

Microsymposium

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Teaching structural biology, bioinformatics and evolution to high school students

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Teaching Structural Biology, Bioinformatics and Evolution to High School Students

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Over 250 students from 45 schools in the Buffalo area have been trained in structural bioinformatics at the Hauptman – Woodward Institute in the past seven years.

The students learn to use state of the art computer programs for amino and nucleic acid sequence analysis of the genomes of all bacteria and eukaryotes. The training includes the use of the most heavily used programs for biological analysis on the World Wide Web and a suite of unique programs developed in our laboratory for proteomic and genomic analysis. The students mine sequence and crystallographic data in the gene and protein banks of the world.

The four major goals of the research are to determine (1) the origin and evolution of the genetic code, (2) the order of evolution of all bacterial species, (3) the nature of evolution of the sequence and function of families of proteins present in all species, and (4) the amino acid residues responsible for substrate specificity in families of enzymes.

The students are not replicating previous experiments for which the results are already known. They are conducting experiments that have never been done before, that challenge basic tenets of structural biology. In this way students learn that genuine research demands flexibility, adaptability, creativity and patience.

The students are given opportunities to present their research goals and results and their interpretation of their data to coworkers, classmates, laymen, and scientists. The students are offered the opportunity to be fully qualified coauthors of abstracts published in the proceedings of scientific meetings and manuscripts submitted to scientific journals. Qualified authorship requires that the student make significant contributions to the gathering and analysis of data critical to the publication and that the student has a full grasp of all details and aspects of the work and the manuscript.

All students go on to US colleges (Harvard, Yale, Brown, Cornell, Carnegie-Mellon, MIT, etc.) most remain in science and several of the earliest students are now pursuing Masters and Phd programs in science. Buffalo, NY 14203

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