



## Renata Riva

Full professor

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### *Education and training*

1987

#### **PhD in Chemical Sciences curriculum synthesis characterization and synthetic methodologies I cycle**

Ricerche sullo sviluppo e sulla utilizzazione di sostanze organiche naturali azotate sintesi stereo- ed enantioselettive semisintesi di alcaloidi indolici.

Relatore Prof. Bruno Danieli

Università di Milano - Milano - IT

1982

#### **Master degree in Chemistry**

Sui processi di trasposizione di gamma-idroperossienoni steroidali ad opera di sali di Fe(II) della luce e della basi. Relatore Prof. Bruno Danieli - 110/110

Università di Milano - Milano - IT

### *Academic experience*

2017 - ONGOING

#### **Full Professor**

Università di Genova - Genova - IT

2000 - 2017

#### **Associate Professor**

Università di Genova - Genova - IT

1992 - 2000

#### **Assistant Professor**

Università di Genova - Genova - IT

1989 - 1992

#### **Post-doctoral fellow**

Università di Genova - Genova - IT

### *Work experience*

1987 - 1992

#### **High School Chemistry Teacher**

Italian Ministry of Education - Loano Genova Rapallo - IT

1986 - 1987

**Post-doctoral fellow at the Massachusetts Institute of Technology Cambridge (MA US) and Indiana University Bloomington (IN US)**

fellowship financed by the National Institute of Health - Bethesda - US

## *Language skills*

**English**

Independent

**French**

Independent

**German**

Basic

## *Teaching activity*

*Courses at the University of Genova:*

- **Bachelor degree: Chemistry and Chemical Technologies**
  - Organic Chemistry Laboratory, since 2000
  - Applied Organic Chemistry, 2003 – 2018
- **Master degree: Chemical Sciences**
  - Complements of Organic Chemistry, since 2014
  - Organic Stereochemistry, 2004 – 2013
- **Master degree: Chemistry and Pharmaceutical Technology**
  - Since 2015: Organic Chemistry 2

*Courses for PhD Students in Italy:*

- **Doctorate in Science and Technology of Chemistry and Materials, University of Genova:**
  - Diversity Oriented Synthesis of Heterocyclic Compounds, 2018
  - Multistep Syntheses, 2013/15 and 2017
  - Stereoselective Syntheses 2013
- **Doctorate in Chemical Sciences, University of Insubria, Como:**
  - Multicomponent reactions: Examples and Applications to Diversity Oriented Synthesis, 2011
- **Doctorate School: Humanoid & Life Technologies; PhD course: Drug Discovery, Italian Institute of Technology, Genova:**
  - Chiral Organocatalysis, 2011
  - Multistep Syntheses 2010/12
- **Doctorate School in Science and Technology of Chemistry and Materials, University of Genova:**
  - Stereoselective Syntheses, 2009 and 2011
  - Asymmetric Syntheses, 2006

*Courses for PhD Students abroad (Visiting Professor within Erasmus mobility for teachers):*

- **Doctorate in Organic Chemistry, Heinrich Heine University, Düsseldorf (D):**
  - Multicomponent Reactions: Multi Diversity Generation and Stereochemistry Control, 2017

- Multicomponent Reactions: Applications to Multi Diversity Generation and in Drug Discovery, 2012

*Master courses:*

- **Second level Master: Management of Chemicals – REACH regulation, University of Genova**
  - Basic Concepts of Organic Chemistry, 2009 and 2013
- **Second level Master: Design and Development of Drugs, University of Pavia**
  - Application of Multicomponent Reactions to the Multiple Diversity Generation, 2008 – 2014

*Other:*

- **Higher Education School of the University of Genova (IANUA – ISSUGE), curriculum Science and Technology of Sustainability:**
  - Coordinator of the teaching activity within the course Circular Economy in the Chemical Industry, 2018.
- **Safety on-line course, University of Genova:**
  - Manipulation of chemicals (for laboratory Technicians and Students), 2017.
- **University of the Third Age, University of Genova:**
  - From fragrances to hormones, 2010
  - Terpenes, an Important Class of Natural Compounds, 2008
- **Seminar in High Schools of Region Liguria:**
  - From fragrances to hormones, 2009, 2019
- **Teaching activity as Assistant Professor:**
  - Support to different Organic Chemistry Laboratories, 1992 – 2000
  - Complementary lessons for different courses, 1992 – 2000
- **High School Teaching activity:**
  - Different Chemistry courses, 1987 – 1992.

## *Postgraduate research and teaching activity*

### **Supervision of PhD students, residents and post-doctoral fellows**

*I have been supervisor/responsible for several students/post-docs:*

**Post-doc supervisor:** 5 (9.5 years).

**Scholarship holders:** about 10.

**PhD Students** (Doctorate School in Science and Technology of Chemistry and Materials, Doctorate in Science and Technology of Chemistry and Materials, curricula Science and Chemical Technologies Drug Discovery, Drug Discovery and Nanobiotechnologies, Nanochemistry): 9 (5 in cotutelle with Researchers of the Italian Institute of Technology, Genova).

**Supervisor of Master Thesis** (Master degree in Chemistry or Chemical

Sciences): 29.

**Co-supervisor of Master Thesis** (Master degree in Chemical Sciences or Industrial Chemistry): 32.

**Supervisor of Bachelor Thesis** (Bachelor in Chemistry and Chemical Technologies): 23.

## PhD committees membership

*Activity within Doctorates:*

- Since 2019: Coordinator of the Doctorate in Science and Technology of Chemistry and Materials, of the Department of Chemistry and Industrial Chemistry, University of Genova {5 curricula: 3 from the previous Doctorate School in Science and Technology of Chemistry and Materials (Sciences and Chemical Technologies, Pharmaceutical, Food and Cosmetologic Sciences, Science and Material Technology) and 2 from the Italian Institute of Technology [Drug Discovery (Drug Discovery and Nanobiotechnologies since XXXII cycle) and Nanochemistry]}.
- Since 2013: Member of the Teachers Council of the Doctorate in Science and Technology of Chemistry and Materials, University of Genova.
- 2009 – 2013: Member of the Teachers Board of the Doctorate School in Humanoid and Life Technologies of the Italian Institute of Technologies, Genova, and the University of Genova and Member of the Teachers Council of the Doctorate in Drug Discovery of this School (Cycles XXV, XXVI, XXVII, XXVIII).

## Postgraduate (PhD) teaching activity

*Teaching activity within Doctorates:*

- **Doctorate in Science and Technology of Chemistry and Materials, University of Genova:**
  - Diversity Oriented Synthesis of Heterocyclic Compounds, 2018
  - Multistep Syntheses, 2013/15 and 2017
  - Stereoselective Syntheses 2013
- **Doctorate in Chemical Sciences, University of Insubria, Como:**
  - Multicomponent reactions: Examples and Applications to Diversity Oriented Synthesis, 2011
- **Doctorate School: Humanoid & Life Technologies; PhD course: Drug Discovery, Italian Institute of Technology, Genova:**
  - Chiral Organocatalysis, 2011
  - Multistep Syntheses 2010/12
- **Doctorate School in Science and Technology of Chemistry and Materials, University of Genova:**
  - Stereoselective Syntheses, 2009 and 2011
  - Asymmetric Syntheses, 2006

## ***Research interests***

*The research activity, all in the field of synthetic organic chemistry, can be summarized as follows:*

- Synthesis of substances of potential biological interest. During her career she worked first on the semisynthesis of natural products of biological interest not readily available from natural sources by transforming more accessible compounds. Then she worked on the synthesis of complex biologically active molecules and on the preparation of simplified analogues ( $\beta$ -lactams, enediynes, iminosugars etc.), exploiting different methodologies in the field of asymmetric synthesis such as organometallic procedures and biocatalysis.
- Diversity oriented synthesis to obtain new scaffolds with potential pharmacological activity, by coupling multicomponent reactions with secondary transformations. The most recent interests are in the field of stereochemistry issues, mainly diastereoselectivity control, in multicomponent reactions. Within this topic she is mainly interested in the synthesis of chiral building blocks obtained by chemoenzymatic or organocatalytic procedures to be used in multicomponent reactions.
- Synthesis of new fluorophores coupling multicomponent reactions with domino reactions catalyzed by transition metals and studies of their photophysical properties and possible applications.
- 'Bio-based' synthesis of new molecules through multicomponent reactions with different applications, exploiting building blocks from agro food industry or renewable sources.
- 'Not infringing' synthesis of active pharmaceutical ingredients in collaboration with pharma companies.
- Synthesis of conjugated between nanoparticles (magnetic or carbon nanotubes) and custom made organic molecules, with possible applications as biological probes and in drug delivery

*Several projects have been possible thanks to international and national collaborations:*

- Thomas J. J. Müller (Heinrich Heine University, Düsseldorf, D).
- Romano V. A. Orru and Dr. Eelco Ruijter (Vrije University, Amsterdam, NL).
- Asunción Barbero Pérez (University of Valladolid, Valladolid, E).
- Jieping Zhu (École Polytechnique Fédérale de Lausanne, Lausanne, CH).
- Ludger Wessjohann (Leibniz Institut für Pflanzenbiochemie, Halle, D).
- Andrea Cavalli and Dr. Jacopo Sgrignani (Institute for Research in Biomedicine (IRB), University of Italian Switzerland (USI), Bellinzona, CH).
- Silvia Giordani (University of Torino and IIT, Torino, and School of Chemical Sciences, Dublin, IRL).
- Maurizio Viale [ente di ricerca IRCCS AOU S. Martino (IST, Istituto

- Nazionale per la Ricerca sul Cancro), Genova].
- Roberta Pennati and Prof. Giorgio Scari (University of Milano, Milano).

## **Grants**

### **2018 - ONGOING**

#### **Design development and evaluation of new STAT3 inhibitors**

Compagnia di San Paolo - IT

Participant

The PI is Dr. Maurizio Viale (IRCCS Azienda Ospedaliera Universitaria San Martino – IST Istituto Nazionale per la Ricerca sul Cancro). I'm responsible of the synthetic unit.

### **2018 - ONGOING**

#### **Research and Innovation Staff Exchange (RISE) Synthesis Characterization structure and properties of Biodegradable Polyesters ('Biodes')**

European Community

Participant

The PI is Prof. Alejandro Müller (Polymat, San Sebastian, (E)). The local research unity is formed by Renata Riva, Dario Cavallo, Lisa Moni (a Coordinator is not foreseen).

### **2017 - 2018**

#### **FFABR Funding of the research activity of Associate Professors**

Italian Ministry for the University and Research - IT

Principal investigator

## **Editorial activity**

*Editorial activity:*

- 2019 – ongoing: Associate Editor of the journal Molecular Diversity.
- 2019 – ongoing: member of the Editorial Board of the journal Molecules.
- 2019: Guest Editor for the special issue on 'New Insights in Diversity Oriented Synthesis' for the journal Molecules.

*I'm reviewer for the following journals indexed on Web of Science and/or Scopus:*

- ACS Combinatorial Science, Advanced Synthesis & Catalysis, Arabian Journal of Chemistry, Asian Journal of Organic Chemistry, Beilstein Journal of Organic Chemistry, Bioorganic Chemistry, Bulgarian Chemical Communications, Catalysts, ChemCatChem, Chemical Communications, Chemistry of Heterocyclic Compounds, Chemistry: A European Journal, Chemistry: An Asian Journal, Combinatorial

Chemistry, European Journal of Medicinal Chemistry, European Journal of Organic Chemistry, Journal of Chinese Chemistry, Journal of Organic Chemistry, Journal of Organometallic Chemistry, Letters in Organic Chemistry, Molecular Diversity, Molecules, Organic Letters, QSAR & Combinatorial Science, RSC Advances, Science, Synlett, Synthesis, Tetrahedron, Tetrahedron: Asymmetry, Tetrahedron Letters.

*Evaluation:*

- of relevant research projects of foreign colleagues
- within ANVUR (VQR 04-10 e 11-14, SIR, regional projects).

## ***Assignments abroad***

*Assignments abroad:*

- **Post-doctoral research associate** at the Massachusetts Institute of Technology [Cambridge (MA) (November 1986 – January 1987)] and at the Department of Chemistry of Indiana University [Bloomington (IN), February 1987 – June 1987], supervisor Prof. William R. Roush. Research topic: enantioselective synthesis of the bottom half of macrolide chlorotricolide.
- **Teaching Activity within the Doctorate in Organic Chemistry, Heinrich Heine University, Düsseldorf (D)** (Visiting Professor within Erasmus mobility for teachers):
  - Multicomponent Reactions: Multi Diversity Generation and Stereochemistry Control, 2017
  - Multicomponent Reactions: Applications to Multi Diversity Generation and in Drug Discovery, 2012.

## ***Other professional activities***

*I'm involved in many collaborations with chemical industries:*

- Scientific collaboration with a pharma company, with research grants for 7 years. Topic: New Syntheses of Molecules with Pharmaceutical Activity. 5 patents (3 international) and several publications on journals document this collaboration.
- Scientific collaboration with a company, with research grants for 4 years. Topic: Synthesis of Standards for the chromatographic determination of contaminants in foods and optimization of analysis conditions (HPLC, GC).
- Scientific collaboration with a company, with a consulting contract. Topic: Research and Purification of Molecules with Antitumor Activity for Possible Pharmacologic and Oncological Applications (POR – FESR 2007-2013 – Asse 1 Innovazione e Competitività Azione 1.2.2. Ricerca Industriale e Sviluppo Sperimentale – anno 2011. The application, mandatory presented to Regione Liguria by a Company, included a consulting contract with RR, and was approved by external reviewers.

- Collaboration with IRCCS Azienda Ospedaliera Universitaria San Martino – IST Istituto Nazionale per la Ricerca sul Cancro, Polo Tecnobionet. Topic: Coupling Microbiological and Chemical Methods for the Efficient and Selective Synthesis of APIs and/or Analogues and Transfer of the Results to the Industrial Sector.
- Several other minor collaborations with companies.