IBS/MBG7030 2016

DESCRIPTION

This course provides an introduction to the theory and latest advances in Functional Genomics technologies and Systems Biology research. A major focus is placed on understanding how the data from these technologies can be interpreted to derive testable hypotheses about the functions of genes and entire biological systems. Topics include Genomics, Transcriptomics, Proteomics, Interactomics, Phenomics, Network Biology, Systems Biology, and Synthetic Biology. The course relies heavily on recent literature relevant to the theory and application of Functional Genomics technologies and Systems Biology.

The course will meet for 2 hours each week (Mondays from 6:xx-8:xx PM). Attendance will be taken and will count toward the final grade. The first hour will consist of a group discussion of one or more research papers. The research papers will be assigned by posting at the Blackboard site (Assigned Journal Articles) about one week before they are to be discussed in class. All students are expected to read the assigned papers before coming to class and to participate in the discussion. The second hour of each class will consist of a lecture by one of the faculty.

ASSIGNMENTS

Journal Article Discussions

Over half of this course is devoted to in-class discussions of assigned journal articles. Students should read the articles before coming to class and be prepared to discuss the articles in detail during class. The articles and the dates that they will be discussed can be found in the Assignments section of the course Blackboard site.

Journal Article Critiques - Written

Students must submit critiques of 6 additional assigned journal articles. These articles can be found in the Assignments section of the course Blackboard site. Critiques must be submitted as a printed hard copy at the beginning of class on the due date, AND as an e-mail attachment text file (e.g., MS Word or rtf). Critiques must be no longer than 2 pages each (no cover), typewritten, 11 point or greater type, and include descriptive answers to as many of the following questions as possible: What is the main hypothesis or biological question being addressed? Why is this a significant problem? What is the biomedical relevance of this work? What smaller questions did the individual experiments in the paper address? Why did the authors choose a particular experimental approach over other approaches? How did they carry out the experiments and what were the critical parameters and controls? How did the authors interpret their data? Did they consider alternative interpretations? What conclusions did the authors reach from their data and how do the data support those conclusions? Are the conclusions justified? Did the paper answer the big biological questions, or any of the smaller questions that the authors set out to address? What additional conclusions can you draw from this work that the authors may have overlooked or chose not to address? What additional experiments or directions would you like to see pursued in relation to this work?

Exams

There will be no exams.
Reading - Assigned and Recommended

Required reading includes all assigned articles for the journal article discussion sessions, plus the articles for written critiques. Additional recommended reading and papers of interest can be found in the Background folder (see Content/Background).

GRADES AND POLICIES

Grades

Percentage of grade

Class attendance and participation in J. article discussions  25%
Journal article critiques  75%

Other Policies

Note that students who do not complete the course but who fail to officially withdraw before the drop deadline (Feb 5) will normally receive an F.

Transcribing sentences verbatim, in whole or in part, directly from published or unpublished work (e.g., web sites) without explicit citation is plagiarism. Students submitting assignments with any such plagiarism may receive a failing grade and be subject to disciplinary action in accordance with Graduate School guidelines.

For additional policies on student conduct, accommodations for students with disabilities, and religious holidays see the link to the left: "Important WSU Offices and University Policies".
### Course Director Russell Finley
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### Instructor Paul Stemmer
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### Instructor Roger Pique-Regi
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- **Office Hours**
Schedule 2017

January 9

hour 1 Finley  Genomics, Functional Genomics, and Systems Biology

hour 2 Finley  Journal Discussion - Pleasance 2010

January 16 - No Class - MLK Day

January 23

hour 1 Finley  Journal Discussion - Evrony 2015

hour 2 Finley  Transcriptomics

January 30* - Irimia 2014

hour 1 Finley  Journal Discussion - Irimia 2014

hour 2 Stemmer  Proteomics I: Proteome Mapping

February 6

hour 1 Huttemann  Journal Discussion -

hour 2 Huttemann  Proteomics II: Posttranslational Modifications

February 13* -

hour 1 Finley  Journal Discussion -

hour 2 Finley  Interactomics I: Protein-Protein Interactions

February 20

hour 1 Finley  Journal Discussion -

hour 2 Finley  Network Biology

February 27* -

hour 1 Finley  Journal Discussion -
March 6 -

hour 1 Finley             Journal Discussion -

hour 2 Pique-Regi Interactomics II: Protein-DNA Networks, continued

March 13 - No Class - Spring Break

March 20* -

hour 1 Pique-Regi Journal Discussion -

hour 2 Finley Phenomics: Genome-wide tagging, knockout, knockdown

March 27 -

hour 1 Finley             Journal Discussion -

hour 2 Finley             Interactomics III: Genetic Interaction Networks

April 3* -

hour 1 Finley             Journal Discussion -

hour 2 Finley             Systems Biology I: Integration and Synthesis

April 10 -

hour 1 Finley             Journal Discussion -

hour 2 Finley             Systems Biology II: Modeling

April 17* -

hour 1 Finley             Journal Discussion -

hour 2 Finley             Systems Biology III: Synthetic Biology

April 24

hour 1 Finley             Journal Discussion -

hour 2 Finley             Journal Discussion -

*Journal article critique due on these dates