

Marco Lolicato

Dip. di Medicina Molecolare
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Education

- 2009–2012 **PhD**, *University of Milano*, Italy, .
Structural Biology, Biophysics of ion channel domains
PhD conferred on: 20/01/2012
- 2002–2008 **Advanced M.Sci. "Higher Education School"**, *Scuola Superiore di Catania*, Italy,
70/70 cum laude. <http://www.scuolasuperiorecatania.it/?lang=en>.
Electrophysiological characterization of a recombinant chimeric pore-forming protein
- 2005–2008 **M.Sci. in Biomolecular Chemistry**, *University of Catania*, Italy, 110/110 cum laude.
- 2002–2005 **BS. in Biology**, *University of Catania*, Italy, 110/110 cum laude.

Awards and Professional Membership

- Dec. 2015 **American Heart Association Postdoctoral Fellowship**
- Dec. 2013 *American Heart Association member*
- Dec. 2013 *Biophysical Society member*
- Jan. 2009 **Awarded PhD Fellowship**
- Oct. 2002 **Granted Admission to Scuola Superiore di Catania for Advanced B.S. + M.Sci**
- Jul. 2005 **8th Student Parabolic Flight Campaign, European Space Agency (ESA)**

International Recognition

- 2014 Commentary on paper: Lolicato et al., 2014, *Nat. Chem. Biol.* 10(6):457-62 - Haitin Y. *Structural biology: a 'funny' cyclic dinucleotide receptor*. 2014 Jun; *Nat Chem Biol.*
- 2017 Papers of note in *Nature* 547 (7663). Highlighted article: Lolicato et al., 2017, *Nature*. - VanHook AM., *Stabilizing channel leak*, *Science Signaling* <https://doi.org/10.1126/scisignal.aao4317>
- 2018 News & Views for Zhang S.Q. et al. paper on *Nat. Chem. Biol.* - Landau M. *Mimicking cross- α amyloids*. 2018, *Nat. Chem. Biol.* <https://doi.org/10.1038/s41589-018-0118-0>

Teaching Courses

2019 – 2021 **Stem Cells**, *University of Pavia, Dipartimento di Medicina Molecolare*, Master degree in 'Medical and Pharmaceutical Biotechnology'.

2020 – **Membrane Biophysics. Structural Biology applied to 'channelopathies'**, *University of Pavia, Dipartimento di Medicina Molecolare*, Master degree in 'Medical and Pharmaceutical Biotechnology'.

2020 – **Big Data - Proteomics module**, *University of Pavia, Dipartimento di Medicina Molecolare*, PhD program in 'Translational Medicine'.

2020 – **Molecular Biology of Cancer**, *University of Pavia, Dipartimento di Medicina Molecolare*, Scuola di Specializzazione in 'Anatomia Patologica'.

2022 – **RNA Technologies and Protein Engineering**, *University of Pavia, Dipartimento di Medicina Molecolare*, Master degree in 'Medical and Pharmaceutical Biotechnology'.

Scientific Boards

2019– *current* **UniPV PhD School in Translational Medicine.**

2022– *current* **UniPV EOS HPC Cluster Governance Committee.**

2024– *current* **International Center of Advanced Computing for Medicine (ICAM).**

Editorial Boards

2019– *current* **MDPI - Membranes.**

2021– *current* **Frontiers in Molecular Biosciences**, *Review Editor*, Structural Biology.

2021– *current* **Frontiers in Cell and Developmental Biology**, *Review Editor*, Structural Biology.

2021– *current* **Frontiers in Physiology.**

2024– *current* **Frontiers in Molecular Biosciences - Molecular Diagnostics and Therapeutics**, *Associate Editor.*

Patents

2022 **Patent application filed: Covalent, Chemogenetic activators for K2P potassium channels and uses thereof**, *Role: Inventor*, U.S. application serial no. 63/376,973.

Current Mentoring Experience

- o Mentor of 3 PhD students and 2 Post-docs;
- o Supervisor of >10 undergrad students and support during their thesis writing;
- o Career coach of master students in Medical and Pharmaceutical Biotechnology

Experience

2022– current **Associate Professor of Molecular Biology**, *University of Pavia, Dipartimento di Medicina Molecolare*, Pavia, Italy.

2019– 2022 **Tenure-track Assistant Professor**, *University of Pavia, Dipartimento di Medicina Molecolare*, Pavia, Italy.

Jan. 2012– **Post-doc**, *University of Milano*, Italy.

Dec. 2012 Structural biology and biochemistry

Discovered via structural biology methods and electrophysiological recordings a new binding site for a previous-unknown-modulator of the cardiac ion channel HCN4

May 2008– **International Graduated School Fellow**,

Dec. 2008 *University of Wuerzburg, Germany*

Jacobs University Bremen, Germany.

Molecular Biology and Electrophysiology of pore-forming proteins

Early-career experience in a foreign country to work on antibiotic translocation through bacterial porins and to carry-on additional electrophysiology experiments.

Languages

Italian Native speaker

English Fluent

Societies

o Alumni SSC member. <http://alumni.ssc.unict.it>

Publications

- [1] Nibali S.C., Siervi S.D., Luchinat E., Magrì A., Messina A., Brocca L., Mantovani S., Oliviero B., Mondelli M.U., Pinto V.D., Turato C., Arrigoni C., and **Lolicato** M. *Vdac1 selective molecules promote patient-derived cancer organoids death through mitochondrial-dependent metabolic interference*. **iScience** (April 2024).
- [2] *Atomwise AIMS Program. Ai is a viable alternative to high throughput screening: a 318-target study*. **Sci. Rep**, page 14(1):7526 (April 2024).
- [3] Barbato A., Giallongo C., Giallongo S., Romano A., Scandura G., Concetta S., Zuppelli T., **Lolicato** M., Lazzarino G., Parrinello N., Del Fabro V., Fontana P., Aguennoz M., Li Volti G., Palumbo G., Di Raimondo F., and Tibullo D. *Lactate trafficking inhibition restores sensitivity to proteasome inhibitors and orchestrates immuno-microenvironment in multiple myeloma*. **Cell Prolif.**, page 13388 (April 2023).
- [4] Iannucci L., D'Erchia A., Picardi E., Bettio D., Conca F., Surdo N., Di Benedetto G., Musso D., Arrigoni C., **Lolicato** M., Vismara M., Grisan F., Salviati L., Milanese L.,

- Pesole G., and K. L. *Cyclic AMP induces reversible EPAC1 condensates that regulate histone transcription. Nat Commun.*, page 5521 (September 2023).
- [5] Arrigoni C., **Lolicato** M., Shaya D., Rohaim A., Findeisen F., Colleran C.M., Dominik P., Kim S.S., Schuermann J., Kossiakoff A.A., and Minor D.L. *Quaternary structure independent folding of voltage-gated ion channel pore domain subunits. Nat Struct Mol Biol.*, page 2021.08.15.456357 (June 2022).
- [6] Longhitano L., Vicario N., Forte S., Giallongo C., Broggi G., Caltabiano R., Barbagallo G.M.V., Altieri R., Raciti G., Di Rosa M., Caruso M., Parenti R., Liso A., Busi F., **Lolicato** M., Mione M.C., Li Volti G., and Tibullo D. *Lactate modulates microglia polarization via IGFBP6 expression and remodels tumor microenvironment in glioblastoma. Cancer Immunol Immunother.* (June 2022).
- [7] Saponaro A. and **Lolicato** M. *Editorial: The key role of lipids in the regulation of ion channels. Front Physiol.*, page 13:1000082 (September 2022).
- [8] Lee H., **Lolicato** M., Arrigoni C., and Minor D.L. *Production of K_{2P}2.1 (TREK-1) for structural studies. In Methods in Enzymology* (January 2021).
- [9] Pellavio G., Todaro F., Alberizzi P., Scotti C., Gastaldi G., **Lolicato** M., Omes C., Caliozna L., Nappi R.E., and Laforenza U. *Hpv infection affects human sperm functionality by inhibition of aquaporin-8. Cells* (2020). doi:10.3390/cells9051241.
- [10] Pope L., **Lolicato** M., and Minor D.L. *Polynuclear ruthenium amines inhibit k2p channels via a "finger in the dam" mechanism. Cell chemical biology* (2020). doi:10.1016/j.chembiol.2020.01.011.
- [11] **Lolicato** M., Natale A.M., Abderemane-Ali F., Crottès D., Capponi S., Duman R., Wagner A., Rosenberg J.M., Grabe M., and Minor D.L. *K2P channel C-type gating involves asymmetric selectivity filter order-disorder transitions. Science advances*, 6(44) (October 2020).
- [12] Yen T.J., **Lolicato** M., Thomas-Tran R., Du Bois J., and Minor D.L. *Structure of the saxiphilin:saxitoxin (STX) complex reveals a convergent molecular recognition strategy for paralytic toxins. Science advances*, 5(6):eaax2650 (June 2019).
- [13] **Lolicato** M., Ely L., Tovo D., Lowe K., Kim Y.C., Samuel D., Bessette P., Garcia J.L., Mikita T., Minor D.L., and Coughlin S.R. *Structural Basis for Activity and Specificity of an Anticoagulant Anti-FXIIa Monoclonal Antibody and a Reversal Agent. Structure*, 26(2):187–198 (feb 2018).
- [14] Zhang S.Q., Huang H., Yang J., Kratochvil H.T., **Lolicato** M., Shu X., Liu L., and DeGrado W.F. *Designed peptides that assemble into cross- α amyloid-like structures. Nat. Chem. Biol.*, 14(9):870–875 (Sep 2018).
- [15] Dang S., Feng S., Tien J., Peters C.J., Bulkley D., **Lolicato** M., Zhao J., Zuberbuehler K., Ye W., Tingxu Chen L.Q., Chen T., Craik C., Jan Y.N., Minor D.L., Cheng Y., and

- Jan L.Y. *Cry-o-EM structures of the TMEM16A calcium-activated chloride channel*. *Nature*, 552(7685):426–429 (dec 2017).
- [16] **Lolicato** M., Arrigoni C., Mori T., Sekioka Y., Bryant C., Clark K.A., and Minor D.L. *K2P2.1 (TREK-1)-activator complexes reveal a cryptic selectivity filter binding site*. *Nature*, 547(7663):364–368 (July 2017).
- [17] Möller S., Alfieri A., Bertinetti D., Aquila M., Schwede F., **Lolicato** M., Rehmann H., Moroni A., and Herberg F.W. *Cyclic Nucleotide Mapping of Hyperpolarization-Activated Cyclic Nucleotide-Gated (HCN) Channels*. *ACS Chem. Biol.*, 9(5):140307145540001–1137 (March 2014).
- [18] **Lolicato** M., Bucchi A., Arrigoni C., Zucca S., Nardini M., Schroeder I., Simmons K., Aquila M., DiFrancesco D., Bolognesi M., Schwede F., Kashin D., Fishwick C.W.G., Johnson A.P., Thiel G., and Moroni A. *Cyclic dinucleotides bind the C-linker of HCN4 to control channel cAMP responsiveness*. *Nat. Chem. Biol.*, 10(6):457–462 (April 2014).
- [19] **Lolicato** M., Riegelhaupt P.M., Arrigoni C., Clark K.A., and Minor D.L. *Transmembrane Helix Straightening and Buckling Underlies Activation of Mechanosensitive and Thermosensitive K2P Channels*. *Neuron*, 84(6):1198–1212 (December 2014).
- [20] Antoniani D., Rossi E., Rinaldo S., Bocci P., **Lolicato** M., Paiardini A., Raffaelli N., Cutruzzolà F., and Landini P. *The immunosuppressive drug azathioprine inhibits biosynthesis of the bacterial signal molecule cyclic-di-GMP by interfering with intracellular nucleotide pool availability*. *Appl. Microbiol. Biotechnol.*, 97(16):7325–7336 (August 2013).
- [21] Reina S., Magrì A., **Lolicato** M., Guarino F., Impellizzeri A., Maier E., Benz R., Ceccarelli M., De Pinto V., and Messina A. *Deletion of β -strands 9 and 10 converts VDAC1 voltage-dependence in an asymmetrical process*. *Biochim. Biophys. Acta*, 1827(6):793–805 (June 2013).
- [22] Wulfmeyer T., Polzer C., Hiepler G., Hamacher K., Shoeman R., Dunigan D.D., Van Etten J.L., **Lolicato** M., Moroni A., Thiel G., and Meckel T. *Structural organization of DNA in chlorella viruses*. *PLoS one*, 7(2):e30133 (2012).
- [23] **Lolicato** M., Nardini M., Gazzarrini S., Möller S., Bertinetti D., Herberg F.W., Bolognesi M., Martin H., Fasolini M., Bertrand J.A., Arrigoni C., Thiel G., and Moroni A. *Tetramerization Dynamics of C-terminal Domain Underlies Isoform-specific cAMP Gating in Hyperpolarization-activated Cyclic Nucleotide-gated Channels*. *J. Biol. Chem.*, 286(52):44811–44820 (December 2011).
- [24] **Lolicato** M., Reina S., Messina A., Guarino F., Winterhalter M., Benz R., and De Pinto V. *Generation of artificial channels by multimerization of β -strands from natural porin*. *Biol. Chem.*, 392(7):617–624 (July 2011).