HIGH SCHOOL GENETICS

Tuesdays, January 28-April 28 (no class Feb 18, Mar 24, Apr 7 or Apr 21; 10 weeks)
12:00pm-1:30pm
Ages 14+

Students learn the basics of genetics and inheritance, including DNA structure and function, cellular processes involving DNA, how DNA influences physical traits of individuals and why genetic diversity is important in populations. Hands-on activities are integrated into each lab. All lab costs are included in registration fee. Course enrollment is limited to 12 students.

Instructor: Tina Oresteen, BSc
Location: STEM Lab (suite 21)
Course fee: $225 OR $25/lab
10% off early registration discount through December 15
10% off sibling discount available beginning December 16

LAB SCHEDULE:

Intro to Genetics – Tuesday, January 28
We start the semester with an introduction to DNA, including reviewing its structure and function, creating a model of a DNA strand and extracting DNA from an octoploid organism.

Directionality of DNA – Tuesday, February 4
This week we create a DNA map to investigate the importance of directionality in DNA, how it relates to gene function, and why it is important in replication.

DNA Replication and Mutation – Tuesday, February 11
Students study the process of DNA replication, model DNA synthesis of leading and lagging strands, and learn how mutations can be incorporated into new DNA.

Mitosis and Meiosis – Tuesday, February 25
In lab today, we model the processes of mitosis and meiosis to study how DNA replication is incorporated into the cell cycle and visualize each stage of mitosis in cells using microscopy.

Codons and Translation – Tuesday, March 3
We study the translation of the genetic code into amino acid sequences and how sequence differences result in different alleles.

Genotypes and Phenotypes – Tuesday, March 10
This week, we investigate genotypes and phenotypes to learn how genetics influences physical traits, and how natural selection acts on phenotypes of individuals.

Laws of Inheritance – Tuesday, March 17
Students learn about Mendel's Laws of Inheritance, work with monohybrid and dihybrid crosses and analyze phenotypic data to learn how alleles are passed from generation to generation.

Genetic Modification – Tuesday, March 31
In this lab, we focus on gene-editing techniques, including CRISPR, and discuss the ethics of modifying genes.

Population Genetics – Tuesday, April 14

We investigate factors that influence the frequency of alleles in a population, and why new populations have low genetic diversity.

Conservation Genetics – Tuesday, April 28
Students learn the importance of genetic diversity in species, and how scientists work to increase the genetic variation within endangered species.

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