



JOHNS HOPKINS  
BIOMEDICAL ENGINEERING

# BME Seminar Series

## Michalina Janiszewska, PhD

Visiting Assistant Professor  
UF Scripps Biomedical Research

Monday, October 17, 2022

1:00 p.m.

Clark 110

Faculty host: Jean Fan



## Spatial Resolution of Genetic Heterogeneity and Tumor Microenvironment Interactions in Glioblastoma

**Abstract:** Despite aggressive chemotherapy, radiation, and surgery, only 6.8% of patients with glioblastoma (GBM), the most aggressive brain tumor, survive beyond 5 years post-diagnosis. Targeted therapies have not been successful in this tumor type due to its extreme heterogeneity. Mosaic amplification of oncogenes suggests that multiple genetically distinct clones are present in each GBM tumor. However, little is known about how different subpopulations of GBM cells interact with each other or with the surrounding tumor microenvironment (TME) to maintain the complex tissue architecture of these tumors.

To address this, we employed spatial protein profiling coupled with single-cell spatial maps of fluorescence in situ hybridization (FISH) for key oncogenes frequently amplified in GBM. Our single-cell FISH analysis of 35,843 single nuclei allowed us to classify tumors based on the relative frequency of co-occurrence of EGFR and CDK4 co-amplification. Interestingly, the tumors with high frequency of cells harboring both amplifications exhibit higher infiltration by CD163+ immunosuppressive macrophages. Our results suggest that high throughput assessment of genomic alterations at the single cell level could provide a measure for predicting the immune state of GBM.

**Bio:** Michalina Janiszewska, PhD, is an Assistant Professor at the Department of Molecular Medicine, UF Scripps Biomedical Research (formerly known as The Scripps Research Institute, FL campus). Her research group investigates different aspects of tumor cell diversity in highly aggressive brain tumors, aiming to understand and disrupt the cancer ecosystem.

Dr. Janiszewska received her BSc in Biotechnology and MSc in Medical Biotechnology from the University of Wroclaw, Poland, and PhD in Life Sciences from the University of Lausanne, Switzerland. Her thesis work, under supervision of Ivan Stamenkovic, MD, focused on cancer stem cell biology. After obtaining her degree in 2012, she moved to work with Kornelia Polyak, MD, PhD, the expert on breast cancer tumor heterogeneity at Dana-Farber Cancer Institute, Harvard Medical School. In 2016, Dr. Janiszewska was promoted to Instructor of Medicine at DFCI/HMS and in September 2018 she opened her independent lab at Scripps Research, FL campus.

Dr. Janiszewska is a recipient of several fellowships and grants, including EMBO and Swiss National Science Foundation fellowship for her postdoctoral work and NIH K99/R00 Career Development award. She has also been selected as 2019 American Association for Cancer Research NextGen Star.