

Genomics Course BMB 961-Sect. 003, 2 Credits, Fall 2006

Title: Genomics and Proteomics of Complex Genetic Systems

Participating Faculty: Christoph Benning, Dean DellaPenna, Doug Gage, John LaPres, Tim Zacharewski, Rob Last and Dan Jones

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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 fifth year, 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. One emphasis will be on the demonstration of available internet resources.

Prerequisites: BMB 801 (or instructor approved equivalent)

Limitation: 25 Students (others upon request)

Location and Time: 1415 BPS Bldg., Tuesdays/Thursdays 9:10 am - 10:00 am

Dates, Topics and Presenters:

Sequencing Genomes (C.B. and D.DP.)

8/29	CB	Sequencing Approaches, Technology
8/31	CB	Data Bases (NCBI and Plant Databases)
9/5	CB	Sequence Comparison Techniques (BLAST etc.)
9/7	CB	Genome Annotation
9/12	DDP	Arabidopsis KOs and Tilligen Analysis
9/14	DDP	COGS (Clusters of Orthologous Genes, NCBI Web site)
9/19	DDP	Metabolic reconstruction I
9/21	DDP	Metabolic reconstruction II
9/26	CB/DDP	Question Answer Session
9/28	CB/DDP	First Mid Term (C.B., D.DP.; 30% of final grade)

Global Gene Expression Analysis (T. Z., J.L. R.L.)

10/03	TZ	Global Gene Expression Analysis I (Spotted Arrays)
10/05	TZ	Global Gene Expression Analysis II (Affymetrix GeneChips)
10/10	TZ	Microarray Data Analysis and Annotation

10/12 TZ Microarray Data Interpretation and Integration
10/17 JL Open Platform Technologies (SAGE) (*Last day to drop class*)
10/19 JL Genotyping, Background on SNPs I
10/24 JL SNPs II.
10/26 JL Transcriptional Networks
10/31 JL Question/ Answer session
11/02 TZ-JL Second Exam (T.Z., J.L.; 30% of final grade)

Expanding into functional “-omics” (D.J. R.L. and D.G.)

11/07 DJ Mass Spectrometry basics and Informatics
11/09 DJ Metabolic Profiling I
11/14 RL Biological applications of metabolic profiling I
11/16 RL Biological applications of metabolic profiling II
11/21 RL Assessing gene function by mutant analysis
11/23 THANKSGIVING – NO CLASS
11/28 RL Genome-wide functional genomics approaches
11/30 DG Proteomics I
12/5 DG Proteomics II
12/7 DG Protein Microarrays and Alternative Technologies
12/12 DJ/DG Question Answer Session
12/14 DJ/DG Final Exam (*D.J., R.L., D.G.; counts 40% of final grade*)