

ALLEGATO B

UNIVERSITÀ DEGLI STUDI DI MILANO

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settore scientifico-disciplinare _____ CHIM/03 - CHIMICA GENERALE ED INORGANICA _____,

presso il Dipartimento di _____ CHIMICA _____,

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Caterina Damiano CURRICULUM VITAE

INFORMAZIONI PERSONALI

COGNOME	DAMIANO
NOME	CATERINA
DATA DI NASCITA	04/04/1989
ORCID	0000-0001-5903-238X
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RUOLO ATTUALE

From March 2020 to present	Postdoctoral researcher at University of Milan Research interests: <ul style="list-style-type: none">• CO₂ valorization: In order to contribute to the transition from linear to circular chemical processes, the research activity is mainly focused on the use of CO₂ as a C1 renewable raw material to produce high added-value fine-chemicals, such as cyclic carbonates and oxazolidinones, which address different end-use customers. Besides the production of largely-used cyclic carbonate solvents, the synthesis of oxazolidinones, which are precursors of pharmaceutical species has also been investigated. These transformations are efficiently promoted by low-cost and low-toxic porphyrin-based catalytic systems.• Synthesis of fine chemicals: The research activity is mainly devoted to the eco-compatible synthesis of fine chemicals by new C-C and C-N bond formations. Organic azides (ArN₃) and diazo-compounds (RR'CN₂) are employed as atom efficient reagents to transfer nitrene and carbene functionalities to saturated and unsaturated hydrocarbons, respectively. These synthetic procedures are responsible for the synthesis of aziridines, allylic amines, benzylic amines, imines, phenanthridines, indoles and cyclopropane-containing molecules. This approach ensures an atom-efficient and eco-sustainable strategy in which N₂ is the only by-product and it also allows the transformation of low-cost compounds, such as hydrocarbons, into high-added value derivatives. These synthetic transformations are efficiently catalyzed by low-toxic metal porphyrin complexes, which show "green" transition metals of the first row as active catalytic centers.
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	<ul style="list-style-type: none"> • Heterogenization of homogeneous catalysts: To increase the eco-sustainability and atom-efficiency of the above-mentioned catalytic processes, the research activity is focused on the development of metal porphyrin complexes anchored on polymeric membranes or cellulose-based materials. This approach allows to exploit the advantages of both homogeneous and heterogeneous catalysis. In fact, benefits of a 'single site' catalysis are coupled with an easy recovery and recycling of the catalyst. • Synthesis of chemosensors: In view of the spectroscopic, photophysical and redox features of porphyrins and metal porphyrins, the research activity is devoted on the synthesis of metal porphyrin complexes which can be employed as high selective chemosensors for analyzing the presence of emerging pollutants in water and air as well as of food contaminants. The chemical versatility of metal porphyrins allows several skeleton modifications and the introduction of a large class of transition metals into the porphyrin core. This synthetic approach permits modulation of the porphyrin structure with respect to the target analyte as well as fine-tuning the analyte/chemosensor interaction.
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TITOLI

TITOLI DI STUDIO

<u>March 2016</u>	Master's Degree in Chemical Sciences 110/110 Obtained on 22/03/2016 at University of Naples "Federico II" Supervisor: Prof. A. Lombardi Thesis project: " <i>New ruthenium porphyrin-peptide conjugates: synthesis and characterization</i> " The main competencies are the synthesis, purification and characterization of metal-porphyrin-peptide covalent compounds.
<u>December 2012</u>	Bachelor's Degree in Chemistry 100/110 Obtained on 12/12/2012 at University of Naples "Federico II" Supervisor: Prof. F. Ruffo Thesis project: " <i>Synthesis of chiral tetradentate N, N', O, O' ligands based on glucose</i> " The main competencies are the synthesis and characterization of chiral ligands for asymmetric catalysis.
<u>July 2008</u>	Diploma scientifico 84/100 Liceo scientifico "E. Fermi", Montesarchio (BN)

TITOLO DI DOTTORE DI RICERCA O EQUIVALENTI, OVVERO, PER I SETTORI INTERESSATI, DEL DIPLOMA DI SPECIALIZZAZIONE MEDICA O EQUIVALENTE, CONSEGUITO IN ITALIA O ALL'ESTERO

<u>January 2020</u>	PhD in Chemical Sciences - European Doctorate Obtained on 29/01/2020 at University of Milan Supervisor: Prof. E. Gallo Thesis project: " <i>Hybrid catalysts for carbene and nitrene transfer reactions</i> " The main competencies are the synthesis and catalytic application of hybrid systems derived from the incorporation of metal porphyrin complexes into bio-scaffolds.
	<u>February 2018 - July 2018:</u> <i>Erasmus+traineeship programme</i> at University of Rennes under the supervision of Prof. B. Boitrel .

CONTRATTI DI RICERCA, ASSEGNI DI RICERCA O EQUIVALENTI

<u>From March 2020 to February 2022</u>	Postdoctoral researcher From 01/03/2020 to 28/02/2022 University of Milan Supervisor Prof. E. Gallo
<u>From March 2022 to February 2024</u>	Postdoctoral researcher From 01/03/2022 to 28/02/2024 University of Milan Supervisor Prof. E. Gallo

ATTIVITÀ DIDATTICA A LIVELLO UNIVERSITARIO IN ITALIA O ALL'ESTERO

TUTORING (Frontal Lessons)	
<u>AA 2021/2022</u> <u>AA 2022/2023</u>	Exercise Tutor for “Chimica Generale e Inorganica” (University of Milan, <i>corso di Laurea in Scienze e Tecnologie per lo studio e la conservazione dei beni culturali e dei supporti della informazione</i>) from November 2021 to January 2022 (18 hours of frontal lessons) and from November 2022 to January 2023 (15 hours of frontal lessons) (Prof. Francesco Ferretti)” for a total of 33 hours of frontal lessons in two academic years .
<u>AA 2017/2018</u>	Exercise Tutor for “Chimica Generale e Inorganica/Laboratorio di Chimica Generale e Inorganica” (University of Milan, <i>corso di Laurea in Scienze Chimiche</i>) from November 2017 to January 2018 (15 hours of frontal lessons) (Prof. Fabio Ragaini, Prof. Francesca Tessore)”.
TUTORING (Master and PhD theses)	
<u>AA 2020/2021</u> <u>AA 2021/2022</u>	Co-Tutor of five master theses in Chemical Sciences: 1) “Sintesi e caratterizzazione di chemosensori per 2,4,6-tricloroanisolo (TCA) nei tappi di sughero (2020)” student: M. Maffeis; 2) “Utilizzo della CO ₂ come sorgente di unità C1 per sintesi di composti della chimica fine (2020)” student: F. Belnome; 3) “Studio dell’attività catalitica di porfirine protonate nella sintesi di <i>N</i> -alchil ossazolidinoni a partire da CO ₂ ed <i>N</i> -alchil aziridine (2021) student: F. Ravasio; 4) “Transfer di unità nitreniche da 4-nitrofenil azide ad aniline variamente sostituire catalizzato da complessi porfirinici di cobalto (II) (2021)” student: N. Beretta; 5) “Low-cost solid supported Zn-porphyrin for the efficient photo-oxidation of aldehydes (2021)” student: G. Zoccoler Co-tutor of one PhD thesis: 1) “Free-base porphyrins for CO ₂ Activation” (2022) PhD student: P. Sonzini
<u>AA 2022/2023</u>	Co-Tutor of one PhD and five master theses in Chemical Sciences in progress during the 2022/2023 academic year. Students: A. Rutigliano, G. Aleo, A. Fata, L. Invernizzi, M. Locate, M. Cavalleri (PhD).
ASSISTANCE	
<u>AA 2020/2021</u> <u>AA 2021/2022</u> <u>AA 2022/2023</u>	Laboratory Assistant for “Chimica Inorganica A” (University of Milan, <i>corso di Laurea Magistrale in Scienze Chimiche</i>) from November 2020 to January 2021 (40 hours), from November 2021 to January 2022 (40 hours) and from November 2022 to January 2023 (24 hours) (Prof. Alessandro Caselli)” for a total of 104 hours in three academic years .
<u>AA 2018/2019</u>	Laboratory Assistant for “Chimica organica e Laboratorio di Chimica/Modulo: Laboratorio di Chimica(con prevenzione e sicurezza)” (University of Milan, <i>corso di Laurea in Scienze Biologiche</i>) from March 2019 to May 2019 (20 hours) (Prof. Lucia Carlucci)”.
	Assistant for Bachelor, Master and PhD students.

DOCUMENTATA ATTIVITÀ DI FORMAZIONE O DI RICERCA PRESSO QUALIFICATI ISTITUTI ITALIANI O STRANIERI

<u>2020-present</u>	Training/Research at the University of Milan as a Postdoctoral researcher under the supervision of Prof. E. Gallo
<u>From February 2018 to July 2018</u>	Training/Research at the University of Rennes (France) for the <i>Erasmus+traineeship programme</i> under the supervision of Prof. B. Boitrel
<u>2016-2020</u>	Training/Research at the University of Milan for the PhD in Chemical Sciences under the supervision of Prof. E. Gallo
<u>2015-2016</u>	Training/Research at the University of Naples "Federico II" for the Master thesis in Chemical Sciences under the supervision of Prof. A. Lombardi
<u>2012</u>	Training/Research at the University of Naples "Federico II" for the Bachelor thesis in Chemical Sciences under the supervision of Prof. F. Ruffo

REALIZZAZIONE DI ATTIVITÀ PROGETTUALE

<u>2023</u>	Participant to the research project titled "CO ₂ valorization by a low economic impact biorefinery (CO ₂ VALE) granted by Fondazione Cariplo , call: 'Economia Circolare - 2022' (granted € 299.250,00, Proposal number: 2022-0781)
<u>2022</u>	Participant to the research project titled "Carbon Dioxide VALorization by chemical, Photo- and Electro-chemical processes (CADIVAPE) - PRIN PNRR 2022- project under evaluation

ORGANIZZAZIONE, DIREZIONE E COORDINAMENTO DI GRUPPI DI RICERCA NAZIONALI E INTERNAZIONALI, O PARTECIPAZIONE AGLI STESSI

<u>From 2016 to present</u>	Member of the research group of Prof. E. Gallo, University of Milan. 2016 - 2020: PhD student; 2020 - present: Postdoctoral researcher
<u>2018</u>	Visiting PhD student to the research group of Prof. B. Boitrel, University of Rennes (France).
<u>2015 - 2016</u>	Member of the research group of Prof. A. Lombardi, University of Naples "Federico II" Master student
<u>2012</u>	Member of the research group of Prof. F. Ruffo, University of Naples "Federico II" Bachelor student

ATTIVITÀ DI RELATORE A CONGRESSI E CONVEGNI NAZIONALI E INTERNAZIONALI

CONFERENCE COMMUNICATIONS	
Oral communication	<p>4)"When daily life meets the lab: Colour Catcher® sheets as solid supports for porphyrin-based photocatalysts and optical sensors" Oral communication at "XLVIII Congresso Nazionale di Chimica Inorganica", Pisa, 6th-9th September 2022.</p> <p>3)"Porphyrin-based catalysts: versatile tools for the atom-efficient synthesis of heterocyclic compounds" Oral communication at "44th ICC: International Conference of Coordination Chemistry", Rimini, 28th August -2nd September 2022.</p> <p>2)"Porphyrin@CC: from laundry sheets to low-cost optical sensors and photocatalysts" INVITED Oral communication at "ICPP-12: International Conference on Porphyrins and Phthalocyanines", Madrid, 10th-15th July 2022.</p> <p>1)"Efficient and low-cost metal-free Porphyrin/TBACl system for the CO₂ valorization into N-alkyl and N-aryl oxazolidin-2-ones" Oral communication at "XXVII Congresso Nazionale della Società Chimica italiana", on-line conference,</p>

	14 th -23 rd September 2021)
Poster communication	<p>4) "Iron and ruthenium glyco-conjugated porphyrins: eco-friendly catalytic systems for three membered rings synthesis" Poster presented at "XLVII Congresso Nazionale di Chimica Inorganica", Bari, 9th-12nd September 2019.</p> <p>3) "Metal Porphyrin-Catalysed Cycloaddition of CO₂ to Aziridines" Poster presented at "XLVI Congresso Nazionale di Chimica Inorganica", Bologna, 10th-13rd September 2018.</p> <p>2) "Mass Spectroscopy: an Useful Tool for Mechanistic Studies" Poster presented at "2nd SSM: Seminario di Spettrometria di Massa", Milano, 23rd June 2017.</p> <p>1) "Glycoporphyrin catalysts for carbene and nitrene transfer reactions" Poster presented at "11st International School of Organometallic Chemistry (ISOC2017)", San Benedetto del Tronto, 2nd-6th September 2017)</p>
Organization/ Secretariat of scientific conferences	<p>Member of the organizing committee of "44th ICC: International Conference of Coordination Chemistry", Rimini, 28th August -2nd September 2022.</p> <p>Member of the secretariat of "ISPC 2019: International School of Process Chemistry", Gargnano (BS), 12nd-15th May 2019.</p>

CONSEGUIMENTO DI PREMI E RICONOSCIMENTI NAZIONALI E INTERNAZIONALI PER ATTIVITÀ DI RICERCA

<u>2018</u>	Erasmus+Traineeship programme at Université de Rennes 1 (Francia), 6 months .
<u>2017</u>	Dalton Transactions Prize for best Poster at 11th International School of Organometallic Chemistry (ISOC2017), S. Benedetto del Tronto (AP), September 2017.
<u>2016</u>	Scholarship for PhD at Università degli Studi di Milano, 3 years.

INCARICHI ISTITUZIONALI

<u>From 2020 to present</u>	Chemistry department Representative in the "Council of Research Fellows" of University of Milan (December 2020 - present)
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APPARTENENZA A SOCIETÀ SCIENTIFICHE

	<p>Member of the Italian Chemical Society (SCI)</p> <p>Member of the Society of Porphyrins & Phthalocyanines (SPP)</p>
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TERZA MISSIONE

<u>AA 2017/2018</u>	Laboratory Assistant for "Progetto Nazionale Lauree Scientifiche (PLS)", (University of Milan) September 2018 (15 hours) (Prof. A. Silvani, Prof. P. Mussini).
<u>2017-2018</u>	<p>MeetMeTonight 2018, 28th-29th September 2018, Milano.</p> <p>MeetMeTonight 2017, 29th-30th September 2017, Milano.</p>

CAPACITÀ E COMPETENZE PERSONALI

LANGUAGE				
	Mother tongue(s): Italian			
	Other language(s): English			
	Listening	Reading	Spoken interaction	Spoken production
	B2	B2	B2	B2
Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user (Common European Framework of Reference for Languages)				

LABORATORY SKILLS	
	<p>Familiar with standard Schlenk techniques to work under a protective atmosphere. Abilities in the synthesis of porphyrins, metal complexes, porphyrin-peptide/sugars conjugates and solid phase peptide synthesis (SPPS).</p> <p>Use of the common and most important laboratory instruments:</p> <ul style="list-style-type: none"> • Characterization and purification by chromatographic techniques (HPLC, UHPLC and direct phase chromatography) both on analytic and preparative scale. • Characterization by mass spectrometry analysis (LC-MS, GC-MS, ESI-Q, ESI-IT-TOF), spectroscopic techniques (UV-Vis and Circular Dichroism) and NMR and EPR spectroscopy.
COMPUTER SKILLS	
	Good knowledge of Microsoft Office, Origin, MestreNova, VMD and PyMol
DRIVING LICENSE	
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PRODUZIONE SCIENTIFICA

PUBBLICAZIONI SCIENTIFICHE

Bibliometric data	<p>Scopus (03/02/2023): Publications = 21; h-index = 6; Number of citations: 161. <u>Additional data</u>: Number of publications/years of activity: 4.2; h-index/years of activity: 1.2; Number of citations/years of activity: 32; Average IF (2022): 6.385</p>
Scientific Publications	<p>22) C. Damiano, M. Cavalleri, C. di Natale, R. Paolesse and E. Gallo*, "Porphyrins anchored onto Colour Catcher®: photoactive material for the conversion of amines and aldehydes into imines and carboxylic acids", submitted to <i>Chem. Eur. J.</i> (IF(2022): 5.020)</p> <p>21) C. Damiano,* N. Panza, J. Nagi, E. Gallo and G. Manca*, "From CO₂ to CS₂: a Theoretical Investigation of the Cycloaddition to Aziridines Mediated by Metal-free Porphyrin-based Catalytic Systems, accepted, <i>New J. Chem</i>, 2023, DOI:10.1039/D2NJ05479E (IF(2022): 3.925)</p> <p>20) M. Cavalleri, C. Damiano, G. Manca* and E. Gallo*, "Protonated Porphyrins: Bifunctional Catalysts for the Metal-Free Synthesis of N-Alkyl-Oxazolidinones" <i>Chem. Eur. J.</i>, 2022 e202202729. DOI:10.1002/chem.202202729 (IF(2022): 5.020)</p> <p>19) N. Panza, M. Alberti, S. Galiè, C. Damiano, F. Cargnoni, M. I. Trioni, A. Caselli* "Ammonium Ferrate Catalyzed Cycloaddition of CO₂ to Aziridines for the Synthesis of 1,3-Oxazolidin-2-ones" <i>Eur. J. Org. Chem</i>, 2022, e202200908. DOI:10.1002/efoc.202200908 (IF(2022): 3.261)</p> <p>18) P. Sonzini, N. Berthet, C. Damiano, V. Dufaud, E. Gallo* "A Metal-free Porphyrin Heterogenised onto SBA-15 Silica: a Performant Material for the CO₂ Cycloaddition to Epoxides and Aziridines", <i>Journal of Catalysis</i>, 2022, 414, 143. DOI:10.1016/j.jcat.2022.08.036 (IF(2022): 8.047)</p> <p>17) C. Damiano,* M. Cavalleri, N. Panza and E. Gallo* "Cobalt Porphyrin-Catalysed Synthesis of Azobenzenes by Dehydrogenative Coupling of Anilines", <i>Eur. J. Org. Chem</i>, 2022, e202200791. DOI:10.1002/efoc.202200791 (IF(2022): 3.261)</p> <p>16) N. Panza, M. Alberti, C. Damiano and A. Caselli*, "Ammonium zincates as suitable catalyst for the room temperature cycloaddition of CO₂ to epoxides", <i>Frontiers in Catalysis</i>, 2022 DOI:10.3389/fctls.2022.991270</p> <p>15) C. Damiano, P. Sonzini, M. Cavalleri, G. Manca* and E. Gallo* "The CO₂ cycloaddition to epoxides and aziridines promoted by porphyrin-based catalysts" <i>Inorg. Chim. Acta</i>, 2022, 540, 121065. DOI:10.1016/j.ica.2022.121065 (IF(2022): 3.118)</p>

- 14) F. Caroleo, G. Magna, **C. Damiano**,* M. Cavalleri, E. Gallo, C. Di Natale, R. Paolesse* "Colour Catcher® Sheet Beyond the Laundry: a Low-cost Support for Realizing Porphyrin-based Mercury Ion Sensors" *Sensors and Actuators B*, **2022**, 364, 131900. DOI:10.1016/j.snb.2022.131900 (IF(2022): 9.221)
- 13) **C. Damiano**, E. Gallo* "Challenging Asymmetric Alkene Cyclopropanation by Unsymmetrical Diazomalonates" *Chem Catalysis*, **2022**, 2, 221. DOI: 10.1016/j.checat.2022.01.006
- 12) **C. Damiano**, D. Intrieri, P. Sonzini, S. Rizzato, C. Di Natale, R. Paolesse, E. Gallo* "Nickel (0) Complexes as Promising Chemosensors for Detecting the "Cork taint" of Wine" *Eur. J. Inorg. Chem.* **2022**, e202101013. (Paper and Cover) DOI: 10.1002/ejic.202101013 (IF(2022): 2.551)
- 11) **C. Damiano**, P. Sonzini, A. Caselli, E. Gallo* "Imido Complexes of groups 8-10 Active in Nitrene Transfer Reactions" *Adv. Organom. Chem.* **2021**, 76, 145. DOI:10.1016/bs.adomc.2021.04.002 (IF(2022): 4.833)
- 10) **C. Damiano**, P. Sonzini, G. Manca, E. Gallo* "Valorization of CO₂ into N-alkyl Oxazolidin-2-ones Promoted by Metal-Free Porphyrin/TBACl System: Experimental and Computational Studies" *Eur. J. Org. Chem.* **2021**, 2807. DOI: 10.1002/ejoc.202100365 (IF(2022): 3.261)
- 9) P. Sonzini, **C. Damiano**, D. Intrieri, G. Manca,* E. Gallo* "A Metal-Free Synthesis of N-Aryl Oxazolidin-2-ones by the One-Pot Reaction of Carbon Dioxide with N-Aryl Aziridines" *Adv. Synth. Catal.* **2020**, 362, 2961. DOI: 10.1002/adsc.202000175 (IF(2022): 5.981)
- 8) **C. Damiano**, P. Sonzini, E. Gallo* "Iron Catalysts with N-Ligands for Carbene Transfer of Diazo Reagents" *Chem. Soc. Rev.* **2020**, 49, 4867. DOI: 10.1039/d0cs00221f (IF(2022): 60.615)
- 7) P. Sonzini, **C. Damiano**, D. Intrieri, E. Gallo* "Synthesis of Cyclic Carbonates by Ruthenium(VI) Bis-imido Porphyrin/TBACl-Catalysed Reaction of Epoxide with CO₂" *J. Porphyrins Phthalocyanines* **2020**, 24, 809. DOI: 10.1142/S1088424619501888 (IF(2022): 1.914)
- 6) D. Intrieri, D. M. Carminati, P. Zardi, **C. Damiano**, G. Manca,* E. Gallo,* C. Mealli "Indoles from Alkynes and Aryl Azides. Scope and Theoretical Assessment of Ruthenium Porphyrin-Catalyzed Reactions" *Chem. Eur. J.* **2019**, 25, 16591. (VIP paper and Cover) DOI : 10.1002/chem.201904224 (IF(2022): 5.020)
- 5) **C. Damiano**, S. Gadolini, D. Intrieri, L. Lay*, C. Colombo, E. Gallo* "Iron and Ruthenium Glyco-conjugated Porphyrins: Eco-friendly Catalytic Systems for the Synthesis of Cyclopropanes and Aziridines" *Eur. J. Inorg. Chem.* **2019**, 4412. DOI: 10.1002/ejic.201900829 (IF(2022): 2.551)
- 4) D. Intrieri, **C. Damiano**, P. Sonzini, E. Gallo* "Porphyrin-based homogeneous catalysts for the CO₂ cycloaddition to epoxides and aziridines" *J. Porphyrins Phthalocyanines* **2019**, 23, 305. (Special issue "Women in Porphyrin Science") DOI: 10.1142/S1088424619300015 (IF(2022): 1.914)
- 3) D. Carminati, E. Gallo,* **C. Damiano**, A. Caselli, D. Intrieri "Ruthenium Porphyrin-Catalyzed Synthesis of Oxazolidinones by Cycloaddition of CO₂ to Aziridines" *Eur. J. Inorg. Chem.* **2018**, 5258. DOI: 10.1002/ejic.201801208 (IF(2022): 2.551)
- 2) D. Intrieri, **C. Damiano**, S. Rizzato, R. Paolesse, M. Venanzi, D. Monti,* M. Savioli, E. Gallo* "Sensing of Diclofenac by a Porphyrin-based Artificial Receptor" *New J. Chem.* **2018**, 42, 15778. DOI: 10.1039/c8nj02737d. (IF(2022): 3.925)
- 1) **C. Damiano**, D. Intrieri, E. Gallo* "Aziridination of Alkenes Promoted by Iron or Ruthenium Complexes" *Inorg. Chim. Acta.* **2018**, 470, 51. DOI: 10.1016/j.ica.2017.06.032 (IF(2022): 3.118)

Data

03/02/2023

Luogo

Milano