Curriculum Vitæ Dr. ANDREA MATTAREI

Personal Information

Family name, First name	Mattarei, Andrea
Place and Date of birth	Rovereto (TN), 21st May 1982
Country of Citizenship	Italy
Address	Via F. Marzolo 4C, 35131, Padova (PD), Italy
Work Address	Department of Pharmaceutical and Pharmacological Sciences, Via F. Marzolo 5, 35131 Padova (PD), Italy
Work Phone	+39 049 8275024
Current Position	Researcher, RTDA, University of Padova
E-mail	andrea.mattarei@unipd.it

Education, training, positions

- **March 2017 – Present:** Term contract Researcher (RTDA) at the Department of Pharmaceutical and Pharmacological Sciences, University of Padova.
- **March 2016 – February 2017:** Post-doctoral fellow at the Department of Biology, University of Padova. Title of the project: "*Synthesis of mitochondrial ion channel inhibitor derivatives*". Supervisior Prof. Ildiko Szabò.
- **March 2014 – February 2016:** Senior research fellow at the Department of Chemical Sciences, University of Padova. The position was obtained upon winning an open competition (Bando Assegni di Ricerca Senior 2013, University of Padova, DR. 3210-2013) requiring the submission and oral defense of an original research proposal. Title of the project: "*Synthesis of Lipid-Mimetic Derivatives of Active Natural Compounds for a Novel Approach to Treat Obesity and Associated Diseases"*.
- **August 2012 – February 2014:** Term contract Researcher of the Institute of Neuroscience of the National Council of Research (CNR).
- **March – April 2013:** Visiting scientist at the Institute of Organic Chemistry of the University of Regensburg, Germany, working in collaboration with Dr. Sabine Amslinger on the project *"Synthesis of a biotinylated benzophenone derivative of a T cell stimulator"*.

- **January 2011 – July 2012:** Post-doctoral fellow of the National Council of Research (CNR). Fellowship granted on the research program "*Development of a Pharmacology of Polyphenols*", funded by the Fondazione Cassa di Risparmio di Padova e Rovigo, CARIPARO – Progetti di Eccellenza. PI: Dr. Mario Zoratti, IN-CNR.
- **March 2011:** PhD in Molecular Sciences, University of Padova, Italy. Thesis Title: "*Development of derivatives of natural polyphenols for pharmacological applications*". Advisor: Prof. Cristina Paradisi.
- **February – August 2010:** Visiting scientist in the laboratory of Prof. Alan P. Kozikowski at the University of Illinois at Chicago, Department of Medicinal Chemistry and Pharmacognosy. Research Project: "*Synthesis and characterization of novel daidzein derivatives. A Dual Drug Approach to improve the activity toward Arginase 1 expression*".
- **January 2008 – December 2010:** Graduate student in the Graduate School of Molecular Sciences at the Department of Chemical Sciences, University of Padova.
- **November 2007:** Habilitation to the profession (*Esame di Stato*).
- **July 2007:** MSC Degree (Laurea Magistrale) in Industrial Chemistry, University of Padova, Italy. Final grade **110/110.** Thesis Title: "*Synthesis and characterization of mitochondriotropic derivatives of quercetin*". Supervisor: Prof. Cristina Paradisi.
- **November 2004:** BSC Degree (Laurea Triennale) in Industrial Chemistry: University of Padova, Italy. 26th November 2004. Final grade **101/110**. Thesis Title: "*Nanostructured Palladium catalysts immobilized on acrylic resins*". Supervisor: Prof. Benedetto Corain.
- **July 2001:** High School Degree. Industrial chemistry school ITIS "Buonarroti", Trento, Italy, 2001. Final grade **100/100**.

List of scientific publications

1. **Mattarei A.**, Romio, M., Managò, A., Zoratti, M., Paradisi, C., Szabò, I., Leanza, L., Biasutto, L. Novel Mitochondria-Targeted Furocoumarin Derivatives as Possible Anti-Cancer Agents. *Frontiers in Oncology*. 8, 122 (2018).

2. Venturini E., Leanza L., Azzolini M., Kadow S., **Mattarei A.**, Weller M., Tabatabai G., Edwards M.J., Zoratti M., Paradisi C., Szabò I., Gulbins E., Becker K.A. Targeting the Potassium Channel Kv1.3 Kills Glioblastoma Cells. *NeuroSignals*. 25(1), 27-38 (2018).

3. **Mattarei, A.**[#], Rossa, A., Bombardelli, V., Azzolini, M., La Spina, M., Paradisi, C., Zoratti, M., Biasutto, L. Novel lipid-mimetic prodrugs delivering active compounds to adipose tissue. *European Journal of Medicinal Chemistry*. 135, 77-88 (2017).

4. **Mattarei, A.**, Enzinger, M., Gu, S., Karunakaran, M.M., Kimmel, B., Berner, N., Adams, E.J., Herrmann, T., Amslinger, S. A Photo-Crosslinkable Biotin Derivative of the Phosphoantigen (E)-4-Hydroxy-3-Methylbut-2-Enyl Diphosphate (HMBPP) Activates Vγ9Vδ2 T Cells and Binds to the HMBPP Site of BTN3A1. 49. *Chemistry – A European Journal*. 11945-11954 (2017).

5. Peruzzo, R., **Mattarei, A.**, Romio, M., Paradisi, C., Zoratti, M., Szabò, I., Leanza, L. Regulation of Proliferation by a Mitochondrial Potassium Channel in Pancreatic Ductal Adenocarcinoma Cells. *Frontiers in Oncology*. 7, 239 (2017).

6. Austin, S., Tavakoli, M., Pfeiffer, C., Seifert, J., **Mattarei, A.**, De Stefani, D., Zoratti, M., Nowikovsky, K. LETM1-mediated K^+ and Na^+ homeostasis regulates mitochondrial Ca^{2+} efflux. *Frontiers in Physiology*. 8, 839 (2017).

7. Sassi, N.*, **Mattarei, A.***, Espina, V., Liotta, L., Zoratti, M., Paradisi, C., Biasutto, L. Potential anti-cancer activity of 7-O-pentyl quercetin: Efficient, membrane-targeted kinase inhibition and pro-oxidant effect. *Pharmacological Research*. 124, 9-19 (2017).

8. Biasutto, L., **Mattarei, A.**, Azzolini, M., La Spina, M., Sassi, N., Romio, M., Paradisi, C., Zoratti, M. Resveratrol derivatives as a pharmacological tool. *Annals of the New York Academy of Sciences*. 1403(1), 27-37 (2017).

9. Leanza, L., Romio, M., Becker, K.A., Azzolini, M., Trentin, L., Managò, A., Venturini, E., Zaccagnino, A., **Mattarei, A.**, Carraretto, L., Urbani, A., Kadow, S., Biasutto, L., Martini, V., Severin, F., Peruzzo, R., Trimarco, V., Egberts, J.H., Hauser, C., Visentin, A., Semenzato, G., Kalthoff, H., Zoratti, M., Gulbins, E., Paradisi, C., and Szabò, I. Direct pharmacological targeting

of a mitochondrial ion channel selectively kills tumor cells in vivo. *Cancer Cell*. 31, 516-531 (2017)

10. Azzolini, M.*, **Mattarei, A.***, La Spina, M., Fanin, M., Chiodarelli, G., Romio, M., Paradisi, C., Biasutto, L. New natural amino acid-bearing prodrugs boost pterostilbene's oral pharmacokinetic and distribution profile. *European Journal of Pharmaceutics and Biopharmaceutics*. 115, 149-158 (2017).

11. Tehran, D., Pirazzini, M., Leka, O., **Mattarei, A.**, Lista, F., Binz, T., Rossetto, O., Montecucco, C. Hsp90 is involved in the entry of clostridial neurotoxins into the cytosol of nerve terminals. *Cellular Microbiology*. 19(2), e12647 (2017).

12. Schnell, L., Mittler, A., **Mattarei, A.**, Tehran, D., Montecucco, C., Barth, H. Semicarbazone EGA inhibits uptake of diphtheria toxin into human cells and protects cell article from intoxication. *Toxins*. 8(7), 221 (2016).

13. Schnell, L., Mittler, A.K., Sadi, M., Popoff, M.R., Schwan, C., Aktories, K., **Mattarei, A.**, Azarnia Tehran, D., Montecucco, C., Barth, H. EGA protects mammalian cells from *Clostridium difficile* CDT, *Clostridium perfringens* Iota toxin and *Clostridium botulinum* C2 toxin. *Toxins*. 8(4), 101 (2016).

14. Azarnia Tehran, D., Zanetti, G., Leka, O., Caccin, P., Lista, F., Binz, T., Shone, C.C., Rossetto, O., Montecucco, C., Paradisi, C., **Mattarei, A.**[#], Pirazzini, M.[#] A novel inhibitor prevents the peripheral neuroparalysis of botulinum neurotoxins. *Scientific Reports.* 5, 17513 (2015).

15. **Mattarei, A.**[*,#], Azzolini, M.*, La Spina, M., Zoratti, M., Paradisi, C., Biasutto, L. Amino acid carbamates as prodrugs of resveratrol. *Scientific Reports.* 5, 15216 (2015).

16. Azzolini, M.*, **Mattarei, A.***, La Spina, M., Marotta, E., Zoratti, M., Cristina, P., Biasutto, L. Synthesis and evaluation as prodrugs of hydrophilic carbamate ester analogs of resveratrol. *Molecular Pharmaceutics*. 12(9), 2441-3454 (2015).

17. **Mattarei, A.**[*,#], Azzolini, M.[*], Zoratti, M., Biasutto, L., Paradisi, C. N-Monosubstituted methoxy-oligo(ethylene glicol) carbamate ester prodrugs of resveratrol. *Molecules*. 20(9), 16085-16102 (2015).

18. Biasutto, L., **Mattarei, A.**, Paradisi, C. Synthesis and testing of novel isomeric mitochondriotropic derivatives of resveratrol and quercetin. *Methods in Molecular Biology*, **Volume** "Mitochondrial Medicine: Methods and Protocols". 1265:161-179 (2015).

19. **Mattarei, A.**, Biasutto, L., Romio, M., Zoratti, M., Paradisi, C. Synthesis of Resveratrol Sulfates: Turning a nightmare into a dream. *Tetrahedron*. 71(20), 3100-3106 (2015).

20. **Mattarei, A.**, Carraro, M., Azzolini, M., Paradisi, C., Zoratti, M., Biasutto, L. New Water-Soluble Carbamate Ester Derivatives of Resveratrol. *Molecules*, 19(10), 15900-17 (2014).

21. Azzolini, M., La Spina, M., **Mattarei, A.**, Paradisi, C., Zoratti, M., Biasutto, L. Pharmacokinetics of Pterostilbene in the Rat. A Map of Distribution in Major Organs. *Molecular Nutrition & Food Research*. 58(11), 2122-32 (2014).

22. Biasutto, L., **Mattarei, A.**, Sassi, N., Azzolini, M., Romio, M., Paradisi, C., Zoratti, M. Improving the efficacy of plant polyphenols. *Anticancer Agents in Medicinal Chemistry*. 14(10), 1332-1342 (2014).

23. Sassi, N., **Mattarei, A.**, Azzolini, M., Szabò, I., Paradisi, C., Zoratti, M., Biasutto, L. Cytotoxicity of mitochondria-targeted resveratrol derivatives: interactions with respiratory chain complexes and ATP synthase. *Biochimica et Biophysica Acta*. 1837(10), 1781-1789 (2014).

24. Sassi, N., **Mattarei, A.**, Azzolini, M., Bernardi, P., Szabò. I., Paradisi, C., Zoratti, M., Biasutto, L. Mitochondria-targeted resveratrol derivatives act as cytotoxic pro-oxidants. *Current Pharmacological Design*. 20, 172-179 (2014).

25. **Mattarei, A.***, Azzolini, M.*, Carraro, M., Sassi, N., Zoratti, M., Paradisi, C., Biasutto, L. Acetal Derivatives as Prodrugs of Resveratrol. *Molecular Pharmaceutics*. 10, 2781-2792 (2013).

26. Durante, M., Sgaragli, G., Biasutto, L., **Mattarei, A.**, Fusi, F. Quercetin Mitochondriotropic Derivatives Antagonize Nitrate Tolerance and Endothelial Dysfunction of Isolated Rat Aorta Rings. *Planta Medica*. 79, 465-467 (2013).

27. Biasutto, L., **Mattarei, A.**, Zoratti, M. Resveratrol and Health: The Starting Point. *ChemBioChem*. 13, 1256-1259 (2012).

28. Sassi, N., Biasutto, L., **Mattarei, A.**, Carraro, M., Giorgio, V., Citta, A., Bernardi, P., Garbisa, S., Szabò, I., Paradisi, C., Zoratti, M. Cytotoxicity of mitochondriotropic quercetin derivative: Mechanisms. *Biochimica et Biophysica Acta*. 1817, 1095–1106 (2012).

29. **Mattarei, A.**, Sassi, N., Biasutto, L., Durante, C., Sandonà, G., Marotta, E., Garbisa, S., Gennaro, A., Zoratti, M., Paradisi, C. Redox Properties and Cytotoxicity of Synthetic Isomeric Mitochondriotropic Derivatives of the Natural Polyphenol Quercetin. *European Journal of Organic Chemistry*. 28, 5577-5586 (2011).

30. Biasutto, L., Sassi, N., **Mattarei, A.**, Marotta, E., Cattelan, P., Toninello, A., Garbisa, S., Zoratti, M., Paradisi, C. Impact of mitochondriotropic quercetin derivatives on mitochondria. *Biochimica et Biophysica Acta*. 1797, 189-196 (2010).

31. **Mattarei, A.**, Biasutto, L., Rastrelli, F., Garbisa, S., Marotta, E., Zoratti, M., Paradisi, C. Regioselective *O*-derivatization of quercetin via ester intermediates. An improved synthesis of rhamnetin and development of a new mitochondriotropic derivative. *Molecules.* 15, 4722-4736 (2010).

32. Biasutto, L., Marotta, E., Bradaschia, A., Fallica, M., **Mattarei, A.**, Garbisa, S., Zoratti, M., Paradisi, C. Soluble polyphenols: Synthesis and bioavailability of 3,4',5-tri(α-D-glucose-3-O-succinyl) resveratrol. *Bioorganic & Medicinal Chemistry Letters*. 19, 6721-6724 (2009).

33. Biasutto, L., Marotta, E., **Mattarei, A.**, Beltramello, S., Caliceti, P., Salmaso, S., Bernkop-Schnurch, A., Garbisa, S., Zoratti, M., Paradisi, C. Absorption and Metabolism of Resveratrol Carboxyesters and Methanesulfonate by Explanted Rat Intestinal Segments. *Cellular Physiology and Biochemistry*. 24, 557-566 (2009).

34. Biasutto, L.*, **Mattarei, A.***, Marotta, E., Bradaschia, A., Sassi, N., Garbisa, S., Zoratti, M., Paradisi, C. Development of mitochondrial-targeted derivatives of resveratrol. *Bioorganic & Medicinal Chemistry Letters*. 18, 5594-5597 (2008).

35. **Mattarei, A.**, Biasutto, L., Marotta, E., De Marchi, U., Sassi, N., Garbisa, S., Zoratti, M., Paradisi, C., A mitochondriotropic derivative of quercetin: a strategy to increase the effectiveness of polyphenols. *ChemBioChem*. 9, 2633-2642 (2008).

***** *First authorship shared* - **#** *Corresponding author*

Patents

1. Mattarei, A., Biasutto, L., Zoratti, M., Paradisi, C., Marotta, E., Garbisa, S., Azzolini, M., Bradaschia, A., Carraro, M., Sassi, N. New derivatives of Resveratrol. Italian Patent N. 0001416513 issued June 19, 2015.

2. Carraro, M., Zoratti, M., Paradisi, C., **Mattarei, A.**, Biasutto, L. Nanocostrutti comprendenti nanoparticelle lipidiche solide rivestite da un guscio idrofilo. Italian Patent N. 0001421549 issued March 22, 2016.

3. Szabò, I., Paradisi, C., **Mattarei, A.**, Leanza, L., Trentin, L., Semenzato, G., Romio, M., Managò, A. Psoralen derivatives as selective tumor-killing agents. Italian Patent N.0001428283 issued April 20, 2017.

Principal Investigator in granted projects

Supporting Talent in Research @University of Padova – STARS Grants 2017 from the University of Padova – STARTING GRANTS. Title of the project: “Development of new chemical probes for organelle-specific real-time calcium imaging”.

Progetti di Rilevante Interesse Dipartimentale PRID 2017 from the Italian Ministry of education, universities and research (MIUR). Title of the project: "New modulators of myosin super-relaxed state to contrast obesity and associated diseases".

Participation in granted projects

Excellence Project CARIPARO 2008-2009 from the Foundation Cassa di Risparmio di Padova e Rovigo (PI: Dr. Mario Zoratti). Title of the project: "Development of a pharmacology of polyphenols".

Investigator Grant AIRC IG2011 from the Association for Cancer Research (PI: Prof. Ildikò Szabò – n°11814). Title of the project: "Induction of apoptosis via mitochondrial Kv1.3 potassium channel as a therapeutic perspective".

Progetti di Rilevante Interesse Nazionale PRIN 2010-2011 from the Italian Ministry of education, universities and research (MIUR) (PI: Prof. Paolo Bernardi – 20107Z8XBW). Title of the project: "Mitochondrial mechanisms of carcinogenesis".

Investigator Grant AIRC IG2014 from the Association for Cancer Research (PI: Prof. Ildikò Szabò – n°15544). Title of the project: "New anti-cancer agents targeting a mitochondrial potassium channel: *in vivo* studies".

Investigator Grant AIRC IG2017 from the Association for Cancer Research (PI: Prof. Ildikò Szabò). Title of the project: "Pharmacological targeting of mitochondrial ion channels to selectively induce apoptosis in cancer cells: *in vivo* studies".

Investigator Grant AIRC IG2017 from the Association for Cancer Research (PI: Prof. Luca Scorrano). Title of the project: " Enhancing cancer cell death and reducing cancer angiogenesis by Opa1 inhibition".

Awards

Best poster Award at the EMBO Workshop Mitochondria, Apoptosis and Cancer: Targeting Mitochondria to defeat Cancer. Prague, Czech Republic, October 1-3, 2009. Poster: P35 Title: "Oxidation potentials and radical-scavenging properties of novel mitochondrion-targeted quercetin derivatives", Abstracts p. 88.

Best poster Award at the 6th International Conference on Polyphenols and Health. Buenos Aires, Argentina, October 16-20, 2013. Poster: P2-1-07 Title: "Improving the properties of plant polyphenols", Abstracts p. 53.

"Giovani Studiosi" Award from the University of Padova for the project "Synthesis of Lipid-Mimetic Derivatives of Active Natural Compounds for a Novel Approach to Treat Obesity and Associated Diseases". DR 3210/2013 Prot.N.104444 del 10/12/2013.

Teaching and tutoring in university courses

Academic years 2016-2017, 2017-2018. Lecturer of the course *Drug Analysis 1* for the Degree in Pharmacy, University of Padova.

Academic year 2016-2017. Lecturer of the course *Drug Analysis 2* during the Summer Courses at the Free University of Bozen (Brixen) for the Degree in Pharmacy, University of Padova.

Academic years 2012-2013, 2013-2014, 2014-2015, 2015-2016. Teaching assistant for the laboratory module of the course *Applied Organic Chemistry* for the Bachelor Degree in Industrial Chemistry at the Department of Chemical Sciences, University of Padova.

Academic year 2011-2012. Teaching assistant for the laboratory module of the course *Preparation and Characterization of Materials II* for the Master Degree in Material Science at the Department of Chemical Sciences, University of Padova.

Academic years 2008-2009, 2009-2010 and 2010-2011. Teaching assistant for the laboratory module of the course **Organic Chemistry I** for the Bachelor Degrees in Chemistry and in Industrial Chemistry at the Department of Chemical Sciences, University of Padova.

Academic year 2008-2009. Tutor for the course **General Chemistry** for the Bachelor Degrees in Chemistry and in Industrial Chemistry at the Department of Chemical Sciences, University of Padova under the supervision of Dr. Alberto Gasparotto.

Dissemination activities

I have taken part in numerous dissemination activities organized by the Department of Chemical Sciences of the University of Padova, contributing to the planning stage and to the realization of the specific events (demonstrations, lectures, dedicated laboratories, supervision of stages in research laboratories). One important yearly dissemination event, to which I have contributed, is "Non è Magia è Chimica" (2009, 2010, 2011) which is dedicated to the public, to children and youngsters in particular. Another important program in which I have been and continue to be involved is the national project "Progetto Lauree Scientifiche" (formerly "Piano Lauree Scientifiche") of the Italian Ministero dell'Istruzione, dell'Università e della Ricerca. Within the framework of this nationwide program, which aims at stimulating the interest of 4th year high school students in scientific disciplines, specifically chemistry, I have been engaged in many activities over the years 2008 to present. These include demonstrations, lectures and tutoring of high school students for short research stages during their school summer holidays.

Padova, May 2nd 2018

Andrea Mattarei