Eric Adriano Zizzi, PhD

M3B Lab, Polito^{BIO}MedLab,
Department of Mechanical and Aerospace Engineering
Politecnico di Torino
Corso Duca degli Abruzzi 24, 10129, Turin (ITALY)

Professional Experience

7/2023 – today	**Post-doctoral Fellow** Politecnico di Torino, Italy
2/2023 – 4/2023	**Visiting Research Student** University of Ottawa, Canada
11/2019 – 7/2023	**PhD Student** University of Turin, Italy
03/2017 – 06/2017	**Undergraduate University Intern** Politecnico di Torino, Italy
02/2017 – 03/2017	**Biomedical Laboratory Intern** University of Modena and Reggio Emilia, Italy

Education

2019 - 2023 **Doctor of Philosophy (PhD)**

Bioengineering and Medical-Surgical Sciences

University of Turin, Politecnico di Torino (joint degree), Italy
Thesis title: *Strategies for the molecular-level understanding of small molecule-target interactions and dynamics through tailored computational modelling*
Supervisors: Prof. Marco A. Deriu, Prof. Jack A. Tuszynski
Thesis Referees: Prof. Dr. Donald Weaver, Prof. Dr. Andrea Danani

2017 - 2019 **Master's degree in biomedical engineering**

Politecnico di Torino, Italy
Final degree: 110/110 cum laude
Thesis title: *Predicting the Interaction between Volatile Anesthetics and Cytoskeleton Proteins by Molecular Modeling*
Supervisors: Prof. Marco Agostino Deriu, Prof. Jack A. Tuszynski

2014 - 2017 **Bachelor's degree in biomedical engineering**

Politecnico di Torino, Turin (ITALY)
Final degree: 100/110
Thesis title: *Analysis of medical images at the cellular scale*

Awards

2024 **Best Paper Award:** In Silico Analysis of the Multi-Targeted Mode of Action of Ivermectin and Related Compounds. M. Aminpour, M. Cannariato, J. Preto, M. E. Safaeeardebili, A. Moracchiato, D. Doria, F. Donato, E.A. Zizzi, M.A. Deriu, D.E. Scheim, A. D. Santin, J. A. Tuszynski. *Computation* 2022, 10(4), 51; https://doi.org/10.3390/computation10040051

2021 **Cover Art:** ACS Central Science, Vol. 9 N. 3, related to the publication "Electronic Energy Migration in Microtubules"

2020 **Cover Art**: Journal of Medicinal Chemistry, Vol. 64 N. 21, related to the publication "Noncovalent Interactions with PAMAM and PPI Dendrimers Promote the Cellular Uptake and Photodynamic Activity of Rose Bengal: The Role of the Dendrimer Structure."

Publications

2025 **Zizzi, E. A.**, Sztandera, K., Gorzkiewicz, M., Buczkowski, A., Apartsin, E., Deriu, M. A., & Klajnert-Maculewicz, B. (2025). Molecular interactions driving the complexation of rose bengal by triazine-carbosilane dendrons. *Nanoscale,* 17, 1433-1448

2024 Cannariato, M., Fanunza, R., **Zizzi, E. A**., Miceli, M., Di Benedetto, G., Deriu, M. A., & Pallante, L. (2024). Exploring TAS2R46 biomechanics through molecular dynamics and network analysis. *Frontiers in Molecular Biosciences,* 11, 1473675.

2024 Toro, A., Arévalo, A. P., Pereira-Gómez, M., Sabater, A., **Zizzi, E. A.,** Perbolianachis, P., ... & Gueron, G. (2024). Blood matters: the hematological signatures of Coronavirus infection. *Cell Death & Disease*, 15(11), 863.

2024 Cannariato, M., **Zizzi, E. A.,** Tuszynski, J. A., & Deriu, M. A. (2024). Multiscale Computational Analysis of the Effect of Taxol on Microtubule Mechanics. ACS Biomaterials Science & Engineering, 10(9), 5666-5674.

2024 Miceli, M., Cannariato, M., Tortarolo, R., Pallante, L., **Zizzi, E. A.**, & Deriu, M. A. (2024). Conformational Dynamics and Molecular Characterization of Alsin MORN monomer and dimeric assemblies. *Proteins: Structure, Function, and Bioinformatics*. (in press)

2024 Pallante, L.; Cannariato, M.; Androutsos, L.; **Zizzi, E. A**.; Bompotas, A.; Hada, X.; Grasso, G.; Kalogeras, A.; Mavroudi, S.; Di Benedetto, G.; Theofilatos, K.; Deriu, M. A. VirtuousPocketome: A Computational Tool for Screening Protein–Ligand Complexes to Identify Similar Binding Sites. Scientific Reports 2024, 14 (1), 6296. https://doi.org/10.1038/s41598-024-56893-7.

2023 Truglia, B., Carbone, N., Ghadre, I., Vallero, S., Zito, M**., Zizzi, E. A**., ... & Tuszynski, J. A. (2023). An In Silico Investigation of the Molecular Interactions between Volatile Anesthetics and Actin. *Pharmaceuticals*, *17*(1), 37.

2023 Cannariato, M., **Zizzi, E. A.**, Pallante, L., Miceli, M., & Deriu, M. A. (2023). Mechanical communication within the microtubule through network-based analysis of tubulin dynamics. *Biomechanics and Modeling in Mechanobiology*, 1-11.

2023 Sztandera, K., Gorzkiewicz, M., **Zizzi, E. A.,** Dybczak, N., Poltorak, L., Deriu, M. A., & Klajnert-Maculewicz, B. (2023). Cellular uptake of rose bengal is mediated by OATP1B1/1B3 transporters. *Bioelectrochemistry*, *152*, 108449.

2023 Kalra, A. P.; Benny, A.; Travis, S. M.; **Zizzi, E. A**.; Morales-Sanchez, A.; Oblinsky, D. G.; Craddock, T. J. A.; Hameroff, S. R.; MacIver, M. B.; Tuszyński, J. A.; Petry, S.; Penrose, R.; Scholes, G. D. Electronic Energy Migration in Microtubules. *ACS Cent. Sci.* **2023**, acscentsci.2c01114. https://doi.org/10.1021/acscentsci.2c01114.

2022 **Zizzi, E. A.;** Cavaglià, M.; Tuszynski, J. A.; Deriu, M. A. Alteration of Lipid Bilayer Mechanics by Volatile Anesthetics: Insights from Ms-Long Molecular Dynamics Simulations. *iScience* **2022**, *25* (3), 103946. https://doi.org/10.1016/J.ISCI.2022.103946/ATTACHMENT/2A3FBAAF-AD50-4195-B199-06838EFE2870/MMC1.PDF.

2022 Uchida, N.; Kohata, A.; Okuro, K.; Cardellini, A.; Lionello, C.; **Zizzi, E. A**.; Deriu, M. A.; Pavan, G. M.; Tomishige, M.; Hikima, T.; Aida, T. Reconstitution of Microtubule into GTP-Responsive Nanocapsules. *Nature Communications 2022 13:1* **2022**, *13* (1), 1–11. https://doi.org/10.1038/s41467-022-33156-5.

2022 Cavaglià, M.; **Zizzi, E. A.**; Dombrowski, S.; Deriu, M. A.; Tuszynski, J. A. Alteration of Consciousness by Anaesthetics: A Multiscale Modulation from the Molecular to the Systems Level. *Journal of Consciousness Studies* **2022**, *29* (5), 21–49. https://doi.org/10.53765/20512201.29.5.021.

2022 Brigante, G.; Lazzaretti, C.; Paradiso, E.; Nuzzo, F.; Sitti, M.; Tüttelmann, F.; Moretti, G.; Silvestri, R.; Gemignani, F.; Försti, A.; Hemminki, K.; Elisei, R.; Romei, C.; **Zizzi, E. A.;** Deriu, M. A.; Simoni, M.; Landi, S.; Casarini, L. Genetic Signature of Differentiated Thyroid Carcinoma Susceptibility: A Machine Learning Approach. *European Thyroid Journal* **2022**, *11* (5). https://doi.org/10.1530/ETJ-22-0058.

2022 Aminpour, M.; Cannariato, M.; Preto, J.; Safaeeardebili, M. E.; Moracchiato, A.; Doria, D.; Donato, F.; **Zizzi, E. A.;** Deriu, M. A.; Scheim, D. E.; Santin, A. D.; Tuszynski, J. A. In Silico Analysis of the Multi-Targeted Mode of Action of Ivermectin and Related Compounds. *Computation 2022, Vol. 10, Page 51* **2022**, *10* (4), 51. https://doi.org/10.3390/COMPUTATION10040051.

2021 **Zizzi, E. A.;** Cavaglià, M.; Tuszynski, J. A.; Deriu, M. A. Insights into the Interaction Dynamics between Volatile Anesthetics and Tubulin through Computational Molecular Modelling. *Journal of Biomolecular Structure and Dynamics* **2021**, 1–15. https://doi.org/10.1080/07391102.2021.1897044.

2021 Sztandera, K.; Gorzkiewicz, M.; Dias Martins, A. S.; Pallante, L.; **Zizzi, E. A**.; Miceli, M.; Bątal, M.; Reis, C. P.; Deriu, M. A.; Klajnert-Maculewicz, B. Noncovalent Interactions with PAMAM and PPI Dendrimers Promote the Cellular Uptake and Photodynamic Activity of Rose Bengal: The Role of the Dendrimer Structure. *Journal of Medicinal Chemistry* **2021**, *64* (21), 15758–15771. https://doi.org/10.1021/acs.jmedchem.1c01080.

2020 Gaetani, R.; **Zizzi, E. A.;** Deriu, M. A.; Morbiducci, U.; Pesce, M.; Messina, E. When Stiffness Matters: Mechanosensing in Heart Development and Disease. *Frontiers in Cell and Developmental Biology* **2020**, *8*. https://doi.org/10.3389/fcell.2020.00334.

Conference Proceedings

2021 **Zizzi E.A.,** Pallante L., Miceli M., Tuszynski J.A., Deriu M.A. PAMAM and PPI dendrimers as potential anti-cancer drug carriers: a computational investigation. CancerTO - Nanoscience

in Cancer Immunotherapy. Frontiers Event Abstracts, p.120. doi: 10.3389/978-2-88966-543-3

2021 Pallante L., **Zizzi E.A.,** Miceli M., Grasso G., Huczynski A, Tuszynski J.A., Deriu M.A. Understanding the molecular binding mechanism of colchicine derivatives targeting βIII human tubulin isotype. CancerTO - Nanoscience in Cancer Immunotherapy. Frontiers Event Abstracts, p.120. doi: 10.3389/978-2-88966-543-3

2021 **Zizzi, E.A**., Cavaglià M., Deriu M.A., Tuszynski, J.A. Molecular Dynamics And Binding Mechanisms Of Volatile Anesthetics Targeting Human Tubulin. 26th Congress of the European Society of Biomechanics, European Society of Biomechanics. https://hdl.handle.net/11583/2940059

International Conferences and Workshops

2025 **Bridging Scales: Computational Biophysics, Subcellular Mechanics and Medicine**

Type: Oral Presentation
Title: *Characterizing drug-nanocarrier interactions through molecular dynamics simulations*

2022 **The TWCF Banff Workshop**

Experimental Testing of the Orch OR Theory of Consciousness

Type: Oral Presentation

Title: *Interaction dynamics between anesthetics and biomolecular targets: computational approaches*

2022 **CCPBioSim 2022**

8th Annual CCPBioSim Conference Frontiers in Biomolecular Simulation 2022
Edinburgh, Scotland
Type: Poster & flash talk
Title: *Dendrimeric nanoparticles for photodynamic therapy: molecular- level insights from MD simulations*

2021 **CancerTO**

Nanoscience in Cancer Immunotherapy
Turin, Italy (Online)
Type: Oral presentation & poster
Title: *PAMAM and PPI dendrimers as potential anti-cancer drug carriers: a computational investigation*

2021 **ESB 2021**

26th Congress of the European Society of Biomechanics
Milan, Italy (Online)
Type: Poster & flash talk
Title: *Molecular Dynamics And Binding Mechanisms Of Volatile Anesthetics Targeting Human Tubulin*

2020 **Virtuous Transfer of Knowledge (ToK) - First Workshop**

First Workshop of the EU-funded VIRTUOUS project (GA: 872181)
Patras, Greece (Online)
Type: Oral presentation
Title: *Characterization of Receptor-Ligand interactions: computational approaches*

Professional Memberships

Editorial Board Member

2023 – Today *Biological Modeling and Simulation* (specialty section of *Frontiers in Molecular Biosciences* and *Frontiers in Applied Mathematics and Statistics*)

2023 – Today *Frontiers in Computational Neuroscience*

Membership of Scientific Societies

- European Society of Biomechanics (member ID 3217)
- American Chemical Society (member number 32730779)
- Biophysical Society (member ID 120390)
- Italian Chapter of the European Society of Biomechanics
- 'Centro 3R'

Courses, Workshops and Schools

Eric A. Zizzi participated in the following national and international courses, workshops and school that have enhanced his skills in molecular modelling and machine learning methods.

2020	Computing@Polito Workshop – HPC/Big Data/Cloud for Research
2020	Multiscale modelling and coarse-graining for flow and transport PDEs
2020	ICTP-SISSA-CECAM Workshop on Molecular Dynamics and Applications to BioSystems
2020	BioExcel Winter School on Biomolecular Simulations
2021	Non-Extensive Statistical Mechanics
2022	AIDD 2022 Spring School
2022	2022 Workshop on MDAnalysis/Machine Learning
2023	1st European Summer School on Artificial Intelligence (ESSAI) and 20th Advanced Course on AI (ACAI)