

Biomedical and Health Informatics Lecture Series

Course Website: [Link](#)

Tuesday, February 14, 2012

12:00 - 12:50 p.m., Room T-360

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Biomedical Informatics and Medical Education
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“Bioinformatics projects supporting Infectious Disease research at Seattle BioMed”

The Seattle Structural Genomics Center for Infectious Disease ([link](#)) is funded by NIAID to solve protein structures from biodefense organisms and emerging infectious diseases. Community input is actively solicited to identify essential enzymes, virulence factors, drug targets and vaccine candidates of biomedical relevance for our structure determination pipeline. Since project inception in late 2007, over 9800 targets have been selected, on eight bacterial and twelve protozoan genera, as well as ssDNA and negative-strand ssRNA viruses with more than 2000 unique proteins expressed and purified for crystallization trials. To date, SSGCID has deposited over 450 protein structures in the Protein Data Bank (PDB), representing the majority of available structures for several organisms. These include over 140 structures from targets requested by, or of specific interest to, the scientific community. This lecture will review the informatics challenges and solutions involved in the SSGCID projects, including Target Selection, process tracking, and management of our extensive collaborations.

Dr. Myler has extensive (over 30 years) experience in parasite molecular biology, genomics and bioinformatics and, more recently, structural biology and drug development. After graduate work on *Plasmodium falciparum* (malaria) antigen identification, Dr. Myler undertook post-doctoral training in molecular biology; studying antigenic variation in African trypanosomes (*Trypanosoma brucei*) and *Anaplasma marginale*. During the last post-doctoral period (at SBRI), Dr. Myler began to study *Leishmania* gene expression and developed expertise in DNA sequencing and bioinformatics. This led to his directing the *L. major* and *T. cruzi* genome sequencing projects at SBRI; an activity that continues until the present as a Co-PI on a trypanosomatid genomic database and annotation project. For the last 10 years, Dr. Myler have been at the forefront of applying genomic technologies such as microarray-based expression profiling and proteomics to increase our understanding of molecular mechanisms underlying trypanosomatid transcription and regulation of gene expression during differentiation. His laboratory has recently started making extensive use of NGS technology for genome re-sequencing, mRNA profiling (RNA-seq) and chromatin immunoprecipitation using sequencing (ChIP-seq) in several *Leishmania* species; once again being at the forefront of this technology for the trypanosomatid field. About 10 years ago, Dr. Myler became actively involved in structural genomics, leading the Target Selection portion of the Structural Genomics of Pathogenic Protozoa (SGPP) project. Dr. Myler is currently PI and Director of the Seattle Structural Genomics Center for Infectious Disease (SSGCID), which is funded under a contract (HHSN272200700057C) from NIAID. The mission of SSGCID is to use X-ray crystallography and NMR spectroscopy to solve the structure of proteins targets in emerging and re-emerging infectious disease organisms, primarily to facilitate development of new therapeutics using structure-based drug design. Dr. Myler is currently also the Scientific Director of the Bioinformatics, Protein Production and DNA Sequencing Cores within Seattle BioMed's Global Health Biotechnology Center (GHBC).