



## **Emmanouil Tampakakis, M.D.**

### **Titles & Department**

Assistant Professor of Medicine, Genetic Medicine, and Biomedical Engineering

### **Specialization Area**

Stem cell biology to understand heart regeneration and development cardiology.

### **Unmet Need**

Better recapitulative stem-cell-based and animal biological models to observe mechanistic drivers of cardiac development and regeneration that allow for identification of therapeutic targets in heart disease and failure.

### **Summary of Research & Work**

Dr. Tampakakis was an integral part of the team that functionalized immature in vitro cardiomyocytes, opening the door to advanced, tunable, and more meaningful biological models to study cardiac development, disease models, and regeneration. Following this development in cell maturation, the Tampakakis lab has been focused on using these cells and other in vivo models to unravel heart health and disease, the latter of which remains the leading cause of death worldwide. Current foci in the lab include using animal models to study sympathetic innervation of postnatal cardiomyocytes, transcriptional enhancers of cardiac phenotypes and their impact on cardiac development and studying the use of regenerative cardiac stem cell therapies with novel contractility regulation.

### **Value Proposition**

- Functional, mature stem cell derived cardiac cells.
- Improved physiologically relevant models for cardiac disease.
- Earlier transcriptional regulation of cardiac phenotype and bias toward disease.
- Detailed identification of mechanisms to improve regenerative application of stem cells.

### **Recent Publications**

- Mapps AA, Boehm E, Beier C, Keenan WT, Langel J, Liu M, Thomsen MB, Hattar S, Zhao H, Tampakakis E, Kuruvilla R. Satellite glial cells modulate sympathetic neuron survival, activity, and autonomic function. *Elife*. August 23, 2022.
- Kowalski W, Garcia-Pak IH, Li W, Uosaki H, Tampakakis E, Zou J, Lin Y, Patterson K, Kwon C, Mukoyama Y. Sympathetic neurons regulate cardiomyocyte maturation in culture. *Front Cell Dev Biol*. March 11, 2022.
- Tampakakis E, Gangrade H, Glavaris S, Htet M, Murphy S, Lin BL, Liu T, Saberi A, Miyamoto M, Kowalski W, Mukoyama Y, Lee G, Minichiello L, Kwon C. Heart neurons use clock genes to control myocyte proliferation. *Sci Adv*. December 3, 2021.

- Miyamoto M, Gangrade H, Tampakakis E. Understanding heart field progenitor cells for modelling congenital heart diseases. Current Cardiology Reports. March 11, 2021.

### **Awards & Honors**

- 2022 Johns Hopkins University Catalyst Award
- 2022 Maryland Stem Cell Research Fund Launch Award
- 2020 W.W. Smith Charitable Trust Award
- 2020 The Magic that Matters Fund, Johns Hopkins University
- 2020 Northwestern Cardiovascular Young Investigators Forum Junior Faculty Award, 3<sup>rd</sup> place
- 2020 Outstanding Early Career Investigator Award, AHA BCVS