

# Alice Tomei

Assistant Professor  
University of Miami College of Engineering  
Biomedical Engineering  
(305) 243-3469  
atomei@miami.edu  
<https://www.tomeilab.com/>

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## BIOGRAPHY

Dr. Tomei is an Assistant Professor in the department of Biomedical Engineering of the University of Miami and the director of the Islet Immunoengineering Laboratory ([www.tomeilab.com](http://www.tomeilab.com)) at the University of Miami Diabetes Research Institute. Dr. Tomei's background uniquely combines expertise in bioengineering and immunology and she is applying her skills to the development of novel immunoengineering platforms to prevent rejection after islet transplantation and to promote antigen-specific tolerance for a cure of type-1 diabetes. To that end, her strategy is to design and develop novel technology platforms with strong clinical translation potential that are supported by solid mechanistic studies in preclinical models of type-1 diabetes that are relevant to the human disease. Her enthusiastic commitment to type-1 diabetes cure-focused research is matched by a solid track record of academic achievements and translational efforts. She has trained in the best engineering school in Italy, the Politecnico di Milano. Then, she conducted her PhD work at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, under the mentorship of Dr. Melody Swartz, world leader in lymphatic and cancer mechanobiology. Then, Dr. Tomei conducted her postdoctoral fellowship at EPFL in the laboratory of Dr. Jeffrey Hubbell, world leader in molecular engineering, and in collaboration with Dr. Cherie Stabler, a leader in diabetes bioengineering research. In recognition of these accomplishments, in 2012, Dr. Tomei was invited to become part of the prestigious Juvenile Diabetes Research Foundation (JDRF) encapsulation consortium, which gathers the world leaders in islet encapsulation and transplantation, and promotes collaborations, sharing of data and protocols with the overall goal of advancing the field. Dr. Tomei has presented her research work at several international conferences, including an invited oral presentation at the Key Opinion Leaders Meeting on Stem Cell Derived Beta Cells at Harvard Medical School in Boston in October 2016, an oral presentation at the annual meeting of the Immunology of Diabetes Society in San Francisco in January 2017, an invited oral presentation at the annual meeting of the international society for cellular therapy (ISCT) in London in May 2017, and an invited oral presentation at the annual meeting of the American Diabetes Association in San Diego in June 2017. Finally, she was invited to serve as member of the grant review panels for both the JDRF and for the California Institute for Regenerative Medicine (CIRM). Dr. Tomei's research has been funded by the Diabetes Research Institute Foundation, the Iacocca Family Foundation, the Juvenile Diabetes Research Foundation (JDRF), the Helmsley Trust, the Tronchetti Provera Foundation, the Children with Diabetes Foundation, the Department of Defense, and the National Institute of Health, including a recently awarded JDRF career development award and a NIH R01. In recognition of her research productivity, Dr. Tomei was awarded the Eliahu I. Jury Early Career Research Award for obtaining major research grants in 2016 and the Alexander Orr Excellence in Teaching Award in 2018. These important achievements further highlight her recognition in the field of immunoengineering for type-1 diabetes.

## RESEARCH INTERESTS

Development of more effective immunoisolation strategies to prevent rejection in allogeneic cell transplantation.  
Development of novel means to promote immunological tolerance to allo- and auto-antigens

## HIGHER EDUCATION

- École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, Ph.D. in Biotechnology and Bioengineering. (2008)
- Politecnico di Milano, Milan, Italy, M.S. in Materials Engineering. (2004)
- Politecnico di Milano, Milan, Italy, B.S. in Materials Engineering. (2002)

## EXPERIENCE

- University of Miami, Assistant Professor. Department of Biomedical Engineering (2015 - Present)
- University of Miami's Miller School of Medicine, Director of the Islet Immunoengineering Lab. Diabetes Research Institute (2012 - Present)
- University of Miami's Miller School of Medicine, Research Assistant Professor. Diabetes Research Institute (2012 - 2014)
- University of Miami's Miller School of Medicine, Visiting Scientist. Diabetes Research Institute (2010 - 2012)

## PUBLICATIONS

### Juried or Refereed Journal Articles or Exhibitions

- Buchwald, P., Tamayo, A., Manzoli, V., **Tomei, A.**, Stabler, C. (2018). Glucose-Stimulated Insulin Release: Parallel Perfusion Studies of Free and Hydrogel Encapsulated Human Pancreatic Islets. *Biotechnology & Bioengineering* (IF=4.5).
- Manzoli, V., Villa, C., Bayer, A., Molano, D. R., Torrente, Y., Ricordi, C., Hubbell, J., Tomei, A. A. (2017). Immunoisolation of Murine Islet Allografts in Vascularized Sites Through Conformal Coating with Polyethylene Glycol. *American Journal of Transplantation* (IF=5.7).
- Manzoli, V., Colter, D. C., Dhanaraj, S., Fornoni, A., Ricordi, C., Pileggi, A., **Tomei, A.** (2017). Engineering human renal epithelial cells for transplantation in regenerative medicine.. *Medical engineering & physics*, 48, 3-13.
- Villa, C., Manzoli, V., Abreu, M., Verheyen, C., Seskin, M., Najjar, M., Molano, R. D., Torrente, Y., Ricordi, C., **Tomei, A.** (2017). Effects of Composition of Alginate-Polyethylene Glycol Microcapsules and Transplant Site on Encapsulated Islet Graft Outcomes in Mice.. *Transplantation* (IF=3.5), 101, 1025-1035.
- Manzoli, V., Colter, D. C., Dhanaraj, S., Fornoni, A., Ricordi, C., Pileggi, A., Tomei, A. A. (2017). Engineering Human Renal Epithelial Cells for Transplantation in Regenerative Medicine. *Medical Engineering & Physics* (IF=2.2) .
- **Tomei, A.**, Villa, C., Ricordi, C. (2015). Development of an encapsulated stem cell-based therapy for diabetes. *Expert Opinion on Biological Therapy* (IF=3.7), 15.
- Najjar, M., Manzoli, V., Villa, C., Martino, M. M., Molano, R. D., Torrente, Y., Pileggi, A., Inverardi, L., Ricordi, C., Hubbell, J. A., **Tomei, A.** (2015). Fibrin Gels Engineered with Pro-Angiogenic Growth Factors Promote Engraftment of Pancreatic Islets in Extrahepatic Sites in Mice. *Biotechnology and Bioengineering* (IF=4.5), 112, 1916-26.
- **Tomei, A.**, Manzoli, V., Fraker, C., Giraldo, J. A., Velluto, D., Najjar, M., Pileggi, A., Molano, R. D., Ricordi, C., Stabler, C. L., Hubbell, J. A. (2014). Device design and materials optimization of conformal coating for islets of Langerhans. *Proc Natl Acad Sci* (IF=9.7), 111, 10514-9.
- Dane, K., Nembrini, C., **Tomei, A.**, Eby, J. K., O'Neil, C. P., Velluto, D., Swartz, M. A., Inverardi, L., Hubbell, J. A. (2011). Nano-sized drug-loaded micelles deliver payload to lymph node immune cells and prolong allograft survival. *J Control Release* (IF=7.7), 156, 154-60.
- Shields, J. D., Kourtis, I., **Tomei, A.**, Roberts, J., Swartz, M. A. (2010). Induction of lymphoidlike stroma and immune escape by tumors that express the chemokine CCL21. *Science* (IF=37), 328, 749-52.
- **Tomei, A.**, Siegert, S., Britschgi, M. R., Luther, S. A., Swartz, M. A. (2009). Fluid Flow Regulates Stromal Cell Organization and CCL21 Expression in a Tissue-engineered Lymph Node Microenvironment. *Journal of Immunology* (IF=4.9), 183, 4273-83.
- **Tomei, A.**, Boschetti, F., Gervaso, F., Swartz, M. A. (2009). 3D Collagen Cultures Under Well-Defined Dynamic Strain: A Novel Strain Device with a Porous Elastomeric Support. *Biotechnology & Bioengineering* (IF=4.5), 103, 217-25.
- Boschetti, F. A., **Tomei, A.**, Turri, S., Swartz, M. A., Levi, M. (2008). Design, Fabrication and Characterization of a Composite Scaffold for Bone Tissue Engineering. *International Journal of Artificial Organs* (IF=1.2), 31, 697-707.
- **Tomei, A.**, Choe, M. M., Swartz, M. A. (2008). Effects of Dynamic Compression on Lentiviral Transduction in an In Vitro Airway Wall Model. *Am J Physiol Lung Cell Mol Physiol* (IF=4.7), 294, L79-86.

- Shields, J. D., Fleury, M. E., Yong, C., **Tomei, A.**, Randolph, G. J., Swartz, M. A. (2007). Autologous Chemotaxis as a Mechanism of Tumor Cell Homing to Lymphatics via Interstitial Flow and Autocrine CCR7 Signaling. *Cancer Cell* (IF=23.2), 11, 526-38.
- **Tomei, A.**, Choe, M. M., Swartz, M. M. (2006). Physiological 3D Tissue Model of the Airway Wall and Mucosa. *Nature Protocols* (IF=13.3), 1, 357-362.

## Book Chapters

- **Tomei, A.**, Stock, A.

## PROFESSIONAL

### Funded Research Performed

- Tomei, A. A. (Principal Investigator), "Conformal Islet Encapsulation For Transplantation At Vascularized Sites To Allow Physiological Insulin Secretion," Sponsored by NIH. (2017 - 2022)
- Tomei, A. A. (Principal Investigator), "Resolution of the impediments of immunoisolation technologies," Sponsored by Juvenile Diabetes Research Foundation. (2016 - 2021)
- Tomei, A. (Principal Investigator), "Conformal Coating Encapsulation of SC-Islets and Evaluation in Clinically Applicable Sites ," Sponsored by Semma Therapeutics. (2018 - 2020)
- Tomei, A. A. (Principal Investigator), "Engineering a novel therapeutic hydrogel with CCL21 and beta cell autoantigens to induce antigen- specific tolerance," Sponsored by Juvenile Diabetes Research Foundation. (2016 - 2019)
- Tomei, A. (Other), Ricordi, C. (Principal Investigator), "Development of an Extrahepatic Site for Islet Transplant without Continuous Immunosuppression ," Sponsored by Juvenile Diabetes Research Foundation . (2016 - 2019)
- Ricordi, C. (Principal Investigator), Tomei, A. A. (Principal Investigator), "Development of an Extrahepatic Site for Islet Transplant without Continuous Immunosuppression (3 Project Center Grant)," Sponsored by Juvenile Diabetes Research Foundation . (2016 - 2019)
- Tomei, A. A. (Principal Investigator), "Conformal Coating Encapsulation of SC- $\beta$  cell products," Sponsored by Semma Therapeutics SRA . (2016 - 2018)
- Tomei, A. A. (Principal Investigator), "Conformal islet encapsulation for transplantation at vascularized sites to allow physiological insulin secretion," Sponsored by NIH. (2016 - 2017)
- Ricordi, C. (Principal Investigator), Tomei, A. A. (Principal Investigator), "Development of an Extrahepatic Site for Beta Cell Replacement without Continuous, Systemic Immunosuppression (4 Project Center Grant)," Sponsored by Juvenile Diabetes Research Foundation . (2012 - 2016)
- Tomei, A. A. (Principal Investigator), "Exploiting encapsulation to induce islet antigen-specific tolerance through lymphoid stromal cells," Sponsored by . ( - 2015)
- Hubbell, J. (Principal Investigator), Tomei, A. A. (Co-Investigator), "Allo- and Xeno-graft Tolerization by CCL21-induced Lymphopoiesis," Sponsored by Juvenile Diabetes Research Foundation. (2011 - 2013)
- Latta, P. (Principal Investigator), Tomei, A. A. (Co-Investigator), "Insulin-producing cell implanting device," Sponsored by NIH. (2011 - 2013)

### Editorial Responsibilities

- Journal of Biomedical Engineering and Informatics (JBEI), Editorial Review Board Member. (2015 - Present)
- CellR4 Repair, Replacement, Regeneration, and Reprogramming, Editorial Review Board Member. (2013 - Present)

### Professional and Honorary Organizations

- JDRF Tolerance Delivery Systems. (2018 - Present)
- Society for Biomaterials, Member. (2018 - Present)
- Immunology of Diabetes Society, Member. (2016 - Present)
- Biomedical Engineering Society, Member. (2015 - Present)
- American Diabetes Association, Member. (2013 - Present)
- JDRF Encapsulation Consortium, Member. (2012 - Present)

### **Honors and Awards**

- Alexander Orr Excellence in Teaching Award, University of Miami College of Engineering. (2018)
- Fellowship to take the Eureka Certification, CTSI. (2017)
- 2016 Eliahu I. Jury Early Career Research Award , University of Miami College of Engineering. (2016)
- 2016 Provost's Research Award, University of Miami. (2016)
- 2016 JDRF CDA, Juvenile Diabetes Research Foundation. (2016)
- 2015 Marc S. Goodman Prize, Diabetes Research Institute. (2015)
- Fellowship to participate to the 2013 Advanced Course in Basic & Clinical Immunology, University of Miami. (2013)