

Curriculum Vitae

Prof. Carlo Punta

PERSONAL DATA

Name: Carlo Punta
Date of Birth: 02/05/1976
Place of Birth: Genova, Italy
Citizenship: Italian
Mother language: Italian
Other languages: English

Work Address: Department of Chemistry, Materials, and Chemical Engineering "G. Natta"
Politecnico di Milano
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EDUCATION

2001 **Laurea in Chemistry**
Department of Chemistry and Industrial Chemistry
University of Genoa, Italy
Evaluation: 110/110 cum laude.

2001-2002 **Fellowship** (one-year) in Free-Radical Chemistry funded by MIUR
Department of Chemistry, Materials, and Chemical Engineering "G. Natta" (CMIC)
Politecnico di Milano.
Supervisor: Prof. Francesco Minisci

2003 (May-November) **Visiting Researcher**
Department of Chemistry
Vanderbilt University, Nashville (Tennessee, U.S.)
Advisor: Prof. Ned A. Porter
Focus on biochemical studies on the peroxidation of polyunsaturated fatty acids.

2002-2005 **Ph.D. in Industrial Chemistry and Chemical Engineering**
CMIC Department, Politecnico di Milano
Advisor: Prof. Francesco Minisci
Ph.D. title: Polar and enthalpic effects in free radical reactions. New processes and new catalysts for ecofriendly synthesis in mild conditions.
Evaluation: full grades cum laude
C.I.N.M.P.I.S. (National Consortium on Methodologies and Innovative Processes of Synthesis)
Award as "The best Ph.D Thesis on Organic Synthesis" in 2005.

2005-2014 **Assistant Professor**
CMIC Department, Politecnico di Milano

2016 (July/August) **Visiting Professor**
Department of Chemistry and Biomolecular Sciences
University of Ottawa (Ontario, Canada)

CURRENT PROFESSIONAL STATUS

Since December, 2014 **Associate Professor**
CMIC Department, Politecnico di Milano

RESEARCH ACTIVITY

Carlo Punta's main research interests concern the development of new catalytic systems for the selective oxidation of organic substrates under mild and eco-friendly conditions and for the free-radical selective synthesis of known and new molecules and materials of industrial and biological interest. Carlo Punta has multiannual and internationally recognized competences in the investigation of oxidation phenomena for a wide range of organic substrates, namely alcohols, hydrocarbons, lipids and cellulose. In the last decade he has focused on the development of catalytic systems based on 2,2,6,6-tetramethylpiperidinyloxy TEMPO and new nitroxyl-type organocatalysts (e.g. N-hydroxyphthalimide) for the mild and eco-friendly oxidation of organic substrates by means of green oxidants (O_2 and H_2O_2). In this context, his research activity has recently successfully focused on the design of new organo-catalysts capable to promote selective oxidations under solvent-free and metal-free conditions. These studies have been also object of several patent applications. More in general, Carlo Punta has a consolidated experience in the study of mechanisms involving free-radicals, Reactive Oxygen Species, and liquid phase aerobic oxidation catalysis.

Among the results of significant scientific interest in this field are to be highlighted:

- (a) homolytic aromatic substitutions in the homocyclic and heterocyclic series;
- (b) oxidation of aromatic substrates, olefins and aryl/alkyl alcohols;
- (c) functionalization of alkanes and alkenes;
- (d) catalysis of oxidation with molecular oxygen and peroxides;
- (e) synthesis of hydroperoxides of polyunsaturated fatty acids of relevant interest in Biology and Medicine;
- (f) chemo- and stereo-selective carbon-carbon bond formation via single electron transfer mediated by titanium salts and hydroperoxides;
- (g) mechanism investigation of redox free-radical processes;
- (h) design of catalytic systems for selective liquid phase oxidations under solvent-free and metal-free conditions;
- (i) development of photochemical protocols for the selective sunlight-induced functionalization of heterocyclic bases in the presence of polycrystalline TiO_2 and mediated by H_2O_2 or O_2 . Very recently these processes were preliminary investigated by means of Molecular Dynamic Studies in order to understand the topography effects on competitive adsorption of quinoline molecules on a nanosized anatase crystal. (Chemical Communication with Inside Cover);
- (j) free-radical one-pot multicomponent and domino reactions by nucleophilic radical addition of imines generated in situ.

Carlo Punta has also gained specific skills in the functionalization of cellulose and β -cyclodextrins and has been successfully involved in the synthesis of nanostructured organic and ceramic materials for drug delivery and environment decontamination. Two main classes of new materials have been in deep investigated: i) Cyclodextrin Nanosponges (CDNS) and ii) Nanostructured Cellulose Templates (NCT).

i) Cyclodextrins (CD) are cyclic oligomers of amylose obtainable by fermentation methods and on industrial scale. The CD formed by seven glucose units linked together, commonly referred to as β -cyclodextrin, is the cheapest member of the family and it can easily undergo polymerization reactions with suitable poly-functional agents, such as tetra-carboxylic acids (or synthetic equivalents). The reaction product is the hyper-cross-linked CDNS. The cross-linking produces a powder consisting of CD units connected by nanochannels to form a cage-like structure. By using different amounts of cross-linking agent, or by changing the type of CD, modulation of the channels between the CD molecules can be achieved, thereby tuning the formation of the porous network and consequently affecting the inclusion capacity of the nanosponges. CDNS are safe and biodegradable materials with negligible toxicity on cell cultures, negligible hemolytic activity and they are well-tolerated after injection in mice. The strict collaboration with Università di Torino (Francesco Trotta), Università di Messina (Valentina Venuti) and Università di Trento (Barbara Rossi) and internal co-workers (Andrea Mele) has allowed to define the structural and dynamic properties of cyclodextrin-based aggregates by vibrational spectroscopy, numerical simulation and neutron scattering experiments. The Raman and IR study of the vibrational dynamics of CDNS in different frequency regimes allowed to develop a strategy for exploring the structural and dynamic properties of the material at molecular level. The

analysis of the spectral features of the vibrational bands, assigned by using numerical simulation to the carbonyl stretching modes of the polymeric network, allowed to give a semi-quantitative description of the cross-linking degree of CDNS as a function of the type and relative amount of the cross-linking agent with respect to CD. These data are correlated to the modification occurring on the so-called boson peak. In this way, a relative measurements of the stiffness of the polymers have been estimated over a mesoscopic length scale. The swelling behaviour of CDNS was firstly investigated by the combined analysis of the spectral features of the HOH bending mode and O-H stretching vibrations. In this way, information on the structural properties of "bound", "intermediate" and "free" water molecules entrapped inside the polymeric network have been achieved, as a function of cross-linking degree of CDNS, hydration level and temperature. This type of analysis provided also insights on the different degree of coordination of water molecules involved in H-bonds networks.

ii) Cellulose is a natural biopolymer and an almost inexhaustible raw source, whose interesting chemico-physical properties allow widespread industrial application. Its supramolecular structure and organization can be advantageously exploited as building block for lightweight multilayer materials, aerogels, and composites. The possibility to cleave the original structure of native cellulose and to produce cellulose nanofibers (CNF) opens interesting perspectives for a wide range of applications, including wastewater treatment. Following the simplest protocol to produce CNF, cellulose can be preliminary oxidized with the 2,2,6,6-tetramethylpiperidinyloxy (TEMPO)-mediated system. Hydrogels obtained from TEMPO Oxidized CNF (TOCNF) have been reported as efficient and reusable adsorbents of heavy metal ions. However, TOCNF can be also used for further cross-linking, taking advantage of the new carboxylic moieties introduced on the polymer backbone. While this process would lead to macro-dimensioned nano-structured systems, the choice of the ideal cross-linker would allow to introduce additional properties and functional groups, increasing the versatility of the systems. In this context, my team research recently reported a thermal route for the production of a new class of aerogels by combining TOCNF with branched-polyethyleneimine (bPEI). The possibility to functionalize selectively the amino groups of the cross-linker, and to use these devices as templates for further organic and inorganic coating, suggests the potentialities of this new nanostructured materials, whose properties can be modulated in order to perform selectively for the absorption and degradation of target contaminants and for biomedical applications in the field of drug-delivery.

Since 2008 Carlo Punta is PI of a Research Group now consisting of 1 Assistant Professor, 1 Chemical Technician, 3 Post-doc fellowships, and a variable number of undergraduate students, who operate under his supervision in three well-equipped experimental laboratories.

Dissemination. Starting his research activity in 2001, Carlo Punta is co-author of 82 original peer-reviewed ISI papers ($H_{index} = 25$, June 2018), which have collected more than 1800 citations (source Web of Science Core Collection), and of 9 contributions to international books edited by Wiley (5), Elsevier (2), InTech (1), and Nova (1), concerning both mechanistic aspects and synthetic applications in the field of aerobic autoxidation and free-radical chemistry. He is also co-inventor of 5 applications for international patents and 2 applications for national ones, related to the aerobic catalytic oxidation of alkyl aromatics for the production of the corresponding hydroperoxides, in collaboration with Polimeri Europa (now Versalis, ENI Spa). He took 13 invited lectures and, moreover, he presented his scientific results, related to free-radical chemistry, in several other oral and poster communications (more than 50) at national and international meetings.

HONORS AND AWARDS

- C.I.N.M.P.I.S. (National Consortium on Methodologies and Innovative Processes of Synthesis) Award as "The best Ph.D Thesis on Organic Synthesis" in 2005.
- Selected in 2006 among the "Best European Young Chemists" by the European Young Chemists Award Committee and consequently invited to contribute to the book "Tomorrow's Chemistry Today" (WILEY-VCH, 2008).
- Selected in 2008 among the "Best European Young Chemists" by the European Young Chemists Award Committee and consequently invited to contribute to the book "Ideas in Chemistry and Molecular Science – Advances in Synthetic Chemistry" (WILEY-VCH, 2010).
- Carlo Punta obtained in 2014 the National Scientific Qualification (Abilitazione Scientifica Nazionale) as Associate Professor (Professore di II Fascia) in Organic Chemistry (Sector 03/C1) and in Chemistry for Technologies (Sector 03/B2), and

- Carlo Punta obtained in 2017 the National Scientific Qualification (Abilitazione Scientifica Nazionale) as Full Professor in Chemistry for Technologies (Sector 03/B2).
- Admitted in 2018 to the individual funding of basic research activities by MIUR.
- Selected in 2017 by Regione Toscana as Regional Stakeholder of Interreg Europe TANIA project (Treating contamination through Nanoremediation)

TEACHING AND EDUCATIONAL OUTREACH

Teaching

Academic Years from 2005/2006 to 2015/2016:

Course of “Foundations of Chemistry” at the School of Industrial Engineering of Politecnico di Milano (Mechanics, Energetics, and Aeronautics Engineering); mandatory (Bachelor’s course, 7 cfu, 1st year, 1st semester, 6h/week)

The teaching evaluation by students for each academic year has resulted always “High” (i.e. higher than 3 in a range between 0 and 4).

Academic Years 2014/2015 and 2015/2016:

Course of “Chemistry + Technology of Materials and Applied Chemistry” at the School of Architecture Urban Planning Construction Engineering (Building and Architectural Engineering); mandatory (Chemistry part, Bachelor’s course, 3 cfu, 3rd year, 1st semester, 3h/week).

Since Academic Year 2016/2017

Course of “Chemistry” at the School of Industrial Engineering of Politecnico di Milano (Mathematics Engineering); mandatory (Bachelor’s course, 7 cfu, 1st year, 1st semester, 6h/week).

The teaching evaluation by students for each academic year has resulted always “High” (i.e. higher than 3 in a range between 0 and 4).

Collaboration to the translation of Educational Books in Chemistry for Italian editions

2007: *Chemistry 10th Ed.*, by Brown/Lemay. Prentice Hall Edition. Italian Edition: Chimica (Edises).

2007: *Chemistry for Engineers*, by Mary Jane Shultz. Houghton Mifflin Edition. Italian Edition: Chimica per l’Ingegneria (Zanichelli).

2008: *General Chemistry 8th Ed.*, by Chang. McGraw-Hill Edition. Italian Edition: Chimica Generale (McGraw-Hill).

2013: *Chemistry and Chemical Reactivity 8th Ed.*, by Kotz, Treichel, Townsend. Brooks/Cole, Cengage Learning. Italian Edition: Chimica (Edises).

Supervisor of post-doctoral research associates

Dr. Cristian Gambarotti (2006-2009)

Dr. Lucio Melone (2009-2014)

Dr. Simona Prosperini (2009-2012)

Dr. Bianca Rossi (2014-2015)

Dr. Andrea Fiorati (2016-2018)

Dr. Aurora Sganappa (2016-2017)

Dr. Manuel Petroselli (2016-2017)

Dr. Francesca Tana (2017)

Dr. Bianca Rossi (2017)

Dr. Arianna Rossetti (2018)

Supervisor of research fellowships

Alessandra Ghilardi (2008-2009)

Francesco Colombo (2010-2011)

Bianca Rossi (2010-2011)

Manuel Petroselli (2013)

Andrea Pugliese (2017)

Supervisor of Ph.D. students in Industrial Chemistry and Chemical Engineering

Dr. Raffaele Spaccini (2007-2009)

Dr. Bianca Rossi (2011-2014)

Dr. Manuel Petroselli (2013-2016)

Dr. Laura Riva (2018-2021)

Supervisor of Master students

Fabio Toraldo (2014) (Chemical Engineering)

Daniela Ghitti (2014) (Pharmaceutical Chemistry)

Aurora Graziano (2017-2018) (*Environmental Engineering*)

Leopoldo Selleri (2018) (*Chemical Engineering*)

Camilla Flematti (2018) (*Chemical Engineering*)

Supervisor of Bachelor students

Francesco Morandi (2011) (*Chemical Engineering*)

Fabio Toraldo (2011) (*Chemical Engineering*)

Gabriele Ercole (2012) (*Chemical Engineering*)

Michele Fumagalli (2013) (*Chemical Engineering*)

Federico Salzani (2014) (*Chemical Engineering*)

Valentina Azzariti (2015) (*Chemical Engineering*)

Alberto Agazzi (2015) (*Chemical Engineering*)

Martina Zanzottera (2015) (*Chemical Engineering*)

Nicole Eranio (2015) (*Environmental Engineering*)

Silvia Simonetti (2015) (*Environmental Engineering*)

Matteo Pagni (2016) (*Chemical Engineering*)

Costanza Preziosi (2016) (*Chemical Engineering*)

Greta Hamad (2016) (*Environmental Engineering*)

Camille Mondini (2016-2017) (*Environmental Engineering*)

Matteo Grana (2016-2017) (*Environmental Engineering*)

Chiara Della Ducata (2016-2017) (*Environmental Engineering*)

Emma Minelli (2017) (*Chemical Engineering*)

Maria Melania Maestri Lucchini (2017) (*Chemical Engineering*)

Francesca Sacchi (2017) (*Chemical Engineering*)

Andrea Salvi (2017) (*Chemical Engineering*)

Marta Tadiotto (2017-2018) (*Environmental Engineering*)

Pietro Scaglia (2017-2018) (*Environmental Engineering*)

Alice Fabretto (2017-2018) (*Environmental Engineering*)

Gaia Cimbrotto (2018) (*Chemical Engineering*)

Laura Cabizzosu (2018) (*Chemical Engineering*)

Oscar Endrizzi (2018) (*Chemical Engineering*)

Marina Mazzeo (2018) (*Chemical Engineering*)

PROFESSIONAL ACTIVITIES

Duties at Politecnico di Milano

Since 2008: Scientific Advisor of the Library of CMIC Department

2008-2012: Scientific Credentials' Advisor for CMIC Department (Politecnico di Milano) and member of Commission of Scientific Credentials of Politecnico di Milano.

2010-2012: Elected Member of Junta of CMIC Department of Politecnico di Milano

2012: VQR (Research Quality Evaluation) Advisor for the CMIC Department of Politecnico di Milano.

- 2015: VQR (Research Quality Evaluation) Advisor for the CMIC Department of Politecnico di Milano.
- 2016: Scientific Credentials' Advisor for CMIC Department (Politecnico di Milano).
- 2017-2018: Member of Commission for design and realization of new CMIC Department (Politecnico di Milano).
- Since 2013: Member of Ph.D. Collegium of Industrial Chemistry and Chemical Engineering of Politecnico di Milano.

Projects and Funding

- Participant in the project PRIN (Research Projects of National Interest) 2002 (2002038342), co-financed by MIUR (University and Research Italian Minister).
- Participant in the project PRIN 2004 (2004038243_005), co-financed by MIUR.
- Principal Investigator (PI) of the Research Unit (RU) of Politecnico di Milano for the project PRIN 2006 (2006033539_004), co-financed by MIUR in 2008. Specific title of the project conducted by the RU: *Development of new radical processes and new catalysts for the eco-friendly synthesis of products of high industrial and biological interest*. Unit Grant: 78.571 €.
- PI of the RU of Politecnico di Milano for the project PRIN 2008 (2008KRBLP5_003), co-financed by MIUR in 2010. Specific title of the project conducted by the RU: *Catalysis for innovative and eco-friendly radical processes of high industrial and synthetic interest*. Unit Grant: 27.143 €.
- PI of the Research Unit of Politecnico di Milano for the project PRIN 2010-2011 (2010PFLRJR_005) co-financed by MIUR in 2013. Project title: *Oxidative and free radical processes: new aspects and applications for developing melanin-inspired biopolymers and antioxidants of biomedical and technological relevance (PROxi)*. Unit Grant: 119.000 €.
- Chemical partner for the project FIRB (Fund for Investments in Basic Research) – Call “Future in research” 2008, co-financed by MIUR in 2010 (RBF08XH0H_001). Project title: *Surface-Associated Selective Transfection (SAST)*. Unit Grant: 100.000 €.
- Chemical partner for the project SURF – DRIADE call, DAFNE Action, co-financed by Regione Lombardia (Italy) in 2010. Project title: *SuRF - Pretrattamenti di Superficie per Rivestimenti Funzionali in Nautica*. Unit Grant: 50.000 €.
- Research Supervisor (PI) of the project “New Process for Phenol Production”, financed by Polimeri Europa (now Versalis, ENI Spa) (2006-2011).
- Research Supervisor (PI) of a research contract financed by Fondazione Politecnico in 2012.
- Research Supervisor (PI) of a research contract financed by Fondazione Politecnico in 2013.
- Research Supervisor (PI) of a research contract financed by Warrant Group in 2015.
- Research Supervisor (PI) of a research contract financed by Baxter Healthcare Corporation in 2016.
- Chemical Partner for the project NanoBonD - Call RSI 2015, POR FSER 2014-2020, co-financed by Regione Toscana (Italy) in 2016. Project title: *NanoBonD - Nanomateriali per la Bonifica associata a Dewatering di matrici ambientali*. Unit Grant: 140.000 €
- PI of the project NAIADI – Call RL-INSTM 2016, co-financed by Regione Lombardia (Italy) in 2016. Project title: *NAIADI - Nanocellulosa da fonti rinnovabili per la somministrazione sostenibile di fitofarmaci*. Grant: 100.000 €.
- Research Supervisor (PI) of a research contract financed by Sipcam-Oxon in 2016.
- Research Supervisor (PI) of a research contract financed by DOMO in 2017.
- Research Supervisor (PI) of a research contract financed by Akzo in 2017.
- Research Supervisor (PI) of a research contract financed by Renato Corti in 2017.
- Research Supervisor (PI) of a PhD fellowship co-financed (50 %) by Innovhub (Stazione Sperimentale per l'Industria della Camera di Commercio di Milano) in 2018.

Journal Reviewing

Organic Letters, Journal of Organic Chemistry, European Journal of Organic Chemistry, Advanced Synthesis & Catalysis, Journal of Molecular Catalysis A, Tetrahedron Letters, ACS Catalysis, Journal of Catalysis, Organic & Biomolecular Chemistry, MedChemCom, ChemCatChem, Catalysis Communications, Carbohydrate Polymers, Accounts of Chemical Research

Organization of National and International Conferences and Meetings

1. Member of the Organizing Committee of the 5th Annual Meeting "Excelling to compete". The doctorate as a strategic resource for Industry. (Politecnico di Milano, 2016).
2. Member of the Organizing Committee of the 6th Annual Meeting "Excelling to compete". The doctorate as a strategic resource for Industry. (Politecnico di Milano, 2017).
3. Member of the Scientific Committee of the III International Summer School on Cyclodextrins. (Asti, 2016)

APPROVED EXPERIMENTS BY APPLICATION AT EUROPEAN LARGE SCALE FACILITIES

1. Experiment n. 11040 (Structural properties of hydration water in cross-linked polymers: the case of cyclodextrins nanosponges), PACE, Laboratoire Léon Brillouin (LLB), CEA Saclay, Paris (F), 25- 28 March 2013, main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, A. Paciaroni.
2. Experiment n. 11504 (Effect of the cross-linker on the structural properties of cyclodextrin nanosponges hydrogel), PACE, Laboratoire Léon Brillouin (LLB), CEA Saclay, Paris (F), 05-9 December 2013 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, A. Paciaroni.
3. Experiment n. 20135365 (Hydrogen-bonding dynamics in cyclodextrin-based hydrogels by Raman spectra line-shape analysis), IUVS, ELETTRA Sincrotrone di Trieste, Trieste (I), 17-22 March 2014 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, F. Trotta.
4. Experiment n. 11766 (Exploring the phase diagram of cyclodextrin-based hydrogel), PACE, Laboratoire Léon Brillouin (LLB), CEA Saclay, Paris (F), 31 March-3 April 2014 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, A. Paciaroni
5. Experiment n. 9754 (Hydration-dependence of correlation lengths for different type of cyclodextrin-based polymers), KWS-2, Forschungsneutronenquelle Heinz Maier-Leibnitz (FRMII), Monaco (G), 15-17 September 2014 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, A. Paciaroni.
6. Experiment n. CRG-2156 IN13 (Exploring the dynamics of water confined in cyclodextrin-based hydrogel), IN13, Istitut Laue Langevin (ILL), Grenoble (F), 13-18 October main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino.
7. Experiment n. 20145189 (Molecular diffusion of a model drug in cyclodextrin-based hydrogels by ultraviolet Raman scattering experiments), IUVS, ELETTRA Sincrotrone di Trieste, Trieste (I), 10- 14 March 2015 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, F. Trotta.
8. Experiment n. 12010 (Dynamic behaviour of confined water in a new class of cyclodextrin-based hydrogel) MUSES, Laboratoire Léon Brillouin (LLB), CEA Saclay, Paris (F), 04-14 May 2015 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi.
9. CERIC experiment n. 20147045 (Relaxation properties of a drug model in cyclodextrin-based cross-linked polymers: a combined NMR and Raman spectroscopy investigation) IUVS, ELETTRA Sincrotrone di Trieste, Trieste (I), 26-29 May 2015 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, F. Trotta.
10. Experiment n. 20150363 (Thermo-activated release of active agents in stimuli-responsive hydrogels based on cyclodextrin: an UV Raman scattering study), IUVS, ELETTRA Sincrotrone di Trieste, Trieste (I), 14-19 September 2015 main: Barbara Rossi, co-proposer: V. Venuti, A. Mele, C. Punta, L. Melone, V. Crupi, D. Majolino, F. Trotta.
11. Experiment n. 11358 (Structural evolution of pH-sensitive cyclodextrins-based hydrogels), KWS-2, Forschungsneutronenquelle Heinz Maier-Leibnitz (FRMII), Monaco (G), 5-7 November 2016

PUBLICATIONS

(corresponding author is indicated with *; since 2008 as PI)

International Papers

2018

- 1) *Environmentally Sustainable and Ecosafe Polysaccharide-Based Materials for Water Nano-Treatment: An Eco-Design Study.*
Corsi, I.*; Fiorati, A.; Grassi, G.; Bartolozzi, I.; Daddi, T.; Melone, L.; **Punta, C.*** *Materials* **2018**, *11*, 1228.
- 2) *Ecofriendly nanotechnologies and nanomaterials for environmental applications: key issue and consensus recommendations for sustainable and ecosafe nanoremediation.*

Corsi, I.; Winther-Nielsen, M.; Sethi, R.; Punta, C.; Della Torre, C.; Libralato, G.; Lofrano, G.; Sabatini, L.; Aiello, M.; Fiordi, L.; Cinuzzi, F.; Caneschi, A.; Pellegrini D.; Buttino, I. *Ecotoxicology and Environmental Safety*, **2018**, *154*, 237-244.

3) *Microwave-assisted synthesis of TEMPO-labeled hydrogels traceable with MRI.*

Mauri, E.; Micotti, E.; Rossetti, R.; Melone, L.*; Papa, S.; Azzolini, G.; Rimondo, S.; Veglianesi, P.; **Punta, C.**; Rossi, F.*; Sacchetti, A. *Soft Matter*, **2018**, *14*, 558-565.

2017

4) *Lipophilic N-Hydroxyphthalimide Catalysts for the Aerobic Oxidation of Cumene: Towards Solvent-Free Conditions and Back.*

Petroselli, M.; Melone, L.; Cametti, M.; **Punta, C.*** *Chem. Eur. J.* **2017**, *23*, 10616 – 10625.

5) *Mechanical and Drug Release Properties of Sponges from Cross-linked Cellulose Nanofibers.*

Fiorati, A.; Turco, G.; Travan, A.; Caneva, E.; Pastori, N.; Cametti, M.; **Punta, C.**; Melone, L. *ChemPlusChem* **2017**, *82*, 848 – 858.

6) *Correlation between collective and molecular dynamics in pH-responsive cyclodextrin-based hydrogels.*

Bottari, C.; Comez, L.; Corezzi, S.; D'Amico, F.; Gessini, A.; Mele, A.; **Punta, C.**; Melone, L.; Pugliese, A.; Masciovecchio C.; Rossi, B. * *Phys.Chem.Chem.Phys.* **2017**, *19*, 22555-22563.

7) *Tuning structural parameters for the optimization of drug delivery performance of cyclodextrin-based nanosponges.* Venuti, V.; Rossi, B.*; Mele, A.; Melone, L.; **Punta, C.**; Majolino, D.; Masciovecchio C.; Caldera, E.; Trotta, F. *Exp. Opin. Drug. Deliv.* **2017**, *14* (3), 331-340.

8) *SANS investigation of water adsorption in tunable cyclodextrin based polymeric hydrogels.*

Rossi, B.; Paciaroni, A.; Venuti, V.; Fadda, G. C.; Melone, L.; **Punta, C.**; Crupi V.; Majolino D.; Mele A. *Phys.Chem.Chem.Phys.* **2017**, *19*, 6022-6029.

9) *Dynamics and interactions of ibuprofen in cyclodextrin nanosponges by solid-state NMR spectroscopy.*

Ferro, M.; Castiglione, F.; Pastori, N.; **Punta, C.**; Melone, L.; Panzeri, W.; Rossi, B.; Trotta, F.; Mele, A. *Beilstein J. Org. Chem.* **2017**, *13*, 182–194.

10) *TEMPO-mediated oxidation of polysaccharides: An ongoing story.* Story.

Pierre, G.; **Punta, C.**; Delattre, C.; Melone, L.; Dubessay, P.; Fiorati, A.; Pastori, N.; Galante, Y.M.; Michaud, P. *Carbohydrate Polymers* **2017**, *165*, 71–85.

2016

11) *Flexible hybrid coatings with efficient antioxidation properties.* Bossi, E.; Tana, F.; Punta, C; Cigada, A.; De Nardo, L. *Food Pack. Shelf Life.* **2016**, *10*, 106–114.

12) *Transport Properties of Ibuprofen Encapsulated in Cyclodextrin Nanosponge Hydrogels: A Proton HR-MAS NMR Spectroscopy Study.* Ferro, M.; Castiglione, F.; **Punta, C.**; Melone, L.; Panzeri, W.; Rossi, B.; Trotta, F.; Mele, A. *JoVE* **2016**, doi:10.3791/53769.

13) *An aerogel obtained from chemo-enzymatically oxidized fenugreek galactomannans as a versatile delivery system.*

Rossi, B.; Campia, P.; Merlini, L.; Brasca, M.; Pastori, N.; Farris, S.; Melone, L.*; **Punta, C.***; Galante, Y.M.* *Carbohydrate Polymers* **2016**, *144*, 353-361.

14) *Surface-Functionalization of Nanostructured Cellulose Aerogels by Solid State Eumelanin Coating.* Panzella, L.*;

Melone, L.; Pezzella, A.; Rossi, B.; Pastori, N.; Perfetti, M.; D'Errico, G.; **Punta, C.***; d'Ischia, M. *Biomacromolecules* **2016**, *17*, 564-571.

- 15) *N-Hydroxyphthalimide catalysts as bioactive prooxidants*. Melone, L.; Tarsini, P.; Candiani, G.*; **Punta, C.*** *RSC Advances* **2016**, *6*, 21749-21755.
- 16) *Vibrational signatures of the water behavior upon confinement in nanoporous hydrogels*. Rossi, B.; Venuti, V.; Mele, A.; **Punta, C.**; Melone, L.; D'Amico, F.; Gessini, A.; Crupi, V.; Majolino, D.; Trotta, F.; Masciovecchio, C. *Phys.Chem.Chem.Phys.* **2016**, *18*, 12252-12259.

2015

- 17) *Dip in colorimetric fluoride sensing by a chemically engineered polymeric cellulose/bPEI conjugate in the solid state*. Melone, L.; Bonafede, S.; Tushi, D.; **Punta, C.**; Cametti, M. *RSC Advances* **2015**, *5*, 83197-83205.
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- 7) *Selective Oxido-Reductive Processes by Nucleophilic Radical Addition Under Mild Conditions*. Gambarotti, C.; **Punta, C.*** *Tomorrow's Chemistry Today*, Bruno Pignataro Ed., **2008**, Wiley-VCH WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. ISBN: 978-3-527-31918-3.
- 8) *Selective Aerobic Radical Epoxidation of α -Olefins Catalyzed by N-hydroxyphthalimide*. **Punta, C.***; Moscatelli, D.; Porta, O.; Minisci, F.; Gambarotti, C.; Lucarini, M. *Mechanisms In Homogeneous and Heterogeneous Catalytic Epoxidation*, S. Ted Oyama Ed., **2008**, Elsevier. DOI: 10.1016/B978-0-444-53188-9.00006-7.
- 9) *NHPI*. Recupero, F.; Gambarotti, C.; **Punta, C.** *EROS (Encyclopedia of Reagents for Organic Synthesis)* John Wiley & Sons, DOI: 10.1002/047084289X.m00598, **2005**.

Invited Lectures

- 2005:** 9th International Symposium on Activation of Dioxygen and Homogeneous Catalytic Oxidation" (Cologne, Germany).
1. *Mechanisms of the aerobic oxidations catalyzed by N-hydroxyderivatives. Enthalpic, polar and solvent effects, "molecule-induced homolysis" and synthetic involvements.*
- 2007:** 234th National Summer Meeting of the American-Chemical-Society (Epoxidation Symposium: Boston, U.S.)
2. *Selective aerobic radical epoxidation of α -olefins catalyzed by N-hydroxyphthalimide (NHPI).*
- 2009:** 238th National Summer Meeting of the American-Chemical-Society (Selective Oxidation Symposium: Washington D.C., U.S.)
3. *Aerobic oxidations catalyzed by N-hydroxyderivatives. Enthalpic, polar and solvent effects, "molecule-induced homolysis" and synthetic involvements.*
- VIII Laboratorio di Metodologie Sintetiche in Chimica Farmaceutica (Certosa di Pontignano, Siena, Italy).
4. *Reazioni Radicaliche Selettive: una risorsa in Chimica Organica.*
- 2010:** Nanoforum 2010 - NANOTECNOLOGIE E PACKAGING 2 (Torino, Italy).
5. *Meccanismi Ossidativi e Strumenti di Prevenzione Mediante Packaging Attivo.*
- 2014:** Nanoforum 2014 – MICRO, NANO, AND ADVANCED TECHNOLOGIES. WHERE RESEARCH MEETS BUSINESS (Roma, Italy).
6. *Innovazioni nei sistemi filtranti per acqua e aria*
- 2015:** ADHOC 2015 – Activation of Dioxygen and Homogeneous Catalytic Oxidation (Madison, WI, U.S.).
7. *New N-Hydroxyphthalimide Derivatives as Catalysts in the Aerobic Oxidation of Alkylaromatics.*
Department of Chemistry and Biomolecular Sciences, University of Ottawa (Ontario, Canada)
 8. *New N-Hydroxyphthalimide Derivatives as Catalysts in the Aerobic Oxidation of Alkylaromatics.*
- 2016:** 1st International Workshop - Ecofriendly Nanotechnologies: State-of-the-art, future perspectives and ecotoxicological evaluation of nano-remediation applied to contaminated sediments (Pisa, Italy)
9. *Nanostructured Polysaccharide-Based Materials for Environmental Remediation.*
Mid-term project meeting "Chemically and Biochemically Modified Polysaccharides from Leguminous Plants with Improved Biostability and Versatile Properties for Industrial Applications" (POLIBIO) (Milano, Italy).

10. *Aerogels obtained from polysaccharides as innovative multifunctional systems*
- 2017:** 1st TANIA (TreAting contamination through NanoremediAtion) Stakeholders Meeting (Interreg Europe) – (Firenze, Italy)
11. *Materiali Polisaccaridici Nanostrutturati per la Bonifica Ambientale.*
- 2017:** 3rd TANIA (TreAting contamination through NanoremediAtion) Exchange Event (Interreg Europe): “Nanoremediation: addressing the public policy challenges” (Metz, France)
12. *Solutions to manage Risk / Health and safety.*
- 2018:** 2nd TANIA (TreAting contamination through NanoremediAtion) Stakeholders Meeting (Interreg Europe): Tecnologie innovative nell’ambito della remediation ambientale nel contest della riqualificazione industriale e ambientale di Piombino – (Piombino, Italy)
13. *Il Caso della Regione Grand’Est (Francia)*

Regular Oral Contributions

- 2006:** 1st European Chemistry Congress (Budapest, Hungary-2006).
14. *Free-radical version of the Strecker synthesis of α -aminoamides promoted by aqueous $H_2O_2/Ti(III)/HCONH_2$ system.*
- 3rd International Symposium on Biorganometallic Chemistry (Milan, Italy-2006).
15. *Free-radical version of the Strecker synthesis of α -aminoamides promoted by aqueous $H_2O_2/TiCl_3/HCONH_2$ system.*
- 2008:** 2nd EuCheMS Chemistry Congress (Torino, Italy).
16. *From stabilized to persistent radicals: the key role of Ti(IV) in the radical-radical cross-coupling mediated by the Ingold-Fischer effect.*
17. *Aerobic Oxidations Catalyzed by N-Hydroxyderivatives. Enthalpic, Polar and Solvent Effects, "Molecule-Induced Homolysis" and Synthetic Involvements.*
- 2012:** 243th National Spring Meeting of the American-Chemical-Society (San Diego, U.S.).
18. *Mild oxidation of alkylaromatics to corresponding hydroperoxides catalysed by N-hydroxy derivatives.*
- 2013:** 245th National Spring Meeting of the American-Chemical-Society (New Orleans, U.S.).
19. *Hydroperoxidation of hydrocarbons mediated by N-hydroxy imides.*
20. *TEMPO-oxidized cellulose nanofibers as template for ceramic aerogels: Synthesis, characterization, and photocatalytic properties.*
- 2014:** iCHAT: International Conference on Hydrogen Atom Transfer (Roma, Italy).
21. *A new lipophilic N-hydroxyphthalimide (NHPI) for the aerobic oxidation of alkylaromatics to the corresponding hydroperoxides.*
- 2017:** XIV Convegno Nazionale AIMAT 2017 e XI Convegno Nazionale INSTM 2017 (Ischia Porto, Italy).
22. *Polysaccharide-based Nanostructured Aerogels*
- 2018:** EuCheMS conference on Organic Free Radicals (ECOFR 2018) (Marseille, France).
23. *Homogeneous aerobic oxidation catalyzed by NHPI derivatives: Co-solvent or not co-solvent? That is the question.*
- XI Congresso Nazionale AICIng (Bologna, Italy)
24. *Ossidazione aerobica selettiva di alchil aromatici catalizzata da N-idrossifalimmide (NHPI)*