industrial Chemistry, "Diversity oriented synthesis of heterocyclic compounds exploiting isocyanides and alkynes in multicomponent reactions", Fabio De Moliner.

### *Teaching Assistance*