

PERSONAL INFORMATION

Giulio Bertuzzi



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📅 Date of birth 13/09/1991 | 🇮🇹 Nationality Italian

WORK EXPERIENCE

01/02/2021 – present time

RTD-A

“G. Ciamician” Department of Chemistry, Università di Bologna (Italy)

Supervisor: Prof. Marco Bandini

- The research activity involves: the usage of CO₂ as a C-1 building block in metal-catalyzed stereoselective carboxylation reactions; the development of new Au(I) and Au(III) chiral complexes for homogenous catalysis; carbocatalysis with (functionalized) Graphene-Oxide and new photocatalytic methodologies for the functionalization of olefins.

01/11/2019 – 31/01/2021

Post-Doc

Department of Chemistry, Aarhus University (DK)

Supervisor: Prof. Karl Anker Jørgensen

- The research activity involves the application of novel organocatalytic methodologies for the synthesis of enantioenriched complex molecular architectures through higher-order cycloadditions, with a focus on mechanistic investigations through kinetic experiments and DFT calculations.

01/11/2018 – 01/11/2019

Post-Doc

“Toso Montanari” Department of Industrial Chemistry, Università di Bologna (Italy)

Supervisor: Prof. Mariafrancesca Fochi; Co-supervisor: Prof. Luca Bernardi

- The research activity involved the development of enantioselective organocatalytic processes aimed at the preparation of asymmetric *N*-heterocycles with multiple stereocenters or stereogenic axes.

EDUCATION AND TRAINING

01/11/2015 – 01/11/2018

PhD in Chemistry

“Toso Montanari” Department of Chemistry, Università di Bologna (Italy)

Settore Disciplinare Chimica Organica (Organic Chemistry) CHIM/06, XXXI ciclo

Supervisor: Prof. Mariafrancesca Fochi; Co-supervisor: Prof. Luca Bernardi

Thesis: “Novel Asymmetric Organocatalytic Transformations: Development, Optimization and Applications”. Winner of the “CINMPIS Award for the Best PhD Thesis” 2019, Torino.

The research activity has been carried out at the “Toso Montanari” Department of Chemistry in Bologna and partly at the Organic Chemistry Department of Aarhus University under the supervision of Prof. Karl Anker Jørgensen.

- Main research interests: application of organocatalytic stereoselective methodologies for: dearomatization of pyridines, regioselective functionalization of indole derivatives and development of peri-selective higher-order cycloadditions of indene and pyrrole derivatives.

25/10/2013 – 31/07/2015

Master Degree in Industrial Chemistry

"Toso Montanari" Department of Chemistry, Università di Bologna (Italy)

Grade: 110/110 *cum laude*

Degree Thesis: "Synthesis and functionalization of a lactam-pyrazole molecular scaffold as a promising anticancer compound"

Supervisor: Prof. Mauro Comes Franchini. Co-supervisor: Dott. Erica Locatelli

01/09/2010 – 24/10/2013

Bachelor Degree in Industrial Chemistry

"Toso Montanari" Department of Chemistry, Università di Bologna (Italy)

Grade: 110/110 *cum laude*

Degree Thesis: "1,3-Dipolar Cycloadditions of Nitrile Imines with α,β -Unsaturated δ -Lactams: Synthesis of Bicyclic Pyrazoles"

Supervisor: Prof. Mauro Comes Franchini. Co-supervisor: Dott. Erica Locatelli

Replace with dates (from - to)

High School Diploma, Scientific Curriculum.

Liceo Scientifico Augusto Righi, Bologna (Italy)

Degree: 100/100 *cum laude*

PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
	Replace with name of language certificate. Enter level if known.				
German	A1	A2	A1	A2	A2
	Replace with name of language certificate. Enter level if known.				

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
[Common European Framework of Reference for Languages](#)

Job-related skills

- Knowledge of experimental technologies and computational techniques for the study of the relationship between structure and reactivity in organic compounds.
- Knowledge of the most recent methodologies employed in organic synthesis and total synthesis of natural compounds.
- Knowledge of the most recent applications of metallic catalysis and organocatalysis for the synthesis of enantioenriched organic molecules.
- Excellent skills in bibliographic research to plan and to carry out the synthesis of organic and organometallic molecules.
- Proficient in the laboratory techniques for the preparation and purification of organic compounds, including the safe treatment of highly reactive or harmful substances.
- Expertise in the use of NMR spectroscopy (1D and 2D) for the characterization and the structural assignment of organic molecules showing various degrees of complexity.
- Knowledge and application of other instrumental techniques to support synthetic activities such as: high performance liquid chromatography (HPLC), IR Spectroscopy, optical polarimetry and MS spectrometry.

Digital skills

- Knowledge of the Microsoft Office programs and the following software: MestRe Nova, ChemOffice, Scopus, Reaxys, and SCI-Finder.
- Basical knowledge of *Gaussian '09* molecular modeling software to carry DFT calculations.

ADDITIONAL INFORMATION

Bibliometric Parameters

Co-author of **17 papers published on peer-reviews journals** (**11** as **first** author and **4** as **corresponding** author).

Total number of citations (Scopus, 23/08/2021) = 231 (by 180 documents).
H-INDEX = 9.

- Publications**
- N. I. Jessen, M. Bura, G. Bertuzzi, K. A. Jørgensen* "Aminocatalytic [8+2] Cycloaddition Reactions toward Chiral Cyclazines" *Angew. Chem. Int. Ed.* **2021**, *60*, 18527-18531.
 - N. I. Jessen, G. Bertuzzi, M. Bura, M. L. Skipper, K. A. Jørgensen* "Enantioselective Construction of the Cycl[3.2.2]azine Core via Organocatalytic [12+2] Cycloadditions" *J. Am. Chem. Soc.* **2021**, *143*, 6140-6151.
 - G. Bertuzzi, D. McLeod, L.-M. Mohr, K. A. Jørgensen*, "Organocatalytic Enantioselective 1,3-dipolar [6+4] Cycloadditions of Tropone" *Chem. Eur. J.* **2020**, *26*, 15491-15496.
 - V. Corti*, G. Bertuzzi*, "Organocatalytic Asymmetric Methodologies towards the Synthesis of Atropisomeric N-Heterocycles" *Synthesis* **2020**, *52*, 2450-2468.
 - G. Bertuzzi*, F. Silvestrini, P. Moimare, D. Pecorari, A. Mazzanti, L. Bernardi*, M. Fochi*, "Chemodivergent Preparation of Various Heterocycles via Phase Transfer Catalysis: Enantioselective Synthesis of Functionalized Piperidines" *Adv. Synth. Catal.* **2020**, *362*, 1167-1175.
 - G. D. Bisag, D. Pecorari, A. Mazzanti, L. Bernardi, M. Fochi, G. Bencivenni, G. Bertuzzi*, V. Corti*, "A Central-to-Axial Chirality Conversion Approach Designed on Organocatalytic Enantioselective Povarov Cycloadditions: First Access to Configurationally Stable Indole-Quinoline Based Atropisomers" *Chem. Eur. J.* **2019**, *25*, 15694-15701.
 - G. Bertuzzi, M. K. Thøgersen, M. Giardinetti, A. Vidal Albalat, A. Simon, K. N. Houk*, K. A. Jørgensen*, "Catalytic Enantioselective Hetero-[6+4] and -[6+2] Cycloadditions for the Construction of Condensed Polycyclic Pyrroles, Imidazoles, and Pyrazoles" *J. Am. Chem. Soc.* **2019**, *141*, 3288-3297.
 - G. Bertuzzi*, L. Bernardi*, M. Fochi*, "Nucleophilic Dearomatizations of Activated Pyridines" *Catalysts* **2018**, *8*, 632.
 - B. S. Donslund, N. I. Jessen, G. Bertuzzi, M. Giardinetti, T. A. Palazzo, M. L. Christensen, K. A. Jørgensen*, "Catalytic Enantioselective [10+4]-Cycloadditions" *Angew. Chem. Int. Ed.* **2018**, *57*, 13182-13186.
 - G. Bertuzzi, S. Crotti, P. Calandro, B. F. Bonini, I. Monaco, E. Locatelli, M. Fochi, P. Zani, E. Strocchi, A. Mazzanti, M. Chiariello, M. Comes Franchini*, "Quinone-fused pyrazoles through 1,3-dipolar cycloadditions: synthesis of tricyclic scaffolds and in vitro cytotoxic activity evaluation on glioblastoma cancer cells" *ChemMedChem*, **2018**, *13*, 1744-1750.
 - G. Bertuzzi, D. Pecorari, L. Bernardi*, M. Fochi* "An Organocatalytic enantioselective direct α -heteroarylation of aldehydes with isoquinoline *N*-oxides" *Chem. Commun.* **2018**, *54*, 3977-3980.
 - G. Bertuzzi, L. Lenti, G. D. Bisag, M. Fochi, M. Petrini*, L. Bernardi* " γ -Regioselective Functionalization of 3-Alkenylindoles via 1,6-Addition to Extended Alkylideneindolenine Intermediates", *Adv. Synth. Catal.* **2018**, *360*, 1296-1302.
 - D. Stevanovic, G. Bertuzzi, A. Mazzanti, M. Fochi, L. Bernardi*, "Catalytic Enantioselective Povarov Reactions of Ferrocenecarbaldehyde-derived imines – Broensted Acid catalysis at Parts-Per-Million Level Loading", *Adv. Synth. Catal.* **2018**, *360*, 893-900.
 - G. Bertuzzi, A. Sinisi, D. Pecorari, L. Caruana, A. Mazzanti, L. Bernardi*, M. Fochi*, "Nucleophilic Dearomatization of Pyridines Under Enamine Catalysis: Regio-, Diastereo- and Enantioselective Addition of Aldehydes to Activated *N*-Alkyl Pyridinium Salts", *Org. Lett.* **2017**, *19*, 834-837.
 - G. Bertuzzi, M. Fochi, M. Comes Franchini*, "Regiocontrolled 1,3-Dipolar Cycloadditions of Nitrile Imines with Acetylenes and α,β -Unsaturated Systems: Synthesis of Polysubstituted and Ring-Fused Pyrazoles with Pharmaceutical Activity", *Targets in Heterocyclic Systems* **2016**, *20*, 337-364.
 - G. Bertuzzi, A. Sinisi, L. Caruana*, A. Mazzanti, M. Fochi*, L. Bernardi*, "Catalytic Enantioselective Addition of Indoles to Activated *N*-Benzylpyridinium Salts: Nucleophilic Dearomatization of Pyridines with Unusual C-4 Regioselectivity", *ACS Catal.* **2016**, *6*, 6473-6477.

- G. Bertuzzi, E. Locatelli, P. Calandro, B. F. Bonini, J. Z. Chandanshive, A. Mazzanti, P. Zani, M. Chiariello, M. Comes Franchini*, "Straightforward Synthesis of a Novel Ring-Fused Pyrazole Lactam and In Vitro Cytotoxic Activity on Cancer Cell Lines", *Eur. J. Med. Chem.* **2016**, *117*, 1-7.

Experiences Abroad Aarhus (Denmark), November 2019 – February 2021. Post-Doc in the group of prof. K. A. Jørgensen.
Aarhus (Denmark), November 2017 – July 2018. Visiting Ph-D student in the group of prof. K. A. Jørgensen.
Los Angeles (USA), August 2018. Visitor in the group of K. N. Houk as the result of a collaboration with prof. K. A. Jørgensen.

- Awards**
- Winner of the "Borsa di Studio Marco Polo" a.a. 2016/2017, Bologna.
 - Winner of the "CINMPIS Award for the Best PhD Thesis" 2019, Torino.
 - Winner of various scholarships for the participation in international congresses and conferences such as: XLI International Summer School on Organic Synthesis "A. Corbella" (2016) and XVIII Ischia Advanced School of Organic Chemistry (2019).

Research Interests

- Application of organocatalytic strategies such as: phase transfer catalysis (PTC), hydrogen-bonding catalysis, chiral phosphoric acid (CPA) catalysis and aminocatalysis, for the discovery of novel processes in organic synthesis.
- Catalytic stereoselective methodologies for the preparation of enantioenriched complex organic compounds of broad interest. The main fields or interest are:
 - Organocatalytic higher-order cycloadditions
 - Stereoselective synthesis of axially chiral compounds
 - Regioselective functionalization of conjugated indole derivatives
 - Organocatalytic nucleophilic dearomatization of arenes
 - Preparation of polycyclic pyrazoles with biological activity
- Mechanistic investigations on the origins of the chemo- regio- and stereoselectivities in organocatalytic stereoselective processes *via* DFT calculations and kinetic studies.

Teaching Activities

- March 2021 – July 2021. Professor for the class of **Laboratory of Chemistry and Organic Chemistry** of the Bachelor Degree of Biotechnologies, *University of Bologna*.
- March 2019 – July 2019. Tutor for the class of **Organic Chemistry I** of the Bachelor Degree of Industrial Chemistry at the Department of Industrial Chemistry, "Toso Montanari", *University of Bologna*.
- March 2017 – July 2017. Tutor for the class of **Organic Chemistry I** of the Bachelor Degree of Industrial Chemistry at the Department of Industrial Chemistry, "Toso Montanari", *University of Bologna*.
- March 2017 – July 2017. Tutor for the class of **Organic Chemistry II** of the Bachelor Degree of Industrial Chemistry at the Department of Industrial Chemistry, "Toso Montanari", *University of Bologna*.
- March 2016 – June 2016. Tutor for the class of **Organic Chemistry I** of the Bachelor Degree of Industrial Chemistry at the Department of Industrial Chemistry, "Toso Montanari", *University of Bologna*.

- Co-supervisor of **4 Bachelor Theses** (G. D. Bisag, M. Collina, E. Luciani, P. Viola), **6 Master Theses** (A. Sinisi, S. Crotti, D. Pecorari, L. Lenti, G. D. Bisag, P. Moimare) and **2 International Project Student Theses** (C. Kolbecher, A. U. Botella). Supervisors: prof. M. Fochi, prof. L. Bernardi and prof. M. Comes Franchini. *University of Bologna*.

Oral Communications at
Conventions and Conferences

- G. Bertuzzi, L. Bernardi, M. Fochi, “When Stereoselective Synthesis Meets Aromaticity: Nucleophilic Dearomatizations and Central-to-axial Chirality Conversion Strategies” (Keynote Lecture), **XIX CINMPIS Scientific Days**, Pavia (Italy), 20 – 21 February 2020
- G. Bertuzzi, K. A. Jørgensen, “Organocatalytic Higher Order Cycloadditions: from a Stereoselective Rediscovery to a Computational Fascination” (Flash Communication), **XVIII CINMPIS Scientific Days**, 18 – 19 February 2019, Bologna (Italy).
- G. Bertuzzi, A. Sinisi, L. Caruana, A. Mazzanti, M. Fochi, L. Bernardi, “Activation of *N*-Benzyl Pyridinium Salts by Lewis Bases: Catalytic Enantioselective Nucleophilic Dearomatization of Pyridines with Unusual C-4 Regioselectivity” (Flash Communication, winner of the best flash communication award), **XXXVII Convegno della Divisione della Chimica Organica – CDCO 2016**, 18 – 22 September 2016, Venezia Mestre (Italy).

Poster Communications at
Conventions and Conferences

- G. Bertuzzi, K. A. Jørgensen, “Organocatalytic Enantioselective Higher Order Cycloadditions”, **XXXIX Convegno della Divisione della Chimica Organica – CDCO 2019**, 8 – 12 September 2019, Torino (Italy); and
IV-China-Italy-Symposium-Organic-Chemistry – CISOC 2019, 16 – 17 April 2019, Bologna (Italy).
- G. Bertuzzi, D. Pecorari, M. Fochi, L. Bernardi, “Organocatalytic Enantioselective α -Heteroarylation of Aldehydes with Isoquinoline *N*-Oxides”, **XXII IUPAC International Conference on Organic Synthesis**, 16 – 21 September 2018, Firenze (Italy); and
XVIII Ischia Advanced School of Organic Chemistry IASOC 2019, 22 – 26 September 2018 – Napoli (Italy).
G. Bertuzzi, M. Fochi, L. Bernardi, “Organocatalytic Nucleophilic Dearomatization of Pyridines Under Enamine Catalysis: Highly Regio-, Diastereo- and Enantioselective Addition of Aldehydes to Activated *N*-Alkyl Pyridinium Salts”, **XVIII Tetrahedron Symposium**, 27 – 30 June 2017, Budapest (Hungary); and
XVI Giornata della Chimica dell’Emilia Romagna, 19 December 2016, Ferrara (Italy).
- G. Bertuzzi, A. Sinisi, L. Caruana, A. Mazzanti, M. Fochi, L. Bernardi, “Activation of *N*-Benzyl Pyridinium Salts by Lewis Bases: Catalytic Enantioselective Nucleophilic Dearomatization of Pyridines with Unusual C-4 Regioselectivity” (*winner of the best poster award*), **XLI International Summer School on Organic Synthesis “A. Corbella” ISOS 2016**, 12 – 17 June 2016, Gargnano BS (Italy).