UNIVERSITÀ DEL PIEMONTE ORIENTALE

Curriculum Vitae Daniela Imperio, PhD

ORCID: 0000-0001-6810-1439

Education And Training

November 2007- October 2010: Ph.D. in Pharmaceutical and Food Biotechnology
The University of Eastern Piedmont, "A. Avogadro", Novara (NO), Italy

- Date of achievement: 17/01/2011 “Molecular imaging: search for new probes and diagnostic applications”
- April-September 2009: Training at Department of Chemistry, Durham University, UK

23 March 2007: Master’s degree in Chemical and Pharmaceutical Technologies at
The University of Eastern Piedmont, "A. Avogadro", Faculty of Pharmacy, Novara (NO), Italy

- Title of the experimental thesis: "*A New Application of Click Chemistry: Synthesis and biological evaluation of Azalignans.* Score: 110 /110 with honors

Professional Experience

Research and professional activities

Winner of a position of Tenure Track (RTT) in Organic Chemistry (Prot. 0100912, 24/07/2024) at the University of Eastern Piedmont, "A. Avogadro" Italy, Department of Science and Technological Innovation, Green Chemistry, Vercelli, Italy
From January 2016: Post-doc researcher and Adjunct Professor. The activities were carried out at The University of Eastern Piedmont, "A. Avogadro", Department of Pharmaceutical Sciences, Novara (NO), Italy. The specific research topics and the related research grants are reported below:

1. Development of new catalysts based on natural compounds for asymmetric epoxidation
2. Development of new glycosylation methodologies
3. Development of new systems useful for drug delivery
4. Synthesis of glycolipids for synthetic vaccines
5. Synthesis of probes for Boron Neutron Capture Therapy
6. Development of greener methods for the synthesis of carbohydrates.

01/06/2024-present Research Grant “*Preparation of boronate compounds for neutron capture therapy"*

01/03/2024-31/05/2024 Research Grant "*Synthesis of Boronate Compounds for Neutron Capture Therapy*"
01/06/2022-28/02/2024 Research Grant *"Organic synthesis assisted by carbohydrates" (PRIN 2020)*
01/03/2020-31/05/2022 Research Grant "*Trifluoroborate sugar derivatives as potential theranostic agents for Boron Neutron Capture Therapy*" (CRT)
02/01/2020-29/02/2020 Research Grant: *"Purification and structural characterization of oligosaccharides from natural sources"* (FAR-19)
02/01/2019-01/01/2020 Research Grant: "*Development of new anti-leukaemia therapies based on antibodies and nanoparticles*" (INTERREG 2018)
01/08/2018-31/12/2018 Research Grant: "*Collaboration between Research Institutions, Small Medium Enterprises and Hospital Centres for the development of new anti-leukaemia therapies based on antibodies and nanoparticles*" (INTERREG 2018)
05/03/2018-31/07/2018 Research Grant: *"Synthesis of fluorescent glycolipids for application in glycobiology*
01/03/2017-28/02/2017 Research Grant: "*Synthesis of synthetic glycolipid-based vaccines"*
15/01/2016-14/01/2017 Research Grant: "*New boronated sugars and their incorporation in functional nanocarriers for a breakthrough in neutron capture therapy"* (SAN PAOLO 2014)

November 2010-November 2012: Researcher in Chemical Research and Development; Bracco Imaging Spa, Colleretto Giacosa, (TO) Italy

April-October 2007 Research Grant: "*Synthesis of functionalized polyamine ligands for paramagnetic metals*"

Teaching: Adjunct Professor at The University of Eastern Piedmont, "A. Avogadro"

2022-present: Substances and methods for Organic Chemistry with low environmental impact and laboratory (CHIM/06, 3CFU) Department of Science and Technological Innovation, Green Chemistry, Vercelli, Italy
2021-present: Organic Chemistry (CHIM/06, 6 CFU) Department of Health Sciences: Biotechnology.
2022: Preparatory Laboratory of Chemistry (CHIM/06, 6 CFU) Department of Health Sciences: Biotechnology.
2018-2019-2020: Organic Chemistry (CHIM/06, 6 CFU) Department of Science and Technological Innovation: Biological Sciences

2016-2019: Support activities for the teaching of "Analysis of Medicines I" for the Degree Course in Pharmacy

2019-present: Support activities for the teaching "The pillars of Discovery and Development" (I) (CHIM/06) Emotion master (held in English)

2016-2019: Teaching: Fundamentals of Chemical Laboratory (ADO).
Degree Course in Biomedical Laboratory, Department of Health Sciences, School of Medicine, Novara (NO)

Academic Commitments And Editorial Activity

Member of Società Chimica Italiana (organic chemistry)
Member of ISNCT (for organic chemistry)
Member of Editorial Board for Carbohydrate Research (Elsevier)

Guest editor for the special issue in Pharmaceuticals (MDPI): "Boron in Medicinal Chemistry: From Synthesis to Therapeutic Applications"

Bibliometrics Indicators - total number of publications: 32 - h-index: 11 (Scopus) - number of citations: 376 (Scopus)

Publications

1. **Imperio D**, Valloni F, Caprioglio D, Minassi A, Casali E, Luigi Panza "Stereoselective Shi-type epoxidation with 3-oxo4,6-*O*-benzylidene pyranoside catalysts: unveiling the role of carbohydrate skeletons" *RSC Adv.*, 2024,**14**, 16778;
2. **Imperio D**, Valloni F, Panza L. "Alternative Routes to 4,6-*O*-Benzylidene β-Thioglycosides". *Helv. Chim. Acta*, **2024,** 107**,** e202300193.
3. **Imperio D,** Casali E, Del Grosso E, Caprioglio D, Minassi A, Panza L. "Trifluoromethyl Ketone Galactose Catalyst for Asymmetric Epoxidation: Experimental and Theoretical Model". *EurJOC*, **2024**, 27, e202301163.
   Imperio D, Brentazzoli M, Valloni F, Minassi A, Panza L. "Iodine-triphenylphosphine triggers an easy one-pot alpha stereoselective dehydrative glycosylation on hemiacetalic benzylated glycosyl donors". *Carbohydr. Res.,* **2023**, 533, 108944.
4. Amenta A., Caprioglio Diego, Minassi A., Panza L., Passerella D., Fasano V., **Imperio D**., "Recent advances in the development of CB_1R selective probes", **2023,** 2, 1196321. https://doi.org/10.3389/fntpr.2023.1196321
5. Rogati F., Maioli C., Lauro G., Caprioglio D., **Imperio D**., Del Grosso E., Botta B., Mannina L., Bifulco G., Ingallina C. and Minassi A. "A Classic Photochemical Approach Inducing an Unexpected Rearrangement: Exploring the Photoreactivity of Pentacyclic Triterpenic Acids" Journal of Natural Products **2023**, 86 (4), 1025-1032.
6. Confalonieri L., **Imperio D.**, Erhard A., Fallarini S., Compostella F., Del Grosso E., Balcerzyk M., Panza L. Organotrifluoroborate Sugar Conjugates for a Guided Boron Neutron Capture Therapy: From Synthesis to Positron Emission Tomography. ACS Omega. **2022**, 7(51), 48340-48348.
7. Zhdanovskaya N., Lazzari S., Caprioglio D., Firrincieli M., Maioli C., Pace E., **Imperio D.**, Talora C., Bellavia D., Checquolo S., Mori M., Screpanti I., Minassi A., Palermo R. Identification of a Novel Curcumin Derivative Influencing Notch Pathway and DNA Damage as a Potential Therapeutic Agent in T-ALL. Cancers (Basel). **2022**,14(23), 5772.
8. Rao Z., Caprioglio D., Gllowitzer A., Kretzer C., **Imperio D.**, Collado J.A., Waltl L., Lackner S., Appendino G., Muñoz E., Temml. V, Werz O., Minassi A., Koeberle A. Rotational constriction of curcuminoids impacts 5-lipoxygenase and mPGES-1 inhibition and evokes a lipid mediator class switch in macrophages. *Biochem Pharmacol*. **2022**, 203, 115202.
9. **Imperio D.**, Grolla A.A., Moro M., Bortolotto V., Del Grosso E., Genazzani A.A., Panza L. "Functionalization of β-cyclodextrin with a urea-based PSMA ligand and preliminary studies on targeting prostate cancer cells". *Bioorg Med Chem Lett*. **2022**, 73, 128890.

10. Morelli L., Compostella F., Panza L., **Imperio D.** "Unusual promoters and leaving groups in glycosylation reactions: The evolution of carbohydrate synthesis", *Carbohydr. Res*., **2022**, 519, 108625;
11. Muz B., Azab A. K., Confalonieri L., Del Grosso E., Fallarini S., **Imperio D.**, Panza L., "Synthesis, equilibrium, and biological study of a C-7 glucose boronic acid derivative as a potential candidate for boron neutron capture therapy", *Bioorganic & Medicinal Chemistry*, **2022,** 59, 116659;
12. **Imperio D.**, Panza L. "Sweet Boron: Boron-Containing Sugar Derivatives as Potential Agents for Boron Neutron Capture Therapy" *Symmetry* **2022**, *14*, 182;
13. Morelli L., Legnani L., Ronchi S., Confalonieri L., **Imperio D.**, Toma L., Compostella F. 2,3-Carbamate mannosamine glycosyl donors in glycosylation reactions of diacetone-d-glucose. An experimental and theoretical study. *Carbohydr Res.* **2021,** *509*, 108421;
14. **Imperio D.**, Campo F., Panza L. Exploring glycosyl sulphates as donors for chemical glycosylation. *Org Biomol Chem*. **2021**, *19,* 4930;
15. Sauerwein, W.A.G.; Sancey, L.; Hey-Hawkins, E.; Kellert, M.; Panza, L**.; Imperio, D**.; Balcerzyk, M.; Rizzo, G.; Scalco, E.; Herrmann, K.; Mauri, P.; De Palma, A.; Wittig, A. "Theranostics in Boron Neutron Capture Therapy" *Life,* **2021**, *11*, 330;
16. **Imperio D**., Bordiga M., Passos C.P., Coïsson J.D., Panza L., "Gentianose: Purification and structural determination of an unknown oligosaccharide in grape seeds", *Food Chemistry*, **2021**, *344*, 128588;
17. **Imperio D**., Morelli L., Compostella F., Panza L., "An Efficient and Concise Synthesis of α-Galactosylceramide" *Synlett,* **2021**, *32*, 287;
18. **Imperio D**., Morelli L., Panza L. "A Short Method for the Synthesis of Hydroxyoleic Acids" *JAOCS, Journal of the American Oil Chemists' Society*, **2021**, *98*, 157;
19. Bünning T.H., Panza L., Azab A.K., Fallarini S., **Imperio, D**. "Synthesis and characterisation of a boron-rich symmetric triazine bearing a hypoxia-targeting nitroimidazole moiety", *Symmetry*, **2021**, *13*, 202;
20. **Imperio D.**, B. Muz, A. K. Azab, Fallarini S., Lombardi G., Panza L., "A short and convenient synthesis of *closo*-dodecaborate sugar conjugates" *Eur. J. Org. Chem*. **2019**, *2019*, 7228;
21. **Imperio D.**, Del Grosso E., Fallarini S., Lombardi G., Panza L. "Anomeric sugar boronic acid analogues as potential agents for boron neutron capture therapy" *Beilstein J. Org. Chem***. 2019**, *15*, 1355;
22. Panza L., Compostella F., **Imperio D.** "A versatile synthesis of αGalCer and its analogues exploiting a cyclic carbonate as phytosphingosine 3,4-diol protecting group" *Carbohydr. Res.* **2019**, *472*, 50;
23. **Imperio D.**, Del Grosso E., Fallarini S., Lombardi G., Panza L. "Synthesis of Sugar-Boronic-Acid Derivatives. A Class of Potential Agents for Boron Neutron Capture Therapy" *Org. Lett.* **2017**, *19*, 1678;
24. Giovenzana G. B., **Imperio D.**, Penoni A., Palmisano G. "Reductive amination with zinc powder in aqueous media*" Beilstein J. Org. Chem.* **2011**, *7,* 1095;
25. Giovenzana G. B., **Imperio D.**, Lattuada L., Uggeri F. "Stevens rearrangement as a tool for the structural modification of polyaminopolycarboxylic ligands" *Org. Biomol. Chem*. **2011**, *9,* 679;

26. Gianolio E., Maciocco L, **Imperio D.**, Giovenzana G. B., Simonelli F., Abbas K., Bisi G., Aime S. "Dual MRI-Spect agent for pH-mapping" *Chem Commun. (Camb)* **2011**, *47,* 1539;
27. **Imperio D.**, Giovenzana G.B., Law G., Parker D., Walton J. "Synthesis and comparative anion profiles of two di-aqua Eu(III) complexes", *Dalton trans*. **2010**, *39*, 9897;
28. Giovenzana G.B., Baranyai Z., Aime S., Cavallotti C., **Imperio D.**, Palmisano G. "NorDATA: an original ligand based on the norbornane skeleton. Synthesis and thermodynamic characterization of metal complexes." *Polyhedron*, **2008**, *27*, 3683;
29. Aime S., Bombieri G., Cavallotti C., Giovenzana G.B., **Imperio D.**, N. Marchini "An unusual gadolinium ten coordinated dimeric complex in the series of MRI contrast agents: $Na[Gd(H_2O)AAZTA]\cdot 3H_2O$.", *Inorg. Chim. Acta*, **2008**, *361*, 1534;
30. Gianolio E., Giovenzana G.B., Ciampa A., Lanzardo S., **Imperio D.**, S. Aime "A novel method of cellular labeling: anchoring MR-imaging reporter particles on the outer cell surface." *ChemMedChem* **2008**, *3*, 60;
31. **Imperio D.**, Pirali T., Galli U., Pagliai F., Cafici L., Canonico P., Sorba G., Genazzani A., Tron G.C. "Replacement of the lactone moiety on podophyllotoxin and steganacin analogues with a 1,5-disubstituted 1,2,3-triazole via ruthenium-catalyzed click chemistry" *Bioorganic & Medicinal Chemistry* **2007**, *15*, 6748.

Book chapters

Kumpinš, V., Luginina, J., Turks, M., **Imperio, D**. *Carbohydrate Chemistry: Proven Synthetic Methods*, **2020**, Vol. 5, 147-152 – CRC Press.

Patents

1. "Process for the preparation of Iopamidol" PCT Int. Appl. WO2015067601 A1
2. "Process for the recovery of a boronic acid" US10377700B2
3. "A process for the preparation of ceramides" EP23156957.5

Conferences/ Seminar

- 24-28 June: ICNCT-20, KraKov, Polland, Oral presentation: "Synthesis and preliminary evaluation of boronated glucosamine derivatives as boron carriers for BNCT"
- 27 November 2023: XXXVII ed. New trends in organic synthesis 2023 (Società Chimica Italiana), Milan, Italy. Poster: "Natural products-assisted organic synthesis in asymmetric epoxidation
- 27 October 2023: 2nd DGBNCT Symposium Universitätsklinikum Würzburg, Oral presentation: "Towards theranostic agents for BNCT"
- 27 September -1 October 2021 ICNCT-19, Granada, Spain, Oral presentation: Sugar derivative as theranostic agents for BNCT
- 25-31 September 2019: 25th International Symposium on Glycoconjugates, Milan, Italy. Poster: "Exploring new strategies for drug delivery"
- 28 October -2 November 2018 ICNCT-18, Taipei, Taiwan.

- 2-7 October 2016: ICNCT-17, Columbia, Missouri, USA. Oral presentation: "*Approaches to the Synthesis of Boronic Acid-Derived Sugars".*
- 20-22 February 2012: 12th International Conference on Microreactor Technology - IMRET 12, Lyon, France.
- 5-7 April 2011: "Chemical Development & Scale-up in the fine chemical and pharmaceutical industries", Nice, France (training course).
- 23-27 August 2009: 7th International Conference on f Elements, ICfE 7 Cologne, Germany. Poster session: "Luminescent Ln(III) complexes based on alternative ligands".
- 18 September 2009: "Research and the Chemistry-Biology Interface from the Northeast School", Chemistry Department, Durham University, UK.
- 17-19 November 2008: 5th Annual Meeting, European Network of Doctoral Studies in Pharmaceutical Sciences, Milan, Italy.
- 23-27 June 2008: The XXXIII edition of "Attilio Corbella" Summer School Seminar in Organic Chemistry, Gargnano, Italy.
- 14-18 April 2008: "Imaging probe preparation", European Molecular Imaging Laboratories, Turin, Italy.

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".
Redatto ai sensi degli artt. 46 e 47 del D.P.R. 28.12.2000, n. 445 (dichiarazioni sostitutive di certificazioni e dell'atto di notorietà)

Novara, 31th July, 2024

Firmato digitalmente da Daniela Imperio
Data: 01.08.2024 10:49:12 CEST
Organizzazione: UNIVERSITA' DEGLI STUDI DEL PIEMONTE ORIENTALE/01943490027