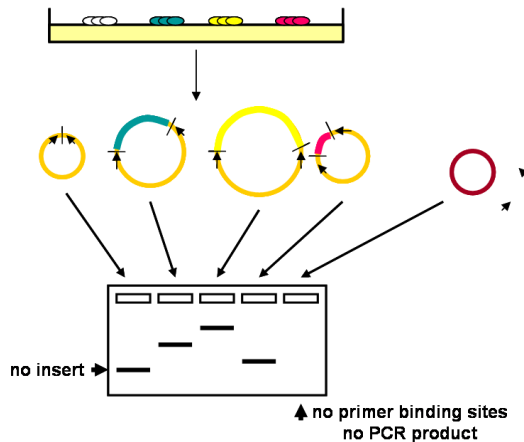


# BIOL 341: Introductory Molecular Biology Laboratory



**Course Instructor:** Dr. Liane Chen

**Credits:** 2

**Format:** Weekly 1 hour lecture with 3 hour lab

**Prerequisites:** BIOL 200

**Offered:** Winter session; available both terms

## Course description:

This lab course consists of two modules.

In the Molecular Biology module, we will be cloning promoters at random from bacterial genomic DNA into a plasmid that contains a GFP reporter gene. If a promoter is successfully cloned in front of the reporter gene, and if this promoter is active under our culture conditions, then bacteria containing the recombinant plasmid will glow when exposed to UV light. Selected clones will then be sequenced, in order to identify some of the promoters that are active.

Little is known about many of the genes that have been identified in genome-wide experiments conducted by UBC researchers. In the Bioinformatics module, you will select one of these poorly characterized genes, use bioinformatics tools and databases to analyze its nucleotide and amino acid sequences, and to propose a function for your chosen gene. In addition, you will outline a plan for testing this function.

## Course objectives:

By the end of the Molecular Biology Module, students should be able to

- explain the theory behind the experimental techniques
- calculate and make solutions.
- keep complete lab notes.
- make and run horizontal gels.
- design and implement strategies to clone DNA fragments into plasmids.
- select successful clones, culture through sterile techniques, and isolate plasmids.
- confirm plasmid structure through restriction enzyme digests and PCR.
- design and use PCR primers.
- troubleshoot experiments
- use Bioinformatics tools to analyze nucleotide and protein sequences for structural and functional domains.
- process and analyze raw data, and present data in a meaningful form.
- report the direct inferences from data, come up with possible interpretations of the data, and connect these interpretations to the research of others.

### Sample Grading Scheme:

5	Professional behaviour
5	Pre-lab quizzes
15	Lab notebook
5	Troubleshooting labs
18	Multiple assignments for Bioinformatics report
17	Multiple assignments for Cloning report
17	Final draft of Bioinformatics report
18	Final draft of Cloning report
<b>100</b>	<b>Total %</b>