UNIVERSITÀ DEGLI STUDI DELL'AQUILA

DISCAB
Dipartimento di Scienze Cliniche Applicate e Biotecnologiche

CURRICULUM VITAE - **MARIO ROSSI**

PERSONAL INFORMATION	**Rossi Mario, PhD** Department of Biotechnological and Applied Clinical Sciences (DISCAB), University of L'Aquila, Vetoio Coppito, 67100, L'Aquila, Italy. mario.rossi@univaq.it

CURRENT POSITION	**Assistant Professor (tenure track position) 05/G1 - Pharmacology, clinical pharmacology and pharmacognosy (BIO/14).**

EDUCATION OTHER QUALIFICATIONS	
2019 - 05/G1 – BIO/14 PHARMACOLOGY	**"National scientific" qualification (ASN) in pharmacology, clinical pharmacology and pharmacognosy (05/G1 - BIO/14 PHARMACOLOGY).** ASN issued by the Ministry of Education, University and Research, Italian Government. **N: 15294.**
2019 - 05/E2 – BIO/11 MOLECULAR BIOLOGY	**"National scientific" qualification (ASN) in molecular biology (05/E2 – BIO/11 MOLECULAR BIOLOGY).** ASN issued by the Ministry of Education, University and Research, Italian Government. **N: 25799.**
2009	**PhD in Molecular Biotechnology (Research Doctorate School in Biomolecular Sciences)** at the Department of Neuroscience, laboratories of Pharmacology, University of Pisa, Pisa, IT. *This three-year-long research PhD project led to the identification of an estrogenic regulatory site on glycoprotein hormone GPCRs resulting in peer-reviewed papers.*
2004	**Master's in molecular biology** (Single Cycle Degree of five years)**. 110/110 Cum Laude,** at the department of Human and Environmental Sciences, laboratories of genetics, University of Pisa, Pisa, Italy. *The research thesis contributed to the understanding of some aspects of endothelin and GDNF signalling and the publication of 1 peer-reviewed paper.*

ACADEMIC APPOINTMENTS	Experienced Assistant Professor with a proven track record of effective research in GPCR molecular pharmacology and signal transduction. Teacher of Pharmacology and toxicology at DISCAB. Skilled in student and postdoc mentorship. **Main research topics include:** • Detecting GPCRs and associated proteins as drug targets in various human diseases, including neurodegenerative diseases, type-2 diabetes, and hyperthyroidism. • Detecting small molecules as modulators of GPCR functions to enhance specific physiological responses, such as insulin secretion.

SINCE 2021	**Assistant Professor (tenure track position) 05/G1 - Pharmacology, clinical pharmacology and pharmacognosy (BIO/14).** DISCAB, University of L'Aquila, L'Aquila, Italy. **Research interests include:** • **Covid19**: Development of an in-vitro system to evaluate covid19 spike protein internalization and its interactions with host proteins. *Principal Investigator of 2 grants.* • **Drug discovery**: Developing of in-vitro FRET based approaches to monitor CXCR1 conformational changes induced by small molecules. *Principal Investigator of 3 grants*. • **Evaluation of drug off-targets for GPCR(s)**: Evaluating potential off-targets of the anti-Parkinsonian Ropinirole. *Principal Investigator of 1 grant.* • **Basic research on GPCR(s)**: Investigating the ability of the M2 muscarinic receptor mRNA to produce receptor fragments by a cap-independent translation mechanism. *Principal Investigator of 1 grant.*
2017-2021	**MRC-Research Associate (MR/P019366).** University of Glasgow, Institute of Molecular, Cell & Systems Biology (IMCSB), Glasgow, United Kingdom. **Research interests include:** • **Neuroprotective effects of the M1-muscarinic receptor signalling**: Positive allosteric modulation of the M1 muscarinic receptor increases lifespan and cognitive functions in a mouse model of neurodegeneration induced by misfolded prion protein (in-vitro, ex-vivo, in-vivo, and omics approaches). *This research project led to 3 publications in peer-reviewed journals.* • **Covid19**: Development of a bioluminescence based in-vitro system to detect ACE2 protein internalization induced by the receptor binding protein (RBD) of the viral Covid19 spike protein. *Principal Investigator of 1 grant. This research project led to 1 publication in a peer-reviewed journal.*
2014-2017	**NIH Research Fellow.** The National Institutes of Health (NIH), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), Molecular Signalling Section, Laboratories of Bioorganic Chemistry, Bethesda, Maryland, USA. **Research interests include:** • **Diabetes**: Detection of pathways crucial for hepatic glucose production (Gi protein, ROS and JNK signalling), tested the effects of allosteric modulation of muscarinic receptors (VU0119498 compound) for side effects and for the ability to promote euglycemia in type 2 mouse models, and tested casein kinase specific inhibitor CX-4945 for antidiabetic effects, etc. Drugs were tested in-vitro, ex-vivo, in-vivo, and with omics approaches for anti-diabetic effects. *These research projects led to publish several papers in peer-reviewed journals.*
2009-2014	**NIH - Research Visiting Fellow.** The National Institutes of Health (NIH), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), Molecular Signalling Section, Laboratories of Bioorganic Chemistry, Bethesda, Maryland, USA.

	Research interests include: ● **Diabetes**: Detection of key proteins important for proper M3 muscarinic receptor mediated cell functions (transmembrane protein 147, Spinophilin). The role of p147 on M3R cell membrane expression was tested in-vitro whereas and the regulatory effects of Spinophilin on beta cell M3R functions was investigated in-vitro, ex-vivo, and in-vivo. *These research projects led to publish 2 papers in peer-reviewed journals.*
2006-2009	**FIRB – Young investigator - Research Fellow (RBIN04CKYN).** University of Pisa, Department of Neuroscience, Laboratories of Pharmacology, Pisa, Italy. **Research interests include:** ● **Hyperthyroidism:** Detection of small molecules, also with estrogenic activity like quercetin, to negatively modulate the thyrotropin GPCR TSHR and other glycoprotein hormone GPCRs. *These research project led to publish several papers in peer-reviewed journals.*
2005-2006	**PRIN – Postgraduate research Fellow (YEAR 2004 - 2004052155_001).** University of Pisa, Department of Neuroscience, Laboratories of Pharmacology, Pisa, Italy. **Research interests include:** ● **Hyperthyroidism:** Detection of organochlorine like small molecules to negatively modulate the thyrotropin GPCR TSHR. *This research project led to publish 1 paper in a peer-reviewed journal.*

TEACHING EXPERIENCE	
FROM OCTOBER – TO DECEMBER 2023	**Lecturer-DB0139 - BIOTECHNOLOGICAL DRUGS AND VACCINE INNOVATIONS course.** Master's degree in "Pharmaceutical and Medical Biotechnologies" (LM09). **64 Hours Course. (6 CFU)** Language: **English**
FROM MARCH – TO JUNE 2023	**Lecturer-B0397 - FARMACOLOGIA E TOSSICOLOGIA CLINICA course.** Master's degree in "Pharmaceutical and Medical Biotechnologies" (LM09). **64 Hours Course (6 CFU)** Language: **Italian**
FROM MARCH – TO JUNE 2023	**Lecturer-B0483 - METODOLOGIE FARMACOLOGICHE E TOSSICOLOGICHE APPLICATE course.** **45 Hours Course (5 CFU)** Bachelor's degree in "Biotechnologies" (L2). Language: **Italian**
FROM MARCH – TO JUNE 2022	**Lecturer-B0397 - FARMACOLOGIA E TOSSICOLOGIA CLINICA course.** Master's degree in "Pharmaceutical and Medical Biotechnologies" (LM09). **54 Hours Course (6 CFU)** Language: **Italian**
FROM MARCH – TO JUNE 2022	**Lecturer-B0483 - METODOLOGIE FARMACOLOGICHE E TOSSICOLOGICHE APPLICATE course.** Bachelor's degree in "Biotechnologies" (L2). **45 Hours Course (5 CFU)** Language: **Italian**
SINCE 2021	**Assistant Professor (tenure track position) 05/G1 - Pharmacology, clinical pharmacology and pharmacognosy (BIO/14).** DISCAB, University of L'Aquila, L'Aquila, Italy. **Activities include:** • Mentor of master students, PhD students, and postdocs in research projects. • Currently mentoring 5 master students. • Co-mentor of a PhD student. • Mentor of a postdoc. • Mentor for advising master students, PhD students, and postdocs in their careers.

RESEARCH ACTIVITIES	
SINCE 2024	**Principal Investigator** (DISCAB, University of L'Aquila) Monitoring ligand ability to modulate CXCR1 receptor conformation by intraFRET: implications also for anti-Covid19 therapies. Amount: **50.000,00 Euro**
2023-2024	**Principal Investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Intra-FRET approaches to detect ligand mediated changes of CXCR1 receptor conformation. Amount: **30.000,00 Euro**
2023-2024	**Principal Investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Funds to investigate Ropinirole, a D2/D3/D4 dopaminergic receptor agonist, possible off targets. Amount: **3.196,00 Euro**
2022-2023	**Principal Investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Funds to investigate ligands ability to modulate CXCR1 receptor activity and to develop a novel approach in drug discovery based on FRET for the detection of changes in CXCR1 receptor conformation. Amount: **50.000,00 Euro**
2022-2023	**Principal investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Funds to investigate new GPCR regulatory mechanisms of cell function: ATENO GRANT awarded by the University of L'Aquila. Amount: **10.000,00 Euro**
2022-2024	**Principal Investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Funds to investigate Covid19 spike protein internalization processes. Preclinic contract: funded by Dompè farmaceutici S.p.A. company. Amount: **50.000,00 Euro**
2022-2023	**Principal Investigator** (DISCAB, University of L'Aquila) Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy. Funds to investigate Covid19 cell entry mechanisms: DISCAB GRANT 2022 awarded by the Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila. Amount: **3.683,00 Euro**

2020-2021	**Principal Investigator** (University of Glasgow, Glasgow, Scotland, United Kingdom). Funds to investigate Covid19 spike protein interactions with the ACE2 receptor and the intracellular signalling involved in covid19 cell entry. Funded by the Welcome Trust Institutional Strategic Support Fund (ISSF) — COVID Response Fund (204820/Z/16/Z). Amount: **10.000,00 British Pound Sterling**

RESPONSIBILITY IN ACADEMIC ACTIVITIES MARCH 2023	**Member of the DISCAB internationalization committee.** University of L'Aquila, L'Aquila, IT. **Activities include:** • Taking advantage of the university and DISCAB online resources to inform students, PhDs, postdocs, researchers, and professors of international opportunities between the University of L'Aquila and other Universities, especially those within the European Union. • Developing strategies, in collaboration with the research and other university committees, to promote international exchanges of students, PhDs, postdocs, researchers, and professors between the university of L'Aquila and other universities, especially those within the European Union.
SINCE JULY 2022	**Member of the VITALITY, PNRR, project for innovation, digitalization, and sustainability for the diffused economy in Central Italy (E13C22001060006).** As Assistant Professor (tenure track position) 05/G1 - Pharmacology, clinical pharmacology and pharmacognosy (BIO/14), the university of L'Aquila has given me the task of promoting pharmaceutical technology development for research purposes at DISCAB (1125 hours maximum per year). *Project funded by the European Union -Next Generation EU.* **Activities include:** • Promoting pharmaceutical innovation at DISCAB.
SINCE JANUARY 2022	**Member of the Research Committee at DISCAB.** Department of Biotechnological and Applied Clinical Sciences (DISCAB), University of L'Aquila, L'Aquila, Italy. **Activities include:** • Implementing strategies to increase research quality within DISCAB, for instance, by favoring collaborations among research groups within the department. • Evaluating and selecting research projects to be funded by intramural fundings. • Evaluating and selecting best posters to be awarded. • Organizing and coordinating DISCAB seminars on different multidisciplinary research subjects. Facilitating interactions and potential collaborations by providing PhD students, postdocs, researchers, and professors with the chance to engage with speakers before and after their presentations.

JANUARY 2023	**Member of the selection committee (secretary role) to hire a postdoctoral research fellow. "***Studio molecolare e cellulare dell'internalizzazione della proteina di superficie ACE2 e della proteina intera spike volto alla promozione di strategie Anti-Covid19*". This postdoc fellowship funded by "07_DOMPE_2022_ROSSI_MARIO" grant and "07_COFIN_ATENEO_ASSEGNI_2023" funds. DISCAB, University of L'Aquila, L'Aquila, Italy.
AUGUST 2022	**Member of the selection committee to hire a postgraduate Fellow**. "*studio cellulare e molecolare dell'interazione tra la proteina virale spike del coronavirus covid19 e la proteina di superficie ACE2.*" Fellowship funded by "07_DOMPE_2022_ROSSI_MARIO" grant. DISCAB, University of L'Aquila, L'Aquila, Italy.
FEBRUARY 2022	**Member of the selection committee to evaluate candidates for a research fellowship position**. "*Studio della sintesi IRES dipendente di frammenti di recettori accoppiati alle proteine G.*" DISCAB, University of L'Aquila, L'Aquila, Italy.
ORGANIZATION AND MANAGERIAL ABILITIES AS	**Research Associate** on MRC Funds (MR/P019366). University Of Glasgow Institute of Molecular, Cell and Systems Biology, College of Medical, Veterinary and Life Sciences, Glasgow, United Kingdom. - Training of undergrads, PhD students, in-vitro, ex-vivo, and in-vivo laboratory techniques. - Engaging in collaborations with different internationally recognized research groups. **NIH Research Fellow**. NIDDK, Bethesda, Maryland, USA. - Training of research fellows in-vitro, ex-vivo, and in-vivo laboratory techniques for research purposes. - Engaging in collaborations with different internationally recognized groups. **Research Visiting Fellow** NIDDK, Bethesda, Maryland, USA. - Training of research fellows in-vitro, ex-vivo, and in-vivo laboratory techniques. - Engaging of in collaborations with different internationally recognized groups on different research projects. **Young Investigator** on FIRB Funds (RBIN04CKYN). Department of Neuroscience, Laboratories of Pharmacology, University of Pisa, Pisa, Italy - Training of undergrads in-vitro laboratory techniques for research purposes.
PROFICIENT AT USING:	Microsoft Office For Both Windows and Macintosh Operating Systems (word processor, spread sheet, presentation software, etc.)
TRAINED AT USING:	Galaxy Bioinformatic Platform for Transcriptomics Data Processing and Differential Gene Expression Analysis (E.g. FastQC, Trimmomatic, HISAT2 A, StringTie, DESeq2, etc.). Scafold4 Software for Proteomics Data Analysis (protein quantification and analysis).

	Metaboanalyst Bioinformatic Platform for Metabolomics Data Analysis. Bioinformatic Platforms to Identify Diseases and Cellular Pathways Associated with Changes in the Transcriptome, the Proteome, and the Metabolome (Pathway Studio, String, Panther, David)

SCIENTIFIC ACHIEVEMENTS BIBLIOMETRIC INDICATORS	**Scopus Author ID: 36554608900** **https://orcid.org/0000-0001-7004-0225** - RCID: 0000-0001-7004-0225 Total number of publications in peer-reviewed journals: 54 (Scopus) • First Author in 10 peer-reviewed journals • Last Author in 4 peer-reviewed journals • First Author in 2 peer-reviewed book-chapters • Second Author in 5 peer-reviewed journals Total number of citations: 1,091 (Scopus) H index: 21 (Scopus); total IF = 349.38

SELECTED PUBLICATIONS	1. Irene Fasciani, Francesco Petragnano, Ziming Wang, Ruairidh Edwards, Narasimha Telegu, Ilaria Pietrantoni, Ulrike Zabel, Henrik Zauber, Marlies Grieben, Maria E. Terzenidou, Jacopo Di Gregorio, Cristina Pellegrini, Silvano Santini Jr, Anna R. Taddei, Barbel Pöhl, Stefano Aringhieri, Marco Carli, Gabriella Aloisi, Francesco Marampon, Eve Charlesworth, Alexandra Roman, Sebastian Diecke, Vincenzo Flati, Franco Giorgi, Fernanda Amicarelli, Andrew B. Tobin, Marco Scarselli, Kostas Tokatlidis, **Mario Rossi**, Martin J. Lohse, Paolo Annibale, Roberto Maggio. One gene - two proteins: The C-terminus of the prototypical M2 muscarinic receptor localizes to the mitochondria and regulates cell respiration. Plos Biology. Accepted (March 2024) **IF 9.8; Q1** 2. Irene Fasciani, Francesco Petragnano, Federica Bono, Gabriella Aloisi, Veronica Mutti, Carla Pardini, Marco Carli, Marco Scarselli, Francesca Vaglini, Adriano Angelucci, Chiara Fiorentini, Luca Lozzi, Cristina Missale, Roberto Maggio, **Mario Rossi**. In-vitro approaches to investigate the detrimental effect of light on dopaminergic neurons. Neuroscience, 2024. 2024 Jan doi: 10.1016/j.neuroscience.2024.01.009. **IF 3.3; Q2** 3. Roberto Maggio, Irene Fasciani, Francesco Petragnano, Maria Francesca Coppolino, Marco Scarselli, and **Mario Rossi**. Unraveling the Functional Significance of Unstructured Regions in G Protein-Coupled Receptors. Biomolecules. 2023 Oct; 13(10): 1431. Published online 2023 Sep 22. doi: 10.3390/biom13101431 **IF: 5.5; Q1** 4. Louis Dwomoh #, **Rossi Mario** #, Miriam Scarpa, Elham Khajehali, Colin Molloy, Pawel Herzyk, Andrew R. Bottrill, Patrick M. Sexton, Arthur Christopoulos, P. J Conn, Craig W. Lindsley, Sophie J. Bradley , Andrew B. Tobin. M1 muscarinic receptor activation reduces the molecular pathology and slows the progression of prion-mediated neurodegenerative disease. doi: 10.1126/scisignal. abm3720. Epub 2022 Nov 15. # These authors contributed equally to this work. **IF 7.3; Q1**

5. Scarpa M, Molloy C, Jenkins L, Strellis B, Budgett RF, Hesse S, Dwomoh L, Marsango S, Tejeda GS, **Rossi M**, Ahmed Z, Milligan G, Hudson BD, Tobin AB, Bradley SJ. Biased M1 muscarinic receptor mutant mice show accelerated progression of prion neurodegenerative disease. Proc Natl Acad Sci U S A. 2021. Dec 14;118(50): e2107389118. doi: 10.1073/pnas.2107389118.
IF 11.1; Q1

6. Luiz Barella, **Rossi M** Sai Pydi, Jaroslawna Meister, Shanu Jain, Yinghong Cui, Oksana Gavrilova, Gianluca Fulgenzi, Lino Tessarollo, and Jurgen Wess. Beta-arrestin-1 is Required for Adaptive Beta-Cell Mass Expansion During Obesity. Nature communications. 2021 Jun 7;12(1):3385. doi: 10.1038/s41467-021-23656-1.
IF 16.6; Q1

7. Sophie J. Bradley, Colin Molloy, Paulina Valuskova, Louis Dwomoh, Miriam Scarpa, **Rossi M**, Lisa Finlayson, Kjell A. Svensson, Eyassu Chernet, Vanessa N. Barth, Karolina Gherbi, David A. Sykes, Caroline A. Wilson, Rajendra Mistry, Patrick M. Sexton, Arthur Christopoulos, Adrian J. Mogg, Elizabeth M. Rosethorne, Shuzo Sakata, R. A. John Challiss, Lisa M. Broad & Andrew B. Tobin. Biased M1-muscarinic-receptor-mutant mice inform the design of next-generation drugs. Nature Chemical Biology volume 16, pages240–249(2020).
IF 14.8; Q

8. Zhu L#, **Rossi M#**, Cohen A, Pham J, Zheng H, Dattaroy D, Mukaibo T, Melvin JE, Langel JL, Hattar S, Matschinsky FM, Appella DH, Doliba NM, Wess J. Proc Natl Acad Sci U S A. 2019 Sep 10;116(37):18684-18690. doi: 10.1073/pnas.1904943116. Epub 2019 Aug 26. Allosteric modulation of β-cell M3 muscarinic acetylcholine receptors greatly improves glucose homeostasis in lean and obese mice. # These authors contributed equally to this work.
IF 11.1; Q1

9. Barella LF, **Rossi M**, Zhu L, Cui Y, Mei FC, Cheng X, Chen W, Gurevich VV, Wess J. βCell-intrinsic β-arrestin 1 signaling enhances sulfonylurea-induced insulin secretion. J Clin Invest. 2019 Jun 11;130:3732-3737. doi: 10.1172/JCI126309.
IF 15.9; Q1

10. **Rossi M**, Zhu L, McMillin S, Pydi S, Cui Y, Lee R, Kaneto H, Birnbaum M, Ma Y, Rotman Y, Liu J, Cyphert T, Finkel T, McGuinness O, and Wess J. Hepatic Gi signaling as a critical novel regulator of whole-body glucose homeostasis. J Clin Invest. 2018 Feb 1;128(2):746-759. doi: 10.1172/JCI94505. Epub 2018 Jan 16.
IF 15.9; Q1

11. Zhu L#, **Rossi M#,** Cui Y, Lee R, Sakamoto W, Perry N, Urs N, Caron M, Gurevich V, Godlewski G, Kunos G, Chen M, Chen W, and Wess J. Hepatic b-arrestin-2 is essential for maintaining euglycemia. J Clin Invest. 2017 Jun 26. pii: 92913. doi: 10.1172/JCI92913. # These authors contributed equally to this work.
IF 15.9; Q1

12. Zhu L, Almac ą J, Dadi P, Hong H, Sakamoto W, **Rossi M**, Lee R, Vierra N, Lu H, Cui Y, McMillin S, Perry N, Gurevich V, Lee A, Kuo B, Leapman R, Matschinsky F, Doliba N, Urs N, Caron M, Jacobson D, Caicedo A & Wess J. b-Arrestin-2 is an essential regulator of pancreatic b-cell function under physiological and pathophysiological conditions. Nature Communication. 2016 Dec 15 DOI: 10.1038/ncomms14295.
IF 16.6; Q1

13. **Rossi M**, Ruiz de Azua I, Barella LF, Sakamoto W, Zhu L, Cui Y, Lu, H Rebholz H, Matschinsky FM, Doliba NM, Butcher AJ, Tobin AB, Wess J. CK2 acts as a potent negative regulator of receptor-mediated insulin release in vitro and in vivo. Proc Natl Acad Sci U S A. 2015 Dec 8;112(49):E6818-24.

IF 11.1; Q1

14. **Rossi M**, Dimida A, Ferrarini E, Silvano E, De Marco G, Agretti P, Aloisi G, Simoncini T, Di Bari L, Tonacchera M, Giorgi F, Maggio R. Presence of a putative steroidal allosteric site on glycoprotein hormone receptors. Eur J Pharmacol. 2009 Nov 25;623(1-3):155-9.

IF 5; Q2

15. **Rossi M**, Dimida A, Dell'anno MT, Trincavelli ML, Agretti P, Giorgi F, Corsini GU, Pinchera A, Vitti P, Tonacchera M, Maggio R. The thyroid disruptor 1,1,1-trichloro-2,2-bis(pchlorophenyl)-ethane appears to be an uncompetitive inverse agonist for the thyrotropin receptor. J Pharmacol Exp Ther. 2007 Jan;320(1):465-74.

IF 3.5; Q2

PLACE AND DATE

L'AQUILA, 28/03/2024