

Biology 105 - Molecular Biology - Spring 2010

Grading

Determination of grades will be based on points earned in the following categories:

10 completed Lab exercises (10 points each)	100
5 Lab Quizzes (20 points each)	<u>100</u>
Total Possible points	200

Grading Scale

A >90%	>180 pts
B 80-89%	160-179 pts
C 65-79%	130-159 pts
D 50-64%	100-129 pts
F <60%	< 100

Completed lab exercises are due the day of the quiz for that same lab.

Lab Exercises

1. Tools of the Trade
2. Growth of *E. coli* Bacteria
3. Isolation and Titration of Bacteriophage Lambda
4. Transformation of *E. coli* with pGlo Plasmid DNA
5. Purification and Restriction Analysis of pGlo Plasmid DNA
6. Isolation of Green Fluorescent Protein (GFP) by Chromatography and polyacrylamide gel electrophoresis (PAGE)
7. Polymerase Chain Reaction (PCR) of Alu DNA from Human Cells
8. Enzyme-Linked Immunosorbant Assay
9. *C. elegans* Genetics
10. Yeast Genetics

Timeline of Experiments

Date	Assignment
Week #1, T 1-26	<p>Lab #1 Tools of the Trade Measuring weights and volumes Make media and solutions to be used in future labs</p>
Week #2, T 2-2	<p>Lab #2 Growth of E. coli bacteria Determine the growth rate Determine concentration of culture in cells/ml Microscopy – bacterial gram stain</p>
Week #3, T 2-10	<p>Lab #2 Growth of E. coli bacteria Count colonies and complete calculations of E. coli concentration</p> <p>Lab #3 Isolation and Titration of Bacteriophage Lambda Infect bacteria with Lambda phage and perform a plaque assay.</p> <p>Supplemental Exercise – Gel electrophoresis</p>
Week #4, T 2-16	<p>Lab #3 Isolation and Titration of Bacteriophage Lambda Count plaques and determine titer.</p> <p>Supplemental Exercise – Gel electrophoresis</p> <p>Quiz #1 Covers Labs 1 & 2</p>
Week #5, T 2-23	<p>Lab # 4 Transformation of E. coli with pGlo Plasmid DNA Transform bacteria with plasmid DNA, plate out and incubate overnight</p> <p>Supplemental Exercise – Gel electrophoresis</p>
Week #6, T 3-2	<p>Lab # 4 Transformation of E. coli with pGlo Plasmid DNA Score transformation results.</p> <p>Lab #5 Purification and Restriction Analysis of pGlo Plasmid DNA Purify plasmid DNA by affinity chromatography Single and double digests of DNA with restriction enzymes Store digests at 4⁰C till next week</p>

Week #7, T 3-9	<p>Lab #5 Purification and Restriction Analysis of pGlo Plasmid DNA Electrophoresis, staining and analysis of DNA digests.</p> <p>Lab #6 Isolation of Green Fluorescent Protein (GFP) by Chromatography and polyacrylamide gel electrophoresis (PAGE) Production of cell lysates</p> <p>Quiz #2 Covers Labs 3 & 4</p>
Week #8, T 3-16	<p>Lab #6 Isolation of Green Fluorescent Protein (GFP) by Chromatography and polyacrylamide gel electrophoresis (PAGE) Extraction of GFP from cell lysates by column chromatography</p> <p>Lab #7 Polymerase Chain Reaction of Alu DNA from Human Cells Extract cheek cell DNA with Chelex</p>
Week #9, T 3-23	<p>Lab #6 Isolation of Green Fluorescent Protein (GFP) by Chromatography and polyacrylamide gel electrophoresis (PAGE) Further purification of GFP by PAGE</p> <p>Lab #7 Polymerase Chain Reaction of Alu DNA from Human Cells Set-up PCR reactions Run Thermocycler Store PCR products at 4⁰C until next lab period</p> <p>Lab #8 Enzyme Linked Immunosorbant Assay Simulated AIDS test</p> <p>Quiz # 3 Covers Labs 5 & 6</p>
Week #10 3-30 to 4-3	Spring Break
Week #11 4-5 to 4-9	<p>Lab #7 Polymerase Chain Reaction of Alu DNA from Human Cells Electrophoresis and analysis of amplified DNA</p>
Week #12 4-12 to 4-16	<p>Lab #9 C. elegans Anatomy and Behavior Distinguishing larval stages and males from females Response to stimuli Transferring worms between plates</p> <p>Quiz # 4 Covers Labs 7 & 8</p>
Weeks #13 4-19 to 4-23	<p>Lab #10 Yeast Genetics Part I - A Simple Cross</p>

Week #14 4-26 to 4-30	Lab #10 Yeast Genetics Part II - Complementation of a mutation by transformation
Week #15 5-3 to 5-7	Lab #11 C. elegans Part I - Fluorescence microscopy of GFP-expressing worms Part II – A Genetic Cross Part III – RNAi affects worm phenotypes
Week #16 5-10 to 5-14	Lab #11 C. elegans Score Genetic Cross and RNAi results Quiz #5 on Labs 9-11