

A Truly Inquiry-based Bioinformatics Exercise Incorporated into a Newly Developed Molecular Biology Laboratory Course

Liane Chen and Kathryn G. Zeiler

Department of Zoology, University of British Columbia, 6270 University Blvd., Vancouver BC,
CAN V6T 1Z4

(lchen@zoology.ubc.ca)

BIOL 341 (Techniques in Molecular Biology) is a third year laboratory course being developed for the University of British Columbia. It is expected to have a large computer-based component, and must handle large enrollments. We are developing a written assignment that will introduce students to bioinformatics tools, in the context of scientific inquiry. Students conduct research on genes of unknown function, possibly linked to materials used in the wet-lab portion of the course, or to genomics research carried out by faculty members. The NCBI databases are used to analyze nucleotide and protein sequences, search for genes with similar sequences, and identify conserved domains and structures. Hypotheses about the structure and function of their unknown gene product (protein) are generated, supported by further research on conserved domains and homologous genes. Findings are written up as a research proposal designed to test and characterize the gene products. Because poorly characterized genes are used, students cannot conduct literature searches on the genes themselves to find previously published results. Thus, students must focus on the scientific process and synthesize new ideas from their bioinformatics data, and have the opportunity to add to the knowledge base. Additionally, this assignment provides the students with further practice in using scientific literature and should improve their technical writing skills. This project is currently being tested with Directed Studies (BIOL 448) students. Early outcomes will be discussed, and further suggestions are welcomed.

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