

## CURRICULUM VITAE ET STUDIORUM

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Among the subfields of nanotechnology, I have always been fascinated by the interface with nanomedicine, where I could explore chemistry in biological applications. In this scenario, during my master's degree, I developed new drugs and their encapsulation in copolymers for use in PDT against microorganisms. This inspired me to further explore the use of nanomaterials to improve biomedical applications, and so I embarked on a PhD project to develop new nanoparticles for use against cancer cells. During my PhD, I conducted research for 18 months at the University of Piemonte Orientale under the supervision of Prof. Dr. Leonardo Marchese and Prof. Dr. Enrica Gianotti. During this time, I developed nanoparticles of mesoporous silica for application in bioimaging and PDT, resulting in 7 articles. In addition, I was able to improve my knowledge in cell culture and molecular biology. The opportunity to learn my way around different fields such as chemistry and biology helped me to develop a critical sense and teamwork through collaborations. These experiences led me to be awarded several innovative postdoctoral fellowships in the field, which brought in an amount of more than €50,000. During my postdoc in Brazil, I developed a nanocluster of ZnO-PEI coated with a real pancreatic cell membrane, which led to interesting results on the buffering effect in hypoxic tumor medium. Also, gold nanoparticles coated with mesoporous silica were developed for smart drug application targeting the efflux of lactic acid from cancer cells in conjunction with the photothermal effect. During this time, I had a great experience at UNISTRA together with Prof. Luisa de Cola's group, working with nanocages and large pore silica for tumor hypoxia application in glioblastoma and developed a new porous B-Si nanoparticle. In addition, I have advised some students on the development of QD, lignin-curcumin nanoparticles for applications in PDT, encapsulation of Ir complexes in MCM-41, and the study of protein corona in silica nanoparticles. I am currently working at IIT with Prof. Paolo Decuzzi on the development of porous PLGA microparticles for applications in NDD and cancer under an MSCA grant.

- **Scientific Career**

- **2006-2009:** Bachelor of Chemistry and Technological Chemistry, State University of Londrina (Brazil) - Scientific initiation scholarship from CNPq

- **2010-2012:** Master of Chemistry, State University of Maringá (Brazil) - CAPES master's scholarship

- **2012-2016:** Doctor in Science, State University of Maringá (Brazil) - CAPES doctoral scholarship

2013-2015: Doctoral Internship Abroad, University of Eastern Piedmont (Italy) - International doctoral scholarship from CAPES-PDSE

- **2016-2022:** Postdoctoral, University of São Paulo, Brazil - CNPq and FAPESP postdoctoral scholarships

2018-2019: Chemistry specialization (teaching)

2019-2020: Postdoctoral Internship Abroad, University of Strasbourg – BEPE (FAPESP)

- **2022 – currently:** Marie Skłodowska Curie MINDED Researcher at Nanotechnology for Precision Medicine – Istituto Italiano di Tecnologia.

- **Scientific Journal Referee**

2016 – Present Journal: Journal of Photochemistry and Photobiology. A, Chemistry

2016 – Present Journal: Bulletin of the Chemical Society of Ethiopia

2016 – Present Journal: Photodiagnosis and Photodynamic Therapy (Print)

2016 – Present Journal: Frontiers in Bioengineering and Biotechnology

2016 – Present Journal: Photochemistry and Photobiology

2016 – Present Journal: The Journal of Physical Chemistry C

2016 – Present Journal: Dyes and Pigments

2016 – Present Journal: Scientific Reports

2016 – Present Journal: PCCP

2016 – Present Journal: RSC Advances

2016 – Present Journal: Microporous and Mesoporous Materials

2016 – Present Journal: Nanomaterials

- **Languages**

**Spanish** Comprehends Well, Speaks Reasonably, Reads Well, Writes Reasonably.

**English** Comprehends Well, Speaks Well, Reads Well, Writes Well.  
**Portuguese** Comprehends Well, Speaks Well, Reads Well, Writes Well.  
**Italian** Comprehends Well, Speaks Well, Reads Well, Writes Well.  
**French** Comprehends Reasonably, Speaks Reasonably, Reads Reasonably, Writes Reasonably.

- **Awards and Grants**

2017 For one of the best Poster presentations at 1st PanPoly Conference, American Chemical Society;

2016 Awarded a young post-doctorate project fellowship from National Council for Scientific and Technological (CNPq) through a national selection process (Brazil - Process number 435325/2016-7 - Development of theranostic nanoparticles for pancreatic cancer treatment by exosomes) – R\$ 61.500,00 (17.083,33 euro);

2018 Awarded a post-doctorate project fellowship from The São Paulo Research Foundation (FAPESP) through a state selection process (São Paulo, Brazil – Process number 2017/22056-7 - Nanosystems containing proton "sponge"/gold nanoparticles for tumor hypoxia conditions) - R\$ 402.960,00 (100.740,00 euro);

2019 Awarded a Research Internship Abroad (BEPE - FAPESP) conducted at the University of Strasbourg, France (Supramolecular Science and Engineering Institute - ISIS) with a project entitled RGDfK-functionalized ultrasmall silica nanoparticles as treatment of glioblastoma under normoxic and hypoxic conditions (Project number 2019/20268-4) - 41.500,00 euro.

2022 Awarded a Marie Skłodowska Curie Action MINDED Cofound fellowship at Istituto Italiano di Tecnologia working in Prof Paolo Decuzzi's group (Nanotechnology for Precision Medicine) with a project entitled Smart nanoTherapy with Optimized Peptide to improve ADHD-like deficits (STOP-ADHD).

- **Publications List**

1. Barreto, Wagner José; Ando, Rômulo Ando; Zanoni, Kassio Papi da Silva; Estevão, Bianca Martins. Adsorption of caffeic acid on titanium dioxide: A spectroscopic study. *Spectrochimica Acta. Part A, Molecular and Biomolecular Spectroscopy (Print)*, 92, 16-20, 2012.

2. Pellosi, Diogo Silva; Estevão, Bianca Martins; Semensato, Juliana; Severino, Divinomar; Baptista, Mauricio Souza; Politi, Mario José; Hioka, Noboru; Caetano, Wilker. Photophysical properties and interactions of xanthene dyes in aqueous micelles. *Journal of Photochemistry and Photobiology, A, Chemistry*, 247, 8-15, 2012.

3. Gerola, Adriana Passarella; Estevão, Bianca Martins; Caetano, Wilker; Hioka, Noboru; Tessaro, André Luiz. Chemometric studies of pheo formulated in pluronics®: photodynamic action against *Artemia salina*. *Química Nova*, 36(1):97-101, 2012.
4. Pellosi, Diogo Silva; Estevão, Bianca Martins; Freitas, Camila Fabiano; Tsubone, Tayana Mazin; Caetano, Wilker; Hioka, Noboru. Photophysical properties of erythrosin ester derivatives in ionic and non-ionic micelles. *Dyes and Pigments*, 99, 705-712, 2013.
5. Gianotti, Enrica; Estevão, Bianca Martins; Cucinotta, Fabio; Hioka, Noboru; Rizzi, Manuela; Renò, Filippo; Marchese, Leonardo. An Efficient Rose Bengal Based Nanoplatfom for Photodynamic Therapy. *Chemistry - A European Journal*, 20, 10921-10925, 2014.
6. Pereira, Paulo Cesar De Souza; Freitas, Camila Fabiano; Chaves, Cristiane Santi; Estevão, Bianca Martins; Pellosi, Diogo Silva; Tessaro, André Luiz; Batistela, Vagner Roberto; Scarminio, Ieda Spacino; Caetano, Wilker; Hioka, Noboru. Chemometry in undergraduate chemistry courses: a proposal for the use of multivariate analysis in the determination of pKa. *Química Nova (Impresso)*, 37 (8), 1417-1425, 2014.
7. Estevão, Bianca Martins; Pellosi, Diogo Silva ; Freitas, Camila Fabiano De ; Vanzin, Douglas ; Franciscato, Douglas Santana; Caetano, Wilker; Hioka, Noboru. Interaction of Eosin and its Ester Derivatives with Aqueous Biomimetic Micelles. Evaluation of Photodynamic Potentialities. *Journal of Photochemistry and Photobiology. A, Chemistry*, 287, 30-39, 2014.
8. Martins Estevão, Bianca; Cucinotta, Fabio; Hioka, Noboru; Cossi, Maurizio; Argeri, Mario; Paul, Geo; Marchese, Leonardo; Gianotti, Enrica. Rose Bengal incorporated in mesostructured silica nanoparticles: structural characterization, theoretical modeling and singlet oxygen delivery. *PCCP. Physical Chemistry Chemical Physics (Print)*, 17, 26804-26812, 2015.
9. De Freitas, Camila Fabiano; Pellosi, Diogo Silva; Estevão, Bianca Martins; Calori, Italo Rodrigo; Tsubone, Tayana Mazin; Politi, Mário José; Caetano, Wilker; Hioka, Noboru. Nanostructured Polymeric Micelles Carrying Xanthene Dyes for Photodynamic Evaluation. *Photochemistry and Photobiology*, 92(6), 790-799, 2016.
10. Martins Estevão, Bianca; Miletto, Ivana; Marchese, Leonardo; Gianotti, Enrica. Optimized Rhodamine B labeled mesoporous silica nanoparticles as fluorescent scaffold for the immobilization of Photosensitizer: a theranostic platform for optical imaging and photodynamic therapy. *PCCP. Physical Chemistry Chemical Physics (Print)*, 18, 9042-9052, 2016.
11. Gianotti, Enrica; Estevão, Bianca Martins; Miletto, Ivana; Tonello, Stelvio; Renò, Filippo; Marchese, Leonardo. Verteporfin based silica nanoplatfom for photodynamic therapy. *ChemistrySelect*, 2, 127-131, 2016.
12. Locardi, F. ; Gianotti, E. ; Nelli, I. ; Caratto, V. ; Martinelli, A. ; Ferretti, M. ; Costa, G.A. ; Canesi, L. ; Balbi, T. ; Fasoli, M. ; Martini, M. ; Estevão, B. Martins ; Miletto, I. . Facile synthesis of NIR and Visible luminescent Sm<sup>3+</sup> doped lutetium oxide nanoparticles. *Materials Research Bulletin*, 86 , 220, 2017.

- 13.** Miletto, Ivana; Gianotti, Enrica; Estevão, Bianca Martins; Marchese, Leonardo. Mesoporous Silica Nanoparticles-Based Nanoplatfoms for Photodynamic Therapy. *Advanced Science Letters*, 23, 5837-5840, 2017.
- 14.** De Souza Pereira, Paulo Cesar; Costa, Paulo Fernando Do Amaral; Pellosi, Diogo Silva; Calori, Italo Rodrigo; Vilsinski, Bruno Henrique; Estevão, Bianca Martins; Hioka, Noboru; Caetano, Wilker. Photophysical properties and interaction studies of Rose Bengal derivatives with biomimetic systems based in micellar aqueous solutions. *Journal of Molecular Liquids (Print)*, 230, 674-685, 2017.
- 15.** Rizzi, Manuela; Tonello, Stelvio; Estevão, Bianca Martins; Gianotti, Enrica; Marchese, Leonardo; Renò, Filippo. Verteporfin based silica nanoparticle for in vitro selective inhibition of human highly invasive melanoma cell proliferation. *Journal of Photochemistry and Photobiology. B, Biology*, 167, 1-6, 2017.
- 16.** Tessaro, André Luiz; Fraix, Aurore; Failla, Mariacristina; Cardile, Venera; Graziano, Adriana; Estevão, Martins Estevão, Bianca; Rescifina, Antonio; Sortino, Salvatore. Light-Controlled Simultaneous 'On Demand' Release of Cytotoxic Combinations for Bimodal Killing of Cancer Cells. *Chemistry-A European Journal*, 24, 7664 –7670, 2018.
- 17.** Da Silva, Ana Claudia; Cordeiro, Patrícia; Estevão, Bianca Martins; Caetano, Wilker; Eckert, Hellmut; Santin, Silvana; Moisés, Murilo; Hioka, Noboru; Tessaro, André. Synthesis of Highly Ordered Mesoporous MCM-41: Selective External Functionalization by Time Control. *Journal of The Brazilian Chemical Society*, 10 (8), 1599-1607, 2019.
- 18.** Freitas, Camila Fabiano; Estevão, Bianca Martins; Pellosi, Diogo Silva; Scarminio, Ieda Spacino; Caetano, Wilker; Hioka, Noboru; Batistela, Vagner Roberto. Chemical equilibria of Eosin Y and its synthetic ester derivatives in non-ionic and ionic micellar environments. *Journal of Molecular Liquids*, 327, 114794, 2020.
- 19.** Estevão, Bianca Martins; De Freitas, Camila Fabiano; Franciscato, Douglas Santana; De Assis, Francisco Fávoro; De Oliveira, Kleber Thiago; Hioka, Noboru; Caetano, Wilker; Muniz, Edvani Curti. Synthetic chlorin derivative self-prevented from aggregation: Behavior in homogeneous medium for PDT applications. *Journal of Molecular Liquids*, 319, 114363, 2020.
- 20.** Moreira, Lucas; Almeida, Alexandre; Camacho, Sabrina Alessio; Estevão, Bianca Martins; Oliveira, Osvaldo Novaes; Aoki, Pedro Henrique Benites. Chain Cleavage of Bioinspired Bacterial Membranes Photoinduced by Eosin Decyl Ester. *Langmuir*, 36, 9578-9585, 2020.
- 21.** Kang, Rui; Klopper, Wim; De Cola, Luisa; Estevão, Bianca Martins; Biedermann, Frank; Talamini, Laura; D'este, Elisa. Discovery of a size-record breaking green-emissive fluorophore: Small, smaller, HINA. *Chemical Science*, 12, 1392-1397, 2021.
- 22.** Romero, Maria Paulina; Buzza, Hilde; Stringasci, Mirian; Estevão, Bianca Martins; Silva, Cecilia; Pereira-da-Silva, Marcelo; Inada, Natalia; Bagnato, Vanderlei Salvador.

Graphene Oxide Theranostic Effect: Conjugation of Photothermal and Photodynamic Therapies Based on an in vivo Demonstration. *International Journal of Nanomedicine*, 16, 1601-1616, 2021.

23. Martins Estevão, Bianca; Comparetti, Edson; Rissi, Nathalia Cristina; Zucolotto, Valtencir. Anti-GPC1-modified mesoporous silica nanoparticles as nanocarriers for combination therapy and targeting of PANC-1 cancer cells. *Materials Advances*, 13, 4200, 2021.

24. Porto, Deyvid de Souza; Estevão, Bianca Martins; Pincela Lins, Paula Maria; Rissi, Nathalia Cristina; Zucolotto, Valtencir; Silva, Maria Fátima G. F. Orange Trunk Waste-Based Lignin Nanoparticles Encapsulating Curcumin as a Photodynamic Therapy Agent against Liver Cancer. *ACS Applied Polymer Materials*, 3, 10, 5061–5072, 2021.

25. Estevão, Bianca Martins; Miletto, Ivana; Hioka, Noboru; Marchese, Leonardo; Gianotti, Enrica. Mesoporous silica nanoparticles functionalized with amino groups for biomedical applications. *Mesoporous silica nanoparticles functionalized with amino groups for biomedical applications. ChemistryOpen*, 10, 1251–1259, 2021.

26. Rissi, Nathalia Cristina; Comparetti, Edson José; Eestevão, Bianca Martins; Mastelaro, Valmor Roberto; Zucolotto, Valtencir. Doped Plasmonic Zinc Oxide Nanoparticles with Near-Infrared Absorption for Antitumor Activity. *ACS Applied Nano Materials*, 4, 9, 9779–9789, 2021.

27. Martins Estevão, Bianca; Vilela, Raquel R.C.; Pinazo Geremias, Isabella; Zaroni, Kassio P.S.; Camargo, Andrea S.S.; Zucolotto, Valtencir. Mesoporous silica nanoparticles incorporated with Ir(III) complexes: From photophysics to photodynamic therapy. *Photodiagnosis and Photodynamic Therapy*, 40, 103052, 2022.

28. Siqueira, Priscila Rodrigues; Souza, Jaqueline Pérola; Estevão, Bianca Martins; Altei, Wanessa Fernanda; Carmo, Talita Laurie Lustosa; Santos, Fabrício Aparecido; Araújo, Heloísa Sobreiro Selistre; Zucolotto, Valtencir; Fernandes, Marisa Narciso. Concentration- and time-dependence toxicity of graphene oxide (GO) and reduced graphene oxide (rGO) nanosheets upon zebrafish liver cell line. *Aquatic Toxicology*, 248, 106199, 2022.

29. Siqueira, Priscila Rodrigues; Souza, Jaqueline Pérola; Venturini, Francine Perri; Carmo, Talita Laurie Lustosa; Azevedo, Vinícius Cavicchioli; Estevão, Bianca Martins; Bonomo, Marina Marques; Santos, Fabrício Aparecido; Zucolotto, Valtencir; Fernandes, Marisa Narciso. rGO outperforms GO in generating oxidative stress and DNA strand breaks in zebrafish liver cells. *Aquatic Toxicology*, 262, 106640, 2023.

30. M. Rokach et al. Tackling myelin deficits in neurodevelopmental disorders using drug delivery systems. *Advanced Drug Delivery Reviews* 207 (2024) 115218.

- **Patent**

Hioka, noboru; Caetano, Wilker; Gerola, Adriana Passarella; Estevão, Bianca Martins; Chaves, Cristiane Santi; Pellosi, Diogo Silva; Freitas, Camila Fabiano; Calori, Italo.

TREATMENT AND CONTROL OF MICRO-ORGANISMS AND ORAL DISEASES THROUGH PHOTODYNAMIC ACTION WITH XANTHENIC DYES AND FORMULATED POLOXAMIDS AND PHOSPHOLIPID LIPOSOMES. 2013, Brazil. Patent: Privilege of Innovation. Registration number: BR1020130317390, title: "TREATMENT AND CONTROL OF MICRO-ORGANISMS AND ORAL DISEASES THROUGH PHOTODYNAMIC ACTION WITH XANTHENIC DYES AND FORMULATED POLOXAMIDS AND LIPOSOMES OF PHOSPHOLIPID", National Institute of Industrial Property - National Institute of Registration: Deposit: 12/10/2013; Concession: 17/11/2015.

- **Skills and Techniques**

- Nanoparticles synthesis and preparation of silica nanoparticles, inorganic nanoparticles, liposomes, polymeric nanoparticles and quantum dots;
- Nanoparticles based on real membranes in cancer applications;
- Organic and inorganic synthesis;
- Physicochemical nanomaterials characterization techniques: dynamic light scattering, zeta potential, nanotracking analysis, spectroscopy analysis (UV-Vis, Fluorescence and life-time, Fourier-transform Infrared Spectroscopy), Ramam, thermogravimetry analysis, stability assays, multisizer analysis;
- $H^1$  and  $C^{13}$  Nuclear Magnetic Resonance analysis
- High-performance liquid chromatography
- Synthesis and modification of molecules;
- Synthesis and modification of polymers;
- Nanoparticles coating and functionalization;
- Fluorescence Microscopy;
- Confocal Microscopy
- Scanning electron microscopy imaging;
- Atomic force microscopy imaging;
- Pancreatic, lung, liver, and neuronal cancer cell culture and cell-based assays;
- Proposal writing
- Project Management
- Laboratory Management
- Statistical Data analysis
- Experience in supervising undergraduate final year projects
- Interdisciplinary skills

- **Participation in events and congresses**

1. Brazilian MRS Meeting 2023, Maceio-AL, Brazil. Polymeric microPLates for sustained drug delivery: A top-down low-pressure fabrication approach. Oral presentation.
2. Brazilian MRS Meeting 2023, Maceio-AL, Brazil. Buffering effect of cell membrane-coated ZnOPEI nanoparticles on pancreatic cancer under hypoxia conditions. Oral presentation.

3. CRS Italy Workshop 2022. Optimising microfabrication of curcumin-loaded polymeric microplates for sustained drug delivery. Genova 7 – 9 October, Italy, 2022.
4. Brazilian MRS Meeting. SBA15 nanosystems containing proton "sponge" for tumor hypoxia conditions; Lignin extracted from orange stem waste is an excellent nanoparticle precursor for biological application; Synthesis of Enhanced Red Upconversion Luminescence ZnO: Al<sup>3+</sup>: Yb<sup>3+</sup>: Er<sup>3+</sup> nanoparticles; Surface PEGylation of hybrid mesoporous silica nanoparticles with incorporated Ir (III) complexes for Photodynamic Therapy. 2019
5. Brazilian MRS Meeting. Mesoporous silica nanoparticles and carbon nanotubes with dual targeting against pancreatic ductal carcinoma: a comparative study; Strong near-infrared absorption and upconversion fluorescence in doped ZnO plasmonic nanoparticles. 2018
6. 1 Pan-American Polymer Science Conference. Nanoformulation of new benzoporphyrins with Pluronic triblock copolymer systems: a great approach to Photodynamic Therapy. 2017.
7. Brazilian MRS Meeting. Synthesis and optimization of aminofunctionalized mesoporous silica nanoparticles and their interaction with bovine serum albumin (BSA). 2017.
8. 1st School of Researchers at USP. 2016.
9. Brazilian MRS Meeting. Verteporfin based silica nanoparticle for selective inhibition of human highly invasive melanoma cell proliferation. 2016.
10. Symposium on Advanced Materials and Surface Science - Honor of Ricardo Aroca. 2016.
11. 6th Czech-Italian-Spanish Conference on Molecular Sieves and Catalysis. HYBRID MESOPOROUS SILICA NANOPARTICLES FOR PHOTODYNAMIC THERAPY: SYNTHESIS, OPTICAL PROPERTIES AND SINGLET OXYGEN GENERATION. 2015.
12. II Meeting of the Paraná Network of Photodynamic Therapy. 2015.
13. 16th International Congress on Photobiology. Photodynamic Effects of Xanthene Dyes and Derivatives on S. Aureus Bacteria: a Chemometric Study. 2014.
14. 6th International FEZA Conference. Organically Modified Silica Nanoparticles with Incorporated Photosensitizer for Photodynamic Therapy. 2014.
15. NIS Colloquium Porous Materials for Selective Separation and Controlled Transport: from Membranes to Nanoparticles. 2014.
16. VII Giornate Italo-Francesi di Chimica. Organically modified MCM-41 Nanoparticles for Photodynamic Therapy: synthesis and characterization. 2014.
17. I Meeting of the Paraná Network of Photodynamic Therapy. 2013.
18. Brazilian MRS Meeting. Eosin Y and ester derivatives / P-123 polymeric micelles: Physical-chemical interactions and potential application in photodynamic therapy. 2012.



19. II USP Conference on Nanotechnology. Eosin Y and ester derivatives / P-123 polymeric micelles: Physical-chemical interactions and potential application in photodynamic therapy. 2012.
20. III Meeting of the nBioNet, Films and Sensors network. 2012.
21. 34 Annual Meeting of the Brazilian Chemical Society. Influence of the micellar microenvironment on the interaction of xanthenic dyes: fluorescence studies. 2011. (Congress).
22. II nBioNet Films & Sensors network workshop. Influence of the micellar microenvironment on the interaction of xanthenic dyes. 2011.
23. XXVII Chemistry Week - IV Chemistry Graduate Day. Light, color, action and reaction. 2011.
24. Annual Scientific Initiation Meeting. Study of the distribution of available sulfur and its correlation with pH and organic matter in the soil under no-tillage. 2009.
25. XLIX Brazilian Congress of Chemistry. Study of nutrient distribution in soils with potato cultivation under no-tillage system. 2009.
26. XLIX Brazilian Congress of Chemistry - CBQ. Spectroscopic UV-Vis, Raman and IV study of adsorption of caffeic acid in TiO<sub>2</sub> and ZnO. 2009.
27. Annual Scientific Initiation Meeting. Study of pH and percentage of organic matter in soil. 2008.
28. XXIV Chemistry Week. Study of pH and percentage of organic matter in soil .. 2008.
29. XXIII Chemistry Week - Interdisciplinarity in Chemical Characterization. 2007.
30. Evolution and Origin of Life. 2006.
31. XXII Chemistry Week - Waste Management. 2006.

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Firma