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Gabriele Di Carlo

CURRICULUM VITAE

INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)

COGNOME	DI CARLO
NOME	GABRIELE
DATA DI NASCITA	29/10/1979

Summary

<i>Current position</i>	<i>Research associate (ricercatore a tempo determinato di tipo A)</i>
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Scopus Author ID:	23488224300
ResearcherID:	B-3811-2015
Publications	35 accepted articles + 1 article under revision + 1 book chapter
IF-average	5.56 (JCR 2019)
H-index (Scopus)	15
Citations (Scopus)	572

Education and Formation

- 07.08.2018** *National Scientific Habilitation for Associate Professorship sector 03/B1 - Principles of chemistry and inorganic systems (ai sensi dell'art. 16 della Legge 240/2010)*
- 10.12.2009** PhD scholarship in Chemical Science (XXII cycle) at University of Milan (Chim/06).
"Synthesis of bioreactive brush block copolymers by reversible addition-fragmentation chain transfer polymerization".
Supervisor: Prof. Stefano Maiorana. Assistant supervisor: Dr. Marcella Chiari. Activity mainly developed at the Institute of Molecular Recognition Chemistry (ICRM-CNR, Via Mario Bianco 9, Milano) under the guidance of Dr. Marcella Chiari.
- 07.03.2006** MSc. in Pharmaceutical Chemistry and Technology at the Faculty of Pharmacy - University of Milan with the vote of 101/110. Thesis defense on 7th March 2006:
"Stereoselective Synthesis of non proteinogenic β -Hydroxy- α -amino acids β -(2-pyrrolidinyl) substituted".
Supervisor: Prof.ssa Concetta La Rosa. Assistant supervisor: Prof. Piero Dalla Croce.

Academic and Nonacademic Research Experiences

- 05.2018 - today** *Research associate (ricercatore a tempo determinato di tipo A) at the Department of Chemistry of Università degli Studi di Milano*
- 08.2016 - 04.2018** Post-doctoral research fellow; Department of Chemistry - University of Milan (Italy). Ministerial PostDoc Fellowship. Project: *" β -Substituted Zn^{II}-Porphyrinates as photosensitizers for DSSC with potential application in the Building Integrated Photovoltaics (BIPV)".*
Supervisor: Prof. Maddalena Pizzotti
- 01.2017 - 06.2017** Visiting researcher at the research group of Prof. T.J. Marks; Department of Chemistry - Northwestern University (Evanston, Illinois - USA). Project: *"Organic synthesis of inverted self-assembled nanodielectrics (I-SANDs) and their application in organic field-effect transistors (OFET)"*
Supervisor: Prof. T.J. Marks. Assistant supervisor: Prof. Antonio Facchetti
- 01.2016 - 07.2016** Scientific collaborator as fixed term contract (co.co.co.) at the Department of Chemistry - University of Milan (Italy). Partnership program between Mapei SpA / Prof.ssa Maddalena Pizzotti (Department of Chemistry - University of Milan) (ns. rif. ID/DB 1206). Project: *"Resine impiegate in celle fotovoltaiche di nuova generazione per superfici vetrate di edifici"*
Supervisor: Prof. Maddalena Pizzotti
- 01.2012 - 12.2015** Post-doctoral research fellow; Department of Chemistry - University of Milan (Italy). Ministerial PostDoc Fellowship. Project: *"Synthesis of push-pull porphyrins with organometallic or coordination donor groups as sensitizers in DSSC solar cells or for applications in optoelectronics".*
Supervisor: Prof. Maddalena Pizzotti
- 07.2010 - 12.2011** Post-doctoral research fellow at the Department of Chemistry - University of Milan (Italy). Fellowship financed by "Silvio Tronchetti Provera Foundation". Project: *"5,10,15,20-tetraphenilporphyrins and related Zn(II) complexes substituted in β -pyrrolic position as novel sensitizers for photoelectrochemical solar cells"*
Supervisor: Prof. Maddalena Pizzotti
- 03.2010 - 06.2010** Post-doctoral research fellow at the Institute of Molecular Recognition Chemistry (ICRM-CNR), Milano (Italy). Fellowship financed by "Spintronic Biosensors for Medicine" (SpinBioMed), CARIPLO foundation 2008 in the research area

“Scientific and Technological research on advanced materials”.
Project: “*Selective Modification of Gold and Silicon Oxide Surfaces*”.

Supervisor: Dr. Marcella Chiari.

04.2008

Consulting service for LAB 901 LIMITED (SCOTLAND) about photo-initiators synthesis for photo-induced polymerization

Research Activities

The main research interests are briefly described as follow and the references refer to the publications listed below.

a) *Nonlinear optics (NLO):*

The study of the second order nonlinear optical response of push-pull systems is of great interest for the development of new materials for optical communication. The main research activity, in close cooperation with Prof. Francesca Tessore (Department of Chemistry - University of Milan), is focused on the design, synthesis and investigation of the optical properties of metal complexes. Macrocyclic ligands with a large π electronic system based on porphyrin nuclei have been synthesized and studied in the recent years. The insertion of electron-donor and/or -acceptor substituents in meso, pyrrolic and axial position of porphyrin rings produces a specific asymmetric push-pull arrangement thus promoting a significant directional charge transfer process and increasing the values of the quadratic hyperpolarizability (β) mainly involved in the second order NLO response. The position and the nature of substituents have been evidenced to greatly impact the optical properties of the synthesized porphyrins. [8] The presence of carboxylic groups in the accepting pendant has been studied to promote aggregation processes in the resulting chromophores which affect their optical response. [13] Nitro-aryl pendants and bulky substituents on the porphyrin structure have been demonstrated to prevent aggregation, however, when the polarity of the investigated structures is low, as in the case of β -substituted ones, their optical responses have been demonstrated to be influenced by a non-negligible contribution of the electronic cubic term (γ). [3] The study of second-order NLO properties of axially coordinated porphyrins have also pointed the key role of the electronic nature of the porphyrin core, involved in the backdonation mechanisms towards the ligands and the periphery of the structure, in determining the optical response of corresponding NLO-phores. [2] The second order NLO responses have been measured by EFISH technique in collaboration with Dr. Stefania Righetto (Department of Chemistry - University of Milan), while the energy levels related to the electronic transitions have been computed by Dr. Alessandra Forni (CNR- SCITEC).

b) *Photoelectrochemical systems for solar cell, water-splitting and CO₂-reduction application*

Today the increasing requirement of electricity is in sharp contrast with the availability of nonrenewable fossil fuel sources. Moreover, the need to reduce of greenhouse gases emission released from their combustion have pushed the scientists to develop greener and more sustainable ways to address all these issues. In this panorama, my research activity contributes with the design and development of efficient systems for a sustainable energy conversion. My research interests the rational design and the subsequent synthesis of porphyrin compounds endowed with specific spectroscopic and electronic features for application on third generation solar cells, water-splitting and CO₂-reduction based photoelectrochemical cells. Although all these applications benefit from the excellent light-harvesting ability and the subsequent electron transfer processes promoted by porphyrin-based chromophores, a fine-tuning of such characteristics is mandatory for the final use. The structural modification of dyes strongly impacts on their photophysical, electrochemical and spectroscopic properties and great efforts have been devoted on investigating the structure activity relationship of porphyrin-based compounds. [7,9] For dye-synthesized solar cells (DSSCs) application the optimization of porphyrin synthetic strategies has allowed us to develop a large series of efficient porphyrin sensitizers. [11,15,18,20,21] The subsequent photophysical investigation at the interface of semiconductor, in collaboration with Prof. Stefano Caramori (University di Ferrara), and the computational study performed by Prof. Filippo De Angelis (University of Perugia) have disclosed the key electron transfer processes involving both meso- and β -substituted porphyrin-based photosensitizers. [12,22-24]

Recent advances in dye-synthesized photoelectrochemical cells (DSPECs) by coupling water oxidation processes (water-splitting) with CO₂-reduction ones enable to produce hydrogen and/or solar-fuels from solar energy. This would simultaneously allow the lowering of CO₂ levels and the production of chemical

compounds with a high energy potential. In this context my research activity has been focused on the design and synthesis of perfluorinated zinc porphyrins with high oxidation potential, as required to the coupling with water oxidation catalysts (WOC). [5,6] The electrochemical redox potentials of the synthesized zinc porphyrins have been assessed in collaboration with Dr. Alessio Orbelli Biroli (University of Pavia) while the fabrication and the subsequent photophysical study of the porphyrin-based DSPEC devices have been performed in collaboration with Prof. Caramori and Prof. Mirko Nataly from University of Ferrara.

c) Microelectronics

Millions of transistors are currently produced per person each day pushing the interest from scientific community on the field of microelectronics. My research interest in this field arose from the experience (2017) as visiting researcher in the prestigious group of Prof. Tobin J. Marks (Northwestern University, IL, USA). The main activities have regarded the synthesis of hybrid organic-inorganic self-assembled nano-dielectrics (SANDs), consisting of phosphonic acid-functionalised Azastilbazolium π -units to assemble Organic Field Effect Transistors (OFET) having a certain dipolar orientation. [1] The subsequent fabrication of conventional Zr-SAND and inverted IZr-SAND and the full characterization of their properties have been also conducted to study the effect of dipole moment inversion on the resulting OFET performances. [10] The research interest also evolved to a different aspect of the microelectronics field thanks to a fruitful collaboration with Prof. Simone Fabiano from Linköping University (Sweden). In particular a series of new air-stable benzimidazole-based dopants has been designed and synthesized with the specific aim to study the impact of their different singly-occupied molecular orbitals (SOMO) energy levels on the n-doping ability of a semiconductor polymer. The outcomes have demonstrated that the charge and energy transport processes are dominated by the (relative) position of the SOMO level and thus related to the enhancement in the electrical conductivity of the polymer. [4] The research has been extended to the design and synthesis of a new series of benzimidazoline-based dopants endowing with high electron density as subject of the master thesis of Dr. Lorenzo Portioli (2019 - Synthesis of Benzimidazole Derivatives as Air-Stable n-Type Dopants for Applications in Microelectronic). Further the efforts on optimizing the benzimidazole nucleus synthesis has provided a ready and sustainable access to such derivative. The extension of the reaction scope on starting materials endowed with different electronic properties along with the NMR study, which has allowed to propose a mechanism related to the ring closure step, are the topic of a manuscript to be submitted as original research article (in preparation).

d) Photochemistry

Emissive compounds with room temperature phosphorescence are object of intense study for organic light emitting diodes (OLEDs) fabrication, photodynamic therapy (PDT), bioimaging, anti-counterfeiting techniques and many other applications. My research interest is recently moved towards the photophysical study of a new class of crystallization induced phosphorescence ionic (CIP) compounds consisting of a set of a benzimidazolium organic cation with different counterions. The photophysical study along with the spectroscopic and computational investigation, in both diluted and condensed state, have disclose the role of the ion-pairing with the counterion on modulating the multi-emissive properties of the cationic luminogen. The comprehensive study has been the subject of the master thesis in Chemistry of Dr. Paola Moretti (2018-2019) and conducted in collaboration with Prof. Elena Cariati (Department of Chemistry - University of Milan), Dr. Alessandra Forni (CNR- SCITEC), Dr. Daniele Marinotto (CNR- SCITEC) and Dr. Chiara Botta (CNR- SCITEC). A manuscript with the fundamental findings is in preparation for publication as original research article.

e) Biosensors (PhD research activities)

The research activity during the PhD experience mainly concerned the synthesis of bioreactive polymeric substrates for application in Protein [29,37] and DNA [35,36] microarrays with the aim of promoting simultaneous detection and quantification of a large number of biomolecular targets. [33,34] Flat surfaces consisted of glass, silicon [28,31] or gold coated by a thick film of a bioreactive polymer afford a suitable environment to immobilize probes in an adequate number and with an appropriate conformation. [30,32] Such a coating provides a 3D binding scaffold which leads to a substantial increase in the density of probes per unit area. Principal activities concern both the synthesis of random co-polymers, attached to the surface by "grafting to" approach, and the synthesis of well-engineered brush block copolymers, obtained by reversible addition-fragmentation chain transfer polymerization, [27] directly initiated on the surfaces via "grafting from" method. A variety of polymers were investigated to improve their binding capacity for

the probes and to study the molecular interactions which occurred between the immobilized probe, on the functionalized solid support, and the biomolecular targets.

Main Collaborations

National collaborations: Dr. A. Forni, CNR-SCITEC (Theoretical study); Prof. C. A. Bignozzi, Ptof. M. Natali and Prof. S. Caramori, University of Ferrara (photophysical and photochemical investigation); Prof. P. Deplano, University of Cagliari (Pt and Pd dithiolene/dithiolate complexes investigation); Prof. P. Ceroni and Prof. G. Bergamini, University of Bologna (Photophysics and nanocrystals); Dr. P. Biagini (Centro Ricerche per le Energie non Convenzionali, Istituto ENI Donegani, Novara (photochemical investigation); Prof. E. Cariati (Photoluminescence properties study)

International collaborations: Prof. T.J. Marks and Prof. A. Facchetti, Northwestern University, Illinois-USA (OFET fabrication and characterization); Prof. S. Fabiano, Linköping University, Svezia (doping of organic semiconductor); Prof. N. Palanisami, VIT-University, India (Ferrocenylpyrazole derivative NLO investigation)

Scientific publications

Co-author of 36 peer-reviewed articles in major international journals with 572 citations (Scopus) yielding an H-index of 15 (Scopus). Co-author of a book chapter.

- | | | |
|---|---|--|
| 1 | Stallings, K.; Smith, J.; Zheng, L.; Wang, B.; Di Carlo, G.; Bedzyk, M.J.; Facchetti, A.; Marks, T.J. "Self-Assembled Nanodielectrics for Solution-Processed Top-Gated Amorphous IGZO Thin Film Transistors" ACS Appl. Mater. Interfaces 2020 , under revision (am-2020-13572r) | original research article
(co-author)
IF: 8.758 (JCR 2019)
Citations (Scopus): 0 |
| 2 | Tessore, F.; Di Carlo, G.; Forni, A.; Righetto, S.; Limosani, F.; Orbelli Biroli, A. "Second Order Nonlinear Optical Properties of 4-Styrylpyridines Axially Coordinated to A4 Zn ^{II} Porphyrins: A Comparative Experimental and Theoretical Investigation" Inorganics 2020 , 8, 45. (DOI:10.3390/inorganics8080045) | original research article (open-access)
(corresponding-author)
IF: 2.08 (2018)
Citations (Scopus): 0 |
| 3 | Di Carlo, G.; Pizzotti, M.; Righetto, S.; Forni, A.; Tessore, F. "Electric-Field-Induced Second Harmonic Generation Nonlinear Optic Response of A4 B-Pyrrolic-Substituted Zn ^{II} Porphyrins: When Cubic Contributions Cannot Be Neglected" Inorg. Chem. 2020 , 59, 7561-7570. (DOI:10.1021/acs.inorgchem.0c00451) | original research article
(first-author)
IF: 4.825 (JCR 2019)
Citations: 0 |
| 4 | Riera-Galindo, S.; Orbelli Biroli, A.; Forni, A.; Puttisong, Y.; Tessore, F.; Pizzotti, M.; Pavlopoulou, E.; Solano, E.; Wang, S.; Wang, G.; Ruoko, T.R.; Chen, W.M.; Kemerink, M.; Berggren, M.; Di Carlo, G. and Fabiano, S. "Impact of Singly Occupied Molecular Orbital Energy on the n-Doping Efficiency of Benzimidazole Derivatives" ACS Appl. Mater. Interfaces 2019 , 11, 37981-37990. (DOI:10.1021/acsami.9b12441) | original research article
(corresponding-author)
IF: 8.758 (JCR 2019)
Citations (Scopus): 2 |
| 5 | Orbelli Biroli, A.; Tessore, F.; Di Carlo, G.; Pizzotti, M.; Benazzi, E.; Gentile, F.; Berardi, S.; Bignozzi, C.A.; Argazzi, R.; Natali, M.; et al. "Fluorinated Zn ^{II} Porphyrins for Dye-Sensitized Aqueous Photoelectrosynthetic Cells" ACS Appl. Mater. Interfaces 2019 , 11, 32895-32908. (DOI:10.1021/acsami.9b08042) | original research article
(co-author)
IF: 8.758 (JCR 2019)
Citations (Scopus): 4 |
| 6 | Berardi, S.; Caramori, S.; Benazzi, E.; Zabini, N.; Nioirettini, A.; Orbelli Biroli, A.; Pizzotti, M.; Tessore, F.; Di Carlo, G. "Electronic Properties of Electron-Deficient Zn(II) Porphyrins for HBr Splitting" Applied Science 2019 , 9, 2739. (DOI: 10.3390/app9132739) | original research article (open-access)
(last-author)
IF: 2.474 (JCR 2018)
Citations (Scopus): 0 |

- 7 **Di Carlo, G.**, Orbelli Biroli, A., Pizzotti, M., Tessore, F. (first author) *"Efficient Sunlight Harvesting by A4 β -Pyrrolic Substituted ZnII Porphyrins: A Mini-Review"* *Frontiers in chemistry* **2019**, 7, 177. (review) (DOI: 10.3389/fchem.2019.00177) **Review (open-access)** (first-author) IF: 3.782 (JCR 2018) Citations (*Scopus*): 7
- 8 Tessore, F.; Orbelli Biroli, A.; **Di Carlo, G.**; Pizzotti, M. (co-author) *"Porphyrins for Second Order Nonlinear Optics (NLO): An Intriguing History"* *Inorganics* **2018**, 6 (3), 81. (DOI: 10.3390/inorganics6030081) **Review (open-access)** (co-author) IF: 2.08 (2018) Citations (*Scopus*): 7
- 9 **Di Carlo, G.**; Biroli, A. O.; Tessore, F.; Caramori, S.; Pizzotti, M. (first author) *" β -Substituted ZnII porphyrins as dyes for DSSC: A possible approach to photovoltaic windows"* *Coordination Chemistry Reviews* **2018**, 358, 153-177. (review) (DOI: 10.1016/j.ccr.2017.12.012) **Review** (first-author) IF: 15.367 (JCR 2019) Citations (*Scopus*): 42
- 10 Wang, B.; **Di Carlo, G.**; Turrise, R.; Zeng, L.; Stallings, K.; Huang, W.; Bedzyk, M. J.; Beverina, L.; Marks, T. J.;* Facchetti, A. *"The Dipole Moment Inversion Effects in Self-Assembled Nanodielectrics for Organic Transistors"* *Chemistry of Materials* **2017**, 29 (23), 9974-9980. (DOI: 10.1021/acs.chemmater.7b03397). **original research article** (co-author) IF: 9.567 (JCR 2019) Citations (*Scopus*): 10
- 11 Colombo, A.; **Di Carlo, G.**; Dragonetti, C.; Magni, M.; Orbelli Biroli, A.; Pizzotti, M.; Roberto, D.; Tessore, F.; Benazzi, E.; Bignozzi, C. A.; Casarin, L.; Caramori, S. *"Coupling of Zinc Porphyrin Dyes and Copper Electrolytes: A Springboard for Novel Sustainable Dye-Sensitized Solar Cells"* *Inorganic Chemistry* **2017**, 56 (22), 14189-14197. (DOI:10.1021/acs.inorgchem.7b02323) **original research article** (co-author) IF: 4.825 (JCR 2019) Citations (*Scopus*): 15
- 12 **Di Carlo, G.**;* Caramori, S.; Casarin, L.; Orbelli Biroli, A.; Tessore, F.; Argazzi, R.; Oriana, A.; Cerullo, G.; Bignozzi, C. A.; Pizzotti, M. *"Charge Transfer Dynamics in β - and Meso-Substituted Dithienylethylene Porphyrins"* *The Journal of Physical Chemistry C* **2017**, 121, 18385-18400 (DOI: 10.1021/acs.jpcc.7b05823). **original research article** (corresponding-author) IF: 4.189 (JCR 2019) Citations (*Scopus*): 10
- 13 Orbelli Biroli, A.; Tessore, F.; Righetto, S.; Forni, A.; Macchioni, A.; Rocchigiani, L.; Pizzotti, M.; **Di Carlo, G.** *"Intriguing Influence of -COOH-Driven Intermolecular Aggregation and Acid-Base Interactions with N,N-Dimethylformamide on the Second-Order Nonlinear-Optical Response of 5,15 Push-Pull Diarylzinc(II) Porphyrinates"* *Inorganic Chemistry* **2017**, 56, 6438-6450. (DOI: 10.1021/acs.inorgchem.7b00510) **original research article** (last-author) IF: 4.825 (JCR 2019) Citations (*Scopus*): 6
- 14 Attar, S.; Espa, D.; Artizzu, F.; Pilia, L.; Serpe, A.; Pizzotti, M.; **Di Carlo, G.**; Marchiò, L.; Deplano, P. *"Optically Multiresponsive Heteroleptic Platinum Dithiolene Complex with Proton-Switchable Properties"* *Inorganic Chemistry* **2017**, 56, 6763-6767. (DOI: 10.1021/acs.inorgchem.7b00238). **original research article** (co-author) IF: 4.825 (JCR 2019) Citations (*Scopus*): 8
- 15 Covezzi, A.; Orbelli Biroli, A.; Tessore, F.; Forni, A.; Marinotto, D.; Biagini, P.; **Di Carlo, G.**;* Pizzotti, M. *"4D- π -1A Type β -Substituted ZnII-Porphyrins: Ideal Green Sensitizers for Building-Integrated Photovoltaics"* *Chemical Communications* **2016**, 52, 12642-12645. (DOI: 10.1039/c6cc05870a). **original research article** (corresponding-author) IF: 5.996 (JCR 2019) Citations (*Scopus*): 14
- 16 Espa, D.; Pilia, L.; Marchiò, L.; Artizzu, F.; **Di Carlo, G.**; Marinotto, D.; Serpe, A.; Tessore, F.; Deplano, P. *"A nonlinear optical active polymer film based on Pd(II) dithione/dithiolate second-order NLO chromophores"* *Dalton Transactions* **2016**, 45, 17431-17438. (DOI: 10.1039/c6dt02911f). **original research article** (co-author) IF: 4.174 (JCR 2019) Citations (*Scopus*): 3
- 17 Senthilkumar, K.; Pizzotti, M.;* Thirumoorthy, K.; **Di Carlo, G.**; Righetto, S.; Orbelli Biroli, A.; Haukka, M.; Nallasamy, P. *"New Internal-Charge-Transfer Second-Order Nonlinear Optical Chromophores Based on the Donor Ferrocenylpyrazole Moiety"* *Journal of Physical Chemistry C* **2016**, 120 (36), 20277-20287. (DOI: 10.1021/acs.jpcc.6b06364). **original research article** (co-author) IF: 4.189 (JCR 2019) Citations (*Scopus*): 6

- 18 Magnano, G.; Marinotto, D.; Cipolla, M. P.; Trifiletti, V.; Listorti, A.; Mussini, P. R.; **Di Carlo, G.**; Tessore, F.; Manca, M.; Orbelli Biroli, A.; Pizzotti, M. *"Influence of alkoxy chains envelope on the interfacial photoinduced processes in tetraarylporphyrin-sensitized solar cells"* *Physical Chemistry Chemical Physics* **2016**, 18, 9577-9585 (DOI: 10.1039/c6cp00129g). **original research article**
(co-author)
IF: 3.430 (JCR 2019)
Citations (*Scopus*): 23

- 19 **Di Carlo, G.*** Orbelli Biroli, A.; Tessore, F.; Rizzato, S.; Forni, A.; Magnano, G.; Pizzotti, M. *"Light-Induced Regiospecific Bromination of meso-Tetra(3,5-di-tert-butylphenyl)Porphyrin on 2,12 B-Pyrrolic Positions"* *Journal of Organic Chemistry* **2015**, 80 (10), 4973-4980. (DOI: 10.1021/acs.joc.5b00367). **original research article**
(corresponding-author)
IF: 4.335 (JCR 2019)
Citations (*Scopus*): 10

- 20 Orbelli Biroli, A.; Tessore, F.; Vece, V.; **Di Carlo, G.**; Mussini, P. R.; Trifiletti, V.; De Marco, L.; Giannuzzi, R.; Manca, M.; Pizzotti, M. *"Highly improved performance of Zn^{II} tetraarylporphyrinates in DSSCs by the presence of octyloxy chains in the aryl rings"* *Journal of Materials Chemistry A* **2015**, 3 (6), 2954-2959. (DOI: 10.1039/c4ta05233a). **original research article**
(co-author)
IF: 11.301 (JCR 2019)
Citations (*Scopus*): 23

- 21 Fermi, A.; Locritani, M.; **Di Carlo, G.**; Pizzotti, M.; Caramori, S.; Yu, Y.; Korgel, B. A.; Bergamini, G.; Ceroni, P. *"Light-harvesting antennae based on photoactive silicon nanocrystals functionalized with porphyrin chromophores"* *Faraday Discussions* **2015**, 185, 481-495. (DOI: 10.1039/c5fd00098j) **original research article**
(co-author)
IF: 3.797 (JCR 2019)
Citations (*Scopus*): 16

- 22 **Di Carlo, G.*** Caramori, S.; Trifiletti, V.; Giannuzzi, R.; De Marco, L.; Pizzotti, M.; Orbelli Biroli, A.; Tessore, F.; Argazzi, R.; Bignozzi, C. A. *"Influence of Porphyrinic Structure on Electron Transfer Processes at the Electrolyte/Dye/TiO₂ Interface in PSSCs: a Comparison between meso Push-Pull and B-Pyrrolic Architectures"* *ACS Applied Materials & Interfaces*, **2014**, 6, 15841-15852. (DOI: 10.1021/am503113x) **original research article**
(corresponding-author)
IF: 8.758 (JCR 2019)
Citations (*Scopus*): 24

- 23 **Di Carlo, G.**; Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.*; Mussini, P.R.; Amat, A.; De Angelis, F.; Abbotto, A.; Trifiletti, V; and Ruffo, R. *"Physicochemical Investigation of the Panchromatic Effect on B-Substituted Zn^{II} Porphyrinates for DSSCs: The Role of the π Bridge between a Dithienylethylene Unit and the Porphyrinic Ring"* *The Journal of Physical Chemistry C*, **2014**, 118, 7307-7320. (DOI: 10.1021/jp412087f). **original research article**
(first-author)
IF: 4.189 (JCR 2019)
Citations (*Scopus*): 21

- 24 **Di Carlo, G.**; Orbelli Biroli, A.; Pizzotti, M.; Tessore, F.; Trifiletti, V; Ruffo, R.; Abbotto, A.; Amat, A.; De Angelis, F. and Mussini, P.R. *"Tetraaryl Zn^{II} Porphyrinates Substituted at B-Pyrrolic Positions as Sensitizers in Dye-Sensitized Solar Cells: A Comparison with meso-Disubstituted Push-Pull Zn^{II} Porphyrinates"* *Chemistry - A European Journal*, **2013**, 19, 10723-10740. (DOI: 10.1002/chem.201300219) **original research article**
(first-author)
IF: 4.857 (JCR 2019)
Citations (*Scopus*): 49

- 25 Longhi, E.; Bossi, A.; **Di Carlo, G.**; Maiorana, M.; De Angelis, F.; Salvatori, P.; Petrozza, A.; Binda, M.; Roiati, V.; Mussini, P.R.; Baldoli, C.; Licandro, E. *"Metal-free Benzodithiophene-containing Organic Dyes for Dye Sensitized Solar Cells"* *European Journal of Organic Chemistry*, **2013**, 84-94. (DOI: 10.1002/ejoc.201200958). **original research article**
(co-author)
IF: 2.889 (JCR 2019)
Citations (*Scopus*): 31

- 26 Mussini, P.R.; Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.; Biaggi, C.; **Di Carlo, G.**; Lobello, M.G.; De Angelis, F. *"Modulating the electronic properties of asymmetric push-pull and symmetric Zn(II)-diarylporphyrinates with para substituted phenylethynyl moieties in 5,15 meso positions: a combined electrochemical and spectroscopic investigation"* *Electrochimica Acta*, **2012**, 85, 509-523. (DOI: 10.1016/j.electacta.2012.08.039). **original research article**
(co-author)
IF: 6.215 (JCR 2019)
Citations (*Scopus*): 17

- 27 **Di Carlo, G.**; Damin, F.; Armelao, L.; Maccato, C.; Unlu, S.; Spuhler, P.S.; Chiari, M. *"Synthesis and conformational characterization of functional diblock copolymer brushes for microarray technology"* Applied Surface Science, **2012**, 258, 3750-3756. (DOI: 10.1016/j.apsusc.2011.12.019).
original research article
(first-author)
IF: 6.182 (JCR 2019)
Citations (*Scopus*): 11
- 28 Marangoni, S.; Rech, I.; Ghioni, M.; Maccagnani, P.; Chiari, M.; Cretich, M.; Damin, F.; **Di Carlo, G.**; Cova, S. *"A 6 × 8 photon-counting array detector system for fast and sensitive analysis of protein microarrays"* Sensors and Actuators, B: Chemical **2010**, B149(2), 420-426. (DOI: 10.1016/j.snb.2010.05.012).
original research article
(co-author)
IF: 7.100 (JCR 2019)
Citations (*Scopus*): 7
- 29 Cretich, M.; **Di Carlo, G.**; Giudici, C.; Pokoj, S.; Lauer, I.; Scheurer, S.; Chiari, M. *"Detection of allergen specific immunoglobulins by microarrays coupled to microfluidics"* Proteomics **2009**, 9(8), 2098-2107. (DOI: 10.1002/pmic.200800651).
original research article
(co-author)
IF: 3.106 (JCR 2019)
Citations (*Scopus*): 36
- 30 Yalcin, A.; Damin, F.; Ozkumur, E.; **Di Carlo, G.**; Goldberg, B.B.; Chiari, M.; Unlu, M.S. *"Direct Observation of Conformation of a Polymeric Coating with Implications in Microarray Applications"* Analytical Chemistry **2009**, 81(2), 625-630. (DOI: 10.1021/ac801954x).
original research article
(co-author)
IF: 6.785 (JCR 2019)
Citations (*Scopus*): 42
- 31 Cretich, M.; **Di Carlo, G.**; Longhi, R.; Gotti, C.; Spinella, N.; Coffa, S.; Galati, C.; Renna, L.; Chiari, M. *"High Sensitivity Protein Assays on Microarray Silicon Slides"* Analytical Chemistry **2009**, 81(13), 5197-5203. (DOI: 10.1021/ac900658c).
original research article
(co-author)
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Citations (*Scopus*): 56
- 32 Bruno, F.; Damin, F.; Causarano, V.; Galbiati, S.; **Di Carlo, G.**; Seia, M.; Porcaro, L.; Ferrari, M.; Chiari, M.; Cremonesi, L. *"High-sensitive microarray substrates specifically designed to improve sensitivity for the identification of fetal paternally inherited sequences in maternal plasma"* Clinical Chemistry and Laboratory Medicine **2009**, 47(7), 818-823. (DOI:10.1515/CCLM.2009.187).
original research article
(co-author)
IF: 3.595 (JCR 2019)
Citations (*Scopus*): 9
- 33 Chiari, M.; Cretich, M.; Damin, F.; **Di Carlo, G.**; Oldani, C. *"Advanced polymers for molecular recognition and sensing at the interface"* Journal of Chromatography, B **2008**, 866(1-2), 89-103. (DOI: 10.1016/j.jchromb.2008.01.006).
review
(co-author)
IF: 3.004 (JCR 2019)
Citations (*WoS*): 15
- 34 Bergese, P.; Cretich, M.; Oldani, C.; Oliviero, G.; **Di Carlo, G.**; Depero, L.E.; Chiari, M. *"Advances in parallel screening of drug candidates"* Current Medicinal Chemistry **2008**, 15(17), 1706-1719. (DOI: 10.2174/092986708784872366).
review
(co-author)
IF: 4.184 (JCR 2019)
Citations (*Scopus*): 15
- 35 Galbiati, S.; Damin, F.; **Di Carlo, G.**; Ferrari, M.; Cremonesi, L.; Chiari, M. *"Development of new substrates for high-sensitive genotyping of minority mutated alleles"* Electrophoresis **2008**, 29(23), 4714-4722. (DOI: 10.1002/elps.200800242)
original research article
(co-author)
IF: 3.081 (JCR 2019)
Citations (*Scopus*): 10
- 36 Cretich, M.; Sedini, V.; Damin, F.; **Di Carlo, G.**; Oldani, C.; Chiari, M. *"Functionalization of poly(dimethylsiloxane) by chemisorption of copolymers: DNA microarrays for pathogen detection"* Sensors and Actuators, B: Chemical **2008**, B132(1), 258-264. (DOI: 10.1016/j.snb.2008.01.033)
original research article
(co-author)
IF: 7.100 (JCR 2019)
Citations (*Scopus*): 25
- 37 Cretich, M.; Longhi, R.; Corti, A.; Damin, F.; **Di Carlo, G.**; Sedini, V.; Chiari, M. *"Epitope mapping of human chromogranin A by peptide microarrays"* Methods in Molecular Biology (Totowa, NJ, United States) **2009**, 570 (Peptide Microarrays), 221-232. (DOI: 10.1007/978-1-60327-394-7_10)
Book chapter
(co-author)
Citations (*WoS*): 11

Conferences Participation and Contributions

- 2019** 14th International Symposium on Macrocyclic and Supramolecular Chemistry, (June 2-6, 2019, Lecce, Italy) - **Poster presentation:** "Ultralong Room-Temperature Phosphorescence from Benzimidazolium Ionic Crystals" Di Carlo, G.; Moretti, P.; Marinotto, D.; Forni, A.; Tessore, F.; Botta, C.; Pizzotti, M. and Cariati E.
- 2018** 46° Congresso Nazionale di Chimica Inorganica (Bologna 10-13 September 2018) - **Oral communication:** "Air-Stable Benzimidazoline n-Type Dopants for Conductive Host Materials with Low Electron Affinities" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Fabiano, S.; Forni, A.; Pizzotti, M.
- 2018** 1st Enerchem School (Firenze 20-24 February 2018) - **Poster presentation:** "Charge Transfer Dynamics in B and meso Patterned Panchromatic Porphyrins" Di Carlo, G.; Caramori, S.; Casarin, L.; Orbelli Biroli, A.; Tessore, F.; Argazzi, R.; Oriana, A.; Cerullo, G.; Bignozzi, C.A.; Pizzottia, M.
- 2016** I Congresso Nazionale Enerchem-1 (Firenze 18-20 February 2016) - **Oral communication:** " *β -substituted porphyrinic dyes with tunable photoelectrochemical properties.*" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Magnano, G.; Pizzotti, M.; Caramori, S.; Bignozzi, C. A.
- 2015** X Convegno Nazionale per la Scienza e Tecnologia dei Materiali - INSTM (Favignana, TP, Italy, 28th June - 1st July 2015) - **Oral communication:** " *β -Pyrrolic Substituted Porphyrins in Dye Sensitized Solar Cells: Synthetic Benefits, Properties and Future Perspectives.*" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Magnano, G.; Pizzotti, M.
- 2014** XI Congresso del Gruppo Interdivisionale di Chimica Organometallica - Co.G.I.C.O. (Milan, Italy, 24-27 June 2014) - **Poster presentation:** "*Synthesis of novel push-pull β -substituted Zn^{II}-porphyrinates by a microwave assisted Sonogashira coupling approach.*" Pizzotti, M.; Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Magnano, G.
- 6th International Conference on Hybrid and Organic Photovoltaics - HOPV14, (Lausanne, Switzerland, 11-14 May 2014) - **Poster presentation:** " *β -Substituted Zn^{II}-tetraarylporphyrinates: dyes with native shielding architecture for Porphyrin-Sensitized Solar Cells.*" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Caramori, S.; Trifiletti, V.; Abboto, A.; Pizzotti M.
- 2013** XLI Congresso Nazionale della Divisione di Chimica Inorganica (Parma, Pr, Italy, 3-6 september 2013) - **Oral communication:** "*Zn^{II}-porphyrinates with a dithienylethylene moiety linked in B-pyrrolic position by different π bridges: a panchromatic-dye approach to PSSCs.*" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.
- Dye sensitised solar cells: from materials to devices. N.I.S.(Nanostructured Interfaces and Surfaces; centre of excellence); (Torino, Italy, 31 January-1 February 2013) - **Poster presentation:** "*Porphyrin-Sensitized Solar Cells: a Comparison with meso Disubstituted Push-Pull and β -Pyrrolic Zn^{II}-Porphyrinates*" Di Carlo, G.; Orbelli Biroli, A.; Pizzotti, M.; Tessore, F.; Trifiletti, V.; Ruffo, R.; Abboto, A.; Amat, A.; De Angelis, F.; Mussini, P.R.
- CNIF 2013: 6° Corso Nazionale di Introduzione alla Fotochimica (Bologna, Italy, 3-6 June 2013) Università di Bologna - Dipartimento di Chimica "G. Ciamician"
- 2012** XL Congresso Nazionale della Divisione di Chimica Inorganica (Sestri Levante, Ge, Italy, 9-13 September 2012) - **Oral communication:** " *β -substituted Zn(II) tetraarylporphyrinates for applications in Dye-Sensitized Solar Cells (DSSCs).*" Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Abboto, A.; Pizzotti, M.
- 2009** MSB 2009: 23rd International Symposium on MicroScale Bioseparation & Methods for System Biology, (Boston, US-MA, 1-5 February 2009) - **Poster presentation:** "*Detection of Antibiotics Residues by Microcantilevers*". Cretich, M.; Bergese, P.; Sadini, V.; Oliviero, G.; Di Carlo, G.; Damin, F.; Depero, L. E.; Chiari, M.
- 2008** MSB 2008: 22nd International Symposium on MicroScale Bioseparation & Methods for System Biology, (Berlin, Germany, 9-13 March 2008) - **Posters presentation:** "*Addition Fragmentation Transfer (RAFT) polymerization for coatings in capillary electrophoresis*". Di Carlo, G.; Chiari, M.; Maiorana, S.; Cretich, M.; Damin, F.; Oldani, C.

"Synthesis and characterization of a novel antifouling copolymer using surface initiated polymerization". Oldani, C.; Chiari, M.; Cretich, M.; Damin, F.; Di Carlo, G.; Ceriotti, L.

"Increase of sensitivity and specificity of allergen related immunoglobulin detection by microarrays in a microflow cell". Cretich, M.; Chiari, M.; Damin, F.; Di Carlo, G.; Oldani, C.; Scheurer, S.

- 2007 XXXII "A. Corbella" Summer School - Seminars in Organic Synthesis, (Gargnano, Bs, Italy, 18-22 June 2007) - **Poster presentation:** *"Sintesi e applicazioni di agenti trasferitori di catena per la modifica di superfici di vetro e ossido di silicio mediante polimeri ottenuti con processi di polimerizzazione RAFT."* Di Carlo, G.; Baldoli, C.; Chiari, M.

Other Contributions (co-author)

- 2019 XLVII Congresso Nazionale della Divisione di Chimica Inorganica della Società Chimica Italiana, (Bari 9-12 september 2019). **Oral communication:** *"Electronic Properties of Electron-Deficient Zn(II) Porphyrins for HBr Splitting"* F. Tessore, G. Di Carlo, M. Pizzotti, A. Orbelli Biroli, S. Caramori, S. Berardi.

- 2019 Hybrid and Organic Photovoltaics 2019 - HOPV 2019 - (Roma 12-15 May 2019). **Oral communication:** *"High-potential porphyrin-based SnO₂ photoanodes for water photooxidation"* F. Tessore, G. Di Carlo, A. Orbelli Biroli, E. Benazzi, S. Caramori.

- 2018 46° Congresso Nazionale di Chimica Inorganica (Bologna 10-13 September 2018) - **Oral communication:** *"Electron-poor ZnII porphyrins for water splitting applications"* Tessore, F.; Di Carlo, G.; Moneta, R.; Orbelli Biroli, A.; Pizzotti, M.; Benazzi, E.; Caramori, S.

- 2017 SmartMatLab Workshop (Milano, Italy, 15 November 2017) - **Oral-communication:** *"Porphyrin-Sensitized Solar Cells: the challenge of photostability."* Tessore, F.; Di Carlo, G.; Orbelli Biroli, A.; Pizzotti, M.

XXVI Congresso Nazionale della Società Chimica Italiana, (Paestum, SA, Italy, 10-14 September 2017) - **Poster presentation:** *"Dependence of the second order NLO response of 5,15 meso push-pull ZnII diarylporphyrins on complex aggregation phenomena."* Tessore, F.; Di Carlo, G.; Orbelli Biroli, A.; Pizzotti, M.; Righetto, S.; Forni, A.; Macchioni, A.; Rocchigiani, L.

XXVI Congresso Nazionale della Società Chimica Italiana, (Paestum, SA, Italy, 10-14 September 2017) - **Oral communication:** *"Porphyrin-Sensitized Solar Cells: the challenge of photostability."* Tessore, F.; Di Carlo, G.; Orbelli Biroli, A.; Pizzotti, M.

- 2015 The Italian Meeting on Porphyrins and Phthalocyanines - 2, (Roma, Italy, 6-8 July 2015) **Poster presentation:** *"Light-induced regiospecific bromination of meso-tetra(3,5-di-tert-butylphenyl)porphyrin on 2,12 β -pyrrolic position."* Di Carlo, G.; Orbelli Biroli, A.; Rizzato, S.; Forni, A.; Magnano, G.; Pizzotti, M.; Tessore, F.

The Italian Meeting on Porphyrins and Phthalocyanines - 2, (Roma, Italy, 6-8 July 2015) **Oral communication:** *"The fascinating world of β -pyrrolic substituted Zn(II)-tetraarylporphyrinates for Dye-Sensitized Solar Cells."* Di Carlo, G.; Orbelli Biroli, A.; Magnano, G.; Pizzotti, M.; Tessore, F.

International Conference on Hybrid and Organic Photovoltaics - HOPV 2015 (Roma, Italy, 10-13 May 2015) **Poster presentation:** *"Alkoxy-substituted Zn^{II} tetraarylporphyrinates with improved power conversion efficiency in DSSCs."* Orbelli Biroli, A.; Magnano, G.; Tessore, F.; Di Carlo, G.; Trifiletti, V.; De Marco, L.; Giannuzzi, R.; Manca, M.; Pizzotti, M.

- 2014 XXV Congresso Nazionale della Società Chimica Italiana-SCI 2014 (Rende, Cs, Italy, 7-12 September 2014) **Oral communication:** *"Tetraarylporfirine per DSC: effetto dei gruppi ingombranti e dello spaziatore."* Magnano, G.; Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.

- 2013 The Italian Meeting on Porphyrins and Phthalocyanines-1-- IMPP-1 (Roma, Italy, 1-3 July 2013) **Oral communication:** *"Push-pull meso and β -substituted Zn^{II}-porphyrinates: from second-order NLO to DSSCs."* Orbelli Biroli, A.; Tessore, F.; Di Carlo, G.; Pizzotti, M.

- 46th Heyrovsky Discussion (Trest, Czech Republic, 23-27 June 2013) **Oral communication:** *"Rationalizing the electronic properties of two classes of push-pull DSSC sensitizers based on Zn(II) di- or tetrarylporphyrinates substituted in meso or beta-pyrrolic positions: an electrochemical investigation."* Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.; Di Carlo, G.; Abbotto, A.; De Angelis, F.; Mussini, P. R.
- 2012** Second International Meeting on Organic Materials for a Better Future - Futurmat2 (Brindisi, Italy, 16-20 September 2012) **Poster presentation:** *"A combined electrochemical, spectroscopic and computational investigation on the electronic properties of Zn(II)-diarylporphyrinates for DSC."* Tessore, F.; Mussini, P. R.; Orbelli Biroli, A.; Pizzotti, M.; Biaggi, C.; Di Carlo, G.; Lobello, M. G.; De Angelis, F.
- Second International Meeting on Organic Materials for a Better Future - Futurmat2 (Brindisi, Italy, 16-20 September 2012) **Oral communication:** *"Zn^{II}-porphyrinates meso and β substituted for DSSCs"* Orbelli Biroli, A.; Tessore, F.; Di Carlo, G.; Pizzotti, M.; De Angelis, F.; Bignozzi, C. A.; Abbotto, A.
- 2010** MSB 2010: 25th International Symposium on MicroScale Bioseparation & Methods for System Biology, (Prague, 21-25 March 2010) **Poster presentation:** *"Novel functional brush coatings: applications to microfluidic devices"*. Di Carlo, G.; Sola, L.; Damin, F.; Cretich, M.; Chiari, M. (3th award as best poster)
- 2009** The 22nd Annual meeting of the IEEE Photonics Society (Belek-Antalya, Turkey, 4-8 october 2009) **Oral communication:** *"Fluorescence enhancement on reflecting substrates for microarray applications"*. Yalcin, A.; Cretich, M.; Di Carlo, G.; Sola, L.; Monroe, M.; Unlu, S.; Chiari, M.
- 2007** μ TAS 2007: 11th International Conference on Miniaturized Systems for Chemistry and Life Sciences (Paris, 7-11 October 2007). **Poster presentation:** *"Surface derivatization of Poly(dimethylsiloxane) by chemisorption of functional copolymers"*. Chiari, M.; Cretich, M.; Damin, F.; Di Carlo, G.; Oldani, C.
- The 20th Annual Meeting of the IEEE Lasers and Electro-Optics Society, 2007 - LEOS 2007. (Lake Buena Vista, FL, USA, 21-25 October 2007) **Oral communication:** *"Characterization of Swelling of A Polymeric Coating for DNA Microarray Applications Using Spectral Self-Interference Fluorescence Microscopy"* Yalcin, A.; Damin, F.; Ozkumur, I. E.; Di Carlo, G.; Goldberg, B. B.; Chiari, M.; Unlu, M. S.
- 2006** AMT 2006: Advances in Microarray Technologies (Amsterdam, Nederland, 31 October - 2 November 2006). **Posters presentation:**
- "Controlled architecture of brush/block polymers in DNA microarray"*. Pirri, G.; Di Carlo, G.; Damin, F.; Cretich, M.; Chiari, M.
- "Silanating ter-polymer coating for microarray: evaluation of ester group density by diffuse reflectance FT-IR spectroscopy (DRIFTS)"*. Pirri, G.; Di Carlo, G.; Damin, F.; Cretich, M.; Chiari, M.

Awards and Acknowledgements

3th award as best poster on MSB 2010: 25th International Symposium on MicroScale Bioseparation & Methods for System Biology, (Prague, 21-25 March 2010)

Recipient of several grants for the participation in Specialist schools and Congresses:

- 1st ENERCHEM school (2018): registration fee partially covered
- ENERCHEM-1 congress (2016): registration fee partially covered
- X Convegno Nazionale per la Scienza e Tecnologia dei Materiali (2015): registration fee entirely covered
- XL Congresso Nazionale della Divisione di Chimica Inorganica (2012): registration fee entirely covered

Research Projects

Funded Individual Financing for Basic Research Activities - Piano Sostegno Ricerca **2018-2019** (Linea 2 Azione A). Project: "Tuning the second order NLO response of axially coordinated push-pull porphyrins" (12 months, PI, **non-competitive call**)

INSTM 2012: "BANDO PER LA PRESENTAZIONE DI PROPOSTE PER LA SPERIMENTAZIONE DI INIZIATIVE DI SVILUPPO, VALORIZZAZIONE DEL CAPITALE UMANO E TRASFERIMENTO DEI RISULTATI DELLA RICERCA CON RICADUTA DIRETTA SUL TERRITORIO LOMBARDO" - ACCORDO DI COLLABORAZIONE TRA REGIONE LOMBARDIA E CONSORZIO INSTM. (**2012-2014**). Project: "Nanocristalli di silicio funzionalizzati con molecole organiche: nuovi materiali ibridi per la conversione dell'energia solare - **SUNNhy**"

Research Units:

- **UNIMI** - Università degli Studi di Milano (**Gabriele Di Carlo: partner**)
- UNIFE - Università degli Studi di Ferrara
- UNIBO - Alma Mater Studiorum - Università di Bologna

"Spintronic Biosensors for Medicine" (**SpinBioMed**), CARIPLO foundation **2008** in the research area "Scientific and Technological research on advanced materials" with the project entitled: "Selective Modification of Gold and Silicon Oxide Surfaces".

Research Units:

- LNESS - Politecnico di Milano
- **ICRM-CNR** - Institute of Chemistry and Molecular Recognition (**Gabriele Di Carlo: partner**)
- IFOM - Fondazione Istituto FIRC di Oncologia Molecolare

"Protein microarray for enhanced diagnostics at low cost by integration of new technological developments" (**NANOSPAD**), European Project (**2005-2008**).

Research Units:

- **ICRM-CNR** - Institute of Chemistry and Molecular Recognition (**Gabriele Di Carlo: partner**)
- Politecnico di Milano
- CNRS - Centre national de la recherche scientifique (France)
- Paul Ehrlich Institute (Germany)
- Tyndall Institute (Ireland)

Not Funded (Positively Evaluated) BANDO STRAORDINARIO PER PROGETTI INTERDIPARTIMENTALI (Bando SEED 2019) Project: "Theranostic approach of Porphyrin-doped PGS-nanoparticles for curcumin delivery in cancer Treatment - ToPoST" [Macro-settore ERC (PE)]
- Department of Chemistry (**Gabriele Di Carlo: Principal Investigator**)
- Department of Environmental Science and Policy (ESP)
Final score: 92/100

Bando FIRB - Programma Futuro in Ricerca **2012**

"**SUNNhy** - Nanocristalli di silicio funzionalizzati con molecole organiche: nuovi materiali ibridi per la conversione dell'energia solare (Rif. RBF12JMTY)"

Research Units:

- UNIME - Università degli studi di Messina (Fausto Puntoriero: Principal investigator)
- **UNIMI** - Università degli Studi di Milano (**Gabriele Di Carlo: Responsible scientist**)
- UNIFE - Università degli Studi di Ferrara
- UNIBO - Alma Mater Studiorum - Università di Bologna

Final Score: First referee: 100/100; Second referee: 93/100

Not Funded VELUX STIFTUNG - Daylight research: effects and utilization of daylight in the fields of Daylight & Human, Daylight & Nature, Daylight Technology - **2019**
Project: "Daylight storage of solar energy by photoelectrosynthetic cells (DayCells)" [Macro-settore ERC (PE)]
- UNIBO - Alma Mater Studiorum - Università di Bologna (Paola Ceroni: Principal investigator)
- **UNIMI** - Università degli Studi di Milano (**Gabriele Di Carlo: Partner**)
- UNIFE - Università degli Studi di Ferrara

CALL FOR PROPOSALS FOR JOINT RESEARCH PROJECTS AS PART OF THE SCIENCE AND TECHNOLOGY COOPERATION BETWEEN ITALY AND THE KINGDOM OF SWEDEN FOR THE YEARS 2018 - 2020. MAECI: Projects of major importance in the Scientific and Technological Collaboration Executive Programs - bilateral scientific and technological projects, in conjunction with the Ministry for the Universities and Research.

“Air stable n-DOPants for Organic semiconductors - A-DOP-O”

Research Units:

- IRU - Italian Research Unit (**Gabriele Di Carlo: partner**)
- SRU - Swedish Research Unit

Fondazione Cariplo: bando Ricerca Scientifica e Tecnologica - Materiali Avanzati 2013
“From crystalline silicon to silicon quantum dots functionalized with porphyrins: new hybrid photoactive materials for third generation solar cells (Rif. 2013-0715)”

Research Units:

- **UNIMI** - Università degli Studi di Milano (**Gabriele Di Carlo: Principal Investigator**)
- UNIFE - Università degli Studi di Ferrara
- UNIBO - Alma Mater Studiorum - Università di Bologna

Editing and Reviewing

- Guest Editor of the Special Issue entitled "Porphyrins in Solar-Powered Applications" in the SCIE-indexed, peer-reviewed, open access journal Applied Sciences (ISSN 2076-3417; IF2019 = 2.474) - (deadline on Dec 31, 2020)

- Guest Editor of the Special issue entitled “Organometallic and Coordination Compounds for Optical and Energy-Related Applications” in the ESCI and Scopus indexed, peer-reviewed, open access journal Inorganics (ISSN 2304-6740, IF2018 = 2.08).

Invited reviewer of original research articles for International journals as Letters in Organic Chemistry, ACS Applied Materials and Interfaces, Chemistry of Materials, Physical Chemistry Chemical Physics.

Teaching

2019-2020 Responsible for the theoretical and practical course of General Chemistry of the Bachelor's degree in Chemical safety and Toxicological Environmental Sciences (class L-29) - Faculty of Pharmacy - University of Milan (lecture - 40 hours; exercise - 16 hours)

Teaching assistant for the practical course of General Chemistry of the Bachelor's degree in Chemistry (class L-27) (laboratory assistant - 20 hours)

2018-2019 Responsible for the theoretical course of General Chemistry of the Bachelor's degree in Chemical safety and Toxicological Environmental Sciences (class L-29) - Faculty of Pharmacy - University of Milan (lecture - 40 hours)

Practical course of Analytical Chemistry of the Bachelor's degree in Chemical safety and Toxicological Environmental Sciences (class L-29) - Faculty of Pharmacy - University of Milan (exercise - 16 hours)

Teaching assistant for the practical course of General Chemistry of the Bachelor's degree in Chemistry (class L-27) (laboratory assistant - 24 hours)

2015-2016 Tutoring lessons for the first year students in General and Inorganic Chemistry:

- Faculty of Agricultural and Food Sciences - University of Milan (exercise - 12 hours)
- Industrial Chemistry - University of Milan (exercise - 14 hours)

2014-2015 Tutoring lessons for the first year students in General and Inorganic Chemistry:

- Faculty of Agricultural and Food Sciences - University of Milan (exercise - 25 hours)

Supervision

- 2019-2020** Supervisor of 2 BSc. students (Camilla PONTILLO, Francesco ARAGONA) in Chemistry - University of Milan
- Supervisor of a BSc. student (Andrea BRUNO) in Chemical safety and Toxicological Environmental Sciences - University of Milan
- Co-supervisor of 2 MSc. students (Cristiana AMATO, Luca DELL'ACQUA) in Chemical Sciences - University of Milan
- Co-supervisor of 2 BSc. students (Maura ALIOTTA, Simone GUSMINI) in Chemistry - University of Milan
- 2018-2019** Supervisor of a MSc. student (Lorenzo PORTIOLI) in Chemical Sciences - University of Milan
- Co-supervisor of 2 BSc. students (Alessandro PETRILLO, Noemi BERETTA) thesis in Chemistry - University of Milan
- 2017-2018** Co-supervisor of 2 MSc. students (Paola MORETTI, Giacomo ANTIFORA) in Industrial Chemistry - University of Milan
- Co-supervisor of a BSc. student (Nicholas BARTALINI) thesis in Chemistry - University of Milan
- 2015-2016** Co-supervisor of a MSc. student in Industrial Chemistry (Alessandra COVEZZI) - University of Milan
- 2014-2015** Co-supervisor of a BSc. student in Chemistry - University of Milan

INSTITUTIONAL RESPONSIBILITIES

- Member of the Board of the Doctoral School in Industrial Chemistry (2018/2019) at the University of Milan
- Member of the Teaching Board (Collegio Didattico) of the Department of Chemistry (University of Milan, 2018-2019; 2019-2020)
- Member of the commission for the refresher course of high school professors of the Department of Chemistry of UNIMI in the framework of the "Piano Lauree Scientifiche" project (Linea C) (2018-2019; 2019-2020)
- Member of examination committees for BSc and MSc thesis in Chemistry, Chemical Science and Industrial Chemistry (2018-2019; 2019-2020).

Data

10/09/20

Luogo

Milano