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Education

UC San Diego	Electrical Engineering,	Ph.D., 2013

Research Experience

Carnegie Mellon University	Assistant Professor	2017-present
UC San Diego	Project scientist	2015-2017
Illumina Inc.	Scientist	2013-2015

Personal Statement. My research group focuses on developing novel computational techniques for natural products discovery and microbiome analysis. I started working on computational methods for natural products discovery after joining Pavel Pevzner's lab at UC San Diego in 2009. Pevzner's lab is one of the leading labs in computational mass spectrometry data analysis, and I transformed the direction of the research in small molecule discovery by integrating computational mass spectrometry with genome-mining guided small molecule discovery.

Currently, one of the major bottlenecks in drug discovery is the lack of enough lead small molecules in the initial stages. Small molecule discovery remains one of the few areas of life sciences that is barely touched by the Big Data revolution. We have extensive experience in providing efficient, widely-used methods for analysis of large-scale mass spectrometry and genomic/metagenomics data sets in the field of small molecule discovery. For example, our database search tools Dereplicator (Mohimani et al. Nature Chemical Biology, 2016) and Dereplicator+ (Mohimani et al., Nature Communications, 2018), are used for dereplicating known small molecules and their novel variants, including polyketide natural products. Polyketide natural products have shown great efficacy against coronavirus, and as part of this project, we will develop novel algorithms and statistical methods for discovering polyketides natural products active against SARS-Cov-2.