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PREREQUISITES: MCB3020 / MCB3020L - Basic Biology of Prokaryotic and Eukaryotic Cells or equivalent cell biology and basic microbiology courses.

The purpose of this laboratory is to introduce students to a variety of research techniques applied to the study of molecular biological sciences. The experiments, in addition to exploring the use of various research techniques, are designed to examine aspects of microbial metabolic potential and protein structure and function. Comprehension of experimental design, quantitative biochemical analysis, and instrumentation are all important goals.

No text is required for the course. This notebook will be used to maintain a record of experimental procedures, observations and data collected in lab. This notebook will be checked and will determine a portion of your final grade. To successfully perform each experiment and complete the laboratory exercise within the scheduled time, it is essential that each student carefully read the instructions for the laboratory exercise and any assigned reference material before coming to class.

GRADING: The grade for the course will be determined from the three lab reports (15 points each), the laboratory record, including performance (15 points), a midterm examination (20 points), a final examination (20 points).

SAFETY PRECAUTIONS: Each student should note the location of the fire extinguisher and emergency shower in the lab. Since potentially hazardous chemicals and radioisotopes will be used in this laboratory, pipetting by mouth is strictly forbidden. In case of an accident, personal injury or damage to the equipment, immediately notify the lab instructor.

LAB RECORD (NOTEBOOK): The lab record should be a complete record of all procedures performed in the lab. All data and observations should be recorded in lab and not copied over at a later time except in cases when portions of the experiment are performed by other members of the group and there is not time at the end of the lab period to copy their results. All observations and data recorded in the notebook should be clearly and completely labeled and should include
all information you collect in lab, as well as any other pertinent observations (e.g. type of organism used, deviations from instructions, air or water temperature, etc. anything that might be pertinent to the interpretation of the experiment). Following the data, a careful interpretation should also be recorded, and comments on the experiment should be made. Your lab record should be sufficiently complete to allow someone else to interpret your results or repeat the experiment exactly as you have. When you do not perform all of an experiment it is your responsibility to obtain the information collected by other class members. Indicate the part of the experiment you performed and the part(s) performed by other members of the class with their names.

LAB REPORTS: Lab reports are due at the beginning of the lab period one week after the exercise is completed. The report should be written in the format expected for submission to a scientific journal, with the following sections:

- Title and name (listing name of group members)
- Abstract
- Materials and Methods
- Results
- Discussion
- References

The abstract should be less than 150 words. The Materials and Methods may refer to the protocol handed out. The Results section should include Figures with legends and Tables with appropriate description in headings and/or footnotes. The Discussion section should be limited to less than 300 words. Other than the results section; the report must represent each individual student’s effort.