Introduction
Dr. Gail Rosen’s lab is doing work on several fronts:
1) Improve our understanding of Biological and Chemical phenomena
2) Develop better technology for these systems.
3) Excite students about Mathematics and Engineering applied to biology and chemistry.

This last area is where I focused my research on.

The D K-12 Program
The research at Drexel is part of the D K-12 program. This is part of a grant from the National Science Foundation to include high school students in research being done in the field of mathematics, science, technologies, and engineering.

While participating in the 5-week program I’ve helped Dr. Gail Rosen develop labs for high school students. Her students will then come into my school, CAPA, and together we will conduct the labs with the students.

Bio-Informatics
- Students will upload and examine the GULO-P gene in Humans.
- They will then run the sequence through the BLAST program and compare the gene to that of a pig.
- The students will then perform the same task and compare the human GULO-P gene with that of a dog.

DNA Trees
- Using the NCBI data base and Matlab, students can examine the evolutionary distance by examining their entire genome.
- Students will compare the Genome of a European Neanderthal, a Russian Neanderthal, Gorilla, Chimp, and Human.

iRobot Programming
Warm-Up
- Students will have to write down how they would communicate to a blind person how to navigate through a maze.
- Have the students share out their ideas.

Challenge Three
- The students will now use their programming skills to navigate an iRobot through a maze.

The Three Labs
Dr. Rosen is creating several labs with these labs include:
1) Having students use DNA to compare evolutionary distance of different species.
2) Have students compare similar gene’s in different animals.
3) Program an iRobot to travel through a maze

Challenge 1
- Students learn how to program the iRobot so that it will move forward and stop in a specific zone.
- Once students pass the challenge, they move onto Challenge two.

Challenge 2
- Students will learn the code to program the iRobot around the corner.
- Once students pass, they move onto challenge Three.

Assessment
- Completion of the first challenge will earn the students 25 points.
- Completion of the second challenge will earn the students an additional 25 points.
- Completion of the final task will earn the students 50 points.
- When a student’s iRobot hits a wall, they will be deducted 2 point.
- The group who finishes the maze in the least amount of time will earn 10 bonus points toward their grade.

PLKonstantopoulos@phila.k12.pa.us
http://ret.coe.drexel.edu