



UNIVERSITÀ DEGLI STUDI DI MILANO

DIPARTIMENTO DI CHIMICA



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Office hours by appointment.

PROFESSIONAL EXPERIENCE (January 2019)

Role

2011–present time Full Professor in Industrial Chemistry, University of Milan

Previous appointments and education

2001-2011 Associate Professor in Industrial Chemistry, University of Milan
2001 “*Docent*”- in Polymer Technology at the Kunglig Tekniska Högskolan – KTH, Stockholm, Department of Polymer Technology. Appointment by an international jury.
1998-2001 Visiting Professor at KTH, Department of Polymer Technology, Stockholm, Professor Ann-Christine Albertsson.
1986-1998 Assistant Professor in Applied Chemistry, University of Brescia (I).
1985-1986 Post-doc Fellow, University of Brescia, supervisor Prof. Paolo Ferruti. Industrial research contract on the development of PVP oligomers.
1983-1984 Post-doc, University of Pisa, Prof. Francesco Ciardelli. Industrial research contract on the development of high solid paintings.
1983 Doctor degree (laurea), University of Pisa. Proff. Mauro Aglietto and Giacomo Ruggeri. Thesis title: “Synthesis of polymeric catalysts”.

Other stages abroad

June 1991 University of Nottingham (UK), in the frame of a "Brite Euram" EU. Professor Steen S. Davis
July 1990 Gent Universität, in the frame of a "Brite Euram" EU. Professor Etienne Schacht.
December 1988 Macrochem Co. – Wellesley, Massachusetts (USA), in the frame of an industrial research contract on the scale up of PVP oligomers. Carlos Samour, PhD.
October 1988 University of Keele, development of biocompatible polymers in the frame of a research programme sponsored by British Council. Professor Ruth Duncan.

RESEARCH INTERESTS

- Biodegradable and biocompatible polymers for applications in nanomedicine: a) chiral polymers for molecular recognition; b) self-assembling polymers as drug carriers; c) decoration of inorganic nanoparticles for antitumor therapy; d) as antiviral and antimalarial agents; e) as nanovectors for cellular imaging.
- Bioinspired polymers with flame-retardant activity.
- Multifunctional composite resins for the absorption of inorganic and organic pollutants from wastewater.
- Composite hydrogels as scaffolds for tissue regeneration.
- Polymers from renewable sources.

Total number of research documents: 146

Total number of citations: 2639

h-index: 29

Published refereed publications: 133

Published book chapters: 3 (+ 3 non indexed by Web of Science)

Patents: 47, from 16 original applications, 8 of which extended internationally by companies.

In addition: *Encyclopedia contribution*: 2 upon invitation, one of which upon invitation by UNESCO, published electronically.

Presentations as invited speaker at international congresses: 17 (5 keynote)

RECOGNITION BY PEERS

- External referee of Start Grant and Consolidator Applications, European Research Council (ERC) calls, 2009-2016.
- Referee for many peer-reviewed Journals in the field of polymer science, particularly polymers for biotechnological applications (e.g. Biomacromolecules, Advanced Biomaterials, Macromolecular Bioscience, Polymer etc.).

ORGANIZATION OF CONGRESSES AND SUMMER SCHOOLS

11 – 13 March 2019	Chair of the international congress “ <i>Milan Polymer Days</i> ” (MIPOL2019), Milan, Italy
14 - 16 February 2018	Chair of the international congress “ <i>Milan Polymer Days</i> ” (MIPOL2018), Milan, Italy.
15 - 16 February 2017	Chair of the international congress “ <i>Milan Polymer Days</i> ” (MIPOL2017), Milan, Italy.
14 – 19 May 2017	Scientific committee – 8th European Summer School on “ <i>Transport phenomena in polymers and hybrid materials</i> ”, Gargnano, Italy.
21 - 25 May 2017	Scientific committee - Europolymer Conference 2017, “ <i>Polymers and additive manufacturing: from fundamentals to applications</i> ”, Gargnano, Italy.
22 - 26 May 2016	Scientific committee - Europolymer Conference 2016, “ <i>Block copolymers for nanotechnology applications</i> ”, Gargnano, Italy.
2 - 6 May 2016	Promoting committee - XXXVII Convegno-Scuola AIM "Mario Farina" - Caratterizzazione di materiali polimerici: tecniche per polimeri fusi e allo stato solido, Gargnano, Italy.

TEACHING EXPERIENCE

2014 – present time	“ <i>Macromolecular chemistry /Lab</i> ”, 6 credits, Bachelor degree in Industrial Chemistry. “ <i>Polymer Chemistry</i> ”, 6 credits, Master Degree in Industrial Chemistry, course held in English. PhD course in Industrial Chemistry.
2010 -2014	“ <i>Polymer Chemistry/Lab</i> ”, 6+3 credits, Master Degree in Industrial Chemistry. “ <i>Bionanotecnologie</i> ”, 3 credits, Master Degree in Industrial in Industrial Biotechnology.
2001-2013	“ <i>Industrial Chemistry/Lab</i> ”, 6+3 credits, Bachelor degree in Industrial Chemistry.
2001 – 2010	“Research Doctorate School in BIOMolecular Sciences (BIOS)”, University of Pisa.
2004-2008	Member of the committee of the “PhD School in Medical Nanotechnology”, University of Milan.
1998 – 2001	“ <i>Polymer Teknologi/Lab</i> ”, 2+4 credits, Master Degree in Polymer Teknologi, KTH, Stockholm “ <i>Polymeric biomaterials</i> ”, 1 credit, Master Degree in Bioteknologi, KTH, Stockholm
1990 - 1997	“ <i>Polymer Chemistry</i> ” and “ <i>Technology of materials and applied chemistry</i> ” Master degree courses in Mechanical Engineering and Civil Engineering, University of Brescia (I).

Supervisor of PhD thesis or specialization schools

2008 and 2016	Supervisor of PhD thesis in Industrial Chemistry, University of Milan.
2004, 2007, 2008, 2012	Supervisor of PhD thesis Bios School, University of Pisa.
2002	Supervisor of PhD thesis in Polymer Teknologi, KTH Stockholm.
2001 e 2002	Supervisor of PhD thesis – intermediate level, (“ <i>Licentiat</i> ”), KTH Stockholm.
1997	Thesis supervisor for the specialization school in Polymer Science “Giulio Natta”, Brescia, I.

CURRENT INSTITUTIONAL RESPONSIBILITIES

- *Co-ordinator* of the Organic Chemistry Section of the Department of Chemistry 2013-2017.
- Member of the *advisory committee* of the Department of Chemistry 2014-2017.
- Member of the *board* of the PhD course in Industrial Chemistry, University of Milan, since 2010;
- Member of the *steering committee* of the Interdisciplinary Center for the Nanostructured Interfaces and Materials (CIMAINA, users.unimi.it/cimaina), since 2006.

FUNDED GRANTS IN THE PAST 5 YEARS

Project title	Funding source	Period	Role
Multifunctional polymers for special applications	ISNTM	2018-present time	Scientific Responsible
Biodegradable antibacterial polymers for water purification	Industrial project	2018	Scientific Responsible
Amphoteric polyamidoamines as innovative tools to selectively direct antimalarial drugs towards <i>Plasmodium</i> -infected red blood cells	Fondazione Cariplo	2014-2017	Co-ordinator
Valorization and reuse of silk processing wastes	Industrial project	2012-2013	Scientific Responsible
Functional polymeric hydrogels for tissue regeneration	Fondazione Cariplo	2011-2014	Scientific Responsible
Polyamidoamine hydrogels: innovation in the removal of metals, metalloids and organic pollutants from waters.	Lombardy Region	2010-2013	Scientific Responsible
Innovative polymeric materials for the quantitative absorption of inorganic and organic water pollutants	Fondazione Cariplo	2010-2013	Co-ordinator

PREVIOUSLY FUNDED PROJECTS

Co-ordinator or scientific responsible of European projects

- 2005 Co-ordinator of the three-year FP6-2005 STREP project: "Development of an innovative, cost-effective technology to produce halogen-free, high-performance flame retarded polyolefins". University of Milan.
- 2005 Scientific responsible of the FP6-2003-SME-CRAFT industrial project: "Customised nanocomposites based on rubber matrices for high demand applications". University of Milan.
- 1998 Scientific co-responsible of the Brite Euram project: "Integration of conventional polymers with ceramic nanoparticles to produce structural composites with enhanced performances", KTH Stockholm.
- 1998 Scientific co-responsible of the FAIR project: "Biodegradable polyesters from 1,3-propanediol and succinate produced by fermentation of re-growing resources", KTH Stockholm.
- 1998 Scientific co-responsible of the Brite Euram project: "Biocompatible flexible polymer alloys based on polyesters from renewable resources for mass-consumer application involving contact with human fluids and tissues", KTH Stockholm.

Scientific responsible of several **PRIN (Italian University and R&D ministry)** projects (or ex 40%): years **1994, 1995, 1996 e 2002**.

National Reserach Council (CNR): scientific responsible of two PF-MSTA projects in **1997**.

INSTM: two-year "PRISMA" project, **2004**. Progetto INSTM – Regione Lombardia two-year project, **2011**.

Three-year Nutek (SE) project (**1999**) and two-year TFR (SE) project (**2000**).

INDUSTRIAL PROJECTS

- 2014 12-month project funded by TINTORIA JACCHETTI on the "Valorization of sericine wastes"
- 2004 6-month project funded by FRESENIUS HEMOCARE (MO) "Synthesis of hydrophilic / hydrophobic graft copolymers as hydrophilic coatings of filters based on polyethylene terephthalate".
- 2002 6-month project funded by MEDIOLANUM FARMACEUTICI (MI) "Synthesis of hydrogels based on polyvinylpyrrolidone-PLGA copolymers".
- 1997 12-month project funded by LASTRA (BS), " Development of new materials as coating plate for offset printing"
- 1996 6-month project funded by VIDEOCOLOR (RM), " Synthesis and characterization of materials based on polyvinylpyrrolidone"

RECENT PUBLICATIONS (2016-2019)

1. M. Galli, B. Rossotti, P. Arosio, A. M. Ferretti, M. Panigati, E. Ranucci, P. Ferruti, A. Salvati, D. Maggioni "A new catechol-functionalized polyamidoamine as an effective SPION stabilizer" *Colloids and Surfaces B: Biointerfaces* **2019**, 174, 260-269. DOI: 10.1016/j.colsurfb.2018.11.007
2. E. M. Coma-Cros, A. Biosca, E.M. J. Marques, L. Carol, P. Urbán, D. Berenguer, M. C. Riera, M. Delves, R.E. Sinden, J.J. Valle-Delgado, L. Spanos, I. Side-Kiamos, P. Perez, K. Paaijmans, M. Rottman, A. Manfredi, P. Ferruti, E. Ranucci, X. Fernández-Busquets, "Polyamidoamine nanoparticles for the oral administration of antimalarial drugs" *Pharmaceutics* **2018**, 10, Article number 225 DOI:10.3390/pharmaceutics10040225
3. F. Lazzari, A. Manfredi, J. Alongi, R. Mendichi, F. Ganazzoli, G. Raffaini, P. Ferruti, E. Ranucci "Self-structuring in water of polyamidoamino acids with hydrophobic side chains deriving from natural α -amino acids" *Polymers* **2018**, 10, Article number 1261 DOI:10.3390/polym10111261
4. A. Manfredi, F. Carosio, J. Alongi, P. Ferruti, E. Ranucci "Disulfide-containing polyamidoamines with remarkable flame retardant activity for cotton fabrics" *Polym. Degrad. Stabil.* **2018**, 156, 1-13. DOI: 10.1016/j.polymdegradstab.2018.07.028
5. A. Manfredi, F. Carosio, P. Ferruti, E. Ranucci, J. Alongi "Linear polyamidoamines as novel biocompatible phosphorus-free surface-confined intumescent flame retardants for cotton fabrics" *Polym. Degrad. Stabil.* **2018**, 151, 52-64. DOI: 10.1016/j.polymdegradstab.2018.02.020
6. A.A.Y. Almulathanon, E. Ranucci, P. Ferruti, M. C. Garnett, C. Bosquillon "Comparison of gene transfection and cytotoxicity mechanisms of linear poly(amidoamine) and branched poly(ethyleneimine) polyplexes" *Pharm Res.* **2018** 35, 86, 22 pages. DOI: 10.1007/s11095-017-2328-7.
7. E. Caruso, S. Ferrara, P. Ferruti, A. Manfredi, E. Ranucci, V. T. Orlandi "Enhanced photoinduced antibacterial activity of a BODIPY photosensitizer in the presence of polyamidoamines" *Lasers Med. Sci.* **2018**, 33, 1401-1407. DOI: 10.1007/s10103-017-2345-0
8. R. Cavalli, L. Primo, R. Sessa, G. Chiaverina, L. di Biasio, J. Alongi, A. Manfredi, E. Ranucci, P. Ferruti "The AGMA1 polyamidoamine mediates the efficient delivery of siRNA" *J. Drug Targeting* **2017**, 1-8. DOI: 10.1080/1061186X.2017.1363215
9. M. Argenziano, C. Dianzani, B. Ferrara, S. Swaminathan, A. Manfredi, E. Ranucci, R. Cavalli, P. Ferruti "Cyclodextrin-based nanohydrogels containing polyamidoamine units: a new dexamethasone delivery system for inflammatory diseases" *Gels*, **2017**, 3, 22.
10. A. Manfredi, N. Mauro, A. Terenzi, J. Alongi, F. Lazzari, F. Ganazzoli, G. Raffaini, E. Ranucci, P. Ferruti "Self-Ordering Secondary Structure of D - And L -Arginine-Derived Polyamidoamino Acids" *ACS Macro Lett.* **2017**, 6, 987-991.
11. N. Mauro, F. Chiellini, C. Bartoli, M. Gazzarri, M. Laus, D. Antonioli, P. Griffiths, A. Manfredi, E. Ranucci, P. Ferruti "RGD-mimic polyamidoamine-montmorillonite composites with tunable stiffness as scaffolds for bone tissue-engineering applications" *J. Tissue Eng. Regen. Med.* **2017**, 1, 2164-2175.
12. C. Gualandi, N. Bloise, N. Mauro, P. Ferruti, A. Manfredi, M. Sampaolesi, A. Liguori, R. Laurita, M. Gherardi, V. Colombo, L. Visai, M. L. Focarete, E. Ranucci, "Poly-L-Lactic Acid Nanofiber-Polyamidoamine Hydrogel Composites: Preparation, Properties, and Preliminary Evaluation as Scaffolds for Human Pluripotent Stem Cell Culturing" *Macromol. Biosci.* **2016**, 16, 1533-1544. DOI: 10.1002/mabi.201600061

13. M. Nicolò, P. Ferruti, E. Ranucci, A. Manfredi, A. Berzi, M. Clerici, V. Cagno, D. Lembo, A. Palmioli, S. Sattin "Linear biocompatible glyco-polyamidoamines as dual action mode virus infection inhibitors with potential as broad-spectrum microbicides for sexually transmitted diseases" *Sci. Rep.* **2016**, 6, Article Number: 33393.
14. E. Ranucci, G. Capuano, A. Manfredi, P. Ferruti "One-step synthesis of poly(lactic-co-glycolic acid)-g-poly-1-vinylpyrrolidin-2-one copolymers" *J. Polym. Sci. Part A: Polym. Ed.* **2016**, 54, 1919-1928.
15. M. Donalisio, P. Quaranta, F. Chiappesi, M. Pistello, V. Cagno, R. Cavalli, M. Volante, A. Bugatti, M. Rusnati, E. Ranucci, P. Ferruti, D. Lembo "The AGMA1 poly(amidoamine) inhibits the infectivity of herpes simplex virus in cell lines, in human cervicovaginal histocultures, and in vaginally infected mice" *Biomaterials* **2016**, 85, 40-53.
16. S. Pizzimenti, M. Daga, E. Ciamporceco, C. Toaldo, P. Pettazzoni, S. Osella-Abate, M. Novelli, R. Minelli, A. Bisazza, P. Gamba, G. Testa, C. Ullio, P. Ferruti, E. Ranucci, M. G. Bernego, C. Ferretti, C. Dianziani, F. Biasi, G. Barrena, R. Cavalli "Improved anti-tumoral therapeutic efficacy of 4-hydroxynonenal incorporated in novel lipid nanocapsules in 2D and 3D models" *J. Biomedical Nanotechnology* **2016**, 11, 2169-2185.