

# Stanford

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## Luca Rosalia

Postdoctoral Scholar, Bioengineering

### Bio

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#### BIO

Luca Rosalia received his bachelor's and master's degrees in Biomedical Engineering from the University of Glasgow (UK). During his studies, he visited the National University of Singapore and the University of Cambridge, where he gained his first exposure to the fields of soft robotics and tissue biomechanics. He pursued doctoral studies in the Health Sciences and Technology (HST) Ph.D. program of Harvard University and Massachusetts Institute of Technology in the lab of Ellen Roche and he's currently at Stanford University as a Postdoctoral Scholar in Bioengineering in the Skylar-Scott lab.

His doctoral work primarily focused on high-fidelity and patient-specific soft robotic preclinical models of valvular heart disease, congenital defects, and heart failure with preserved ejection fraction. Luca leveraged these platforms for the testing and development of medical devices through several partnerships with industry. During his studies, he also worked as an R&D engineer in the Structural Heart division of Abbott Laboratories on the development of transcatheter aortic valve replacements (TAVR). He also gained clinical experience at the Veterans Affairs Medical Center in Boston and at Boston Children's Hospital. In the Skylar-Scott lab, Luca will be working on whole-heart bioprinting.

#### HONORS AND AWARDS

- Career Awards at the Scientific Interface (CASI), The Burroughs Wellcome Fund (2024)

#### STANFORD ADVISORS

- Mark Skylar-Scott, Postdoctoral Faculty Sponsor

#### LINKS

- My website: <https://www.lucarosalia.com/>

### Publications

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#### PUBLICATIONS

- **A Low-Cost, Open-Source 3D Printer for Multimaterial and High-Throughput Direct Ink Writing of Soft and Living Materials.** *Advanced materials (Deerfield Beach, Fla.)*  
Weiss, J. D., Mermin-Bunnell, A., Solberg, F. S., Tam, T., Rosalia, L., Sharir, A., Rüttsche, D., Sinha, S., Choi, P. S., Shibata, M., Palagani, Y., Nilkant, R., Paulvannan, et al  
2025: e2414971
- **Soft robotic platform for progressive and reversible aortic constriction in a small-animal model** *SCIENCE ROBOTICS*  
Rosalia, L., Wang, S. X., Ozturk, C., Huang, W., Bonnemain, J., Beatty, R., Duffy, G. P., Nguyen, C. T., Roche, E. T.  
2024; 9 (91): eadj9769

- **Modulating Cardiac Hemodynamics Using Tunable Soft Robotic Sleeves in a Porcine Model of HFpEF Physiology for Device Testing Applications** *ADVANCED FUNCTIONAL MATERIALS*  
Rosalia, L., Ozturk, C., Wang, S. X., Quevedo-Moreno, D., Saeed, M. Y., Mauskapf, A., Roche, E. T.  
2023
- **Soft robotic patient-specific hydrodynamic model of aortic stenosis and ventricular remodeling** *SCIENCE ROBOTICS*  
Rosalia, L., Ozturk, C., Goswami, D., Bonnemain, J., Wang, S. X., Bonner, B., Weaver, J. C., Puri, R., Kapadia, S., Nguyen, C. T., Roche, E. T.  
2023; 8 (75): eade2184
- **A magnetically actuated, optically sensed tensile testing method for mechanical characterization of soft biological tissues** *SCIENCE ADVANCES*  
Rosalia, L., Hallou, A., Cochrane, L., Savin, T.  
2023; 9 (2): eade2522
- **A soft robotic sleeve mimicking the haemodynamics and biomechanics of left ventricular pressure overload and aortic stenosis** *NATURE BIOMEDICAL ENGINEERING*  
Rosalia, L., Ozturk, C., Coll-Font, J., Fan, Y., Nagata, Y., Singh, M., Goswami, D., Mauskapf, A., Chen, S., Eder, R. A., Goffer, E. M., Kim, J. H., Yurista, et al  
2022; 6 (10): 1134-+
- **Device-Based Solutions to Improve Cardiac Physiology and Hemodynamics in Heart Failure With Preserved Ejection Fraction** *JACC-BASIC TO TRANSLATIONAL SCIENCE*  
Rosalia, L., Ozturk, C., Shoar, S., Fan, Y., Malone, G., Cheema, F. H., Conway, C., Byrne, R. A., Duffy, G. P., Malone, A., Roche, E. T., Hameed, A.  
2021; 6 (9-10): 772-795
- **Geometry-Based Customization of Bending Modalities for 3D-Printed Soft Pneumatic Actuators** *IEEE ROBOTICS AND AUTOMATION LETTERS*  
Rosalia, L., Ang, B., Yeow, R.  
2018; 3 (4): 3489-3496
- **AI-Powered Multimodal Modeling of Personalized Hemodynamics in Aortic Stenosis.** *Advanced science (Weinheim, Baden-Wurtemberg, Germany)*  
Ozturk, C., Pak, D. H., Rosalia, L., Goswami, D., Robakowski, M. E., McKay, R., Nguyen, C. T., Duncan, J. S., Roche, E. T.  
2024: e2404755
- **A Soft Robotic Actuator System for In Vivo Modeling of Normal Pressure Hydrocephalus.** *IEEE transactions on bio-medical engineering*  
Flurenbrock, F., Rosalia, L., Podgorsak, A., Sapozhnikov, K., Trimmel, N. E., Weisskopf, M., Oertel, M. F., Roche, E., Zeilinger, M. N., Korn, L., Daners, M. S.  
2024; 71 (3): 998-1009
- **A Multi-Domain Simulation Study of a Pulsatile-Flow Pump Device for Heart Failure With Preserved Ejection Fraction** *FRONTIERS IN PHYSIOLOGY*  
Ozturk, C., Rosalia, L., Roche, E. T.  
2022; 13: 815787
- **Computational Modeling of a Low-Cost Fluidic Oscillator for Use in an Educational Respiratory Simulator** *ADVANCED NANOBIO MED RESEARCH*  
Dillon, T., Ozturk, C., Mendez, K., Rosalia, L., Gollob, S., Kempf, K., Roche, E.  
2021; 1 (12): 2000112
- **Object-Oriented Lumped-Parameter Modeling of the Cardiovascular System for Physiological and Pathophysiological Conditions** *ADVANCED THEORY AND SIMULATIONS*  
Rosalia, L., Ozturk, C., Van Story, D., Horvath, M. A., Roche, E. T.  
2021; 4 (3)
- **Lumped-Parameter and Finite Element Modeling of Heart Failure with Preserved Ejection Fraction** *JOVE-JOURNAL OF VISUALIZED EXPERIMENTS*  
Rosalia, L., Ozturk, C., Roche, E. T.  
2021
- **A SOFT ROBOTIC SLEEVE FOR COMPRESSION THERAPY OF THE LOWER LIMB**

Rosalia, L., Lamberti, K. K., Landry, M. K., Leclerc, C. M., Shuler, F. D., Hanumara, N. C., Roche, E. T., IEEE  
IEEE.2021: 1280-1283

- **An organosynthetic soft robotic respiratory simulator** *APL BIOENGINEERING*

Horvath, M. A., Hu, L., Mueller, T., Hochstein, J., Rosalia, L., Hibbert, K. A., Hardin, C. C., Roche, E. T.  
2020; 4 (2): 026108