NYU | DEPARTMENT OF BIOLOGY

BIOL-UA 223 Molecular and Cell Biology laboratory

Instructors:
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Course Description:
This laboratory course applies concepts learned in the Molecular and Cell Biology course (BIOL-UA 21) to a molecular biology research project. The research project will introduce students to standard genetic and biochemical techniques common in a molecular biology lab, such as DNA isolation, agarose-gel electrophoresis, and transformation. The project also will provide students with a hands-on understanding of how modern DNA-sequencing technology, along with bioinformatic tools, can be used to discover genetic differences and understand cellular function.

Pre-requisite:
Molecular and Cell Biology I (BIOL-UA 21)

Textbook and Required Materials:
Lab Notebook
Molecular Cell Biology. 7th Ed. By Lodish, et.al. Freeman Publisher
Recombinant DNA: Genes and Genomes -A Short Course. 3rd Ed.
By James Watson, et.al. Cold Spring Harbor Laboratory Press
Molecular Biology: A laboratory Guide. By Alan Gerstein. John Wiley Publisher

Grading:

Midterm	25%
Final Quiz	15%
Lab Notebook	10%
Assignments	20%
Final Paper	20%
Attendance	5%
Class Participation	5%

Topics:
Introduction.
Culturing of Yeast Strain on YPD Plates
Select mutants from yeast cultures
Mini-plasmid prep of E. coli library cultures.
Transformation of yeast mutants with plasmid DNA isolated in Exp IV
Agarose Gel Electrophoresis on Plasmid DNA.
Select transformed colonies
Genomic DNA Extraction for MiSeq Sequencing.
End Repair of genomic DNA and

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Adapter Ligation and Post-Ligation Cleanup procedure for MiSeq Sequencing
Primer Design
Confirm sequences of interest via PCR.
Library Amplification and Post-Amplification Cleanup
Genomic Center: Size-Selection and Sequencing of Samples
Agarose Gel Electrophoresis on PCR samples.
Analysis of NGS Results