

# The Medical College of Wisconsin

## Division of Biostatistics

Proudly Presents:  
A Statistical Research Seminar  
Talk By:



**Michael Zimmermann, PhD**

Director, Assistant Professor, Clinical and Translational Science Institute

**Title:** Structural Bioinformatics and the Next Frontiers of Genetic Data Interpretation

**ABSTRACT:** Clinical genomics sequencing has revolutionized healthcare by providing more precise tools for defining, diagnosing, and treating genetic diseases, as well as unraveling the genetic component of complex diseases. Because these methods are relatively new, key information regarding genetic variation remains uninterpreted and therefore unable to be used in healthcare or even further research. For example, existing clinical workflows estimate the impact of DNA changes on protein function by their effect on linear protein sequence. This approach fails to accommodate changes to protein structural (3D) and time-dynamic (4D) properties, including stability, chemistry, and local mobility, that could impair or dysregulate the protein. We believe it is imperative to develop an approach that systematically evaluates many protein properties and how they are each altered by genomic variants, to reach the right interpretation.

Computational tools for simulating the detailed effects of mutations are used in basic science fields but have not yet been parameterized and standardized for more wide application to clinically observed and cancer-associated genetic variants. Thus, improved tools are needed for genomic data interpretation. The Zimmermann lab focuses on the development, translation, and application of molecular modeling and simulation to better understand how genetic variants alter proteins, such as epigenetic regulators. Our experience with applying structure-based dynamic simulations to variants identified from clinical genomics sequencing has demonstrated that knowledge of the mechanism of dysfunction can be brought to light – a novel form of evidence that is applicable to individual cases yet ignored by current clinical genomics guidelines.

**Tuesday, February 25, 2020**

**3:30 – 4:30 PM**

**Medical College of Wisconsin**

**MEB M2050**

*Light refreshment will be provided*