

CURRICULUM VITAE ET STUDIORUM: Dr. Roncaglia Fabrizio

Personal data: Born in Modena (MO), 16-08-1972

Present Position: Assistant Professor in Organic Chemistry at UniMORE

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EDUCATION

1999-12 Master Degree in chemistry (110/110 cum laude) at University of Modena and Reggio Emilia (UniMORE), thesis in organic synthesis (supervisor: prof. F. Ghelfi).

2000-02 Process engineer at “TECOMA drying technology S.r.l.” Maranello (MO)

2002-05 Medical sales representative at “SOLVAY Pharmaceuticals S.p.A.”

2007-12 Ph.D. in Chemistry at UniMORE with a thesis entitled ‘Atom Transfer Radical cyclization of α -perhaloacetals, a new variant of the Ueno-Stork reaction’ (supervisor: Prof. F. Ghelfi).

VISITS AND STAYS

2006-06 Visiting scientist at Department of Green Chemistry and Technology, University of Ghent

BRIEF DESCRIPTION OF THE RESEARCH ACTIVITY

FABRIZIO RONCAGLIA devoted 15 years to the study of synthetic methods, mainly based on atom transfer radical processes (cyclization, addition, and polymerization), with the aim of obtaining carbon-based molecular structures suitable for diverse applications. This activity let him to gain competence in synthetic planning, design of experimental synthetic methods and in the “early scale-up” towards the production of 10 – 100 g of molecular targets with atom-level precision and featuring high purity. Different techniques for the analysis of complex mixtures and pure substances were also acquired (TLC, GC-MS, LC-MS, multinuclear NMR, FT-IR and UV-Vis spectrometry, etc). Particular interest was directed to the development of sustainable synthetic methods, suitable for industrial scale-up.

More recently, the acquired skills were employed in applied subjects and used to modify monomers, polymers, surfaces, etc or to produce novel (commercially unavailable) functional substances or materials. Collaborative projects are currently active, in the field of sustainable chemistry (biorefineries) and advanced materials for the energy sector.

MAJOR COLLABORATIONS

prof. L. Tassi (DSCG UniMORE), prof. L. Forti (DSV UniMORE), prof. R. Biagi (FIM UniMORE), prof. M. Romagnoli (DIEF UniMORE).

Companies: Litokol S.p.A.; Athena S.p.A.; Italbox Imballaggi S.p.A.

FUNDING AND PROJECTS

2007 - Design, synthesis and reactivity of nitroaliphatic compounds, carbocycles and heterocycles by the use of chiral non racemic organocatalysts and/or biocatalysts (participant)

2008 - Atom Transfer Radical Cyclization (ATRC) for the synthesis of molecules with a maleic framework, having a focused pharmacological activities. (participant)

- 2019** – CARbon based COMposite Materials for Bipolar Plates (CARCOM) (co-applicant)
2021 – Transcription factor TEAD ligands prevent YAP activator binding to halt cancer growth and resistance (Hip Targeting) (participant)
2022 – Ph.D project “Lignin Depolymerization-Upgrading 2 Materials” (supervisor)
2022 – Ph.D project “Green (Algae) Hydrogen Production” (supervisor)
2022 – Ph.D project “Innovative methodologies for the synthesis of biobased monomers and polymers” (supervisor)

TEACHING ACTIVITIES

- Advanced Organic Chemistry pt. 2 (Master of science in Chemistry), UniMORE (from 2021/22 until now)
Applied Organic Chemistry (Bachelor of science in Chemistry), UniMORE (from 2008/09 until now)
Organic Chemistry (Bachelor of science in Natural Sciences), UniMORE (from 2014/15 to 2016/17)
Green Chemistry (Master Reach) (2012/13)
Organic Chemistry (Bachelor of science in Biotechnology), UniMORE (from 2008/09 to 2010/11)

ACADEMIC DUTIES

- Component of the security commission
Component of the Departmental Council (Giunta di Dipartimento)
Representative for UniMORE at Cluster SPRING (Italian cluster for circular bioeconomy)

MEMBERSHIPS AND APPOINTMENTS

- Member of the Division of Organic Chemistry of the Italian Chemical Society (from 2005 to 2010)
Member of the Doctorate ‘M3ES’ of UniMORE (from the academic years 2010/2011 until now)

BIBLIOMETRIC INDICATORS and SCIENTIFIC PRODUCTION

33 publications in scientific journals:

2 Patents

Citations: 353 (Source: Scopus)

H-index: 15 (Source: Scopus)

TECHNOLOGICAL TRANSFER

- 2019** – Research and development of siloxane-based primers for wood (Renner Italia S.p.A.)
2020 – Development of starch-based adhesives for corrugated board (Italbox Imballaggi S.p.A.)
2020 – Hybrid bio-binders for the construction industry (Litokol S.p.A.)
2022 – Carbon materials for hydrogen economy (Athena S.p.A.)

PATENTs

WO2008004115A1 - Process to prepare Gabapentin

IT n. N. 102019000000532 - Indurenti non migratori per materiali proteici

LIST OF SCIENTIFIC PUBLICATIONS ON INTERNATIONAL JOURNALS WITH IF.

1. Bellesia, F.; De Buyck, L.; Ghelfi, F.; Libertini, E.; Pagnoni, U. M.; Roncaglia, F. “2,2-Dichlorination of Aldehydes with the 2,6-Lutidine·HCl/Cl₂/CH₂Cl₂ system: an

- Environmentally Benign Process Suitable for Scale Up”, *Tetrahedron*, **2000**, 56, 7507-7511.
- De Buyck, L.; Danieli, C.; Ghelfi, F.; Pagnoni, U. M.; Parsons, A. F.; Pattarozzi, M.; Roncaglia, F. “A new route to (\pm)-*erythro*-roccellic acid and chaetomellic anhydride C through functional rearrangement, promoted by *n*-propylamine or CH₃ONa/CH₃OH, of *N*-propyl-3-chloro-4-dichloromethyl-3-dodecylpyrrolidin-2-one”, *Tetrahedron*, **2005**, 61, 2871-2877.
 - Bellesia, F.; Danieli, C.; De Buyck, L.; Galeazzi, R.; Ghelfi, F.; Mucci, A.; Orena, M.; Pagnoni, U. M.; Parsons, A. F.; Roncaglia, F. “A short approach to chaetomellic anhydride A from 2,2-dichloropalmitic acid: elucidation of the mechanism governing the functional rearrangement of the chlorinated pyrrolidin-2-one intermediate”, *Tetrahedron*, **2006**, 62, 746-757.
 - De Buyck, L. Forzato, C.; Ghelfi, F.; Mucci, A.; Nitti, P.; Pagnoni, U. M.; Parsons, A. F.; Pitacco, G.; Roncaglia, F. “A new and effective route to (\pm)-botryodiplodin and (\pm)-*epi*-botryodiplodin acetates using a halogen atom transfer Ueno-Stork cyclization”, *Tetrahedron Letters*, **2006**, 47, 7759-7762.
 - Forzato, C.; Furlan, G.; Ghelfi, F.; Nitti, P.; Pitacco, G.; Roncaglia, F.; Valentin, E. “Lipase-catalysed deacetylation of botryodiplodin acetate”, *Tetrahedron: Asymmetry*, **2007**, 18, 447-450.
 - Felluga, F.; Forzato, C.; Ghelfi, F.; Nitti, P.; Pitacco, G.; Pagnoni, U. M.; Roncaglia, F. “Atom transfer radical cyclization (ATRC) applied to a chemoenzymatic synthesis of Quercus lactones”, *Tetrahedron: Asymmetry*, **2007**, 18, 527-536.
 - Felluga, F.; Ghelfi, F.; Pagnoni, U. M.; Parsons, A. F.; Pattarozzi, M.; Roncaglia, F.; Valentin, E. “A novel short approach to (*Z*)-pulchellalactam through Transition-Metal-Catalyzed Atom-Transfer Radical Cyclization of 1-isopropylprop-2-enyl dichloroacetate”, *Synthesis*, **2007**, 1882-1886.
 - Montgomery, I.; Parsons, A. F.; Ghelfi, F.; Roncaglia, F. “Radical initiation using borole derivatives”, *Tetrahedron Letters*, **2008**, 49, 628-630.
 - Van der Steen, M.; Stevens, C. V.; Eeckhout, Y.; De Buyck, L.; Ghelfi, F.; Roncaglia, F. “Undecylenic acid: a valuable renewable Building Block on route to Tyromycin A derivatives”, *European Journal of Lipid Science and Technology*, **2008**, 110, 846-852.
 - Ghelfi, F.; Pattarozzi, M.; **Roncaglia**, F.; Parsons, A. F.; Felluga, F.; Pagnoni, U. M.; Valentin, E.; Mucci, A.; Bellesia, F. “Preparation of the Maleic Anhydride Nucleus from Dichloro γ -Lactams: Focus on the Role of the N-Substituent in the Functional Rearrangement and in the Hydrolytic Steps.”, *Synthesis*, **2008**, 19, 3131-3141.
 - Roncaglia, F.; Stevens, C. V.; Van der Steen, M.; Pattarozzi, M.; De Buyck, L. “A new synthetic route to Tyromycin A and its analogue from renewable resources”, *Tetrahedron*, **2009**, 65, 1481-1487.

12. Pattarozzi, M.; Ghelfi, F.; Roncaglia, F.; Pagnoni, U. M.; Parsons, A. F. "Synthesis of the Disubstituted Maleic Anhydride Frame using a novel Tandem Radical-Polar Reaction", *SynLett*, **2009**, 13, 2172-2176.
13. Ghelfi, F.; Roncaglia, F.; Pattarozzi, M.; Giangiordano, V.; Petrillo, G.; Sancassan, F.; Parsons, A. F. "Atom transfer radical cyclization of O-allyl-2,2-dichlorohemiacetal acetates: an expedient method to dichloro- γ -lactones", *Tetrahedron*, **2009**, 65, 10323-10333.
14. Pattarozzi, M.; Roncaglia, F.; Accorsi, L.; Parsons, A. F.; Ghelfi, F. "Functional rearrangement of 3-Cl or 3,3-diCl-g-lactams bearing a secondary 1-chloroalkyl substituent at C-4", *Tetrahedron*, **2010**, 66, 1357-1364.
15. Pattarozzi, M.; Roncaglia, F.; Giangiordano, V.; Davoli, P.; Prati, F.; Ghelfi, F. "'Ligand-Free-Like' CuCl-Catalyzed Atom Transfer Radical Cyclization of N-Substituted N-Allyl Polychloroamides to γ -Lactams", *Synthesis*, **2010**, 4, 694-700.
16. Ghelfi, F.; Pattarozzi, M.; Roncaglia, F.; Giangiordano, V.; Parsons, A. F. "Expedient Synthesis, on large scale, of chaetomelic anhydrides from N-allyl-2,2-dichlorocarboxyamides", *Synthetic Communications*, **2010**, 40, 1040-1051.
17. Felluga, F.; Ghelfi, F.; Pitacco, G.; Roncaglia, F.; Valentin, E.; Venneri, C. D. "Esterase-mediated synthesis of optically active GABA analogues containing a stereogenic all-carbon quaternary carbon atom", *Tetrahedron Asymmetry*, **2010**, 21, 2183-2191.
18. Roncaglia, F.; Andrew F. Parsons, Franco Bellesia, Franco Ghelfi, "Acetic Anhydride / Et₃N / DMAP: An effective acetylating system for hemiacetals.", *Synthetic Communications* **2011**, 41, 1175-1180.
19. Cornia, A.; Felluga, F.; Frenna, V.; Ghelfi, F.; Parsons, A. F.; Pattarozzi, M.; Roncaglia, F.; Spinelli, D. "CuCl-catalyzed radical cyclisation of N- α -perchloroacyl-ketene-N,S-acetals: a new way to prepare disubstituted maleic anhydrides" *Tetrahedron*, **2012**, 68, 5863-5881.
20. Bellesia, F.; Choi, S-R.; Felluga, F.; Fiscaletti, G.; Ghelfi, F.; Menziani, M. C.; Parsons, A. F.; Poulter, C. D.; Roncaglia, F.; Sabbatini, M.; Spinelli, D. "Novel route to chaetomelic acid A and analogues: Serendipitous discovery of a more competent FTase inhibitor" *Bioorganic & Medicinal Chemistry*, **2013**, 21, 348-358.
21. Bellesia, F.; Clark, A. J.; Felluga, F.; Gennaro, A.; Isse, A. A.; Roncaglia, F.; Ghelfi, F. "Efficient and Green Route to γ -Lactams by Copper-Catalysed Reversed Atom Transfer Radical Cyclisation of α -Polychloro-N-allylamides, using a Low Load of Metal (0.5 mol%)" *Adv. Synth. Catal.* **2013**, 355, 1649 – 1660.
22. Roncaglia, F.; Ghelfi, F.; Felluga, F.; Poppi, V. "Simultaneous deprotection-oxidation of cyclic hemiacetals: a fine ending for a Ueno-Stork ATRC to dichloro- γ -lactones" *Tetrahedron Letters* **2014**, 55, 2865 – 2868.
23. Clark, A. J.; Cornia, A.; Felluga, F.; Gennaro, A.; Ghelfi, F.; Isse, A. A.; Menziani, M. C.; Muniz-Miranda, F.; Roncaglia, F.; Spinelli, D. *Eur. Journal Org. Chem.* **2014**, 6734 - 6745.

24. Isse, A.A.; Visonà, G.; Ghelfi, F.; Roncaglia, F.; Gennaro, A. "Electrochemical Approach to Copper-Catalyzed Reversed Atom Transfer Radical Cyclization" *Adv. Synth. Catal.* **2015**, 357, 782–792.
25. Clark, A. J.; Curran, D. P.; Fox, D. J.; Ghelfi, F.; Guy, C. S.; Hay, B.; James, N.; Phillips, J. M.; Roncaglia, F.; Sellars, P. B.; Wilson, P.; Zhang, H. "Axially Chiral Enamides: Substituent Effects, Rotation Barriers, and Implications for their Cyclization Reactions" *J. Org. Chem.* **2016**, 81, 5547–5565.
26. Roncaglia, F. "Designing and Using a Safer, Greener Azole Oxamide for Chemiluminescence Demonstrations" *J. Chem. Educ.* **2017**, 94, 1288–1290.
27. Aivaras Dirvanauskas, A.; Galavotti, R.; Lunghi, A.; Nicolini, A.; Roncaglia, F.; Totti, F.; Cornia, A. "Solution structure of a pentachromium(II) single molecule magnet from DFT calculations, isotopic labelling and multinuclear NMR spectroscopy" *Dalton Trans.* **2018**, 47, 585-595.
28. Nicolini, A.; Galavotti, R.; Barra, A-L.; Borsari, M.; Caleffi, M.; Luo, G.; Novitchi, G.; Park, K.; Ranieri, A.; Rigamonti, L.; Roncaglia, F.; Train, C.; Cornia, A. "Filling the Gap in Extended Metal Atom Chains: Ferromagnetic Interactions in a Tetrairon(II) String Supported by Oligo- α -pyridylamido Ligands" *Inorg. Chem.* **2018**, 57, 5438-5448.
29. Rigamonti, L.; Vaccari, M.; Roncaglia, F.; Baschieri, C.; Forni, A. "New Silver(I) Coordination Polymer with Fe₄ Single-Molecule Magnets as Long Spacer" *Magnetochemistry* **2018**, 4, 43.
30. Roncaglia, F.; Romagnoli, M.; Incudini, S.; Santini, E.; Imperato, M.; Spinelli, L.; Di Bona A.; Biagi, R.; Mucci A. "Graphite-epoxy composites for fuel-cell bipolar plates: Wet vs dry mixing and role of the design of experiment in the optimization of molding parameters" *Int. J. Hydrogen Energy* **2021**, 46, 4407.
31. Durante, C.; Cocchi, M.; Lancellotti, L.; Maletti, L.; Marchetti, A.; Roncaglia, F.; Sighinolfi, S.; Tassi, L. "Analytical Concentrations of Some Elements in Seeds and Crude Extracts from *Aesculus hippocastanum*, by ICP-OES Technique" *Agronomy* **2021**, 11, 47.
32. Roncaglia, F.; Forti, L.; D'Anna, S.; Maletti, L. "An Expedient Catalytic Process to Obtain Solketal from Biobased Glycerol" *Processes* **2021**, 9, 141.
33. Mazzoni, R.; Roncaglia, F.; Rigamonti L. "When the Metal Makes the Difference: Template Syntheses of Tridentate and Tetradentate Salen-Type Schiff Base Ligands and Related Complexes" *Crystals* **2021**, 11, 483.

BOOK CHAPTERS AND MANUSCRIPTS IN JOURNALS WITHOUT IF.

1. Baraldi, C.; Foca, G.; Maletti, L.; Marchetti, A.; Roncaglia, F.; Sighinolfi, S.; Tassi L. *Red Horse-Chestnut Seeds of *Aesculus × Carnea*: A New Way for Health and Food Design?*. In

- Nuts and Seeds in Health and disease prevention, 2nd edition, 125 London Wall, London EC2Y 5AS, United Kingdom, 2020.* City, date. Editors. ISBN: 978-0-12-818553-7.
2. Roncaglia, F; *Investigation of molding parametres on graphite/epoxy composite-based BIPOLAR PLATES*, EFC19 - European Fuel Cells and Hydrogen Conference n. 19186, **2019**.
 3. Spinelli, L.; Roncaglia, F.; Biagi, R.; di Bona, A.; Romagnoli, M.; Mucci, A. *Graphite/epoxy composite for building Bipolar Plates*, EFC21 - European Fuel Cells and Hydrogen Conference n. 57085, **2021**.
 4. Romano, G.; Paradisi, E.; Rosa, R.; Leonelli, C.; Roncaglia, F. *Synthesis of Glycerol Carbonate from Glycerol and Urea Using a Microwave Reactor*, Ampere Newsletter **2022**, 111, 1.