

UNIVERSITY OF GENOVA

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

XXII 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 newborn 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 XXII cycle was the second one to be organized by it.

Between February, 25 and March, 4, 2010, 17 out of the remaining 18 students of the XII cycle of the School have finished their program, acquiring the degree of "Research Doctor". During an official ceremony held on March, 5, I had the honour and the pleasure to deliver to all these students a final certificate, reporting all their activities during the doctorate. As already done last year, I have now put together all these certificates, adding some general information 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 XXII cycle the board of professors was formed by:

- Luca Banfi (director), DCCI, Organic Chemistry.
- Luisa Mosti, DISCIFAR, Medicinal Chemistry
- Gabriella Borzone, DCCI, Inorganic Chemistry
- Francesco Bondavalli, DISCIFAR, Medicinal Chemistry
- Guido Busca, DICHEP, Industrial and Technological Chemistry
- Stefano Delfino, DCCI, Inorganic Chemistry
- Silvia Lanteri, DICTFA, Analytical Chemistry
- Emilia Mariani, DISCIFAR, Pharmaceutical Technologies
- Lorenzo Mattera, DIFI, Physics of Matter
- Franco Merlo, DCCI, Physical Chemistry
- Saverio Russo, DCCI, Industrial Chemistry
- Antonio Turturro, DCCI, Industrial Chemistry

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

Chemical Sciences and Technologies

- Luca Banfi (coordinator), DCCI, Organic Chemistry.
- Stefano Delfino, DCCI, Inorganic Chemistry
- Emanuele Magi, DCCI, Analytical Chemistry
- Enrico Marsano, DCCI, Industrial Chemistry
- Franco Merlo, DCCI, Physical Chemistry
- Maria Rosa Pinasco, DCCI, Metallurgy
- Saverio Russo, DCCI, Industrial Chemistry
- Sergio Thea, DCCI, Organic Chemistry

Medicinal, Food, and Cosmetic Sciences

- Luisa Mosti (coordinator), DISCIFAR, Medicinal Chemistry
- Alessandro Balbi, DISCIFAR, Medicinal Chemistry
- Annamaria Bassi, DIMES, General Pathology
- Vincenzo Bertini, DICTFA, Organic Chemistry
- Raffaella Boggia, DICTFA, Food Chemistry
- Vito Boido, DISCIFAR, Medicinal Chemistry
- Francesco Bondavalli, DISCIFAR, Medicinal Chemistry
- Cristina Emanuel, l'Oreal
- Paolo Giunchedi, University of Sassari, Pharmaceutical Technologies
- Silvia Lanteri, DICTFA, Analytical Chemistry
- Emilia Mariani, DISCIFAR, Pharmaceutical Technologies
- Mauro Mazzei, DISCIFAR, Medicinal Chemistry
- Vincenzo Minganti, DICTFA, Inorganic Chemistry
- Brunella Parodi, DICTFA, Pharmaceutical Technologies
- Angelo Ranise, DISCIFAR, Medicinal Chemistry
- Giorgio Roma, DISCIFAR, Pharmaceutical Technologies
- Carla Villa, DISCIFAR, Pharmaceutical Technologies

Material Science and Technology

- Gabriella Borzone (coordinator), DCCI, Inorganic Chemistry.
- Guido Busca, DIChEP, Industrial and Technological Chemistry
- Giacomo Cerisola, DIChEP, Chemistry Foundations of Technologies
- Maurizio Ferretti, DCCI, Physical Chemistry
- Alessandra Gliozzi, DIFI, Applied Physics
- Rinaldo Marazza, DCCI, Inorganic Chemistry
- Lorenzo Mattera, DIFI, Physics of Matter
- Paolo Nanni, DIChEP, Chemistry Foundations of Technologies
- Marina Putti, DIFI, Experimental Physics
- Antonio Turturro, DCCI, Industrial Chemistry

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 XXII cycle it was formed by:

- Jean-Pierre Bros, universit  Aix-Marseille 1 (France)
- Anita Caccialupi, Ansaldo Energia, Genova
- Fabio Comin, ESRF, Grenoble (France)
- Giuseppe Giardina, NiKem Research, Bollate (MI)
- Stephen Hanessian, Universit  de Montr al (Canada), and University of California, Irvine (USA).
- Andr  Loupy, CNRS, Paris (France)
- Alberto Modelli, ST Microelectronics, Agrate Brianza (MI)
- Massimo Morbidelli, ETH, Zurich (Switzerland)
- Stefano Rossini, ENI Technologies, S. Donato Milanese (MI)
- Domenico Sanfilippo, Snamprogetti, S. Donato Milanese (MI)
- 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 XXII cycle, the School has activated **22 type A Courses** and **25 type B courses specific for the doctorate (for a total of 57 credits)**, plus other 7 courses in common with the master degrees. The School has informed of about 86 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 XXII CYCLE

Students who completed in due time the Doctorate Programme

- Roberta Amendola (STM)
- Luca Borago (STM)
- Paolo Brotto (STM)
- Marina Carrozza (SFAC)
- Elena Casazza (STC)
- Maria Francesca Catalano (SFAC)
- Matteo Caviglia (SFAC)
- Matteo Fabbreschi (STC)
- Lijo Francis (STC)
- Francesco Gagliardi (STM)
- Sushilkumar Jadhav (STC)
- Chiara Macciò (SFAC)
- Daniela Nichino (STM)
- Paolo Oliveri (SFAC)
- Ai Lien Ong (STC)
- Amanda Penco (STM)
- Aman Ullah (STC)

Students who postponed the final exam to 2011

- Federico Wrubl (STC)

Students who resigned during the Doctorate

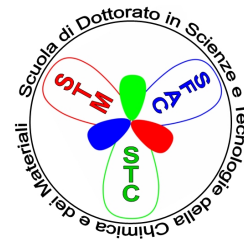
- Ivano Cascone (STC)

PICTURES OF THE FINAL PROCLAMATION





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



PH.D. CERTIFICATE
OF
ROBERTA AMENDOLA



Doctorate Course:
Science and Technology of Materials

Start of the Doctorate Program:
January 1st, 2007

End of the Doctorate Program:
December 31st, 2009

Advisors:
*Dr. Paolo Piccardo
Prof. Maria Giuseppina Ienco*

Thesis Title:
*Influence of alloying elements on properties
of casting copper base alloys*

Defense Date:
March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Roberta Amendola has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 ROBERTA AMENDOLA,
CONFERRING HER THE TITLE OF**

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 of the University of Genova from 1/1/2007 to 31/12/2008, and at IENI Institute of CNR (Genova Section) from 1/1/2009 to 31/12/2009. However, Roberta Amendola also spent some short periods abroad, at the German Aerospace Center (DLR – ITT), Stuttgart (Germany) (21-23/5/2009 and 9-11/12/2009), at Montana State University, Bozeman (USA) (21-27/8/2009), and at the Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, Sofia (Bulgaria) (12-18/9/2009).

Scientific Publications

Original publications on ISI Journals:

- 1) Fontana, S.; Amendola, R.; Chevalier, S.; Piccardo, P.; Caboche, G.; Viviani, M.; Molins, R.; Sennour, M., Metallic interconnects for SOFC: Characterisation of corrosion resistance and conductivity evaluation at operating temperature of differently coated alloys, *Journal of Power Sources*, **2007**, 171, 652-662. IMPACT FACTOR (2006): 3.521.
- 2) Piccardo, P.; Chevalier, S.; Gannon, P.; Viviani, M.; Caboche, G.; Fontana, S.; Barbucci, A.; Amendola, R., ASR evaluation of different kinds of coatings on a ferritic stainless steel as SOFC interconnects, *Surface & Coatings Technology*, **2007**, 202, 1221-1225. IMPACT FACTOR (2006): 1.559.
- 3) Piccardo, P.; Amendola, R.; Fontana, S.; Chevalier, S.; Caboches, G.; Gannon, P., Interconnect materials for next-generation solid oxide fuel cells, *Journal of Applied Electrochemistry*, **2009**, 39, 545-551. IMPACT FACTOR (2008): 1.540.
- 4) Amendola, R.; Ienco, M. G.; Pellati, G.; Piccardo, P.; Pinasco, M. R.; Stagno, E., "Sviluppo dell'attività metallurgica in Liguria: il ferro in Valle Stura dal XIV al XVIII secolo", *La metallurgia italiana*, Luglio/Agosto 2008, Pagine 27-36. IMPACT FACTOR: *not present*.
- 5) Piccardo, P.; Amendola, R.; Adobati, A.; Faletti, C., "Studio della fluidità di leghe a base rame", *La metallurgia italiana*, Maggio 2009, pagine 31-38. IMPACT FACTOR: *not present*.

Original publications on other Journals:

- 1) Piccardo, P.; Amendola, R., "La metallografia ottica nello studio di cricche e tensioni nei giunti saldati", *Rivista Italiana della Saldatura*, Numero 2 Marzo/Aprile 2008, Pagine 243-249

Conference proceedings published on books:

- 1) Piccardo, P.; Amendola, R. "Interconnects and LSCF: is this couple working", *International Workshop, Advances and innovation in SOFCs*, September 13-17, 2009, Katarino, Bulgaria, Edited by D. Vladikova, Z. Stoyanov ISBN 987-954-92483-1-9
- 2) Piccardo, P.; Amendola, R., "SOFC's interconnects materials development", *International Workshop, Advances and innovation in SOFCs*, September 13-17, 2009, Katarino, Bulgaria, Edited by D. Vladikova, Z. Stoyanov ISBN 987-954-92483-1-9

Communications at Conferences

Oral presentations:

- 1) Amendola, R.; Piccardo, P.; Adobati, A., "Studio della fluidità di leghe a base rame", 7° Convegno Nazionale INSTM sulla scienza e tecnologia dei materiali, 9-12/6/2009, Tirrenia (PI), Italy.
- 2) Piccardo, P.; Amendola, R., "Interconnects and LSCF: is this couple working", International Workshop on Advances and innovation in SOFCs September 13-17, 2009, Katarino, Bulgaria.

Posters:

- 3) Piccardo, P.; Amendola, R.; Pinasco, M.R.; Ienco, M. G.; Pellati, G.; Fabbreschi, M.; Chevalier, S.; Fontana, S.; Caboche, G. "History and perspectives of metallic interconnects in FC design", Proton Conducting Materials for Next Generation Solid Oxide Fuel Cells, 22-24/10/2007, Genova.
- 4) Piccardo, P.; Amendola, R.; Pinasco, M.R.; Ienco, M. G.; Pellati, G.; Fabbreschi, M., "La metallografia ottica nello studio di cricche e tensioni nei giunti saldati", GNS4 - Giornate Nazionali di Saldatura, 25-26/10/2007 Genova.
- 5) Amendola, R.; Piccardo, P.; Adobati, A., "Studio della fluidità di leghe a base rame", 7° Convegno Nazionale INSTM sulla scienza e tecnologia dei materiali, 9-12/6/2009, Tirrenia (PI), Italy.

Congresses Attended

- 1) *History and perspectives of metallic interconnects in FC design, Proton Conducting Materials for Next Generation Solid Oxide Fuel Cells*, 22-24/10/2007, Genova.
- 2) *GNS4 - Giornate Nazionali di Saldatura*, 25-26/10/2007, Genova.
- 3) *7° Convegno Nazionale INSTM sulla scienza e tecnologia dei materiali*, 9-12/6/2009, Tirrenia (PI), Italy
- 4) *International Workshop, Advances and innovation in SOFCs*, 13-17/9/2009, Katarino (Bulgaria).

Courseware

During her doctorate, Roberta Amendola has acquired 25.0 credits of Courseware.

Courses attended and passed (18 credits)

Courses Given by Teachers of the University of Genova:

- 1) Intermetallic compounds (2 credits)(2007).
- 2) Amorphous metallic materials and composite materials (3 credits)(2007).
- 3) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).

Courses Given by invited experts:

- 1) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 2) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J. P. Rigueiro) (1 credit)(2008)

Other courses:

- 1) "Deformazione plastica dell'acciaio. Laminazione a caldo e a freddo dei prodotti piani" (Associazione Italiana di Metallurgia) Milano, 14-15-16-22-23/3/2007 (2 credits).
- 2) "Failure Analysis" (Associazione Italiana di Metallurgia) Milano, 27-29/3/2007 (2 credits).
- 3) "Tribologia", (Associazione Italiana di Metallurgia) Milano, 29-30/5 and 5-6-7/6/2007 (2 credits).
- 4) "Prove meccaniche" (Associazione Italiana di Metallurgia), Trento, 13-16/5/2008 (2 credits).
- 5) "Corso base sul creep", (Associazione Italiana di Metallurgia) Milano, 31/3 and 1/4/2009

National and International Schools or Workshops (3 credits)

- 1) *Incontro con gli archeomateriali: imparare a riconoscere il sapere, l'uomo e il lavoro che stanno dietro a un reperto*, Genova, 2-3-2007 (0.25 credits).
- 2) *Proton conducting materials for next-generation Solid Oxide Fuel Cell*, Genova, 22-24/10/2007 (1 credit).
- 3) *Metallografia e Anomalie di Fabbricazione e di Esercizio*, Milano, 31/1/2008 (0.5 credits).
- 4) *Rivestimenti superficiali per applicazioni industriali*, Polo Tecnologico Navacchio (PI), 17-18/4/2008 (1 credit).
- 5) *Giornata di formazione ed aggiornamento Istituto Italiano della Saldatura (GE), "Il creep nei giunti saldati*, Genova, 5/6/2008 (0.25 credits).

Seminars Given (2 credits)

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

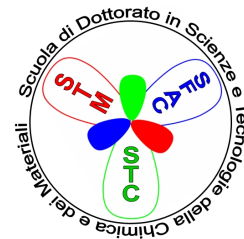
Seminars Attended (2 credits)

- 1) 20/02/07, Dept. of Chemistry and Industrial Chemistry, Genova, "La metallografia per i Beni Culturali: monete argentate ma non d'argento, il caso dei veri falsi", Dr. Paolo Piccardo.
- 2) 4/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Energie rinnovabili: materiali e tecnologie per celle a combustibile a carbonati fusi", Dr. Paolo Capobianco, Ansaldo Fuel Cells.
- 3) 14/5/2007, Dept. of Physics, Genova, "X-ray and neutron scattering: methods and examples", Dr. Olivier Plantivin, European Synchrotron Radiation Facility.
- 4) 16/5/2007, Faculty of Engineering, Genova, "Ossidi Ceramici per l'Ambiente e le Costruzioni", prof. Dario Beruto, Università di Genova.
- 5) 22/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Rapid prototyping: la trasformazione diventa innovativa", Ing. Lanfranco Galter, Technimold srl.
- 6) 5/10/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "From Hamiltonian to microstructure-first principles calculations of a phase diagram and microstructure" Prof. Tetsuo Mohri, Division of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, JAPAN.
- 7) 2/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "High pressure high temperature technique as a tool for the synthesis of ceramic materials with transition metals in mixed valence state", Dr. Alberto Ubaldini, Advanced Nano Materials Laboratory, National Institute for Materials Science (NIMS), Tsukuba (Japan).
- 8) 28/5/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Palette per turbine a gas: requisiti funzionali e tecnologie produttive", Emanuela Cordano, Ansaldo Ricerche.
- 9) 22/10/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Materials Research Activity at the Technological Centre of the Brazilian Navy", Dr.ssa Selma Luiza Silva del "Centro Tecnológico da Marinha em Sao Paulo (Brasil).
- 10) 6/2/2009, Dept. of Physics, Genova, "L'energia del futuro", Prof. Carlo Rubbia, CERN, Ginevra.
- 11) 3/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Ipotesi chimica sull'origine della vita: dal Big Bang alla comparsa dei primi organismi viventi", Prof. Piero Ugliengo, Università di Torino.
- 12) 13/3/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 13) 25/3/2009, IENI-CNR, Genova, "Experimental methods for investigations of thermophysical and structure-sensitive properties of metallic melts", Dr. Yuriy Plevachuk, Ivan Franko National University, Department of Metal Physics, Lviv, Ukraine.

- 14) 16/4/2009, Faculty of Literature, Genova, "Metal processing, craftsmen and workshops, in ancient societies", Prof. Michel Pernot.
- 15) 16/4/2009, Faculty of Literature, Genova, "About Middle and Upper Palaeolithic in Europe: contribution of reliable chronological information from luminescence dating", Prof. Cristel Lahaye.
- 16) 16/4/2009, Faculty of Literature, Genova, "Self-organizing maps in archaeometry and structural chemistry", Prof. Igor Kuzmanowski.
- 17) 14/5/2009, ore 11.00, CNR-IENI, Genova, "Impedance Spectroscopy and Fuel Cells", Prof. Zdravko Stoynov, Bulgarian Academy of Sciences, Sofia.



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PH.D. CERTIFICATE
OF
LUCA BORAGNO



Doctorate Course:

Science and Technology of Materials

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisors:

Prof. Giovanni Carlo Alfonso

Dr. Paola Stagnaro

Thesis Title:

*Ethylene/propylene based random copolymers with higher α -olefins:
correlation between structure and properties*

Defense Date:

March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Luca Boragno has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 LUCA BORAGNO,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 C.N.R. Institute for the Study of Macromolecules, Genova Section. However, Luca Boragno, also spent **about 4 months abroad**: at the Katholieke Universiteit Leuven, Belgium, under the supervision of Prof. V. Mathot (7/5-7/6/2007); at the DESY synchrotron facility in Hamburg (Germany) (31/10-6/11/2007 and 10-15/12/2008); at the ESRF synchrotron facility in Grenoble (France) (4-9/3/2009 6-9/04/2009 3-7/09/2009 and 24-27/10/2009); at Lyondell-Basell in Frankfurt (Germany) (15-17/12/2008); at State Key Lab at Changchun Institute for Applied Chemistry – Chinese Academy of Science (CIAC-CAS), Changchun, China, under the supervision of Prof. Jinghua Yin (28-4/28-6/2009).

Scientific Publications

Original publications on ISI Journals:

- 1) Menichetti, S.; Vigliani, C.; Liguori, F.; Cogliati, C.; Boragno, L.; Stagnaro, P.; Losio, S.; Sacchi, M. C., Ethylene-based copolymers with tunable content of polymerizable hindered phenols as nonreleasing macromolecular additives, *Journal of Polymer Science Part A-Polymer Chemistry*, **2008**, 46, 6393-6406. IMPACT FACTOR (2008): 3.821.
- 2) Stagnaro, P.; Boragno, L.; Canetti, M.; Forlini, F.; Azzurri, F.; Alfonso, G. C., Crystallization and morphology of the trigonal form in random propene/1-pentene copolymers, *Polymer*, **2009**, 50, 5242-5249. IMPACT FACTOR (2008): 3.331.
- 3) Galimberti, M.; Piemontesi, F.; Alagia, L.; Losio, S.; Boragno, L.; Stagnaro, P.; Sacchi, M. C., Towards block copolymers from non living isospecific single site catalytic systems, *J. Polymer Science, Part A: polymer chemistry*, **2010**, in press. IMPACT FACTOR (2008): 3.821.

Other publications:

- 4) Limbo, S.; Piergiovanni, L.; Boragno, L.; Stagnaro, P.; Mendichi, R.; Castellano, M., Proprietà morfologiche, ottiche e diffusionali di film per imballaggio alimentare ottenuti da miscele di polietilene a bassa densità con copolimeri etilene-cicloolefine, in *Ricerche e innovazione nell'industria alimentare*, Porretta, S., Ed. Chiriotti: 2007.

Communications at Conferences

Oral communications:

- 1) Boragno, L., "Frazionamento termico di copolimeri statistici propene/1-pentene mediante SSA", Macrogiovani – Gargnano (BS) Palazzo Feltrinelli, 8/5/2008.
- 2) Boragno, L., "Microstructure of C3/C5 random copolymers: the recently discovered δ -form", 2nd National Forum of Young Researchers on Polymeric Materials and Biomaterials, Genova, 4-5/7/2008.
- 3) Boragno, L.; Stagnaro, P.; Forlini, F.; Azzurri, F.; Alfonso G.C., "Structural and Morphological Features of the δ -Form in Isotactic Propene/1-Pentene Random Copolymers", XIX Convegno Italiano di Scienza e Tecnologia delle Macromolecole, Milano, 13-17/9/2009, p. 2.26.

Posters:

- 4) Boragno, L.; Stagnaro, P.; Azzurri, F.; Forlini, F.; Alfonso, G.C., "Crystallization Behaviour of Propylene/1-Pentene Random Copolymers", ICPC, International Conference on Polyolefin Characterization, Valencia, 14-17/9/2008, p. 74.
- 5) Boragno, L., "Frazionamento termico di copolimeri statistici propene/1-pentene mediante SSA", Macrogiovani, Gargnano (BS), 8/5/2008.

Congresses Attended

- 1) 2^o National Forum of Young Researchers on Polymeric Materials and Biomaterials, Genova, 4-5/7/2008
- 2) ICPC, International Conference on Polyolefin Characterization – Valencia, 14-17/9/2008.
- 3) XIX Convegno Italiano di Scienza e Tecnologia delle Macromolecole, Milano, 13-17/9/2009.

Courseware

During his doctorate, Luca Boragno has acquired 25.5 credits of Courseware.

Courses attended and passed (16 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).
- 2) In vitro tests for evaluation of toxicity and biological action of chemical compounds (2 credits)(2007).
- 3) Fundamental of modern polymer processing (2 credits)(2007).
- 4) New topics about food composition and analysis (2 credits)(2007).
- 5) Innovative pharmaceutical dosage forms: preparation and control methods (2 credits) (2008).

Courses Given by invited experts:

- 1) Intellectual property in the chemical, pharmaceutical and food sectors: patent searches and patenting procedures (Ferreo-Osella) (1 credit)(2007).

- 2) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 3) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J. P. Rigueiro) (1 credit)(2008).
- 4) Ionic liquids (C. Chiappe) (1 credit)(2009).
- 5) Bioplastics (A. Casale) (1 credit)(2009).

National and International Schools or Workshops (5.5 credits)

- 1) *Giornata tecnologica AIM su "Innovazione nell'imballaggio. Imballaggio attivo ed intelligente"*, Milano, 5/7/2007 (0.5 credits).
- 2) *Nanofunpoly – Multihybrids – Industrial training session on Polymer nanocomposites degradation and fire characterization*, Alessandria, 10/10/2007 (0.5 credits).
- 3) *La corretta interpretazione dei tracciati termoanalitici*, Alessandria, 23/10/2007 (0.5 credits).
- 4) *Analisi Termica-Applicazione ed interpretazione dei tracciati*, Milano, 5/3/2008 (0.5 credits).
- 5) *XXIX Convegno-Scuola AIM M.Farina "Cicli di vita dei materiali polimerici"*, Gargnano (BS), 5-9/5/2008 (2 credits)
- 6) *Macrogiovani 2008*, Gargnano (BS), 8/5/2008 (0.5 credits).
- 7) *2nd National Forum of Young Researchers on Polymeric Materials and Biomaterials*, Genova, 4-5/7/2008 (0.5 credits).
- 8) *Giornata tecnologica AIM su "Materie plastiche per il Packaging. Novità dal mondo della Ricerca"*, Rho (MI), 27/03/2009 (0.5 credits).

Seminars Given (2 credits)

- 1) The student presented 5 seminars as final test for the 5 attended courses given by internal teachers (see above).
- 2) "Shear-Induced Crystallization of Polymers Added with Nucleating Agents", given during the Workshop: "Process-Related Structures and Properties of Crystallizable Polymers", Dept. of Chemistry and Industrial Chemistry, Genova, 7/3/2007.

Seminars Attended (2 credits)

- 1) 16/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Prospettive nel ritardo alla fiamma dei materiali polimerici", Prof. Giovanni Camino, Politecnico di Torino.
- 2) 11/4/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Phase Behaviour of polymer blends. From nanophase separation to predictions", Dr. Valeria Arrighi, Heriot-Watt University, Edinburgh (UK).
- 3) 12/2/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Supramolecular chirality and photomodulation of properties of amorphous and liquid crystal polymers obtained by ATRP", Dr. Loris Giorgini, Università di Bologna.
- 4) 22/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "La grande macchina dei suoni: le tecnologie e i materiali degli organi a canne", Prof. Umberto Anselmi Tamburini, Dipartimento di Chimica Fisica, Università di Pavia.
- 5) 26/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Interferenti Endocrini: nuovo pericolo per la salute umana o falso allarmismo?", C. Liscio.
- 6) 26/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Carbon Nanotube: A leading material", P. Waghmare.
- 7) 26/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Crescita di Cristalli Singoli", R. Pasero.
- 8) 13/3/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 9) 16/7/2009, CNR-ISMAL, Genova "X-ray Scattering on Soft Matter", Sergio Funari, Beamline Scientist at HASYLAB-DESY, Hamburg, Germany.
- 10) 27/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Insulated molecular wires as model conjugated polymers with controlled interstrand interactions", Prof. Franco Cacialli, Department of Physics and Astronomy (CMMP Group) and London Centre for Nanotechnology, University College London.
- 11) 28/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Why can't you use thermal neutrons to study gadolinium-based materials?", Prof. Dominic Ryan, Mc Gill University (Montreal).
- 12) 20-11-2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Materials for solar energy", L. Francis.
- 13) 20-11-2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Role of dendrimers in Drug Delivery", A. Ullah.
- 14) 20-11-2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Polimeri per uso nel fotovoltaico", E. Casazza.
- 15) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Retinopatie e Diabete: ruolo del fattore di crescita vascolare (VEGF)", F. Catalano.
- 16) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: basi teoriche e strumentazione", C. Macciò.
- 17) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: aspetti pratici e applicazioni", M. Carrozza.
- 18) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Flow chemistry, a new efficient technique for today's chemists", M. Caviglia.



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



PH.D. CERTIFICATE
OF
PAOLO BROTTTO



Doctorate Course:
Science and Technology of Materials
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009

Advisors:
Prof. Enrico Galleani
Prof. Marina Putti

Thesis Title:
*Study of structural modifications produced by neutron
irradiation of magnesium diboride and
calculation of superconductive properties*

Defense Date:
March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Paolo Brotto has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 PAOLO BROTTTO,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 Physics of the University of Genova.

Scientific Publications

Original publications on ISI Journals:

- 1) Putti, M.; Brotto, P.; Monni, M.; d'Agliano, E. G.; Sanna, A.; Massidda, S., Intraband vs. interband scattering rate effects in neutron irradiated MgB₂ - art. no. 57005, *Europhys. Lett.*, **2007**, 77, 57005-57005. IMPACT FACTOR (2006): 2.228
- 2) Brotto, P.; Tropeano, M.; Ferdeghini, C.; Manfrinetti, P.; Palenzona, A.; d'Agliano, E. G.; Putti, M., Experimental confirmation of the low B isotope coefficient of MgB₂, *Physical Review B*, **2008**, 78. IMPACT FACTOR (2008): 3.322
- 3) Pallecchi, I.; Brotto, P.; Ferdeghini, C.; Putti, M.; Palenzona, A.; Manfrinetti, P.; Lehmann, A. G.; Orecchini, A.; Petrillo, C.; Sacchetti, F.; Affronte, M.; Allodi, G.; De Renzi, R.; Serventi, S.; Andreone, A.; Lamura, G.; Daghero, D.; Gonnelli, R. S.; Tortello, M., Investigation of Li-doped MgB₂, *Superconductor Science & Technology*, **2009**, 22. IMPACT FACTOR (2008): 1.847

Communications at Conferences

Oral communications:

- 1) Brotto, P.; Monni, M.; Galleani d'Agliano, E.; Sanna, A.; Massidda, S.; Putti, M., "Intraband vs. interband scattering rate effects in neutron irradiated MgB₂", Workshop "Multiband superconductivity: MgB₂ and beyond", Portovenere (SP), 22-23/3/2007.
- 2) Brotto, P.; Tropeano, M.; Ferdeghini, C.; Manfrinetti, P.; Palenzona, A.; Galleani d'Agliano, E.; Putti, M., "Role of disorder in two-gap MgB₂", 44th Workshop of the International School of Solid State Physics on "Low Dimensional Dynamical Phenomena and Simulations", Erice, Sicily, 20-26/7/2008.

Posters:

- 3) Brotto, P.; Monni, M.; Galleani d'Agliano, E.; Sanna, A.; Massidda, S.; Putti, M., "Intraband vs. interband scattering rate effects in neutron irradiated MgB₂", *50th anniversary of BCS - From BCS to Exotic Superconductivity*, Cargèse (Corse, France), 16-28/7/2007.
- 4) Brotto, P.; Tropeano, M.; Ferdeghini, C.; Manfrinetti, P.; Palenzona, A.; Galleani d'Agliano, E.; Putti, M., "Experimental confirmation of the low B isotope coefficient of MgB₂", SATT 14 - Convegno nazionale di superconduttività, Parma, 3/2008.
- 5) Brotto, P.; Galleani D'Agliano, E.; Pallecchi, I.; Putti, M., "Hc₂ vs Tc behavior in disordered MgB₂ – Intraband scattering investigation", Workshop "Superconductors by the mediterranean sea : classic and novel materials, electronic state and critical properties ", Alghero, Porto Conte, 7-11/9/2009.

Congresses Attended

- 1) 1st Year's meeting PRIN 2006 "Two gap superconductivity MgB₂ and beyond", Torino, 3/2007
- 2) SATT 14 - Convegno nazionale di superconduttività, Parma, 3/2008.

Courseware

During his doctorate, Paolo Brotto has acquired 22.0 credits of Courseware.

Courses attended and passed 11 credits)

Courses Given by Teachers of the University of Genova:

- 1) Topics in solid state theory (3 credits)(2007).
- 2) Statistical mechanics (3 credits)(2007).
- 3) Vibrational Spectroscopy (2 credits)(2008).

Courses Given by invited experts:

- 1) Symmetry in solids (P. Rogl) (1 credit)(2007).
- 2) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 3) Magnetic structure (P. Rogl) (1 credit)(2009).

National and International Schools or Workshops (5 credits)

- 1) *Workshop "Multiband superconductivity: MgB₂ and beyond"*, Portovenere (SP), 22-23/3/2007 (1 credit)
- 2) *44th Workshop of the International School of Solid State Physics on "Low Dimensional Dynamical Phenomena and Simulations"*, Erice, Sicily, 20-26/7/2008 (2 credits).
- 3) *50th anniversary of BCS - From BCS to Exotic Superconductivity*, Cargèse (Corse, France), 16-28/7/2007 (2 credits).
- 4) *Workshop "Superconductors by the mediterranean sea : classic and novel materials, electronic state and critical properties "*, Alghero, Porto Conte, 7-11/9/2009 (2 credits).

Seminars Given (2 credits)

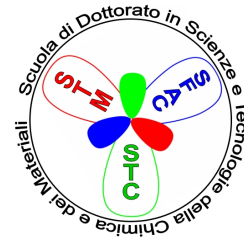
The student presented 3 seminars as final test for the 3 attended courses given by internal teachers (see above)

Seminars Attended (2 credits)

- 1) 14/5/2007, Department of Physics, Genova, "X-ray and neutron scattering: methods and examples", Dr. Olivier Plantivin, European Synchrotron Radiation Facility.
- 2) 5/10/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "From Hamiltonian to microstructure-first principles calculations of a phase diagram and microstructure" Prof. Tetsuo Mohri, Division of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, JAPAN.
- 3) 04/07/2007, Department of Physics, Genova, "Eterostrutture per l'elettronica di spin: attività presso il centro LNESS di Como", Dr Riccardo Bertacco, Politecnico di Milano.
- 4) 09/03/2007, Department of Physics, Genova, "The Vortex Lattice in High Temperature Superconductors: Pinning, Melting, and Nonlocal Elasticity", prof E.H. Brandt Max Planck Institute, Stuttgart (D).
- 5) 2/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "High pressure high temperature technique as a tool for the synthesis of ceramic materials with transition metals in mixed valence state", Dr. Alberto Ubaldini, Advanced Nano Materials Laboratory, National Institute for Materials Science (NIMS), Tsukuba (Japan).
- 6) 6/2/2009, Department of Physics, Genova, "L'Energia del Futuro", Prof. Carlo Rubbia CERN (Ginevra)
- 7) 3/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Ipotesi chimica sull'origine della vita: dal Big Bang alla comparsa dei primi organismi viventi", Dr Piero Ugliengo Università di Torino.
- 8) 9/3/2009, Department of Physics, Genova, "Quali energie per il futuro?", Prof. Mauro Marinelli Università di Genova
- 9) 21/4/2009, Department of Physics, Genova, "Ultra-sensitive force detection applied to magnetic resonance imaging" Dr. Martino Poggio.
- 10) 28/4/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Flussi e accumuli di energia accoppiati a trasferimenti protonici in biosistemi", Prof. A. Morelli, Università di Genova.
- 11) 13/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Microalghe: una risorsa per produrre biodiesel ed alimenti", Prof. M. Tredici, Università di Firenze.
- 12) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.
- 13) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Acciai inossidabili: aspetti metallurgici della saldatura", M. Fabbreschi.
- 14) 8/10/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Point-contact spectroscopy: a method for the study of the electron-quasiparticle interaction function", Prof. Marian Reiffers, Institute of Experimental Physics, Kosice (Slovakia).
- 15) 9/10/2009, Department of Physics, Genova, "Controlled Fabrication of Epitaxial Functional Oxide Artificial Nano-wire and Nano-dot Structures and their giant properties", H. Tanaka, Institute of Scientific and Industrial Research (ISIR-Sanken), Osaka University (Japan)
- 16) 9/10/2009, Department of Physics, Genova, "Stochastic Resonance in Vanadium Dioxide: Toward Creation of Biomimetic Devices with Neuronal Signal Processing", T. Kanki, Institute of Scientific and Industrial Research (ISIR-Sanken), Osaka University (Japan)
- 17) 22/10/2009, Department of Physics, Genova, "From Single Crystals to Nanoparticles: Molecular Approach to Study the Nature of Catalytic Action of Silver in Ethylene Epoxidation", V.I. Bukhtiyarov, Boreskov Institute of Catalysis, Novosibirsk, Russia
- 18) 3/12/2009, Department of Physics, Genova, "La tecnologia e materiali per l'ultra alto vuoto". Prof. L. Scaltrito, Politecnico di Torino.



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



PH.D. CERTIFICATE
OF
MARINA CARROZZA



Doctorate Course:

Pharmaceutical, Food and Cosmetic Sciences

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisor:

Prof. Vincenzo Minganti

Thesis Title:

*The use of trace element accumulator organisms
and passive samplers for marine
environment contamination studies*

Defense Date:

February 26th, 2010

On February 26th, 2010, at the Department of Pharmaceutical Sciences, Marina Carrozza has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Antonella Di Stilo, University of Torino
- Prof. Rafael Cela Torrijos, University of Santiago de Compostela
- Prof. Vito Boido, 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 MARINA CARROZZA
CONFERRING HER THE TITLE OF**

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

Genova, February 26th, 2010

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

The Coordinator of the Doctorate Course
(Prof. Luisa Mosti)

ACTIVITY REPORT

Research Activity

The research activity was entirely carried out at the Dept. of Chemistry and Pharmaceutical and Food Technologies (University of Genova).

Scientific Publications

Communications at Conferences

Congresses Attended

Courseware

During her doctorate, Marina Carrozza has acquired 27.0 credits of Courseware.

Courses attended and passed (19 credits)

Courses Given by Teachers of the University of Genova:

- 1) Intermetallic compounds (2 credits)(2007).
- 2) New topics about food composition and analysis (2 credits)(2007).
- 3) Microwave technology applied to chemical processes (3 credits)(2007).
- 4) Instrumental techniques for trace elements determination in pharmaceuticals, food products and environmental samples (2 credits)(2008).
- 5) Membranes and membrane processes (2 credits)(2008).
- 6) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patent. Free Data Bases and on payment (2 credits)(2008).

Courses Given by invited experts:

- 1) Intellectual property in the fields of Chemical, Medicinal, and Food Science. Patent retrieval in databases and European and International Patents (R. Ferreccio-R. Osella) (1 credit)(2007).
- 2) Search of potential drugs: examples in the oncological area, (T. Bandiera) (1 credit)(2007).
- 3) Upscale of active principles production: from laboratory to industrial technology transfer (P. Gatti) (1 credit)(2007)
- 4) Technologies for control of CO₂ in the atmosphere: from confinement to reutilization (M. Aresta) (1 credit)(2008)
- 5) Control of food quality (C. Pizarro) (1 credit)(2008).
- 6) Radio Pharmaceuticals in Anti-tumour Therapy: Preparation and Pharmacokinetics (M. Chinol)(1 credit)(2009).

National and International Schools or Workshops (3 credits)

- 1) *L'evoluzione della spettrometria di massa*, 24/5/2007, Genova (0.5 credits).
- 2) *Scuola Nazionale in Metodologie Chimico Fisiche per lo Studio dei Sistemi Biologici*, Camogli (GE), 16-21/9/2007 (2 credits).
- 3) *La direttiva 98/83/CE 'Qualità delle acque destinate al consumo umano; applicazione e sviluppi legislativi negli stati dell'Unione Europea*, 8/5/2009, Genova (0.5 credits).

Seminars Given (2 credits)

- 1) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: aspetti pratici e applicazioni".

Seminars Attended (3 credits)

- 1) 27/4/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Farmacovigilanza: esperienza in un ospedale pediatrico", C. Bianchi.
- 2) 10/5/2007, Dept. of Pharmaceutical Sciences, Genova, "Il processo analitico di laboratorio automatizzato: dalla gestione informatica alla firma digitale.", R. Massacane.
- 3) 18/5/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "I servizi della distribuzione intermedia", dr. Cassinelli.
- 4) 4/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli, Prof. Bice Fubini, Università di Torino.
- 5) 04/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Spettrometria di massa e proteomica: come distinguere Leucina e Isoleucina nel sequenziamento peptidico in trappola ionica", Dr. Andrea Armirotti, DIMES Univ.Genova.

- 6) 14/06/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Recenti acquisizioni nello studio chimico biologico di metaboliti secondari di origine vegetale", Prof. N. De Tommasi, Dipartimento di Scienze Farmaceutiche, Università di Salerno.
- 7) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Miscibility of polymer blends. the effect of hydrogen bonding", Dr. E. Princi.
- 8) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Dr. A. Mumot.
- 9) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Ultrasensitive Raman measurements in living cells using gold and silver nanoparticles", Dr. A. Giusti.
- 10) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà di bagnabilità delle superfici solide in tensioattivi e studio mediante diagnostica AFM della formazione di strutture di tensioattivi", Dr. E. Santini.
- 11) 13/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Introduction to the Three-Way Principal Component Analysis", Prof. Rasmus Bro.
- 12) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Introduzione alla spettroscopia NIR", Prof. E. Tamburini, Università di Ferrara
- 13) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "La spettroscopia NIR nell'industria farmaceutica", Dr. S. Lonardi, consultant, Verona.
- 14) 15/2/2008, 27/9/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Controllo NIR, dal ricevimento merci al prodotto finito", Dr. G. Campolongo, Büchi Italia
- 15) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, Spettroscopia NIR e chemiometria, P. Oliveri.
- 16) 26/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Carbon Nanotube: A leading material", P. Waghmare.
- 17) 26/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Crescita di Cristalli Singoli", R. Pasero.
- 18) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "L'approccio computazionale nella Chimica Farmaceutica: cenni teorici ed applicazioni pratiche", E. Cichero.
- 19) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Derivati cumarinici con potenziale attività antivirale verso il virus dell'epatite C", M. Giampieri.
- 20) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Configurazione assoluta: sguardo sui metodi chimico-fisici per la sua determinazione, contributo dell'HPLC chirale, un caso di studio di alcol secondario e suoi derivati", A. Romussi.
- 21) 27/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "La gestione dei dispositivi medici", Dr. Tiziana Corsetti and Dr. Elena Bestoso.
- 22) 3/4/2009, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "La nutrizione parenterale", Dr. Attilia Grassi and Dr. Sabrina Beltrami.
- 23) 24/4/2009, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "I farmaci oncologici e le norme di buona preparazione", Dr. Barbara Rebesco and Dr. Federica Mina.
- 24) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Retinopatie e Diabete: ruolo del fattore di crescita vascolare (VEGF)", F. Catalano.
- 25) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: basi teoriche e strumentazione", C. Macciò.
- 26) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Flow chemistry, a new efficient technique for today's chemists", M. Caviglia.



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



PH.D. CERTIFICATE
OF
ELENA CASAZZA



Doctorate Course:
Chemical Sciences and Technologies
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009
Advisors:
Prof. Saverio Russo
Dr. Orietta Monticelli
Thesis Title:
*Synthesis and characterization of high
performance thermoplastic polyesters*
Defense Date:
February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Elena Casazza has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 ELENA CASAZZA,
CONFERRING HER THE TITLE OF

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

Genova, February 25th, 2010

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 in part carried out at the Department of Chemistry and Industrial Chemistry (University of Genova), and in part at the company PG Group in Ferrara (Italy)

Scientific Publications

Original publications on ISI Journals:

- 1) Casazza, E.; Ricco, L.; Russo, S.; Scamporrino, E., Nature of a low molar mass peak in anionic poly(epsilon-caprolactam). Its identification as macrocyclic ensemble, *Macromolecules*, **2007**, 40, 739-745. IMPACT FACTOR (2006): 4.277.
- 2) Ricco, L.; Casazza, E.; Mineo, P.; Russo, S.; Scamporrino, E., Nature of a low molar mass peak in anionic poly(epsilon-caprolactam). Main aspects of its formation, *Macromolecules*, **2008**, 41, 3904-3911. IMPACT FACTOR (2007): 4.411.

Communications at Conferences

Congresses Attended

Courseware

During her doctorate, Elena Casazza has acquired 23.5 credits of Courseware.

Courses attended and passed (17 credits)

Courses Given by Teachers of the University of Genova:

- 1) Dendritic macromolecules: synthesis and reactivity (2 credits)(2007)
- 2) Fundamentals of modern polymer processing (2 credits)(2007)
- 3) Vibrational spectroscopy (2 credits)(2008)
- 4) Experimental Design (3 credits)(2008)
- 5) NMR spectroscopy in the characterization of synthetic polymers (2 credits)(2009)
- 6) New topics about food composition and analysis (2 credits) (2009).

Courses Given by invited experts:

- 1) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 2) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 3) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J.P. Rigueiro) (1 credit)(2008).
- 4) Control of food quality (C. Pizarro) (1 credit)(2008).

National and International Schools or Workshops (2.5 credits)

- 1) *Course on REACH*, Milano 3-4/4/2007 (0.5 credits).
- 2) *Seminario ISE 2007 (International Seminar on Elastomer)*, Freiburg (D), 23-27/9/2007 (2 credits).

Seminars Given (2 credits)

- 1) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Polimeri per uso nel fotovoltaico"

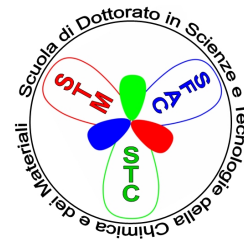
Seminars Attended (2 credits)

- 1) 24/1/2007, Lenzing (Austria), "La filmatura su tessuto per la produzione di membrane traspiranti", Dr.Reifensteiner, Lenzing Gmbh.
- 2) 10/2/2007, Ferrara, "Regolazione del peso molecolare e dei gruppi terminali nella polimerizzazione del nylon 6", Dr Filippini, consultant.
- 3) 9/3/2007, Ferrara, "TPV, termoplastic vulcanizates", Dr.Traz Ouadi, Exxon Mobil.
- 4) 15/3/2007, Ferrara, "Test di invecchiamento alla luce, strumentazioni e metodiche standard", Dr.Giussani, URAI s.r.l.
- 5) 11/4/2007, Ferrara, "Valutazione del rischio chimico", Dr. Razzini, P-group.
- 6) 22/5/2007, Ferrara, "A new generation of organic phosphinates as flame retardant additives", Dr.Schacker, Clariant Gmbh.
- 7) 31/5/2007, Ferrara, "The seizing of glass fibers for PBT and PP", Dr. Kashikar, Owens Corning.
- 8) 16/11/2007, Ludwigshafen (D), "UV stabilizers", Dr. Shambonydella, BASF.
- 9) 22/9/2008, Ferrara, "Utilizzo dei TPU nel mondo della calzatura", Dr.Petrone, P-Group.

- 10) 15/10/2008, Ferrara, "Problematiche nello stampaggio di pezzi espansi con tecnologia Mucell®", Dr.Pizzati, P-Group.
- 11) 13/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Microalghe: una risorsa per produrre biodiesel ed alimenti", Prof. M. Tredici, Università di Firenze.
- 12) 18/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Calcolo dello spettro NMR con metodi DFT: applicazione alla determinazione strutturale di molecole organiche complesse", Prof. Alessandro Bagno, Università di Padova.
- 13) 3/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Materiali polimerici per il risparmio energetico: diodi elettroluminescenti e celle fotovoltaiche", Silvia Destri, Istituto per lo Studio delle Macromolecole (ISMAC), CNR, Milano.
- 14) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.
- 15) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Materials for solar energy", L. Francis.
- 16) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Role of dendrimers in Drug Delivery", A. Ullah.



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



PH.D. CERTIFICATE
OF
MARIAFRANCESCA CATALANO



Doctorate Course:

Pharmaceutical, Food and Cosmetic Sciences

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisor:

Prof. Annamaria Bassi

Thesis Title:

Assessment of an In vitro model of human cutaneous cells to evaluate the safety and functionality of cosmetic formulations

Defense Date:

February 26th, 2010

On February 26th, 2010, at the Department of Pharmaceutical Sciences, Mariafrancesca Catalano has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Antonella Di Stilo, University of Torino
- Prof. Rafael Cela Torrijos, University of Santiago de Compostela
- Prof. Vito Boido, 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 MARIAFRANCESCA CATALANO
CONFERRING HER THE TITLE OF**

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

Genova, February 26th, 2010

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

The Coordinator of the Doctorate Course
(Prof. Luisa Mosti)

ACTIVITY REPORT

Research Activity

The research activity was entirely carried out at the Dept. of Experimental Medicine (University of Genova).

Scientific Publications

Original publications on ISI Journals:

- 1) Parodi, A.; Sanguineti, R.; Catalano, M.; Penco, S.; Pronzato, M.A.; Scanarotti, C.; Bassi, A.M., "A comparative study of Leukaemia Inhibitory Factor and Interleukin-1 α intracellular content in a human keratinocyte cell line after exposure to cosmetic fragrances and Sodium Dodecyl Sulphate", *Toxicology Letters*, **2010**, *192*, 101-107. IMPACT FACTOR (2008): 3.249.

Original publications on non-ISI Journals:

- 2) De Pascale, C.; Domenicotti, C.; Nitti, M.; Marengo, B.; Catalano, M.; Scanarotti, C.; Sanguineti, R.; Siri, M.; Ledda, S.; Penco, S.; Bassi, A.M., "Modulation of CYP1A1 by PKC Inhibitors and TPA Pre-Treatments in MH1C1 Rat Hepatoma Cells Exposed to 3-Methylcholanthrene", *The open toxicology journal*, **2009**, *3*, 47-57.

Communications at Conferences

Congresses Attended

Prizes

Mariafrancesca Catalano was awarded the Prize UNIPRO - COSMOPROF 2010 "Cosmetological research: university and industry", for the best doctorate thesis.

Courseware

During her doctorate, Mariafrancesca Catalano has acquired 24.5 credits of Courseware.

Courses attended and passed (18 credits)

Courses Given by Teachers of the University of Genova:

- 1) In vitro tests for evaluation of toxicity and biological action of chemical compounds (2 credits)(2007).
- 2) New topics about food composition and analysis (2 credits)(2007).
- 3) Membranes and membrane processes (2 credits)(2008).
- 4) Main plants used in Phytocosmetics and their constituents (2 credits)(2008).
- 5) Innovative pharmaceutical dosage forms: preparation and control methods (2 credits)(2008).
- 6) Instrumental techniques for trace elements determination in pharmaceuticals, food products and environmental samples (2 credits)(2008).

Courses Given by invited experts:

- 1) Intellectual property in the fields of Chemical, Medicinal, and Food Science. Patent retrieval in databases and European and International Patents (R. Ferreccio-R. Osella) (1 credit)(2007).
- 2) Search of potential drugs: examples in the oncological area, (T. Bandiera) (1 credit)(2007).
- 3) Upscale of active principles production: from laboratory to industrial technology transfer (P. Gatti) (1 credit)(2007)
- 4) Biotechnological drugs (B. Gatto) (1 credit)(2008).
- 5) Control of food quality (C. Pizarro) (1 credit)(2008).
- 6) Development of dyes in cosmetic industry: the L'Oréal experience (C. Emmanuel)(1 credit)(2009).

National and International Schools or Workshops (2.5 credits)

- 1) *Scuola nazionale in "Metodologie chimico-fisiche per lo studio dei sistemi biologici"*, Camogli, 16-23/9/2007 (2 credits).
- 2) *Workshop "La direttiva 98/83/CE 'Qualità delle acque destinate al consumo umano' applicazione e sviluppi legislativi negli stati dell'Unione Europea*, Genova, 8/5/2009 (0.5 credits).

Seminars Given (2 credits)

- 1) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Retinopatie e Diabete: ruolo del fattore di crescita vascolare (VEGF)".

Seminars Attended (2 credits)

- 1) 11/4/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Phase Behaviour of polymer blends. From nanophase separation to predictions", D.ssa Valeria Arrighi, Heriot-Watt University, Edinburgh (UK).
- 2) 17/4/2007, Dept. of Pharmaceutical Sciences, Genova, "Il sistema endocannabinoide nel controllo del dolore e dell'ansia", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.

- 3) 27/4/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Farmacovigilanza: esperienza in un ospedale pediatrico", Dr. C. Bianchi.
- 4) 10/5/2007, Dept. of Pharmaceutical Sciences, Genova, "Il processo analitico di laboratorio automatizzato: dalla gestione informatica alla firma digitale.", Dr. Roberto Massacane.
- 5) 21/5/2007, Dept. of Experimental Medicine, "Genetic and Pharmacological Dissection of the Roles of the Endocannabinoid System in the Brain", Giovanni Marsicano, Centro di Ricerche INSERM, Francois Magendie Université, Bordeaux.
- 6) 22/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Rapid prototyping: la trasformazione diventa innovativa", Dr. Lanfranco Galter, Technimold srl.
- 7) 4/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli", Prof. Bice Fubini, Università di Torino.
- 8) 04/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Spettrometria di massa e proteomica: come distinguere Leucina e Isoleucina nel sequenziamento peptidico in trappola ionica", Dr. Andrea Armirotti, DIMES Univ.Genova.
- 9) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Miscibility of polymer blends. the effect of hydrogen bonding", Dr. Elisabetta Princi.
- 10) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Dr. Anna Mumot.
- 11) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Ultrasensitive Raman measurements in living cells using gold and silver nanoparticles", Dr. Anna Giusti.
- 12) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà di bagnabilità delle superfici solide in tensioattivi e studio mediante diagnostica AFM della formazione di strutture di tensioattivi", Dr. Eva Santini.
- 13) 12/2/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Supramolecular chirality and photomodulation of properties of amorphous and liquid crystal polymers obtained by ATRP", Dr. Loris Giorgini, Università di Bologna.
- 14) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 15) 11/4/2008, Faculty of Medicine, Genova, "Targeting the chaperone Hsp90 in the treatment of (but not only) cancer", Prof. Stefano Moro.
- 16) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "L'approccio computazionale nella Chimica Farmaceutica: cenni teorici ed applicazioni pratiche", E. Cichero.
- 17) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Derivati cumarinici con potenziale attività antivirale verso il virus dell'epatite C", M. Giampieri.
- 18) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Configurazione assoluta: sguardo sui metodi chimico-fisici per la sua determinazione, contributo dell'HPLC chirale, un caso di studio di alcol secondario e suoi derivati", A. Romussi.
- 19) 15/9/2009, Faculty of Medicine, Genova, "The dengue virus NS2B-NS3 protease as a potential drug target", Prof. Gerd Katzenmeier, Institute of Molecular Biosciences, Mahidol, University at Salaya.
- 20) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: basi teoriche e strumentazione", C. Macciò.
- 21) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: aspetti pratici e applicazioni", M. Carrozza.
- 22) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Flow chemistry, a new efficient technique for today's chemists", M. Caviglia.



UNIVERSITÀ DEGLI STUDI DI GENOVA
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PH.D. CERTIFICATE
OF
MATTEO CAVIGLIA



Doctorate Course:

Pharmaceutical, Food and Cosmetic Sciences

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisors:

Prof. Luisa Mosti

Prof. Angelo Ranise

Thesis Title:

Rational design, synthesis and biological evaluation of novel indole derivatives and bioisosteres thereof having potential cannabimimetic or antiproliferative activity

Defense Date:

February 26th, 2010

On February 26th, 2010, at the Department of Pharmaceutical Sciences, Matteo Caviglia has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Antonella Di Stilo, University of Torino
- Prof. Rafael Cela Torrijos, University of Santiago de Compostela
- Prof. Vito Boido, 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 MATTEO CAVIGLIA
CONFERRING HIM THE TITLE OF**

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

Genova, February 26th, 2010

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

The Coordinator of the Doctorate Course
(Prof. Luisa Mosti)

ACTIVITY REPORT

Research Activity

The research activity was mainly carried out at the Dept. of Pharmaceutical Sciences (University of Genova). However, Matteo Caviglia **has also spent a research period of 6 months abroad**, at Cambridge University (UK) under the guidance of Prof. S. Ley, from 3/11/2008 to 30/4/2009.

Scientific Publications

Communications at Conferences

Oral Communications:

- 1) Caviglia, M., "Further Studies on Formation and Reactivity of Ternary Iminium Salts of Ethyleneurea and Ethylenethiourea", 4^o Edizione Giornate Italo Francesi, Nice (France), 17-18/4/2008.
- 2) Caviglia, M.; Brasholz, M.; Ley, S. V., "Towards a Flow Process for the Total Synthesis of (-)-Hennoxazole A", XXXIV Corso Estivo "A. Corbella", Gargnano (BS) 22-26/6/2009.

Posters:

- 3) Caviglia, M.; Cesarini, S.; Spallarossa, A.; Fossa, P.; Mosti, L.; Ranise, A., "Synthesis of indole iminium salts as key intermediates in a convergent multi-step one-pot synthesis of new potent antiproliferative Knoevenagel-type agents", XIX National Meeting on Medicinal Chemistry, Verona 14-18/9/2008.
- 4) Caviglia M. "One-pot stereoselective synthesis, antitumor activity and s.a.r. of new knoevenagel-type compounds prepared via indole iminium salts", ESMEC, European School of Medicinal Chemistry, Urbino, 13-18/9/2009

Congresses Attended

- 1) 7th Sigma Aldrich Young Chemists Symposium, Riccione, 22-24/10/2007.
- 2) Giornate Italo - Francesi di Chimica, Nice - Sophia Antipolis (Parco Valrose), 17-18/4/2008
- 3) XIX National Meeting on Medicinal Chemistry, Verona 14-18/9/2008.

Courseware

During his doctorate, Matteo Caviglia has acquired 29.5 credits of Courseware.

Courses attended and passed (14 credits)

Courses Given by Teachers of the University of Genova:

- 1) Bioinformatics (3 credits)(2007).
- 2) Bioorganic chemistry (2 credits)(2007).
- 3) Microwave technology applied to chemical processes (3 credits)(2007).
- 4) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patent. Free Data Bases and on payment (2 credits)(2008).

Courses Given by invited experts:

- 1) Intellectual property in the fields of Chemical, Medicinal, and Food Science. Patent retrieval in databases and European and International Patents (R. Ferreccio-R. Osella) (1 credit)(2007).
- 2) Search of potential drugs: examples in the oncological area, (T. Bandiera) (1 credit)(2007).
- 3) Combinatorial chemistry applied to pharmacologically relevant molecules, (E. Felder) (1 credit)(2007).
- 4) Biotechnological drugs (B. Gatto) (1 credit)(2008).

National and International Schools or Workshops (12 credits)

- 1) *Processo di drug discovery: applicazioni delle microonde e tecniche combinate MW-US*, Pavia, 16-03-2007 (0.5 credits).
- 2) *L'evoluzione della spettrometria di massa*, 24/5/2007, Genova.
- 3) 32th Scuola di sintesi organica "A. Corbella", Gargnano (BS), 18-22/6/2007. (2 credits).
- 4) *ESMEC, European School of Medicinal Chemistry*, Urbino, 1-6/7/2007. (2 credits).
- 5) *Corso di perfezionamento sulla proprietà intellettuale*, Pavia, 20-21/9/2007 (1 credit).
- 6) *ESMEC, European School of Medicinal Chemistry*, Urbino, 6/7-11/7/2008. (2 credits)
- 7) *XXXIV Corso Estivo "A. Corbella"*, Gargnano (BS) 22-26/6/2009 (2 credits).
- 8) *ESMEC, European School of Medicinal Chemistry*, Urbino, 13-18/9/2009 (2 credits).

Seminars Given (2 credits)

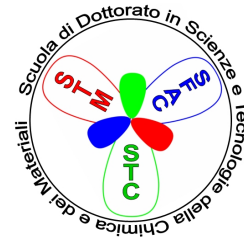
- 1) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Flow chemistry, a new efficient technique for today's chemists".

Seminars Attended (2 credits)

- 1) 16/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Prospettive nel ritardo alla fiamma dei materiali polimerici", Prof. Giovanni Camino, Politecnico di Torino.
- 2) 30/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "NMR di omo- e co-polimeri in soluzione", Prof.ssa Annalaura Segre, del CNR di Montelibretti (Roma).
- 3) 6/02/2007, IST-CBA, Genova, "Struttura e funzione delle integrine avb 3 e allbb3 dall'unione di dati a diversa risoluzione", Prof. Mattia Rocco, SS Proteomica - IST Genova.
- 4) 17/4/2007, Dept. of Pharmaceutical Sciences, Genova, "Il sistema endocannabinoide nel controllo del dolore e dell'ansia", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.
- 5) 10/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "L'evoluzione del processo analitico nel laboratorio di analisi cliniche", Dr. Roberto Massacane.
- 6) 11/5/2007, Dept. of Pharmaceutical Sciences, Genova, "Etnofarmacologia, empirismo o scienza?", Prof. A. Guerci.
- 7) 14/06/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Recenti acquisizioni nello studio chimico biologico di metaboliti secondari di origine vegetale", Prof. Nunziatina De Tommasi, Dipartimento di Scienze Farmaceutiche, Università di Salerno.
- 8) 21/5/2007, Dept. of Experimental Medicine, Genova "Genetic and Pharmacological Dissection of the Roles of the Endocannabinoid System in the Brain", Giovanni Marsicano, Research Centre INSERM, Francois Magendie Université, Bordeaux.
- 9) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Dr. A. Mumot.
- 10) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Le Cicloaddizioni di Diels-Alder e 1,3-dipolari", Dr. Ennio Zunino.
- 11) 3/12/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "The Tool Box for Medicinal Chemists: Past Present Future", D.ssa Agnes Bombrun (Head of the Chemistry Department of Merck Serono - Switzerland)
- 12) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 13) 6/5/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Metallazione regio- e stereoselettiva di eterocicli: utilità sintetica", Prof. Saverio Florio, Università di Bari.
- 14) 3/7/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Potent XIAP Antagonists by a Fragment-Based MCR Approach", Ilaria Monfardini.
- 15) 15/5/2009, Dept. of Pharmaceutical Sciences, Genova, "Farmaci recentemente approvati: uno sguardo critico al passato e un trend per il futuro, Dr. Paolo Pevarello, Preclinical Research Director, Newron Pharmaceuticals S.p.A.
- 16) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Retinopatie e Diabete: ruolo del fattore di crescita vascolare (VEGF)", F. Catalano.
- 17) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: basi teoriche e strumentazione", C. Macciò.
- 18) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: aspetti pratici e applicazioni", M. Carrozza.



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



PH.D. CERTIFICATE
OF
MATTEO FABBRESCHI



Doctorate Course:
Chemical Sciences and Technologies
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009

Advisors:
Prof. Maria Rosa Pinasco
Ing. Andrea Ghidini

Thesis Title:
*Influence of chemical-physical and microstructure
parameters on plastic mold steels fracture toughness and
metallurgic properties*

Defense Date:
February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Matteo Fabbreschi has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 MATTEO FABBRESCHI,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

The commission has evaluated the thesis and the overall activity of Dr. Matteo Fabbreschi as
EXCELLENT

Genova, February 25th, 2010

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 all carried out at the Department of Chemistry and Industrial Chemistry (University of Genova).

Scientific Publications

Original publications on ISI Journals:

- 1) Bocchini, G. F.; Pellati, G.; Fabbreschi, M.; Pinasco, M. R.; Gerosa, R., "Assessment of the nickel diffusion degree on sintering using statistical methods", *Metallurgia Italiana*, **2009**, 29-42. IMPACT FACTOR (2008): *not present*.

Original publications on non ISI Journals:

- 2) Pinasco, M.R.; Fabbreschi, M.; Firrao, D.; Gerosa, R.; Ghidini, A.; Matteis, P.; Rivolta, B., "Steels for large plastic moulds: microstructures arising during the production cycle", *Materials Science & Technology 2008 Conference and Exhibition (MS&T08)*. 5-9/10/2008 Pittsburgh, Pennsylvania (pp. 1916-1935). ISBN/ISSN: 978-0-87170-723-9.

Books:

- 1) Delfino, D.; Pipino, G.; Piccardo, P.; Pellati, G.; Pinasco, M.R.; Ienco, M.G.; Fabbreschi, M. "L'attività metallurgica nel castellaro di Bergeggi" pages 204-212 of the book "Monte S. Elena (Bergeggi -SV) Un sito ligure d'altura affacciato sul mare - Scavi 1999-2006", All'insegna del Giglio sas Editor, 2009.

Communications at Conferences

Oral communications:

- 1) Fabbreschi, M.; Ienco, M.G.; Pellati, G.; Pinasco, M.R.; "Influence of chemical-physical and microstructural parameters on plastic mould steels fracture toughness", 2° Forum Nazionale dei Giovani Ricercatori di Scienza e Ingegneria dei Materiali (INSTM) Università di Genova - DCCI – 3-5/6/2008
- 2) Fabbreschi, M.; Ienco, M. G.; Pellati, G.; Scavino, G.; Ubertaini, G.; Gerosa, R.; Rivolta, B.; Ghidini, A., "Acciaio innovativo per stampi per materie plastiche: caratterizzazione microstrutturale", 32° Convegno Nazionale AIM (Associazione italiana Metallurgia) Ferrara 24-26/9/08.
- 3) Calcagno, C.; Fabbreschi, M.; Pellati, G.; Gerosa, R.; Mortasino, G.M.M.; Vasile, I., "Characterization of welded joints of plastic mould steels in function of process parameters", VII Convegno Nazionale INSTM, Tirrenia, 9-12/6/2009.

Posters:

- 4) Calcagno, C.; Fabbreschi, M.; Pellati, G.; Gerosa, R.; Matteis, P., "Hardening structural aspects of an innovative steel for plastic moulds", VII Convegno Nazionale INSTM, Tirrenia, 9-12/6/2009.

Congresses Attended

- 1) 2° Forum Nazionale dei Giovani Ricercatori di Scienza e Ingegneria dei Materiali, Genova, 3-5/7/2008.
- 2) Convegno Nazionale dell'AIM, Ferrara, 24-26/9/2008.
- 3) "Analisi chimica dei materiali metallici", Milano, 12-13/11/2008.
- 4) VII Convegno Nazionale Consorzio INSTM, Tirrenia (Pisa), 9-12/6/2009.

Courseware

During his doctorate, Matteo Fabbreschi has acquired 31.0 credits of Courseware.

Courses attended and passed (26 credits)

Courses Given by Teachers of the University of Genova:

- 1) Ceramic materials: catalysts, adsorbents and materials for electronics (2 credits)(2007).
- 2) Intermetallic compounds (2 credits)(2007).
- 3) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2008).
- 4) Amorphous metallic materials and composite materials (3 credits)(2008).

Courses Given by invited experts:

- 1) The REACH regulations (T. Munari) (1 credit)(2007)
- 2) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 3) Martensitic Transformations (P. Rogl) (1 credit)(2008)
- 4) Technologies for control of CO₂ in the atmosphere: from confinement to reutilization (M. Aresta)(1 credit)(2008)

Other courses:

- 1) "Deformazione plastica dell'acciaio. Laminazione a caldo e a freddo dei prodotti piani" (Associazione Italiana di Metallurgia) Milano, 14-15-16-22-23/3/2007 (2 credits).
- 2) "Failure Analysis" (Associazione Italiana di Metallurgia) Milano, 27-29/3/2007 (2 credits).
- 3) "Tribologia", (Associazione Italiana di Metallurgia) Milano, 29-30/5 and 5-6-7/6/2007 (2 credits).
- 4) "Gli acciai inossidabili: la metallurgia, le caratteristiche, la corrosione, la produzione e il mercato degli acciai inossidabili - 1° modulo", (Associazione Italiana di Metallurgia) Milano, 11,12,18,19,25,26/2/2009 (2 credits).

- 5) "Gli acciai inossidabili: le lavorazioni, la messa in opera, i criteri di scelta e di progettazione, le applicazioni degli acciai inossidabili", (Associazione Italiana di Metallurgia) Milano, 3,4,10,11,17,18/6/2009. (2 credits).
- 6) "Corrosione e protezione dei metalli", (Associazione Italiana di Metallurgia) Milano, 18-19-25-26/11 and 2-3/12/2009. (2 credits).

National and International Schools or Workshops (1 credits)

- 1) *Metallografia e anomalie di fabbricazione e di esercizio*, Milano, 31/01/08 (0.5 credits).
- 2) *Innovazioni nei sistemi di tempra per ottimizzare le caratteristiche meccaniche*, Piacenza, 8/4/2008 (0.5 credits)

Seminars Given (2 credits)

- 1) 6-10-2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Acciai inossidabili: aspetti metallurgici della saldatura".

Seminars Attended (2 credits)

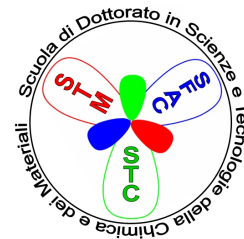
- 1) 30/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "NMR di omo- e co-polimeri in soluzione", Prof. Annalaura Segre, CNR, Montelibretti (Roma).
- 2) 20/02/07, Dept. of Chemistry and Industrial Chemistry, Genova, "La metallografia per i Beni Culturali: monete argentate ma non d'argento, il caso dei veri falsi", Dr. Paolo Piccardo, Università di Genova.
- 3) 4/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Energie rinnovabili: materiali e tecnologie per celle a combustibile a carbonati fusi", Dr. Paolo Capobianco, Ansaldo Fuel Cells.
- 4) 10/5/2007, Dept. of Pharmaceutical Sciences, Genova, "Il processo analitico di laboratorio automatizzato: dalla gestione informatica alla firma digitale.", Dr. Roberto Massacane.
- 5) 14/5/2007, Dept. of Physics, Genova, "X-ray and neutron scattering: methods and examples", Dr. Olivier Plantivin, European Synchrotron Radiation Facility.
- 6) 16/5/2007, ore 14, Faculty of Engineering, Genova, "Ossidi Ceramici per l'Ambiente e le Costruzioni", prof. Dario Beruto, Università di Genova.
- 7) 22/5/2007, ore 15, Dept. of Chemistry and Industrial Chemistry, Genova, "Rapid prototyping: la trasformazione diventa innovativa", Ing. Lanfranco Galter, Technimold srl.
- 8) 5-10-2007, Dept. of Chemistry and Industrial Chemistry, Genova, "From Hamiltonian to microstructure-first principles calculations of a phase diagram and microstructure", Prof. Tetsuo Mohri, Division of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, JAPAN.
- 9) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 10) 2/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "High pressure high temperature technique as a tool for the synthesis of ceramic materials with transition metals in mixed valence state", Dr. Alberto Ubaldini, Advanced Nano Materials Laboratory, National Institute for Materials Science (NIMS), Tsukuba (Japan).
- 11) 6/5/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Turbine a gas Ansaldo e cicli combinati", Ing. Marco Provenzano e Raffaele Traverso.
- 12) 28/5/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Palette per turbine a gas: requisiti funzionali e tecnologie produttive", Emanuela Cordano, Ansaldo Ricerche.
- 13) 30/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà magnetiche inusuali in composti intermetallici", Prof. Julián G. Sereni, Low Temperature Division, CAB-CONICET, S.C., Bariloche, Argentina.
- 14) 3/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Ipotesi chimica sull'origine della vita: dal Big Bang alla comparsa dei primi organismi viventi", Prof. Piero Ugliengo, Università di Torino.
- 15) 13/3/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 16) 28/4/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Flussi e accumuli di energia accoppiati a trasferimenti protonici in biosistemi", Prof. A. Morelli, Università di Genova.
- 17) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.

Teaching Assistance

Matteo Fabbreschi has assisted the courses of "Laboratory of Chemistry of Materials I" (12 hours)(2008/2009) and of "Laboratory of Chemistry of Metallic Materials" (10 hours)(2008/2009).



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



PH.D. CERTIFICATE
OF
LIJO FRANCIS



Doctorate Course:
Chemical Sciences and Technologies
Start of the Doctorate Program:
January 1st, 2007

End of the Doctorate Program:
December 31st, 2009

Advisor:
Prof. Enrico Marsano

Thesis Title:
*Fabrication and Characterization of Functionally
Graded Electrospun fibers for Membrane
and Photoluminescent Based Applications*

Defense Date:
February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Lijo Francis has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 LIJO FRANCIS,
CONFERRING HIM THE TITLE OF

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

Genova, February 25th, 2010

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, Francis Lijo **has also spent a research period of 6 months abroad**, at the "National University of Singapore" under the guidance of Prof. S. Ramakrishna (Healthcare Energy and Materials Laboratory), from 9/4/2009 to 3/10/2009.

Scientific Publications

Original publications on ISI Journals:

- 1) Francis, L.; Giungo, F.; Balakrishnan, A.; Marsano, E., Synthesis, characterization and mechanical properties of nylon–silver composite nanofibers prepared by electrospinning, *Current Applied Physics*, in press. Doi: 10.1016/j.cap.2009.12.025. IMPACT FACTOR (2008): 1.526.
- 2) Francis, L.; Thavasi, V.; Marsano, E.; Vijila, C.; Vijay, V. K.; Ramakrishna, S., Electrospun Polyimide/Titanium Dioxide NanoComposite Membrane by Combined Electrospinning and Electrospaying, *Journal of Nanoscience and Nanotechnology*, accepted. IMPACT FACTOR (2008): 1.929.
- 3) Marsano, E.; Francis, L.; Giunco, F., Polyamide 6 Nanofibrous Nonwovens Via Electrospinning, *Journal of Applied Polymer Science*, accepted. IMPACT FACTOR (2008): 1.187.
- 4) Sanosh, K. P.; Balakrishnan, A.; Francis, L.; Kim, T. N., Sol gel synthesis of forsterite nanopowders with narrow particle size distribution, *J. Alloy Compd.*, in press. Doi:10.1016/j.jallcom.2010.01.097. Impact factor (2008): 1.510

Communications at Conferences

Oral communications:

- 1) Francis, L.; Corsini, P.; Giunco, F.; Marsano, E., "Preparation of Novel Polymeric Nano Fibers Using Electrospinning Technique", Giornate Italo-Francesi di Chimica, Nizza, 17-18/4/2008.
- 2) Francis, L.; Corsini, P.; Marsano, E., "Preparation of novel polymeric nanofibres containing silver nanoparticles using electrospinning technique, POLYMCON '09, Calicut (India), 9-11/1/2009

Posters:

- 3) Francis, L.; Marsano, E. "Novel Procedure For The Synthesis of Nano Sized Silver Particles", Giornate Italo-Francesi di Chimica, Nizza, 17-18/4/2008.
- 4) Francis, L., "Synthesis of silver nano particles and preparation of novel polymeric nano fibers containing silver nano particles using electrospinning technique", 2° Forum Nazionale dei Giovani Ricercatori su Materiali Polimerici e Biomateriali", Genova 4-5/7/2008.
- 5) Marsano E.; Giunco, F.; Francis, L., "Electrospun Polyamide-6 Nano Fibers Containing Silver Nano Particles", Macromolecular Conference, Genova, July 2009.

Congresses Attended

- 1) Giornate Italo-Francesi di Chimica, Nizza, 17-18/4/2008.
- 2) 2° Forum Nazionale dei Giovani Ricercatori su Materiali Polimerici e Biomateriali", Genova 4-5/7/2008.
- 3) POLYMCON '09, Calicut (India), 9-11/1/2009.
- 4) Macromolecular Conference, Genova, July 2009.

Prizes

- 1) Young Researcher Award in connection with the presentation of the communication "Preparation of novel polymeric nanofibres containing silver nanoparticles using electrospinning technique, POLYMCON '09, Calicut (India), 9-11/1/2009

Courseware

During his doctorate, Lijo Francis has acquired 21.1 credits of Courseware.

Courses attended and passed (17 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).
- 2) Fundamentals of modern polymer processing (2 credits)(2007).
- 3) NMR spectroscopy in the characterization of synthetic polymers (2 credits)(2007).
- 4) Vibrational spectroscopy (2 credits)(2008).
- 5) Topics in solid state theory (3 credits)(2008).

Courses Given by invited experts:

- 1) Imaging, Assembling, And Modification Of Nanostructured Materials By High Resolution Scanning Probes (Prof. Szymonski) (1 credit)(2007)
- 2) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).

- 3) Upscale of active principles production: from laboratory to industrial technology transfer (P. Gatti) (1 credit)(2007)
- 4) Martensitic Transformations (P. Rogl) (1 credit)(2008)
- 5) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J.P. Rigueiro)(1 credit)(2008)

National and International Schools or Workshops (0.1 credits)

- 1) *Process-Related Structures and Properties of Crystallizable Polymers*, 7/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova, (0.1 credits)

Seminars Given (2 credits)

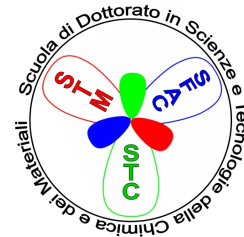
- 1) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Materials for solar energy".

Seminars Attended (2 credits)

- 1) 16/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Prospettive nel ritardo alla fiamma dei materiali polimerici", Prof. Giovanni Camino, Politecnico di Torino.
- 2) 11/4/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Phase Behaviour of polymer blends. From nanophase separation to predictions", D.ssa Valeria Arrighi, Heriot-Watt University, Edinburgh (UK).
- 3) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Fibre naturali di seta di ragno", Dr. Paola Corsini.
- 4) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Tecnologia a membrana per la depurazione delle acque", Dr. Bartosz Tylkowski.
- 5) 4/09/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Photochemical modification of natural polymers", Alina Sionkowska, N. Copernicus University, Torun (Polonia).
- 6) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Miscibility of polymer blends. the effect of hydrogen bonding", Dr. Elisabetta Princi.
- 7) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Dr. Anna Mumot.
- 8) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Le Cicloaddizioni di Diels-Alder e 1,3-dipolari", Dr. Ennio Zunino.
- 9) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Ultra sensitive Raman measurements in living cells using gold and silver nanoparticles", Dr. Anna Giusti.
- 10) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà di bagnabilità delle superfici solide in sistemi tensioattivi", Dr. Eva Santini.
- 11) 12/2/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Supramolecular chirality and photomodulation of properties of amorphous and liquid crystal polymers obtained by ATRP", Dr. Loris Giorgini, Università di Bologna.
- 12) 22/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "La grande macchina dei suoni: le tecnologie e i materiali degli organi a canne", Prof. Umberto Anselmi Tamburini, Dipartimento di Chimica Fisica, Università di Pavia.
- 13) 30/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà magnetiche inusuali in composti intermetallici", Prof. Julián G. Sereni, Low Temperature Division, CAB-CONICET, S.C., Bariloche, Argentina.
- 14) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Reazioni Tandem IEDHDA (Inverse Electron Demand Hetero-Diels-Alder) e cicloaddizioni 1,3-dipolari di nitroalcheni", M. Maccagno.
- 15) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Sensori Chimici", P. Lecinska.
- 16) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.
- 17) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Acciai inossidabili: aspetti metallurgici della saldatura", M. Fabbreschi.
- 18) 8/10/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Point-contact spectroscopy: a method for the study of the electron-quasiparticle interaction function", Prof. Marian Reiffers, Institute of Experimental Physics, Kosice (Slovakia).
- 19) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Role of dendrimers in Drug Delivery", A. Ullah.
- 20) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Polimeri per uso nel fotovoltaico", E. Casazza.



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



PH.D. CERTIFICATE
OF
FRANCESCO GAGLIARDI



Doctorate Course:
Science and Technology of Materials
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009

Advisor:
Prof. Corrado Boragno

Thesis Title:
Study and optimization of super hydrophobic materials

Defense Date:
March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Francesco Gagliardi has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 FRANCESCO GAGLIARDI,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 carried out at the Department of Physics of the University of Genova, in collaboration with the company SELEX Communications S.p.A., apart from a short stay in Grenoble, at the ESRF synchrotron facility in Grenoble (France) 16-23/7/2007.

Scientific Publications

Original publications on ISI journals:

- 1) Buatier de Mongeot, F.; Chiappe, D.; Gagliardi, F.; Toma, A.; Felici, R.; Garibbo, A.; Boragno, C., Wetting process in superhydrophobic disordered surfaces, *Soft Matter*, **2010**, in press. IMPACT FACTOR (2008): 4.586.

Patents:

- 2) Gagliardi, F.; Garibbo, A.; Boragno, C., Procedimento per la preparazione di un film superidrofobico, *Italian Patent*, TO2009A000279.

Communications at Conferences

Oral communications:

- 1) Gagliardi F., "Transition from Cassie-Baxter to Wenzel regime on disordered superhydrophobic surfaces", ACSIN10 "10th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures", Granada (E) 21-24/9/2009.

Posters:

- 2) Gagliardi, F., "Superfici superidrofobiche otticamente trasparenti", IV Simposio sulle Tecnologie Avanzate -- Nuovi Orizzonti Teorici e Applicativi, Roma, 21-22/6/2007.
- 3) Gagliardi, F., "Sem and Fib characterization of lotus leaf replica", Workshop on "Nanopatterning via Ions, Photon beam and Epitaxy", Sestri Levante (GE), 23-27/9/2007.

Congresses Attended

- 1) *Nuovi Orizzonti Teorici e Applicativi*, Roma, 21-22/6/2007.
- 2) *Workshop on "Nanopatterning via Ions, Photon beam and Epitaxy"*, Sestri Levante (GE), 23-27/9/2007.
- 3) *ACSIN 10*, Granada (E), 21-25/9/2009.

Courseware

During his doctorate, Francesco Gagliardi has acquired 17.0 credits of Courseware.

Courses attended and passed (10 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).
- 2) Fundamental of modern polymer processing (2 credits)(2007).
- 3) Optical properties of materials (3 credits)(2007).

Courses Given by invited experts:

- 1) Martensitic Transformations (P. Rogl) (1 credit)(2008).
- 2) Self-assembly and hierarchical microstructures: The principles of nature for the design of materials (J. P. Riguro) (1 credit)(2008).

National and International Schools or Workshops (3 credits)

- 1) Summer school "Nanosteps, Self-organized nanostructures on crystal surfaces", Cargese, France, 30/6-12/7/2008 (3 credits).

Seminars Given (2 credits)

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

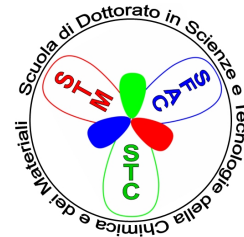
Seminars Attended (2 credits)

- 1) 14/5/2007, Department of Physics, Genova, "X-ray and neutron scattering: methods and examples", Dr. Olivier Plantivin, European Synchrotron Radiation Facility.
- 2) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà di bagnabilità delle superfici solide in sistemi tensioattivi", Eva Santini.
- 3) 5/10/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "From Hamiltonian to microstructure-first principles calculations of a phase diagram and microstructure" Prof. Tetsuo Mohri, Division of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, JAPAN.

- 4) 23/11/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Simulazione molecolare multiscala: progettazione di materiali polimerici nanostrutturati", Prof. Maurizio Fermeglia, Università di Trieste.
- 5) 6/2/2009, Dept. of Physics, Genova, "L'energia del futuro", Prof. Carlo Rubbia, CERN, Geneve (CH).
- 6) 3/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Ipotesi chimica sull'origine della vita: dal Big Bang alla comparsa dei primi organismi viventi", Prof. Piero Ugliengo, Università di Torino.
- 7) 9/3/2009, Dept. of Physics, Genova, "Quali energie per il futuro?", prof. Mauro Marinelli, Università di Genova.
- 8) 13/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 9) 25/3/2009, IENI-CNR, Genova, "Experimental methods for investigations of thermophysical and structure-sensitive properties of metallic melts", Dr. Yuriy Plevachuk, Ivan Franko National University, Department of Metal Physics, Lviv, Ukraine.
- 10) 28/4/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Flussi e accumuli di energia accoppiati a trasferimenti protonici in biosistemi", Prof. A. Morelli, Università di Genova.
- 11) 21/5/2009, Dept. of Physics, Genova, "Origin of Water on Earth: Astronomical Units to Angstroms" prof. Mike Drake, University of Arizona, Tucson, USA.
- 12) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.
- 13) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Acciai inossidabili: aspetti metallurgici della saldatura", M. Fabbreschi.
- 14) 8/10/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Point-contact spectroscopy: a method for the study of the electron-quasiparticle interaction function", Prof. Marian Reiffers, Institute of Experimental Physics, Kosice (Slovakia).
- 15) 9/10/2009, Department of Physics, Genova, "Controlled Fabrication of Epitaxial Functional Oxide Artificial Nano-wire and Nano-dot Structures and their giant properties", H. Tanaka, Institute of Scientific and Industrial Research (ISIR-Sanken), Osaka University (Japan)
- 16) 9/10/2009, Department of Physics, Genova, "Stochastic Resonance in Vanadium Dioxide: Toward Creation of Biomimetic Devices with Neuronal Signal Processing", T. Kanki, Institute of Scientific and Industrial Research (ISIR-Sanken), Osaka University (Japan)



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



PH.D. CERTIFICATE
OF
SUSHILKUMAR A. JADHAV



Doctorate Course:

Chemical Sciences and Technologies

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisor:

Prof. Giovanni Petrillo

Thesis Title:

*Synthesis of long-chain disulfides and carboxylic acids
as building-blocks of metal-organic nanohybrids*

Defense Date:

February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Sushilkumar A. Jadhav has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 SUSHILKUMAR A. JADHAV,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

Genova, February 25th, 2010

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 entirely carried out at the Department of Chemistry and Industrial Chemistry (University of Genova).

Scientific Publications

Original publications on ISI Journals:

- 1) Viale, M.; Petrillo, G.; Maccagno, M.; Castagnola, P.; Aiello, C.; Cordazzo, C.; Mariggio, M. A.; Jadhav, S. A.; Bianchi, L.; Leto, G.; Rizzato, E.; Poggi, A.; Spinelli, D., Sensitivity of different resistant tumour cell lines to the two novel compounds (2Z,4E)-2-methylsulfanyl-5-(1-naphthyl)-4-nitro-2,4-pentadienoate and (1E,3E)-1,4-bis(2-naphthyl)-2,3-dinitro-1,3-butadiene, *European Journal of Pharmacology*, **2008**, 588, 47-51. IMPACT FACTOR (2007): 2.376
- 2) Demartini, A.; Alloisio, M.; Cuniberti, C.; Dellepiane, G.; Jadhav, S. A.; Thea, S.; Giorgetti, E.; Gellini, C.; Muniz-Miranda, M., Polydiacetylene-Functionalized Noble Metal Nanocages, *Journal of Physical Chemistry C*, **2009**, 113, 19475-19481. IMPACT FACTOR (2008): 3.396
- 3) Prato, M.; Alloisio, M.; Jadhav, S. A.; Chincarini, A.; Svaldo-Lanero, T.; Bisio, F.; Cavalleri, O.; Canepa, M., Optical Properties of Disulfide-Functionalized Diacetylene Self-Assembled Monolayers on Gold: a Spectroscopic Ellipsometry Study, *Journal of Physical Chemistry C*, **2009**, 113, 20683-20688. IMPACT FACTOR (2008): 3.396
- 4) Raimondo, C.; Alloisio, M.; Demartini, A.; Cuniberti, C.; Dellepiane, G.; Jadhav, S. A.; Petrillo, G.; Giorgetti, E.; Gellini, C.; Muniz-Miranda, M., Photopolymerization in water of diacetylenes chemisorbed onto noble metal nanoparticles: a spectroscopic study, *Journal of Raman Spectroscopy*, **2009**, 40, 1831-1837. IMPACT FACTOR (2008): 3.526
- 5) Jadhav, S., 2-(1H-Benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU): a useful condensing reagent, *Synlett*, in press. IMPACT FACTOR (2008): 2.659.

Communications at Conferences

Oral communications:

- 1) Alloisio, M.; Demartini, A.; Jadhav, S. A.; Cuniberti, C.; Dellepiane, G.; Petrillo, G.; Thea, S.; Giorgetti, E.; Gellini, C.; Muniz-Miranda, M., "Photopolymerization in water of diacetylenes chemisorbed onto noble-metal nanoparticles: a spectroscopic study." COFEM 2008 Giornate di Chimica Organica Fisica e Meccanicistica 25-26/9/2008, Sestri Levante, Italy (poster and flash communication).
- 2) Jadhav, S., Fluorescent long-chain organic compounds for organic-inorganic nanohybrids", Meeting PRIN, Genova, DCCI, 16/6/2009.
- 3) Jadhav, S. A.; Petrillo, G.; Thea, S.; Maccagno, M., New organic building blocks for self-assembly on noble-metal nanostructures, XXXIV "A. CORBELLÀ" SUMMER SCHOOL, 22-26/6/2009, Gargnano (BS), Italy.
- 4) Jadhav, S. A.; Petrillo, G.; Thea, S.; Maccagno, M., Self-assembled monolayers (SAMs) of organic compounds on metal nanostructures: a form of nanotechnology, Sigma Aldrich Young Chemists Symposium (SAYCS), 12-15/10/2009, Pesaro, Italy.

Posters:

- 5) Bianchi, L.; Giorgi, G.; Maccagno, M.; Jadhav, S. A.; Petrillo, G.; Spinelli, D.; Stenta, M.; Tavani, C.: Building-blocks from 3,4-dinitrothiophene: recent advancements. RSC-SCI Joint Meeting on Heterocyclic Chemistry, XI ed. Lercis, 8-11/5/2008 (P18).
- 6) Jadhav, S. A.; Petrillo, G.; Thea, S.; Maccagno, M., "Synthesis and characterization of long chain symmetrical disulfides bearing cyclic-amine end groups", Sigma Aldrich Young Chemists Symposium (SAYCS), P35, 20-22/10/2008, Pesaro, Italy.

Congresses Attended

- 1) RSC-SCI Joint Meeting on Heterocyclic Chemistry, XI ed. Lercis, 8-11/5/2008.
- 2) Giornate di Chimica Organica Fisica e Meccanicistica (COFEM), Sestri Levante (GE), 24-26/9/2008.
- 3) Congresso SAYCS (Sigma-Aldrich Young Chemists Symposium), Pesaro, 20-22/10/2008.
- 4) "Nanoparticles, Nanowires and Nanostructures: an interdisciplinary playground from Chemistry to Physics and Biology", Torino, 21/11/2008.
- 5) Meeting PRIN, Dept. of Chemistry and Industrial Chemistry, Genova, 16/6/2009
- 6) Sigma-Aldrich Young Chemists Symposium (SAYCS) 2009, Pesaro, 12-14/10/2009.

Courseware

During his doctorate, Sushilkumar A. Jadhav has acquired 26.5 credits of Courseware.

Courses attended and passed (18 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).
- 2) New topics about food composition and analysis (2 credits)(2007).
- 3) Bioorganic chemistry (2 credits)(2007)
- 3) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patent. Free Data Bases and on payment (2 credits)(2008).
- 4) Pharmaceutical biotechnology (3 credits)(2008).

Courses Given by invited experts:

- 1) Symmetry in solids (P. Rogl) (1 credit)(2007)
- 2) Upscale of active principles production: from laboratory to industrial technology transfer (Dr. Gatti) (1 credit)(2007)
- 3) Combinatorial chemistry applied to pharmacologically relevant molecules (E. Felder) (1 credit)(2007)
- 4) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J.P. Rigueiro)(1 credit)(2008)
- 5) Biotechnological Drugs (B. Gatto) (1 credit)(2008).
- 6) Ionic liquids (C. Chiappe) (1 credit)(2009).

National and International Schools or Workshops (4.5 credits)

- 1) XXXIII Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 23-27/6/2008 (2 credits)
- 2) Molecular Modification of Inorganic Surfaces for Nanomedicine, Pavia, 9/2/09 (0.5 credits).
- 3) XXXIV Scuola Estiva di Sintesi Organica "A. Corbella", Gargnano (BS), 22-26/6/2009 (2 credits)

Seminars Given (2 credits)

- 1) 28/9/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Cyclodextrins: Chemistry and their use in enzyme technology".

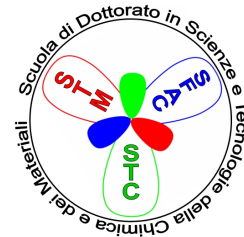
Seminars Attended (2 credits)

- 1) 14/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Cavitands at work: from molecular recognition to supramolecular polymers", Prof. Enrico Dalcanale, Università di Parma.
- 2) 4/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli, Prof.ssa Bice Fubini, Università di Torino.
- 3) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", D.ssa Anna Mumot.
- 4) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Le Cicloaddizioni di Diels-Alder e 1,3-dipolari", Dr. Ennio Zunino.
- 5) 3/12/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "The Tool Box for Medicinal Chemists: Past Present Future", D.ssa Agnes Bombrun (Head of the Chemistry Department of Merck Serono - Switzerland)
- 6) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 7) 10/6/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Studio preclinico in vitro ed in vivo dell'attività antitumorale di nuove molecole a struttura 1,3-butadienica", Dr. Maurizio Viale, Istituto Nazionale per la Ricerca sul Cancro di Genova.
- 8) 30/9/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà magnetiche inusuali in composti intermetallici", Prof. Julián G. Sereni, Low Temperature Division, CAB-CONICET, S.C. di Bariloche, Argentina.
- 9) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Reazioni Tandem IEDHDA (Inverse Electron Demand Hetero-Diels-Alder) e cicloaddizioni 1,3-dipolari di nitroalcheni", M. Maccagno
- 10) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Sensori Chimici", P. Lecinska.
- 11) 3/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Ipotesi chimica sull'origine della vita: dal Big Bang alla comparsa dei primi organismi viventi", Prof. Piero Ugliengo, Università di Torino.
- 12) 13/3/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 13) 19/3/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Derivati imminici altamente reattivi per la sintesi di composti azotati.", Prof. Marino Petrini, Università di Camerino.
- 14) 28/4/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Flussi e accumuli di energia accoppiati a trasferimenti protonici in biosistemi", Prof. A. Morelli, Università di Genova.
- 15) 13/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Microalghe: una risorsa per produrre biodiesel ed alimenti", Prof. M. Tredici, Università di Firenze.

- 16) 18/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Calcolo dello spettro NMR con metodi DFT: applicazione alla determinazione strutturale di molecole organiche complesse, Prof. Alessandro Bagno, Università di Padova.
- 17) 3/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Materiali polimerici per il risparmio energetico: diodi elettroluminescenti e celle fotovoltaiche", Silvia Destri, Istituto per lo Studio delle Macromolecole (ISMAL), CNR, Milano.
- 18) 27/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Insulated molecular wires as model conjugated polymers with controlled interstrand interactions", Prof. Franco Cacialli, Department of Physics and Astronomy (CMMP Group) and London Centre for Nanotechnology, University College London.
- 19) 28/7/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Why can't you use thermal neutrons to study gadolinium-based materials?", Prof. Dominic Ryan, Mc Gill University (Montreal).
- 20) 28/9/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Impact of preparative processes on bread properties and crumb texture", A. L. Ong



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



PH.D. CERTIFICATE
OF
CHIARA MACCIÒ



Doctorate Course:

Pharmaceutical, Food and Cosmetic Sciences

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisor:

Prof. Sergio Alessandro Balbi

Thesis Title:

*Design and synthesis of novel pyrazole derivatives as
antiproliferative and pro-apoptotic agents*

Defense Date:

February 26th, 2010

On February 26th, 2010, at the Department of Pharmaceutical Sciences, Chiara Macciò has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Antonella Di Stilo, University of Torino
- Prof. Rafael Cela Torrijos, University of Santiago de Compostela
- Prof. Vito Boido, 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 MACCIÒ
CONFERRING HER THE TITLE OF**

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

Genova, February 26th, 2010

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

The Coordinator of the Doctorate Course
(Prof. Luisa Mosti)

ACTIVITY REPORT

Research Activity

The research activity was entirely carried out at the Dept. of Pharmaceutical Sciences (University of Genova).

Scientific Publications

Original publications on ISI Journals:

- 1) Anzaldi, M.; Maccio, C.; Mazzei, M.; Bertolotto, M.; Ottonello, L.; Dallegrì, F.; Balbi, A., Antiproliferative and Proapoptotic Activities of a New Class of Pyrazole Derivatives in HL-60 Cells, *Chemistry & Biodiversity*, **2009**, 6, 1674-1687. IMPACT FACTOR (2008): 1.659

Communications at Conferences

Posters:

- 1) Macciò, C.; Balbi, A.; Anzaldi, M.; Mazzei, M.; Bertolotto, M. "A new class of pyrazole derivatives endowed with antiproliferative and proapoptotic activity", Giornate Italo - Francesi di Chimica, Nice - Sophia Antipolis (Parco Valrose), 17-18/4/2008, CA37, P93.
- 2) Macciò, C. "Synthesis and antiproliferative activity of new pyrazole derivatives", European School of Medicinal Chemistry-ESMEC, Urbino, 13-18/9/2009.

Congresses Attended

- 1) 7th Sigma Aldrich Young Chemists Symposium, Riccione, 22-24/10/2007.
- 2) Giornate Italo - Francesi di Chimica, Nice - Sophia Antipolis (Parco Valrose), 17-18/4/2008
- 3) 3rd Meeting "Nuove Prospettive in Chimica Farmaceutica", Castelvecchio Pascoli, 12-14/2/2009.

Courseware

During her doctorate, Chiara Macciò has acquired 29.0 credits of Courseware.

Courses attended and passed (17 credits)

Courses Given by Teachers of the University of Genova:

- 1) Bioinformatics (3 credits)(2007).
- 2) Bioorganic chemistry (2 credits)(2007).
- 3) Microwave technology applied to chemical processes (3 credits)(2007).
- 4) Databases classification: bibliographic, chemical substances, chemical reactions, numeric patent. Free Data Bases and on payment (2 credits)(2008).

Courses Given by invited experts:

- 1) Intellectual property in the fields of Chemical, Medicinal, and Food Science. Patent retrieval in databases and European and International Patents (R. Ferreccio-R. Osella) (1 credit)(2007).
- 2) Search of potential drugs: examples in the oncological area, (I. Bandiera) (1 credit)(2007).
- 3) Combinatorial chemistry applied to pharmacologically relevant molecules, (E. Felder) (1 credit)(2007).
- 4) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 5) Biotechnological drugs (B. Gatto) (1 credit)(2008).
- 6) Control of food quality (C. Pizarro) (1 credit)(2008).
- 7) Radio Pharmaceuticals in Anti-tumour Therapy: Preparation and Pharmacokinetics (M. Chinol)(1 credit)(2009).

National and International Schools or Workshops (7 credits)

- 1) *Processo di drug discovery: applicazioni delle microonde e tecniche combinate MW-US*, Pavia, 16-03-2007 (0.5 credits).
- 2) *ESMEC, European School of Medicinal Chemistry*, Urbino, 1-6/7/2007. (2 credits).
- 3) Workshop "New trends in drug discovery", Parma, 29/2/2008. (0.5 credits)
- 4) *ESMEC, European School of Medicinal Chemistry*, Urbino, 6/7-11/7/2008. (2 credits)
- 5) *ESMEC, European School of Medicinal Chemistry*, Urbino, 13-18/9/2009 (2 credits).

Seminars Given (2 credits)

- 1) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: basi teoriche e strumentazione".

Seminars Attended (3 credits)

- 1) 16/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Prospettive nel ritardo alla fiamma dei materiali polimerici", Prof. Giovanni Camino, Politecnico di Torino.
- 2) 30/01/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "NMR di omo- e co-polimeri in soluzione", Prof.ssa Annalaura Segre, del CNR di Montelibretti (Roma).

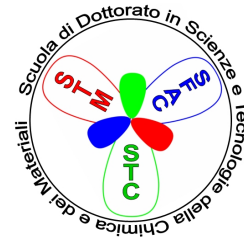
- 3) 14/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Cavitands at work: from molecular recognition to supramolecular polymers", Prof. Enrico Dalcanale, Università di Parma.
- 4) 17/4/2007, Dept. of Pharmaceutical Sciences, Genova, "Il sistema endocannabinoide nel controllo del dolore e dell'ansia", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.
- 5) 10/5/2007, Dept. of Pharmaceutical Sciences, Genova, "L'evoluzione del processo analitico nel laboratorio di analisi cliniche", Dr. Roberto Massacane.
- 6) 11/5/2007, Dept. of Pharmaceutical Sciences, Genova, "Etnofarmacologia, empirismo o scienza?", Prof. A. Guerci.
- 7) 21/5/2007, Dept. of Experimental Medicine, Genova, "Genetic and Pharmacological Dissection of the Roles of the Endocannabinoid System in the Brain", Giovanni Marsicano, Centro di Ricerche INSERM, Francois Magendie Université, Bordeaux.
- 8) 24 maggio 2007, Dept. of Chemistry and Industrial Chemistry, Genova, workshop "L'evoluzione della spettrometria di massa".
- 9) 4/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli, Prof. Bice Fubini, Università di Torino.
- 10) 04/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Spettrometria di massa e proteomica: come distinguere Leucina e Isoleucina nel sequenziamento peptidico in trappola ionica", Dr. Andrea Armirotti, DIMES University of Genova.
- 11) 26/9/2007, "Click Chemistry", Anna Mumot.
- 12) 15/2/2008, Dept. of Chemistry and Pharmaceuticals and Food Technologies, Genova, "Introduzione alla spettroscopia NIR", Prof.ssa E. Tamburini, Università di Ferrara
- 13) 15/2/2008, Dept. of Chemistry and Pharmaceuticals and Food Technologies, Genova, "La spettroscopia NIR nell'industria farmaceutica", Dr. S. Lonardi, consulente, Verona.
- 14) 15/2/2008, Dept. of Chemistry and Pharmaceuticals and Food Technologies, Genova, "Controllo NIR, dal ricevimento merci al prodotto finito", Dr. G. Campolongo, Büchi Italia
- 15) 15/2/2008, Dept. of Chemistry and Pharmaceuticals and Food Technologies, Genova, Spettroscopia NIR e chemiometria, P. Oliveri.
- 16) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 17) 10/6/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Studio preclinico in vitro ed in vivo dell'attività antitumorale di nuove molecole a struttura 1,3-butadienica", Dr. Maurizio Viale, Istituto Nazionale per la Ricerca sul Cancro di Genova.
- 18) 3/11/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "La sintesi orientata alla diversità di collezioni di molecole", D.ssa Chiara Ghiron, SienaBiotech.
- 19) 3/11/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Sfruttare la chemiodiversità delle sostanze naturali", Prof. G. Appendino, Università del Piemonte Orientale.
- 20) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "L'approccio computazionale nella Chimica Farmaceutica: cenni teorici ed applicazioni pratiche", E. Cichero.
- 21) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Derivati cumarinici con potenziale attività antivirale verso il virus dell'epatite C", M. Giampieri.
- 22) 7/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Configurazione assoluta: sguardo sui metodi chimico-fisici per la sua determinazione, contributo dell'HPLC chirale, un caso di studio di alcol secondario e suoi derivati", A. Romussi.
- 23) 24/11/2008, Dept. of Pharmaceutical Sciences, Genova, "Lipidomica", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.
- 24) 27/2/2009, Dept. of Pharmaceutical Sciences, Genova, "Chiral chromatography : a mature technology, a scientific challenge", Prof. Christian Roussel, Marseille, France.
- 25) 27/2/2009, Dept. of Pharmaceutical Sciences, Genova, "Chemistry derived from N-(o-amino-phenyl) thiazoline-2-thione", Federico Andreoli, Marseille, France.
- 26) 15/5/2009, Dept. of Pharmaceutical Sciences, Genova, "Farmaci recentemente approvati: uno sguardo critico al passato e un trend per il futuro, Dr. Paolo Pevarello, Preclinical Research Director, Newron Pharmaceuticals S.p.A.
- 27) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Retinopatie e Diabete: ruolo del fattore di crescita vascolare (VEGF)", F. Catalano.
- 28) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Spettroscopia atomica di assorbimento ed emissione: aspetti pratici e applicazioni", M. Carrozza.
- 29) 27/11/2009, Dept. of Pharmaceutical Sciences, Genova, "Flow chemistry, a new efficient technique for today's chemists", M. Caviglia.

Teaching Assistance

Chiara Macciò has assisted the courses of "Analysis of Drugs I" (30 hours)(2008/2009), "Analysis of Drugs II" (30 hours)(2007/2008), and of "Instrumental Analysis of Drugs" (30 hours)(2007/2008). She acted as tutor for the courses of "Anatomy" (160 hours) and "Analysis of Drugs II" (40 hours).



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



PH.D. CERTIFICATE
OF
DANIELA NICHINO



Doctorate Course:

Science and Technology of Materials

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisors:

Prof. Annalisa Relini

Prof. Massimo Stefani

Thesis Title:

*Study of interactions between membranes with
different lipid composition and amyloid-forming proteins*

Defense Date:

March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Daniela Nichino has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 DANIELA NICHINO,
CONFERRING HER THE TITLE OF**

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 Physics of the University of Genova.

Scientific Publications

Original publications on ISI Journals:

- 1) Cecchi, C.; Nichino, D.; Zampagni, M.; Bernacchioni, C.; Evangelisti, E.; Pensalfini, A.; Liguri, G.; Gliozzi, A.; Stefani, M.; Relini, A., A protective role for lipid raft cholesterol against amyloid-induced membrane damage in human neuroblastoma cells, *Biochimica Et Biophysica Acta-Biomembranes*, **2009**, 1788, 2204-2216. IMPACT FACTOR (2008): 4.180

Other publications:

- 2) Marano N., Mackay F., Nichino D., Relini A., Rolandi R., Gliozzi A., Stefani M., Interactions of native and aggregated HypF-N with lipid monolayers and supported bilayers of varied lipid composition, *FASEB Journal (Meeting Abstracts)*, **2009**, 23, 851.5.

Communications at Conferences

Oral presentations:

- 1) Nichino, D., "Studio AFM dell'interazione tra proteina A β e rafts lipidici: ruolo protettivo del colesterolo", CIV Congresso Nazionale della Società Italiana di Fisica, Genova, 22-27/09/2008.

Posters:

- 2) Nichino, D., "An Atomic Force Microscopy Study Of Membrane Rafts: Protecting Effect Of Cholesterol Against Amyloid Beta Aggregates", Winter Workshop' e 'Hands-on Winter School', Linz, 11-19/02/2008.

Congresses Attended

- 1) 2nd Meeting on molecular mechanisms in amyloid generation and toxicity - "The dark side of protein biology", Firenze, 16/11/2007
- 2) XCIV Congresso Nazionale della Società Italiana di Fisica, Genova, 22-27/09/2008.

Courseware

During her doctorate, Daniela Nichino has acquired 25.0 credits of Courseware.

Courses attended and passed (14 credits)

Courses Given by Teachers of the University of Genova:

- 1) Molecular biophysics of lipidic and proteic systems (2007) (3 credits)
- 2) Bioinformatics (2007) (3 credits).
- 3) Fundamentals of soft matter (2007) (3 credits)
- 4) Bioorganic Chemistry (2007) (2 credits)
- 5) Introduction to Bionanotechnology (2007) (1 credit)

Courses Given by invited experts:

- 1) Imaging, Assembling, And Modification Of Nanostructured Materials By High Resolution Scanning Probes (M. Szymonski) (1 credit)(2007).
- 2) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).

National and International Schools or Workshops (7 credits)

- 1) *Workshop Misfolding proteico e amiloidosi II*, Genova, 4-5/1/2007 (1 credit).
- 2) "NANOMED" school, Genova, 26-29/11/2007 (2 credits).
- 3) *Winter Workshop' e 'Hands-on Winter School'*, Linz, 11-19/02/2008 (2 credits).
- 4) *Workshop "Misfolding proteico e amiloidosi III"*, Sestri Levante (Genova), 11-12/4/2008 (1 credit).
- 5) *Workshop "Misfolding proteico e amiloidosi IV"*, Genova, 22-23/5/2009 (1 credit)

Seminars Given (2 credits)

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

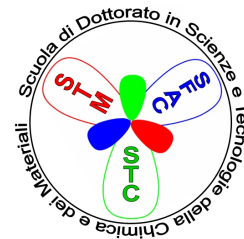
Seminars Attended (2 credits)

- 1) 26/01/2007, Pavia: "Pentraxins: from proteins to drugs for cardiovascular disease, amyloidosis, Alzheimer's disease and osteoarthritis".
- 2) 23/01/2007, IST-CBA, Genova, "Metodi ottici nello studio di gel di fibrina", Prof. Fabio Ferri, Università Insubria, Como.
- 3) 6/02/2007, IST-CBA, Genova, "Struttura e funzione delle integrine $\alpha_v\beta_3$ e $\alpha_{IIb}\beta_3$ dall'unione di dati a diversa risoluzione", Prof. Mattia Rocco, IST, Genova.

- 4) 20/2/2007, IST, Genova "La natura come modello per applicazioni in biotecnologie e nanotecnologie: l'esempio della biosilice", Marco Giovine, Università di Genova.
- 5) 27/2/2007, IST, Genova "Studio strutturale di sistemi ibridi organici/inorganici: le spicole silicee da spugne marine", Gianluca Croce.
- 6) 13/4/2007, Genova, "Sphingolipid Signalling in Astrigial Cells", Dr.L. Riboni, Università di Milano.
- 7) 16/4/2007, Department of Experimental Medicine, Genova, "Stress ossidativo e anti-ossidanti nell'invecchiamento e nelle demenze dell'anziano: la biologia applicata alla chimica geriatrica", Prof. Patrizia Mecocci, Università di Perugia.
- 8) 16/4/2007, Department of Experimental Medicine, Genova, "La visione e le illusioni ottiche", Prof. Carmen Burtolo, Università di Genova.
- 9) 16/4/2007, Department of Experimental Medicine, Genova, "Anticorpi anti-fosfolipidi e patologie epatiche", Prof. Emanuele Albano, Università del Piemonte Orientale, Novara.
- 10) 17/4/2007, Dept. of Pharmaceutical Sciences, Genova, "Il sistema endocannabinoide nel controllo del dolore e dell'ansia", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.
- 11) 04/06/2007, Dept. of Pharmaceutical Sciences, Genova, "Spettrometria di massa e proteomica: come distinguere Leucina e Isoleucina nel sequenziamento peptidico in trappola ionica", Dr. Andrea Armirotti, Università di Genova.
- 12) 28/11/2007, CEBR, Genova, "Rischio chimico nel laboratorio biologico", Dr. Lucrezia Guida.
- 13) 11/3/2008, IST, Genova, "Investigating Protein-Protein Interactions with AFM Spectroscopy", G. Brzezinka, M. Targosz-Korecka, Jagiellonian University, Kraków (Poland)
- 14) 11/3/2008, IST, Genova "AFM Studies of Erythrocytes and Multiple Myeloma Proteins", A. Radzik, Jagiellonian University, Kraków (Poland).
- 15) 13/3/2008, Department of Physics, "Energetica del Sistema Nervoso", A. Morelli, Università di Genova.
- 16) 3/7/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Potent XIAP Antagonists by a Fragment-Based MCR Approach", Ilaria Monfardini, DOBIG, Università di Genova.



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



PH.D. CERTIFICATE
OF
PAOLO OLIVERI



Doctorate Course:

Pharmaceutical, Food and Cosmetic Sciences

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisor:

Prof. Michele Forina

Thesis Title:

Non-specific analytical techniques and new chemometrics methods for the characterization and exploitation of typical foods

Defense Date:

February 26th, 2010

On February 26th, 2010, at the Department of Pharmaceutical Sciences, Paolo Oliveri has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Antonella Di Stilo, University of Torino
- Prof. Rafael Cela Torrijos, University of Santiago de Compostela
- Prof. Vito Boido, 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 PAOLO OLIVERI
CONFERRING HIM THE TITLE OF**

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

The commission has evaluated the thesis and the overall activity of Dr. Paolo Oliveri as
EXCELLENT

Genova, February 26th, 2010

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

The Coordinator of the Doctorate Course
(Prof. Luisa Mosti)

ACTIVITY REPORT

Research Activity

The research activity was mainly carried out at the Dept. of Chemistry and Pharmaceutical and Food Technologies (University of Genova). However, Paolo Oliveri **has also spent three research periods abroad for a total of 9 months:** at the Department of Chemistry of the Universidad de La Rioja, Logroño (ES), under the supervision of Prof. Consuelo Pizarro Millan from 20/9/2007 to 19/12/2007; at the Prepared Foods Department of Ashtown Food Research Centre (Teagasc) of Dublin (IR) under the supervision of Dr. Gerard Downey from 28/9/2008 to 21/12/2008; at the Department of Analytical Chemistry, Nutrition and Food Sciences of the Universidad de Santiago de Compostela (ES), under the supervision of Prof. Rafael Cela Torrijos from 27/9/2009 to 10/12/2009. Moreover, Paolo Oliveri has spent about 20 days carrying out research at the Università di Venezia, Dept. of Physical Chemistry, under the supervision of Prof. Salvatore Daniele.

Scientific Publications

Original publications on ISI Journals:

- 1) Forina, M.; Oliveri, P.; Casale, M.; Lanteri, S., Multivariate range modeling, a new technique for multivariate class modeling - The uncertainty of the estimates of sensitivity and specificity, *Analytica Chimica Acta*, **2008**, 622, 85-93. IMPACT FACTOR (2007): 3.186.
- 2) Forina, M.; Oliveri, P.; Lanteri, S.; Casale, M., Class-modeling techniques, classic and new, for old and new problems, *Chemometrics and Intelligent Laboratory Systems*, **2008**, 93, 132-148. IMPACT FACTOR (2007): 2.063.
- 3) Forina, M.; Casale, M.; Oliveri, P.; Lanteri, S., CAIMAN brothers: A family of powerful classification and class modeling techniques, *Chemometrics and Intelligent Laboratory Systems*, **2009**, 96, 239-245. IMPACT FACTOR (2008): 1.940.
- 4) Oliveri, P.; Baldo, M. A.; Daniele, S.; Forina, M., Development of a voltammetric electronic tongue for discrimination of edible oils, *Analytical and Bioanalytical Chemistry*, **2009**, 395, 1135-1143. IMPACT FACTOR (2008): 3.328.
- 5) Forina M.; Oliveri P.; Jäger H.; Römisch U.; Smeyers-Verbeke J., Class modeling techniques in the control of the geographical origin of wines, *Chemometrics and Intelligent Laboratory Systems*, **2009**, 99(2), 127-137. IMPACT FACTOR (2008): 1.940.
- 6) Casale M.; Casolino C.; Oliveri P.; Forina M., The potential of coupling information using three analytical techniques for identifying the geographical origin of Liguria extra virgin olive oil, *Food Chemistry*, **2010**, 118(1), 163-170. IMPACT FACTOR (2008): 2.696.
- 7) Casale M.; Sinelli N.; Oliveri P.; Di Egidio V.; Lanteri S., Chemometric strategies for feature selection and data compression applied to NIR and MIR spectra of extra virgin olive oils for cultivar identification, *Talanta*, **2010**, in press doi: 10.1016/j.talanta.2009.10.030. IMPACT FACTOR (2008): 3.206.

Other original publications:

- 8) Forina, M.; Casale, M.; Oliveri, P., Application of Chemometrics to Food Chemistry, in *Comprehensive Chemometrics*, eds. Walczak, B.; Tauler, R., and Brown, S., vol. 4, pp. 75-128, Elsevier Ltd, Amsterdam, 2009.

Communications at Conferences/School

Oral Communications:

- 1) Oliveri, P. "Recenti sviluppi del metodo di modellamento di classe Multivariate Range Modelling", Workshop del Gruppo di Lavoro di Chemiometria SCI, Modena, 15-16/2/2007.
- 2) Forina, M.; Lanteri, S.; Casale, M.; Oliveri, P., "Some remarks on multivariate calibration and classification", VI Colloquium Chemiometricum Mediterraneum, St. Maximin la Sainte Baume (France), 5-7/9/2007.
- 3) Oliveri, P.; Casale, M.; Forina, M., "Chemometric models for characterization of typical food", IV Journées Franco-Italiennes de Chimie, Nice Sophia Antipolis, 16-17/4/2008.
- 4) Oliveri, P.; Baldo, M. A.; Daniele, S.; Forina, M., "Messa a punto di una lingua artificiale per la caratterizzazione dell'olio d'oliva", Workshop del Gruppo di Lavoro di Chemiometria SCI, Pisa, 14-15/5/2008.
- 5) Oliveri, P.; Casale, M.; Lanteri, S.; Forina, M., "Strumenti chemiometrici per la NIR. Multivariate Range Modeling: basi teoriche e confronto con UNEQ e SIMCA", III Simposio Italiano Spettroscopia NIR, Lazise, 22-23/5/2008.
- 6) Oliveri, P.; Forina, M.; Casale, M.; Baldo, M.A.; Daniele, S., "Wavelet transform with an alternative common basis for the compression of data provided by an artificial tongue for the verification of olive oil provenance", XXIII Congresso Nazionale della Società Chimica Italiana, Sorrento (NA), 5-10/7/2009.

Lessons inside national or international schools:

- 7) Oliveri, P., "Strategie chemiometriche per il trattamento di dati chimico-alimentari" (60 min.), Scuola di Sicurezza Alimentare, Villa Gualino (Torino), 10-11/4/2008.
- 8) Oliveri, P., "Classificazione e Modellamento di classe, e assistenza alle esercitazioni" (120 min.), Scuola di Chemiometria, Genova, 28-31/1/2008 and 27-30/5/2008 and 26-29/1/2009.

Posters:

- 9) Oliveri, P.; Capron, X.; Jäger, H.; Römish, U.; Smeyers-Verbeke, J.; van Jaarsveld, F.; Forina, M., "Class modeling techniques for the control of the geographical origin of wines" VI Colloquium Chemiometricum Mediterraneum, St. Maximin la Sainte Baume, 5-7/9/2007.
- 10) Oliveri, P.; Di Egidio, V.; Woodcock, T.; Downey, G., "Authentication of Extra Virgin Olive Oil from Liguria by Means of Near Infrared Spectroscopy and Class-Modelling Techniques", XXIII Congresso Nazionale della Società Chimica Italiana, Sorrento (NA), 5-10/7/2009.
- 11) Baldo, M. A.; Oliveri, P.; Forina, M.; Daniele, S., "Development of a voltammetric electronic tongue for the discrimination of edible oils", XXIII Congresso Nazionale della Società Chimica Italiana, Sorrento (NA), 5-10/7/2009.

Congresses Attended

- 1) *Workshop del Gruppo di Lavoro di Chemiometria SCI*, Modena, 15-16/2/2007.
- 2) *VI Colloquium Chemiometricum Mediterraneum*, St. Maximin la Sainte Baume, 5-7/9/2007.
- 3) *Giornate Italo Francesi di Chimica (JIFC 2008)*, Nice (Sophia Antipolis), 17-18/4/2008.
- 4) *Workshop del Gruppo di Lavoro di Chemiometria SCI 2008*, Pisa, 14-15/5/2008.
- 5) *III Simposio Italiano Spettroscopia NIR*, Lazise (VR), 22-23/5/2008.
- 6) *XXIII Congresso Nazionale della Società Chimica Italiana*, Sorrento (NA), 5-10/7/2009.

Courseware

During his doctorate, Paolo Oliveri has acquired 22.25 credits of Courseware.

Courses attended and passed (16 credits)

Courses Given by Teachers of the University of Genova:

- 1) Chemometric strategies and algorithms and their applications (3 credits)(2007).
- 2) New topics about food composition and analysis (2 credits)(2007).
- 3) Mathematical methods for chemistry (2 credits)(2007).
- 4) Experimental design (2 credits)(2008).
- 5) Instrumental techniques for trace elements determination in pharmaceuticals, food products and environmental samples (3 credits)(2008).

Courses Given by invited experts:

- 1) Intellectual property in the fields of Chemical, Medicinal, and Food Science. Patent retrieval in databases and European and International Patents (R. Ferreccio-R. Osella) (1 credit)(2007).
- 2) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J. P. Rigueiro) (1 credit)(2008).
- 3) Radio Pharmaceuticals in Anti-tumour Therapy: Preparation and Pharmacokinetics (M.Chinol) (1 credit)(2009).
- 4) Magnetic Structure (P. Rogl) (1 credit)(2009).

National and International Schools or Workshops (3.25 credits)

- 1) *Scuola di Sicurezza Alimentare (modulo Tecniche avanzate di analisi nel settore agroalimentare)*, Villa Gualino (Torino), 10-11/4/008 (1 credit).
- 2) *Workshop "Studio e Caratterizzazione di Materiali e loro Rivestimenti a mezzo di Analisi Strumentali delle Superfici"*, 25/6/2009, Faenza (RA) (0.25 credits).
- 3) *Course "Cromatografia liquida"*, Santiago de Compostela, 5-9 and 13-16/10/2009 (2 credits).

Seminars Given (2 credits)

- 1) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Spettroscopia NIR e chemiometria".

Seminars Attended (1.5 credits)

- 1) 27/4/2007, ore 14.30, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Farmacovigilanza: esperienza in un ospedale pediatrico", Dr. C. Bianchi.
- 2) 14/06/2007, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Recenti acquisizioni nello studio chimico biologico di metaboliti secondari di origine vegetale", Prof. Nunziatina De Tommasi, Dipartimento di Scienze Farmaceutiche, Università di Salerno.
- 3) 13/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Introduction to the Three-Way Principal Component Analysis", Prof. Rasmus Bro.
- 4) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Introduzione alla spettroscopia NIR", Prof. E. Tamburini, Università di Ferrara
- 5) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "La spettroscopia NIR nell'industria farmaceutica", Dr. S. Lonardi, consultant, Verona.
- 6) 15/2/2008, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "Controllo NIR, dal ricevimento merci al prodotto finito", Dr. G. Campolongo, Büchi Italia.

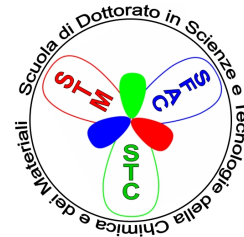
- 7) 16/4/2009, Faculty of Literature, Genova, "Metal processing, craftsmen and workshops, in ancient societies", Prof. Michel Pernot.
- 8) 16/4/2009, Faculty of Literature, Genova, "About Middle and Upper Palaeolithic in Europe: contribution of reliable chronological information from luminescence dating", Prof. Cristel Lahaye.
- 9) 16/4/2009, Faculty of Literature, Genova, "Self-organizing maps in archaeometry and structural chemistry", Prof. Igor Kuzmanowski.
- 10) 3/4/2009, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "La nutrizione parenterale", Dott.ssa Attilia Grassi e Dott.ssa Sabrina Beltrami.
- 11) 24/4/2009, Dept. of Chemistry and Pharmaceutical and Food Technologies, Genova, "I farmaci oncologici e le norme di buona preparazione", Dr. Barbara Rebesco and Dr. Federica Mina.
- 12) 13/5/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Microalghe: una risorsa per produrre biodiesel ed alimenti", Prof. M. Tredici, Università di Firenze.
- 13) 15/5/2009, Dept. of Pharmaceutical Sciences, Genova, "Farmaci recentemente approvati: uno sguardo critico al passato e un trend per il futuro", Dr. Paolo Pevarello, Preclinical Research Director, Newron Pharmaceuticals S.p.A.

Teaching Assistance

Paolo Oliveri has assisted the courses of "Analysis of Drugs I" (30 + 30 hours)(2007/2008 and 2008/2009), "Analytical Chemistry" (10 + 10 hours)(2007/2008 and 2008/2009), "Chemistry of nutrients of plant origin and of dietary products" (10 + 10 hours)(2007/2008 and 2008/2009).



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



PH.D. CERTIFICATE
OF
AI LIEN ONG



Doctorate Course:

Chemical Sciences and Technologies

Start of the Doctorate Program:

January 1st, 2007

End of the Doctorate Program:

December 31st, 2009

Advisors:

Dr. Aldo Bottino

Prof. Gustavo Capannelli

Thesis Title:

New diffusion media in the fuel cell technology

Defense Date:

February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Ai Lien Ong has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 AI LIEN ONG,
CONFERRING HER THE TITLE OF**

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

Genova, February 25th, 2010

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, Ai Lien Ong **has also spent a research period of 3 months abroad**, at "Huafan University", Taipei (Taiwan) under the guidance of Prof. Wei-Mon Yan from 1/10/2009 to 31/12/2009.

Scientific Publications

Original publications on ISI Journals:

- 1) Ong, A. L.; Bottino, A.; Capannelli, G.; Comite, A., Effect of preparative parameters on the characteristic of poly(vinylidene fluoride)-based microporous layer for proton exchange membrane fuel cells, *Journal of Power Sources*, **2008**, 183, 62-68. IMPACT FACTOR (2007): 2.809

Communications at Conferences

Oral communications:

- 1) Ong, A. L., "Novel electrically conductive sulfonated poly(vinylidene fluoride) based film as microporous layer for proton exchange membrane fuel cells", E-MRS 2009 Spring Meeting, Strasbourg (France), 7-13/6/2009

Poster:

- 2) Ong, A.L.; Bottino, A.; Capannelli, G.; Comite, A., "Effect of Preparative Parameters on the Characteristic of PVDF-Based Microporous Layer for PEM Fuel Cells", Scuola "High Temperature Polymer Electrolyte Membrane Fuel Cells (HT-PEMFC)", Newcastle upon Tyne (UK), 16-23/3/2008.
- 3) Ong, A.L.; Bottino, A.; Comite, A.; Capannelli, G., "Novel PVDF-Based Microporous Layer for PEM Fuel Cells", 4^e Giornate Italo-Francesi di Chimica, Nice (France), 17-18/4/2008.
- 4) Ong, A.L.; Bottino, A.; Comite, A.; Capannelli, G., "Conductive Poly(vinylidene Fluoride) Microporous Layer for Proton Exchange Membrane Fuel Cell Applications", XVII National Congress of the Industrial Chemistry Division, "Energia, materiali e prodotti da tecnologie e processi eco-sostenibili", Genova (Italy), 30/6-3/7/2008.
- 5) Ong, A.L.; Bottino, A.; Capannelli, G.; Comite, A., "Sulfonated Poly(vinylidene Fluoride) Based Composite Films with Improved Electrical Conductivity for PEM Fuel Cell Application", Euromembrane 2009, Montpellier (France), 6-11/9/2009.

Congresses Attended

- 1) 4^e Giornate Italo-Francesi di Chimica, Nice (France), 17-18/4/2008.
- 2) XVII National Congress of the Industrial Chemistry Division, "Energia, materiali e prodotti da tecnologie e processi eco-sostenibili", Genova (Italy) 30/6-3/7/2008.
- 3) E-MRS 2009 Spring Meeting, Strasbourg (France), 7-13/6/2009.
- 4) EUROMEMBRANE 2009, Montpellier (France), 6-11/9/2009.

Prizes

- 1) Young Scientist Awards in recognition of the outstanding paper contributed to Symposium C: Materials for Polymer Electrolyte Membrane Fuel Cells at European Materials Research Society (E-MRS) 2009 Spring Meeting, France, 2009.

Courseware

During her doctorate, Ai Lien Ong has acquired 27.0 credits of Courseware.

Courses attended and passed (17 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of modern polymer processing (2 credits)(2007).
- 2) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2007).
- 3) Electrochemistry for environment and energy (3 credits)(2007).
- 4) Vibrational spectroscopy (2 credits)(2008)
- 5) Membranes and membrane processes (2 credits)(2008).

Courses Given by invited experts:

- 1) Imaging, Assembling, And Modification Of Nanostructured Materials By High Resolution Scanning Probes (M. Szymonski) (1 credit)(2007)
- 2) Symmetry in Solids (P. Rogl) (1 credit)(2007)
- 3) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 4) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 5) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J.P. Rigueiro) (1 credit)(2008).

National and International Schools or Workshops (6 credits)

- 1) *New Materials for Membranes*, Hamburg (Germany), 2-7/6/2007 (2 credits).
- 2) *XXIV Summer School of the European Membrane Society "Membranes for Reactive Processes"*, Genoa (Italy), 11-14/7/2007 (2 credits).
- 3) *High Temperature Polymer Electrolyte Membrane Fuel Cells (HT-PEMFC)*, Newcastle upon Tyne (UK), 16-13/3/2008 (2 credits).

Seminars Given (2 credits)

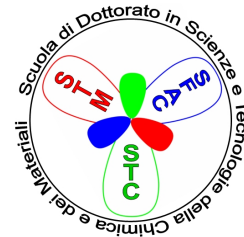
- 1) 28/9/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Impact of preparative processes on bread properties and crumb texture".

Seminars Attended (2 credits)

- 1) 14/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Cavitands at work: from molecular recognition to supramolecular polymers", Prof. Enrico Dalcanale, Università di Parma.
- 2) 11/4/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Phase Behaviour of polymer blends. From nanophase separation to predictions", D.ssa Valeria Arrighi, Heriot-Watt University, Edinburgh (UK).
- 3) 4/5/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Energie rinnovabili: materiali e tecnologie per celle a combustibile a carbonati fusi", Dr. Paolo Capobianco, Ansaldo Fuel Cells.
- 4) 14/5/2007, Dept. of Physics, Genova, "X-ray and neutron scattering: methods and examples", Dr. Olivier Plantivin, European Synchrotron Radiation Facility.
- 5) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Fibre naturali di seta di ragno", Paola Corsini.
- 6) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Tecnologia a membrana per la depurazione delle acque", Bartosz Tylkowski.
- 7) 4/09/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Photochemical modification of natural polymers", Alina Sionkowska, N. Copernicus University, Torun (Polonia).
- 8) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Miscibility of polymer blends. the effect of hydrogen bonding", Elisabetta Princi.
- 9) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Anna Mumot.
- 10) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Le Cicloaddizioni di Diels-Alder e 1,3-dipolari", Ennio Zunino.
- 11) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Ultra sensitive Raman measurements in living cells using gold and silver nanoparticles", Anna Giusti.
- 12) 27/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Proprietà di bagnabilità delle superfici solide in sistemi tensioattivi", Eva Santini.
- 13) 5/10/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "From Hamiltonian to microstructure-first principles calculations of a phase diagram and microstructure" Prof. Tetsuo Mohri, Division of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Sapporo, JAPAN.
- 14) 12/2/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Supramolecular chirality and photomodulation of properties of amorphous and liquid crystal polymers obtained by ATRP", Dr. Loris Giorgini, Università di Bologna.
- 15) 2/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "High pressure high temperature technique as a tool for the synthesis of ceramic materials with transition metals in mixed valence state", Dr. Alberto Ubaldini, Advanced Nano Materials Laboratory, National Institute for Materials Science (NIMS), Tsukuba (Japan).
- 16) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Reazioni Tandem IEDHDA (Inverse Electron Demand Hetero-Diels-Alder) e cicloaddizioni 1,3-dipolari di nitroalcheni", M. Maccagno
- 17) 1/12/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Sensori Chimici", P. Lecinska.
- 18) 13/3/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Macromolecular engineering for nanostructured materials via Atom Transfer Radical Polymerization (ATRP)", Prof. Krzysztof Matyjaszewski, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
- 19) 28/9/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Cyclodextrins: Chemistry and their use in enzyme technology", S. Jadhav



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



PH.D. CERTIFICATE
OF
AMANDA PENCO



Doctorate Course:
Science and Technology of Materials
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009

Advisor:
Prof. Ornella Cavalleri
Prof. Maria Elisabetta Cosulich

Thesis Title:
Nanopatterning processes at the HOPG surface after interaction with proteins and other macromolecules

Defense Date:
March 4th, 2010

On March 4th, 2010, at the Department of Chemistry and Industrial Chemistry, Amanda Penco has orally presented her doctorate research work in front of the Commission, formed by

- Prof. Renato Gonnelli, Politecnico di Torino
- Prof. Massimo Stefani, Università di Firenze
- Prof. Gabriella Borzone, Università di 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 AMANDA PENCO,
CONFERRING HER THE TITLE OF

**RESEARCH DOCTOR IN
SCIENCE AND TECHNOLOGY OF MATERIALS**

Genova, March 4th, 2010

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 Physics of the University of Genova.

Scientific Publications

Original publications on ISI Journals:

- 1) Svaldo-Lanero, T.; Penco, A.; Prato, M.; Canepa, M.; Rolandi, R.; Cavalleri, O., Nanopatterning by protein unfolding, *Soft Matter*, **2008**, 4, 965-967. IMPACT FACTOR (2007): 4.703.

Communications at Conferences

Oral communications:

- 1) Penco, A., "Molecular nanopatterns on graphite obtained by protein adsorption", Christmas Workshop di Fisica della Materia "Advances in Solid State Physics, Surface Science and Nanoscience", Genova, 22-23/12/2008.

Posters:

- 2) Penco, A., "Protein adsorption on hydrophobic surfaces: unfolding vs reassembly", EBSA (European Biophysics Congress 2009), Genova, 11-15/07/2009.
- 3) Penco, A., "Yeast Cytochrome C adsorption on conductive substrates: a spectroscopic ellipsometry investigation", EBSA (European Biophysics Congress 2009), Genova, 11-15/07/2009.
- 4) Penco, A., "Template-induced protein unfolding and reassembly", Winter Workshop, Linz, 15-19/02/2008

Congresses Attended

- 1) EBSA (European Biophysics Congress 2009), Genova, 11-15/07/2009.
- 2) 2nd Meeting on molecular mechanisms in amyloid generation and toxicity - "The dark side of protein biology", Firenze, 16/11/2007
- 3) Christmas Workshop di Fisica della Materia "Advances in Solid State Physics, Surface Science and Nanoscience", Genova, 22-23/12/2008.

Courseware

During her doctorate, Amanda Penco has acquired 27.0 credits of Courseware.

Courses attended and passed (15 credits)

Courses Given by Teachers of the University of Genova:

- 1) Molecular biophysics of lipidic and proteic systems (2007) (3 credits)
- 2) Optical properties of materials (2007) (3 credits).
- 3) Fundamentals of soft matter (2007) (3 credits)
- 4) Bioorganic Chemistry (2007) (2 credits)
- 5) Introduction to Bionanotechnology (2007) (1 credit)

Courses Given by invited experts:

- 1) Imaging, Assembling, And Modification Of Nanostructured Materials By High Resolution Scanning Probes (M. Szymonski) (1 credit)(2007).
- 2) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 3) Advanced Spectroscopies for Measurements on Single Molecules (S. Cannistraro) (1 credit)(2007).

National and International Schools or Workshops (8 credits)

- 1) *Workshop Misfolding proteico e amiloidosi II*, Genova, 4-5/1/2007 (1 credit).
- 2) "NANOMED" school, Genova, 26-29/11/2007 (2 credits).
- 3) *Winter Workshop' e 'Hands-on Winter School'*, Linz, 11-19/02/2008 (2 credits).
- 4) *Workshop "Misfolding proteico e amiloidosi III"*, Sestri Levante (Genova), 11-12/4/2008 (1 credit).
- 5) *Workshop "Caratterizzazione nano meccanica quantitativa tramite microscopia a sonda: Veeco Harmonix"*, Genova, 4/12/2008 (0.5 credits).
- 6) *Workshop "Misfolding proteico e amiloidosi IV"*, Genova, 22-23/5/2009 (1 credit)

Seminars Given (2 credits)

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

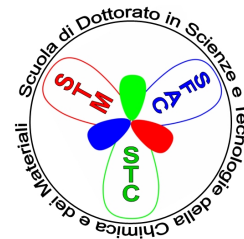
Seminars Attended (2 credits)

- 1) 20/2/2007, IST, Genova "La natura come modello per applicazioni in biotecnologie e nanotecnologie: l'esempio della biosilice", Marco Giovine, Università di Genova.
- 2) 27/2/2007, IST, Genova "Studio strutturale di sistemi ibridi organici/inorganici: le spicole silicee da spugne marine", Gianluca Croce.

- 3) 13/4/2007, Genova, "Sphingolipid Signalling in Astrigial Cells", Dr.L. Riboni, Università di Milano.
- 4) 16/4/2007, Department of Experimental Medicine, Genova, "Stress ossidativo e anti-ossidanti nell'invecchiamento e nelle demenze dell'anziano: la biologia applicata alla chimica geriatrica", Prof. Patrizia Mecocci, Università di Perugia.
- 5) 16/4/2007, Department of Experimental Medicine, Genova, "La visione e le illusioni ottiche", Prof. Carmen Burtolo, Università di Genova.
- 6) 16/4/2007, Department of Experimental Medicine, Genova, "Anticorpi anti-fosfolipidi e patologie epatiche", Prof. Emanuele Albano, Università del Piemonte Orientale, Novara.
- 7) 17/4/2007, Dept. of Pharmaceutical Sciences, Genova, "Il sistema endocannabinoide nel controllo del dolore e dell'ansia", Prof. Daniele Piomelli, Louise Turner Arnold Chair in the Neurosciences, Professor of Pharmacology and Biological Chemistry and Director of the Center for Drug Discovery-University of California, Irvine CA.
- 8) 4/6/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli", Prof. Bice Fubini, Università di Torino.
- 9) 04/06/2007, Dept. of Pharmaceutical Sciences, Genova, "Spettrometria di massa e proteomica: come distinguere Leucina e Isoleucina nel sequenziamento peptidico in trappola ionica", Dr. Andrea Armirotti, Università di Genova.
- 10) 28/11/2007, CEBR, Genova, "Rischio chimico nel laboratorio biologico", Dr. Lucrezia Guida.
- 11) 11/3/2008, IST, Genova, "Investigating Protein-Protein Interactions with AFM Spectroscopy", G. Brzezinka, M. Targosz-Korecka, Jagiellonian University, Kraków (Poland)
- 12) 11/3/2008, IST, Genova "AFM Studies of Erythrocytes and Multiple Myeloma Proteins", A. Radzik, Jagiellonian University, Kraków (Poland).
- 13) 13/3/2008, Department of Physics, "Energetica del Sistema Nervoso", A. Morelli, Università di Genova.
- 14) 3/7/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Potent XIAP Antagonists by a Fragment-Based MCR Approach", Ilaria Monfardini, DOBIG, Università di Genova.
- 15) 27/11/08, Faculty of Medicine, Genova, "Effector and regulatory T cell responses in cancer: insights for improvement in immunotherapy", Prof. Francesco Indiveri.
- 16) 27/11/08, Faculty of Medicine, Genova, "Riconoscimento di RNA-cap analogues da parte delle metiltrasferasi di Flavivirus" Prof. Martino Bolognesi.
- 17) 6-2-2009, Department of Physics, Genova, "L'energia del futuro", Prof. Carlo Rubbia, CERN, Ginevra.



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



PH.D. CERTIFICATE
OF
AMAN ULLAH



Doctorate Course:
Chemical Sciences and Technologies
Start of the Doctorate Program:
January 1st, 2007
End of the Doctorate Program:
December 31st, 2009
Advisors:
*Prof. Saverio Russo
Dr. Orietta Monticelli*
Thesis Title:
*Synthesis of POSS and metal POSS (M-POSS) -based polymer
nanocomposites and their chemical and physical characterization*
Defense Date:
February 25th, 2010

On February 25th, 2010, at the Department of Chemistry and Industrial Chemistry, Aman Ullah has orally presented his doctorate research work in front of the Commission, formed by

- Prof. Mario Casciola, University of Perugia
- Prof. Paolo Ferruti, University of Milano
- Prof. Renata Riva, 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 AMAN ULLAH,
CONFERRING HIM THE TITLE OF**

**RESEARCH DOCTOR IN
CHEMICAL SCIENCES AND TECHNOLOGY**

The commission has evaluated the thesis and the overall activity of Dr. Aman Ullah as
EXCELLENT

Genova, February 25th, 2010

**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, Aman Ullah **has also spent a research period of 6 months abroad**, at the Southern Methodist University of Dallas (Texas, U.S.A.) under the guidance of Prof. Brent S. Sumerlin, from 2/2/2009 to 31/7/2009.

Scientific Publications

Original publications on ISI Journals:

- 1) Monticelli, O.; Fina, A.; Ullah, A.; Waghmare, P., Preparation, Characterization, and Properties of Novel PSMA-POSS Systems by Reactive Blending, *Macromolecules*, **2009**, *42*, 6614-6623. IMPACT FACTOR (2008): 4.407
- 2) Roy, D.; Ullah, A.; Sumerlin, B. S., Rapid Block Copolymer Synthesis by Microwave-Assisted RAFT Polymerization, *Macromolecules*, **2009**, *42*, 7701-7708. IMPACT FACTOR (2008): 4.407

Publication with an acknowledged contribution:

- 3) Carniato, F.; Bisio, C.; Gatti, G.; Boccaleri, E.; Bertinetti, L.; Coluccia, S.; Monticelli, O.; Marchese, L., *Angew. Chem., Int. Ed. Eng.*, **2009**, *48*, 6059-6061.

Communications at Conferences

Oral communications:

- 1) Ullah, A. "Microwave-assisted well defined Polymers via Reversible Addition Fragmentation Chain Transfer (RAFT) Polymerization", 2009 ACS DFW Section Meeting-in-Miniature, Denton (Texas, USA), 2/5/2009.

Posters:

- 2) Ullah, A. "Hybrid polymer Systems Based on Poly(Styrene-co-Maleic Anhydride) and Polyhedral Oligomeric Silsesquioxanes (POSS)" EUPOC 2008- Europolymer conference, Advanced polymeric materials for the energy resources exploitation: Synthesis, Properties and Applications, Gargnano (BS), 1-5/6/2008. P53, page 124.
- 3) Monticelli, O.; Fina, A.; Waghmare, P.; Ullah, A.; Zunino, E.; Carniato, F.; Boccaleri, E.; Russo, S. "Nanocomposites Based on POSS and Me-POSS", XVII Congresso Nazionale di Chimica Industriale. Energia, materiali e prodotti da tecnologie e processi eco-sostenibili, Genova, Italy, 30/6-3/7/2008, POL-P0.
- 4) Waghmare, P.; Ullah, A. "Synthesis and Characterization of films based on Poly (styrene-co-maleic anhydride) (PSMA) and Amino POSS", 2° Forum Nazionale dei Giovani Ricercatori su Materiali Polimerici e Biomateriali, INSTM, Genova, 4-5/7/2008.

Congresses Attended

- 1) Second Young Polymer Scientists Conference e Sixth Short Course on Nanostructured Polymer Materials: from Chemistry to Applications, Terni, 13-15/4/2008.
- 2) "Advanced Polymeric Materials for the Energy Resources Exploitation (EUPOC 2008), Gargnano (BS). 1-5/6/2008.
- 3) XVII Congresso Nazionale di Chimica Industriale. Energia, materiali e prodotti da tecnologie e processi eco-sostenibili, Genova, Italy, 3/7/2008.(only one day attendance) and 2° Forum Nazionale dei Giovani Ricercatori su Materiali Polimerici e Biomateriali, Genova, 4-5/7/2008.
- 4) 2009 ACS DFW Section Meeting-in-Miniature, Denton (Texas, USA), 2/5/2009.

Courseware

During his doctorate, Aman Ullah has acquired 23.45 credits of Courseware.

Courses attended and passed (19 credits)

Courses Given by Teachers of the University of Genova:

- 1) Fundamentals of modern polymer processing (2 credits)(2007).
- 2) NMR spectroscopy in the characterization of synthetic polymers (2 credits)(2007).
- 3) Dendritic macromolecules: synthesis and reactivity (2 credits)(2007)
- 4) Introduction to Bionanotechnology (1 credit)(2007)
- 5) Vibrational spectroscopy (2 credits)(2008).
- 6) Fundamentals of scanning and transmission electronic microscopy (3 credits)(2008).

Courses Given by invited experts:

- 1) Imaging, Assembling, And Modification Of Nanostructured Materials By High Resolution Scanning Probes (Prof. Szymonski) (1 credit)(2007)
- 2) Carbon nanotechnologies: Fullerenes and nanotubes (M. Prato) (1 credit)(2007).
- 3) Upscale of active principles production: from laboratory to industrial technology transfer (Dr. Gatti) (1 credit)(2007).
- 4) Martensitic Transformations (P. Rogl) (1 credit)(2008).
- 5) Solid State Magnetic Resonance Techniques (R. De Renzi) (1 credit)(2008).
- 6) Self-assembly and hierarchical microstructures: The principles of Nature for the design of materials (J.P. Rigueiro)(1 credit)(2008).

- 7) Technologies for control of CO₂ in the atmosphere: from confinement to reutilization (M. Aresta)(1 credit)(2008).

National and International Schools or Workshops (0.45 credits)

- 1) *Incontro con gli archeomateriali: imparare a riconoscere il sapere, l'uomo e il lavoro che stanno dietro a un reperto*, 2/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova (0.25 credits).
- 2) *Process-Related Structures and Properties of Crystallizable Polymers*, 7/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova (0.1 credits).
- 3) *Interdisciplinary Grant Collaboration Group-Research & Grant Development Workshop*, 16/4/2009, Southern Methodist University (SMU) (Dallas, TX, USA) (2 hours) (0.1 credits).

Seminars Given (2 credits)

- 1) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Role of dendrimers in Drug Delivery".

Seminars Attended (2 credits)

- 1) 14/3/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Cavitands at work: from molecular recognition to supramolecular polymers", Prof. Enrico Dalcanale, Università di Parma.
- 2) 11/4/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Phase Behaviour of polymer blends. From nanophase separation to predictions", D.ssa Valeria Arrighi, Heriot-Watt University, Edinburgh (UK).
- 3) 4/06/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Nanoparticelle e salute: aspetti chimici e morfologici alla base della potenziale pericolosità di materiali particellari sempre più piccoli, Prof.ssa Bice Fubini, Università di Torino.
- 4) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Fibre naturali di seta di ragno", Paola Corsini.
- 5) 18/7/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Tecnologia a membrana per la depurazione delle acque", Bartosz Tylkowski.
- 6) 26/9/2007, Dept. of Chemistry and Industrial Chemistry, Genova, "Click Chemistry", Anna Mumot.
- 7) 12/2/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Supramolecular chirality and photomodulation of properties of amorphous and liquid crystal polymers obtained by ATRP", Dr. Loris Giorgini, Università di Bologna.
- 8) 1/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Cinquant'anni giocando ad aprire e chiudere eterocicli", Prof. Domenico Spinelli, Università di Bologna.
- 9) 2/4/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "High pressure high temperature technique as a tool for the synthesis of ceramic materials with transition metals in mixed valence state", Dr. Alberto Ubaldini, Advanced Nano Materials Laboratory, National Institute for Materials Science (NIMS), Tsukuba (Japan).
- 10) 3/7/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Potent XIAP Antagonists by a Fragment-Based MCR Approach", Ilaria Monfardini, DOBIG, Genova.
- 11) 17/7/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "In situ nanomanipulation and functional characterization on complex superconducting/magnetic oxides", dott.sa Regina Ciancio, Laboratorio SUPERMAT-INFM-CNR, Salerno.
- 12) 22/10/2008, Dept. of Chemistry and Industrial Chemistry, Genova, "Materials Research Activity at the Technological Centre of the Brazilian Navy", Dr.ssa Selma Luiza Silva del "Centro Tecnológico da Marinha em Sao Paulo (Brasil).
- 13) 23/2/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Molecules Shaped Like Trees: Moving Triazine Dendrimers from the Flask toward the Clinic and into the Market", Dr. Eric Simanek.
- 14) 25/2/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Learning from nature: A rational drug design. Concept for non-toxic enediyne anti-tumor drugs", Dr. Elfi Kraka.
- 15) 4/3/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Olefin Metathesis in metal Coordination Spheres: the Quest for Molecular Gyroscopes", Dr. John A. Gladysz.
- 16) 5/3/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Metalated Nitriles: Tunable Chiral Nucleophiles", Dr. Fraser Fleming.
- 17) 17/4/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "A New Approach to Mild Cleansing: "Mitigating Irritation with Hydrophobically-modified Polymers"", Michael J. Fevola.
- 18) 22/4/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Towards self-healing polymeric materials", Abhijeet Bapat.
- 19) 1/5/2009, Southern Methodist University (SMU) (Dallas, TX, USA), "Efforts Toward the Development of Mobile (Slip-Link) Cross-linked Polymeric Material", Michael F. Mayer.
- 20) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Chimica della fotografia, dai sali d'argento ai pixel", F. Wrubl.
- 21) 6/10/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Acciai inossidabili: aspetti metallurgici della saldatura", M. Fabbreschi.
- 22) 8/10/09, Dept. of Chemistry and Industrial Chemistry, Genova, "Point-contact spectroscopy: a method for the study of the electron-quasiparticle interaction function", Prof. Marian Reiffers, Institute of Experimental Physics, Kosice (Slovakia).

- 23) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova,, "Materials for solar energy", L. Francis.
- 24) 20/11/2009, Dept. of Chemistry and Industrial Chemistry, Genova, "Polimeri per uso nel fotovoltaico", E. Casazza.