MAE *Seminar* SERIES

Dr. Vincent Tutino

Research Assistant
Professor (Ph.D.)

Neurosurgery
University at Buffalo

Building Biomarkers for Brain Aneurysms

ABSTRACT

This talk will describe my PhD work on developing brain aneurysm biomarkers, and how a multi-disciplinary team and I have begun to commercialize this novel technology. Brain aneurysms are almost always asymptomatic, rupturing without warning and causing deadly hemorrhagic strokes. While they can be caught incidentally on medical imaging intended for other purposes, there is no widely used screening for them. This is because medical imaging is prohibitively expensive, and can pose its own set of risks to the patient. We sought to identify novel, blood-based biomarkers for brain aneurysms that could be assessed in a pre-screen for the disease, thereby identifying which individuals truly need medical imaging. This could be used to catch aneurysms before they rupture so that patients can receive life-saving preventive treatments. To this end, we used next-generation RNA sequencing to find a panel a genes in the blood that are associated with brain aneurysms. We then used a state-of-the-art machine learning strategy to develop classification models that use the expression of these genes to predict the presence of a brain aneurysm. Based on our exciting results, we incorporated a company and are now commercializing this technology.

BIO SKETCH

Vincent Tutino received his Bachelor of Science degree in Chemistry from St. John Fisher College in Rochester, NY and his Master of Science degree in Biomedical engineering from the University of Buffalo in Buffalo, NY. After completing his doctorate in Biomedical Engineering at the University at Buffalo, he co-founded Neurovascular Diagnostics, Inc. and is presently the company's CEO. With the vision of better disease management through early detection, he is heading an effort to create a blood-based pre-screen to identify asymptomatic individuals who are harboring unruptured brain aneurysms. For this project, Dr. Tutino coordinates a multidisciplinary team of doctors and bioinformatics researchers to implement a machine learning strategy to discover and develop novel biomarkers from high-dimensional gene expression data. He has also studied mechanisms of aneurysm initiation, growth, and rupture using in vivo and imaging-based models to better understand aneurysm natural history.

University at Buffalo

UB Department of Mechanical and Aerospace Engineering

School of Engineering and Applied Sciences