Study Guide for Bio150 Lab Final Practical Exam

The lab exam will contain ~25 stations with ~2 questions/station.

It will cover all of our lab sessions since the midterm lab exam (Laboratories #7-12). To review, I suggest reading the introduction to each lab and the individual lab exercises that we covered. Make sure you understand what we did in the experiments and can answer the relevant questions from the lab manual. Review your graphs and other results.

Here is an idea of some of the topics that will be on the exam:

**Lab 7 – Photosynthesis**
- Extract preparation
- Absorption spectrum
- Absorption vs. reflection/transmission
- Fluorescence experiment

**Lab 8 – Cellular Respiration**
- Inhibitors – Sodium fluoride (NaF) and sodium azide (NaN₃) – Know what stage(s) is (are) inhibited and the result
- Know the equation for cellular respiration – Substrates and products
- What substrates are good? bad?
- Effect of temperature and pH? Why?
- What is the “purpose” of cellular respiration?
- When does fermentation occur and what is produced?
- Tetrazolium experiment

**Lab 9 – Cell Division**
- Growth curves
- Sigmoidal curve
- Exponential growth
- Doubling time – Know how to calculate from a growth curve
- Cell cycle – Interphase, mitosis (prophase, metaphase, anaphase, telophase), cytokinesis
  - Be able to identify under microscope, from pictures, on models

**Lab 10 – Genetics and Evolution: Part I**
- Mitosis vs. meiosis
- Results of meiosis – benefits of sex?
- Mendel – Why peas?
- Phenotype, genotype, allele, homozygous, heterozygous, dominant, recessive
- Punnett square – Monohybrid cross, dihybrid cross, P, F1, F2, phenotypic and genotypic ratios
  - Normal autosomal Mendelian inheritance
  - Codominance – e.g., Blood type (A, B, O)
  - Sex-linked traits
- Frequency – Know how to calculate frequency of a phenotype and of an allele
- Pedigree analysis – genotype determination
Lab 11 – Genetics and Evolution: Part II
DNA structure, DNA replication, base pairing rules, template strand, complementary strand, transcription, RNA sequence, codon, genetic code, translation, amino acid sequence, central dogma
DNA sequence → RNA sequence → protein sequence
Electrophoresis of hemoglobin protein
Mutations

Lab 12 – Genetics and Evolution: Part III
Hardy-Weinberg equation
Genetic drift - causes
Natural selection - fitness