Genomics Course BMB 961-Sect. 001, 2 Credits, Fall 2016

***Title**:* Genomics and Proteomics of Complex Genetic Systems

Participating Faculty: Kevin Childs, Dan Jones, John LaPres, Timothy Zacharewski, and George Mias

***Coordinator**:* John J. LaPres (lapres@msu.edu)

Description: Recent advancements in bacterial, fungal, plant, animal and human genome projects have elevated genetic research to a new level. In concert, emerging computational and experimental tools have led to novel strategies for the investigation of biological and biochemical processes across organisms on a genomic scale. This course, now in its seventh offering, has been developed to provide students with a current overview of developments in the areas of structural and functional genomics, as well as proteomics and metabolomics. Examples from eukaryotic (animal, plant, and fungi) and, in some cases, prokaryotic organisms will be covered.

Prerequisites: BMB 801 (or instructor approved equivalent)

Grading: Grades for BMB961-003 will be based on attendance and in class presentations. Each student will be responsible for delivering at least one journal club style presentation during "Case Studies" days listed below. The presentation will focus on recent journal articles using a technology or methodology discussed during the course.

Limitation: 25 Students (others upon request)

Location and Time: 111 Biochemistry
10:20 – 11:10 am Mondays and Wednesdays

Dates, Topics and Presenters:

08/31	JL	Sequencing Approaches I
09/07	JL	Sequencing Approaches II
09/12	JL	BLAST
09/14	KC	Sequence Assembly
09/19	KC	Annotation
09/21	KC	Comparative Genomics I
09/26	KC	Comparative Genomics II
09/28	TZ	Hybridizations Platforms (Microarrays)
10/03	JL	Case Studies I
10/05	JL	RNA-Seq
10/10	JL	Sequencing approaches to miRNA
10/12	JL	Sequencing approaches to methylation/epigenomics
10/17	JL	SNPs

10/19	JL	Considerations for large scale functional genomics
10/24	JL	Population functional genomics or large scale phenotyping
10/26	JL	Collaborative Cross and Mouse Phenome panel
10/31	JL	Case Studies II
11/02	JL	Case Studies III
11/07	DJ	Mass Spectrometry basics and Informatics
11/09	DJ	Metabolic Profiling I
11/14	DJ	Metabolic Profiling II/ Case Study
11/16	DJ	Proteomics I
11/21	DJ	Proteomics II
11/23	GM	Systems Biology and Networks I
11/28	GM	*Systems Biology and Networks II*
11/30	GM	*Systems Biology and Networks III*
12/05	JL	Case Studies IV
12/07	JL	*Case Studies V*