ORLANDO SANTORO

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Current Position

January 2022 – Now Assistant Professor of General and Inorganic Chemistry, University of Insubria, Department of Biotechnology and Life Sciences, Varese - Italy

Academic Qualifications

2025 National Scientific qualification as associate professor for the disciplinary field of 03/C2 – Industrial and Applied Chemistry

2023 National Scientific qualification as associate professor for the disciplinary field of 03/B1 – Principles of chemistry and inorganic systems

2023 National Scientific qualification as associate professor for the disciplinary field of 03/B2 – Principles of chemistry for applied technologies

2016 PhD, School of Chemistry, University of St Andrews, United Kingdom

2011 MSc in Chemistry, Department of Chemistry, University of Salerno, Italy

2009 BSc in Chemistry, Department of Chemistry, University of Salerno, Italy

Academic Research Activity

October 2020 – December 2021 and February 2017 – January 2019 Post-doctoral research assistant, Rennes Institute of Chemical Sciences, Université de Rennes 1, France (Prof. Jean-François Carpentier, Sponsored by TOTAL Petrochemicals)

February 2019 – September 2020 Post-doctoral research assistant, Department of Chemistry and Biochemistry, The University of Hull, United Kingdom (Prof. Carl Redshaw)

Teaching Activity

University of Insubria

Lecturer for the General and Inorganic Chemistry course (1st year BSc in Biotechnology, 56 h)

Lecturer for the Biomaterials course (1st year MSc in Biotechnology, 18 h)

The University of Hull

Laboratory demonstrator for the 3rd Year Research Projects (Organometallic Chemistry and Catalysis)

Training of MSc students and co-supervision of their research projects (with Prof. Carl Redshaw):

University of St Andrews

Academic Year 2014/15, Semester 1 - Delivery of Inorganic Chemistry tutorials

Academic Year 2013/14, Semester 2 - Laboratory demonstrator for the 3rd Year Research Project

Publications

(1) "*The Exposure to Polypropylene Micro- and Nanoplastics Impairs Wound Healing and Tissue Regeneration in the Leech Hirudo verbena*" C. Bon, A. Maretti, L. Pulze, N. Paris, **O. Santoro**, S. Pragliola, L. Izzo, N. Baranzini, A. Grimaldi, *Microplastics* **2025**, *4*, 56.

(2) "*A kinetic and mechanistic study of copper-based catalysts in the ARGET-ATRP of multifunctional natural molecules: the case of methacrylated eugenol*" A. Vittore, **O. Santoro**, M. Candida, S. Vaghi, S. Pragliola, M. Mella, L. Izzo, *Polymer* **2025**, *324*, 128228.

(3) "*Bio-based production of cis,cis-muconic acid as platform for a sustainable polymers production*" F. Molinari, A. Salini, A. Vittore, **O. Santoro**, L. Izzo, S. Fusco, L. Pollegioni, E. Rosini, *Bioresour. Technol.* **2024**, *408*, 131190.

(4) "*Antimicrobial polymer surfaces containing quaternary ammonium centers (QACs): synthesis and mechanism of action*" **O. Santoro**, L. Izzo, *Int. J. Mol. Sci.* **2024**, *25*, 7587.

(5) "*Evaluation of Nanoparticles Covalently Bound with BODIPY for Their Photodynamic Therapy Applicability*" M. C. Malacarne, E. Caruso, M. B. Gariboldi, E. Marras, G. Della Bitta, O. Santoro*, A. Simm, R. Li, C. T. J. Ferguson, *Int. J. Mol. Sci.* **2024**, *25*, 3187.

(6) "*Inherently Antimicrobial P(MMA-ran-DMAEMA) Copolymers Sensitive to Photodynamic Therapy: A Double Bactericidal Effect for Active Wound Dressing*" **O. Santoro,** M. C. Malacarne, F. Sarcone, L. Scapinello, S. Pragliola, E. Caruso, V. T. Orlandi. L. Izzo, *Int. J. Mol. Sci.* **2023**, *24*, 4340.

(7) "*Ring Opening Polymerization of Lactides and Lactones by Multimetallic Titanium Complexes Derived from the Acids $Ph_2C(X)CO_2H$ (X = OH, NH_2)*" X. Zhang, T. J. Prior, K. Chen, **O. Santoro**, C. Redshaw, *Catalysts* **2022**, 12, 935.

(8) "*Comonomer-controlled synthesis of long-chain branched (LCB)-polyethylene*" **O. Santoro**, L. Piola, K. Mc Cabe, O. Lhost, K. Den Dauw, A. Fernandez, A. Welle, L. Maron, J.-F. Carpentier, E. Kirillov, *Eur. Polym. J.* **2022** 177, 111477

(9) *"Group 12 and 13 metal-alkenyl promoted generation of long-chain branching in metallocene-based polyethylene"* **O. Santoro**, L. Piola, K. Mc Cabe, O. Lhost, K. Den Dauw, A. Fernandez, A. Welle, L. Maron, J.-F. Carpentier, E. Kirillov, *Eur. Polym. J.* **2022**, *173*, 111257.

(10) *"Meso-and Rac-[bis(3-phenyl-6-tert-butylinden-1-yl)dimethylsilyl] zirconium Dichloride: Precatalysts for the Production of Differentiated Polyethylene Products with Enhanced Properties"* K. Giffin, V. Cirriez, **O. Santoro**, A. Welle, E. Kirillov, J.-F. Carpentier, *Polymers* **2022***, 14,* 2217.

(11) "*Recent Advances in RO(CO)P of Bio-Based Monomers"* **O. Santoro**, L. Izzo, F. Della Monica, *Sustain. Chem.* **2022**, *3*, 259.

(12) *"Metallocalix[n]arenes in catalysis: A 13-year update"* **O. Santoro**, C. Redshaw, *Coord. Chem. Rev.*, **2021**, 448, 214173.

(13) *"Al-alkenyl-induced formation of long-chain branched polyethylene via coordinative tandem insertion and chain-transfer polymerization using $(nBuCp)_2ZrCl_2$/MAO systems: An experimental and theoretical study"* **O. Santoro**, L. Piola, K. Mc Cabe, O. Lhost, K. Den Dauw, A. Vantomme, A. Welle, L. Maron, J.-F. Carpentier, E. Kirillov, *Eur. Polym. J.* **2021**, *54*, 110567.

(14) *"Scandium calix[n]arenes (n= 4, 6, 8): structural, cytotoxicity and ring opening polymerization studies"* A. F. Al Alshamrani, **O. Santoro**, T. J. Prior,M. A. Alamri, G. J. Stasiuk, M. R. J. Elsegood, C. Redshaw, *Dalton Trans.* **2021**, *50*, 8302.

(15) *"Comparative assessment of marine weathering of ROP-derived biopolymers against conventional plastics"* K. Rodgers, W. M. Mayes, **O. Santoro**, C. Redshaw,R. Mccumskay, D. R. Parsons, *Mar. Pollut. Bull.*, **2021**, *167*, 112272.

(16) "*Lithium calix[4]arenes: structural studies and use in the ring opening polymerization of cyclic esters"* **O. Santoro**, M. R. J. Elsegood, S. J. Teat, T. Yamato, C. Redshaw, *RSC Adv.*, **2021**, *11*, 11304.

(17) *"Synthesis, characterisation and ROP catalytic evaluation of Cu(II) complexes bearing 2,2'-diphenylglycine-derived moieties"* A.F. Al Alshamrani, **O. Santoro**, S. Ounsworth, T. J. Prior, G. J. Stasiuk, C. Redshaw, *Polyhedron*, **2021**, *195*, 114977.

(18) "*Rare-earth metal complexes derived from the acids $Ph_2C(X)CO_2H$ (X= OH, NH_2): Structural and ring opening polymerization (ROP) studies*" J. Collins, **O. Santoro**, T. J. Prior, K. Chen and C. Redshaw, *J. Mol. Struct.,* **2021**, *1224*, 129083.

(19) *"Long-Chain Branched Polyethylene via Coordinative Tandem Insertion and Chain-Transfer Polymerization Using rac-{EBTHI}$ZrCl_2$/MAO/Al–alkenyl Combinations: An Experimental and Theoretical Study"* **O. Santoro**, L. Piola, K. Mc Cabe, O. Lhost, K. Den Dauw, A. Vantomme, A. Welle, L. Maron, J.-F. Carpentier, E. Kirillov, *Macromolecules*, **2020**, *53*, 8847.

(20) "*INSIGHTS into the structures adopted by titanocalix[6 and 8]arenes and their use in the ring opening polymerization of cyclic esters*" **O. Santoro**, M. R. J. Elsegood, E. Bedwell, J. Pryce, C. Redshaw, *Dalton Trans.,* **2020**, *49,* 11978.

(21) "*Synthesis of Biodegradable Polymers: A Review on the Use of Schiff-Base Metal Complexes as Catalysts for the Ring Opening Polymerization (ROP) of Cyclic Esters*" **O. Santoro**, X. Zhang, C. Redshaw, *Catalysts*, **2020**, *10*, 800.

(22) "*Use of titanocalix[4]arenes in the ring opening polymerization of cyclic esters*" Ziyue Sun, Yanxia Zhao, **O. Santoro**, M. R. J. Elsegood, E. V. Bedwell, K. Zahra, A. Walton, C. Redshaw, *Catal. Sci. Tech.*, **2020**, *10,* 1619.

(23) "*Use of titanium complexes bearing diphenolate or calix[n]arene ligands in* α*-olefin polymerization and the ROP of cyclic esters*" **O. Santoro**, C. Redshaw, *Catalysts*, **2020**, *10*, 210.

(24) "*Synthesis and structures of mono- and di-nuclear aluminium and zinc complexes bearing α-dimine and related ligands, and their use in the ring opening polymerization of cyclic esters*", X. Lin, Y. Zhao, S. Qiao, Z. Sun, **O. Santoro**, C. Redshaw, *Dalton Trans.* **2020**, *49*, 1456.

(25) "*Synthesis, characterization and catalytic activity of stable [(NHC)H][$ZnXY_2$] (NHC =N-Heterocyclic carbene, X, Y = Cl, Br) species*", **O. Santoro**, F. Nahra, D. B. Cordes, A. M. Z. Slawin, S. P. Nolan, C. S. J. Cazin, *J. Mol. Cat. A: Chem*., **2016**, *423*, 85.

(26) "*Generalization of the Copper to Late Transition Metal Transmetallation to Carbenes beyond N-Heterocyclic Carbenes*", Y. D. Bidal, **O. Santoro**, M. Melaimi, D. B. Cordes, A. M. Z. Slawin, G. Bertrand, C. S. J. Cazin, *Chem. Eur. J.*, **2016**, *22*, 9404.

(27) "*Homoleptic and heteroleptic bis-NHC Cu(I) complexes as carbene transfer reagents*", **O. Santoro**, F. Lazreg, D. B. Cordes, A. M. Z. Slawin, C. S. J. Cazin, *Dalton Trans.*, **2016**, *45*, 4970.

(28) "*N-heterocyclic carbene copper(I) catalysed N-methylation of amines using CO_2*", **O. Santoro**, F. Lazreg, Y. Minenkow, L. Cavallo, C. S. J. Cazin, *Dalton Trans.*, **2015**, *44*, 18138.

(29) "*A general synthetic route to [Cu(X)(NHC)] (NHC = N-heterocyclic carbene, X = Cl, Br, I) complexes*", **O. Santoro**, A. Collado, A, M. Z. Slawin, S. P. Nolan, C. S. J. Cazin, *Chem. Commun*., **2013**, *49*, 10483.

(30) "*Asymmetric Hydrodimerization of Styrene by a Chiral Zirconium Complex Containing a Tetradentate [OSSO]-type Bis(phenolate) Ligand*", N. Galdi, **O. Santoro**, L. Oliva, A. Proto, C. Capacchione*, Catal. Commun*., **2011**, *12*, 1113.

Patents

(1) "*Process for Preparing Propylene Polymers Having Long Chain Branches*" A. Welle, J.-F. Carpentier, E. Kirillov, L. Piola, **O. Santoro**, Patent WO2022029212A1 to Total Research and Technology Feluy.

(2) "*Process for Preparing Ethylene Polymers Having Long Chain Branches*" A. Welle, J.-F. Carpentier, E. Kirillov, L. Piola, **O. Santoro**, Patent WO2022029213A1 to Total Research and Technology Feluy.

(3) "*Processo di sintesi dell'omopolimero del mircene*" L. Izzo, **O. Santoro**, L. Scapinello, M. Caprio, R. Lapenta Deposito n. 102024000014725

(4) "*Uso dell'omopolimero del guiacil metacrilato per pneumatici*" L. Izzo, **O. Santoro**, L. Scapinello, M. Caprio, R. Lapenta. Deposito n. 102024000014737

(5) "*Copolimero del guaicil metacrilato/mircene, sua preparazione ed usi*" " L. Izzo, **O. Santoro**, L. Scapinello, M. Caprio, R. Lapenta. Deposito n. 102024000014743.

Contributions to Conferences

Member of the scientific committee of the *Milan Polymer Days 2024 – University of Milan (June 2024)*

Oral Communications
(1) *Milan Polymer Days – University of Milan (June 2025)*
"Tuning thermal and mechanical properties of ABA copolymers from elastomers to thermoplastics"
(2) *Milan Polymer Days – University of Milan (June 2023)*
"Sustainable polymers via Controlled Radical Polymerization (CRP): synthetic and mechanistic aspects"
(3) *Milan Polymer Days – University of Milan (June 2022)*
"Biodegradable polylactones by Ti-catalyzed Ring Opening Polymerization (ROP) of cyclic esters"
(4) *Dalton Younger Members Event – University of Leeds (September 2015)* "N-Heterocyclic Carbene Copper(I) Catalysed N-methylation of amines using CO_2"

Posters
(1) *2nd EuCheMS Congress on Green and Sustainable Chemistry – University of Lisbon (October 2015)*
"N-Heterocyclic Carbene Copper(I) Catalysed N-methylation of amines using CO_2"
(2) *20th EuCheMS Conference on Organometallic Chemistry – University of St Andrews (Luglio 2013)*
"Copper-NHC complexes in synthesis"