



## Greta Varchi

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### WORK EXPERIENCE

01/01/2020 – CURRENT – Bologna, Italy  
**DIRECTOR OF RESEARCH** – ITALIAN NATIONAL RESEARCH COUNCIL

2017 – CURRENT – Houston, United States  
**FULL AFFILIATE MEMBER** – DEPARTMENT OF NANOMEDICINE HOUSTON, HOUSTON METHODIST RESEARCH INSTITUTE

Professional, scientific and collaboration activities in the field of chemistry and nanomedicine <https://www.houstonmethodist.org/for-health-professionals/department-programs/nanomedicine/>

2001 – 2019 – Bologna, Italy  
**RESEARCHER** – ITALIAN NATIONAL RESEARCH COUNCIL, INSTITUTE FOR ORGANIC SYNTHESIS AND PHOTOREACTIVITY

Professional, scientific and technical activities. Group leadership, projects coordination and scientific management, are among my duties. My scientific activity spans from the synthesis of biologically active molecules to the preparation, characterization, and tailored functionalization of nanomaterials for drug delivery and diagnosis purposes. [https://www.isof.cnr.it/varchi\\_greta/](https://www.isof.cnr.it/varchi_greta/)

2016 – 2018 – Bologna, Italy  
**COORDINATOR OF CHEMNNOCARE** – ITALIAN NATIONAL RESEARCH COUNCIL, INSTITUTE FOR ORGANIC SYNTHESIS AND PHOTOREACTIVITY

Coordinator of the “Chemistry and Nanotechnology for Health Care” thematic platform which aims to provide multidisciplinary advances in the field of (bio)medicine, healthcare and biomedical engineering, through the synergistic integration of consolidated expertise in the field of organic, inorganic and metallo-organic chemistry, analytical and physical organic chemistry, biochemistry, nanotechnology and cellular biology. This unit counts approximately 30 researchers.

2002 – 2004 – Stony Brook, United States  
**POST-DOCTORAL RESEARCHER** – DEPARTMENT OF CHEMISTRY, STONY BROOK UNIVERSITY

Professional, scientific and technical activities <https://www.stonybrook.edu/chemistry/>

1999 – 2000 – Munich, Germany  
**PHD VISITING SCIENTIST** – DEPARTMENT OF ORGANIC CHEMISTRY - LUDWIG MAXIMILIAN UNIVERSITY (LMU)

Professional, scientific and technical activities <https://www.cup.uni-muenchen.de/de/departments/chemie/>

1998 – 1998 – Marburg, Germany  
**VISITING RESEARCHER** – FACHBEREICH CHEMIE, UNIVERSITY OF MARBURG

Professional, scientific and technical activities <https://www.uni-marburg.de/de/fb15>

## EDUCATION AND TRAINING

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1998 – 2003 – Bologna, Italy

**PHD IN CHEMICAL SCIENCES** – Faculty of Industrial Chemistry, University of Bologna

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### Field(s) of study

- Organic Chemistry

**Thesis:** Stereo-defined, hetero-substituted molecules, as building blocks for the synthesis of biologically

1991 – 1997 – Bologna, Italy

**MSC DEGREE IN INDUSTRIAL CHEMISTRY** – Faculty of Industrial Chemistry, University of Bologna

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## PROJECTS

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CURRENT

### Funded Projects

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Thereafter a selection of projects for which I have been responsible/PI.

**ECHA/2018/11** Development of a searchable database for pre-clinical and clinical information of approved pharmaceuticals. Framework contract of Innovamol Consulting Srl from the European Chemicals Agency (2018-2023). **Role:** Participant

**ECHA/2021/67** Drafting and publishing two scientific publications on the development of an IUCLID database for pharmaceuticals and correlation analysis for endpoints of interest-based on this IUCLID database. Contract of Innovamol Consulting Srl from the European Chemicals Agency (2021-2024). **Role:** Participant

**NanoBinders** Biomimetic Nanocarriers boosting chemotherapy by restoring breast cancer immune surveillance - Project funded by the Worldwide Cancer Association (UK)- **Role:** Principal Investigator (2021-2023)

**Hydra** A tHeranostic approach to reduce the local recurrence of MYxofibrosarcoma - Project funded by the Italian Ministry of Health (2019-2022). **Role:** Unit coordinator

**KerLAR** Novel keratin-based nanomaterials from agri-food wastes for the production of advanced packaging – Industrial Research project; **Role:** Coordinator (2017-2020)

**AIRC IG-19172** – Site-specific covalent inhibition of SMYD3 as a new therapeutic approach for colorectal, breast and ovarian cancer – Italian Association for Cancer Research; **Role:** participant (2017-2020)

**SNAPSHOT** Mesenchymal Stem Cells and photoactivable Nanoparticles: a novel Anticancer Phototherapy System for High-Grade Osteosarcoma Treatment - Project funded by the Italian Ministry of Health; **Role:** Unit coordinator (2017-2020)

**AIRC IG16740** Albumin-based multimodal cancer therapy: a light-triggered implemented approach. Project funded by the Italian Association for Cancer Research; **Role:** Principal Investigator (2016-2019)

**PG-33677-2014** Ricerca, progettazione e sviluppo di contenitori in materiale plastico, destinati all'industria conserviera, a forte contenuto innovativo – Industrial research project; **Role:** Coordinator (2016-2019)

**AIRC MFAG-16941** Stem cells and innovative Nanoparticles as Anticancer Phototherapy System for High-Grade Osteosarcoma Treatment; Project funded by the Italian Association for Cancer Research; **Role:** Unit coordinator (2016-2019)

**Industria 2015** - New technologies for the Made in Italy; Project funded by the Italian Ministry of Economic Development; **Role:** Unit coordinator (2014-2017)

**NanoREG:** A common European approach to the regulatory testing of Manufactured Nanomaterials; European Commission; Responsible of WP2 and WP5 (2013-2016)

**AIRC IG 12834** Multimodal cancer therapy implemented with functionalized photoactivable nanoparticles; Project funded by the Italian Association for Cancer Research; **Role:** Unit coordinator (2013-2016)

**AIRC MFAG 13048** In vivo sonodynamic therapy: evaluation of cavitation effects on cancer tissue with innovative sonosensitizers; Project funded by the Italian Association for Cancer Research; **Role:** Unit coordinator (2013-2016)

## EDITORIAL ACTIVITY

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2020 – CURRENT

### Guest Editor

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Special Issue entitled "Drug Delivery in Photodynamic Therapy (PDT)" on the open access journal *Pharmaceutics* [https://www.mdpi.com/journal/pharmaceutics/special\\_issues/drug\\_delivery\\_PDT](https://www.mdpi.com/journal/pharmaceutics/special_issues/drug_delivery_PDT)

2019 – CURRENT

**Guest Editor**

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Special Issue "Applications of Green Nanomaterials in Biomedical Treatment" on the open-access journal *Applied Sciences*  
[https://www.mdpi.com/journal/applsci/special\\_issues/Green\\_Nanomaterials\\_Biomedical\\_Treatment](https://www.mdpi.com/journal/applsci/special_issues/Green_Nanomaterials_Biomedical_Treatment)

2016 – CURRENT

**Associate Editor**

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Associate Editor of *Frontiers in Organic Chemistry* <https://loop.frontiersin.org/people/405855/overview>

2016 – 2017

**Guest Editor**

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Critical Reviews in *Oncogenesis - Nitric oxide and Cancer*

2017 – 2018

**Topic Editor Frontiers in Organic Chemistry**

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<https://www.frontiersin.org/research-topics/8927/prostate-cancer-molecular-entities-targeting-this-challenging-disease>

2021 – CURRENT

**Topic Editor Frontiers in Organic Chemistry**

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<https://www.frontiersin.org/research-topics/25885/small-molecules-and-smart-drug-delivery-systems-for-combination-cancer-immunotherapy>

● **PROJECT EVALUATOR**

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**Project Evaluator**

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- 2021, 2020, 2019, 2018: European Commission - Marie Skłodowska-Curie Fellowships (MSCA)
- 2021: Bulgarian research foundation
- Project evaluator for the Italian Ministry of Education and Research

● **TUTORING & TEACHING**

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**Tutoring**

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During my career, I have been co-tutor of 20 Laurea thesis in organic, pharmaceutical and material chemistry. In addition, I am supervisor or co-supervisor of 3 PhD thesis:

**2009- 2012** Tutor of a PhD Thesis in Pharmaceutical Sciences – University of Bologna. Title: Small molecules as modulators of different targets involved in tumour progression (Claudia Ferroni, PhD)

**2005-2008** Co-tutor of a PhD Thesis in Chemical Sciences – University of Bologna. Title: Semi-synthesis of antitumor molecules starting from natural compounds – A SAR study (Cristian Samori, PhD)

**2017- 2020** Tutor of PhD Thesis in Materials Sciences & Technology– University of Parma. Title: (Bio)polymeric Nanoparticles for mRNA and siRNA delivery (Cecilia Martini, Dr.)

## TEACHING

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**2016** "The importance of intellectual property in chemistry" - Dipartimento di Scienze Chimiche e Geologiche Università di Modena e Reggio Emilia.

**2016-current** (1 lecture/year) "Chemical and biological aspects of drug-delivery systems. State-of-the-art and future perspectives". The University of Bologna – Course to PhDs in Chemical sciences.

**2016- current** (1 lecture/year) "Drug discovery & Drug delivery: where are we standing". The University of Udine – Course to students in Medicine.

**2019** "Intellectual property rights for chemists" – H2020 European project "**Integrata** - Integrating **chemical and biological approaches to target NAD production and signalling in cancer**" <https://www.integrata-h2020.eu>

## ● OUTREACH ACTIVITY

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2014 – CURRENT

### The Research Language

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The Research Language science popularization initiative promoted by the National Research Council of Bologna Research and the Italian Institute of Astrophysics. **Role in the project:** a member of the organizing committee. In addition, I actively participate in the project with a class entitled "Nature, the chemical reagent of humanity", which highlights the importance of natural substances and the role of chemistry in improving their features. Every year I meet about 10 classes of different schools for an average of 200 students.

2016 – 2017

### Raw Matters@Schools

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Raw Matters@Schools Raw Matters Ambassadors at Schools aims at elaborating strategic planning of dissemination capacity and methodology to improve the image of science & technology in schools for students of 10-19 yrs explaining the value of raw materials while promoting new professional careers in this sector.

## ● ENTREPRENEURSHIP

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2017 – 2021

### Kerline

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KerLine Srl Co-founder and Chief of Operating Officer

Company Mission: KerLine aims at industrializing the production of high molecular weight keratin from the textile and food industry wastes. KerLine is devising and pioneering further developments on different product lines, for instance, biomedical devices (ex. bandages, plasters, etc.), cosmetic and nutraceutical products (ex. creams, lotions, supplements, etc.), pharmaceutical (ex. drug formulation etc.) and other advanced materials, still, by keeping a strong scientific imprint in the concept of natural and multifunctional to achieve a unique positioning on the market and a solid competitive advantage ([www.kerlinesrl.com](http://www.kerlinesrl.com))

2015 – 2016

### Theramol

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Theramol Srls - Therapeutic Molecules for Innovative Targets - Co-founder

Company Mission: The TheraMol business project aims to design and synthesise novel, selective and effective small molecules that can inhibit the SMYD3 enzyme and provide an in vivo proof-of-concept on animal models of colorectal cancer.

## ● BOOK CHAPTERS

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2019 – 2019

### **Extraction and Characterization of Keratin from Different Biomasses**

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Book chapter in Sharma S., Kumar A. (eds) Keratin as a Protein Biopolymer. Springer Series on Polymer and Composite Materials. Springer, Cham. [https://doi.org/10.1007/978-3-030-02901-2\\_3](https://doi.org/10.1007/978-3-030-02901-2_3)

2019 – 2019

### **Silk Fibroin Based Technology for Industrial Biomanufacturing**

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*Factories of the Future*; Springer International Publishing: Cham, 2019; Vol. 82, pp 409–430. [http://link.springer.com/10.1007/978-3-319-94358-9\\_19](http://link.springer.com/10.1007/978-3-319-94358-9_19)

2016 – 2016

### **Molecular Design of Compounds Targeting Histone Methyltransferases**

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Del Rio, A.; Varchi, G. M. In *Epi-Informatics: Discovery and Development of Small Molecule Epigenetic Drugs and Probes*; Academic Press, 2016; pp 257–272. <https://doi.org/10.1016/B978-0-12-802808-7.00009-5>

### **Eco-Friendly Electrospun Membranes Made of Biodegradable Polymers for Wastewater Treatment**

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Aluigi, A.; Sotgiu, G.; Dambruoso, P.; Guerrini, A.; Ballestri, M.; Ferroni, C.; Varchi, G. In *Electrospinning for Advanced Energy and Environmental Applications*; CRC Press, 2015; pp 219–242. <http://www.crcnetbase.com/doi/10.1201/b18838-10>

2021 – 2021

### **A glance at drug delivery systems and emerging immunotherapeutic strategies for the treatment of glioblastoma**

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Varchi, G.; Gariboldi, M. B.; Ferroni In *Frontiers in Clinical Drug Research - Anticancer agents*; Atta-ur-Rahman, F., Ed.; 978-1-68108-776-4, 2021; pp 37–81.

## ● PATENTS

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2017 – 2017

### **Nanoparticles as Delivery Vehicles of Active Ingredients and Methods for the Production Thereof**

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Annalisa Aluigi, Varchi Greta, Sotgiu Giovanna, Guerrini Andrea WO 2018/229093

2010 – 2010

### **Androgen Receptor Modulating Compounds, Preparation and Uses Thereof**

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Varchi, G.; Guerrini, A.; Tesei, A.; Brigliadori, G. WO 2010/092546 <http://www.google.com/patents/US20110275829?dq=Androgen+Receptor+modulating+compounds,+preparation+and+uses+thereof&hl=en&sa=X&ei=nBY3Uau2H-Sk4gSW64CABg&ved=0CDkQ6AEwAg>

### **Non-steroidal compounds for androgen receptor modulation**

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Varchi, G.; Guerrini, A. . WO 2010/116342, 2010 <http://www.google.com/patents?hl=en&lr=&vid=USPATAPP13263616&id=ikcEAgAAEBAJ&oi=fnd&dq=Non-steroidal+compounds+for+androgen+receptor+modulation&printsec=abstract>

## **KERATIN NANOFIBERS AS DELIVERY VEHICLES OF ACTIVE INGREDIENTS, METHODS FOR THE PRODUCTION AND USES THEREOF**

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A. Aluigi, G. Sotgiu, G. Varchi; WO2019238610A1

## **POLYENYLCYCLOPROPANECARBOXYLIC ESTERS WITH HIGH INSECTICIDAL ACTIVITY**

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BORZATTA, Valerio, VARCHI, Greta, CAPPARELLA, Elisa, GUERRINI, Alberto, BATTAGLIA, Arturo TREFILETTI, Federico, 2009  
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2009037228>