

Example BioChemistry Skills

Related Coursework - Immunology, Bioinformatics, Vertebrate Biology, Genetics, Intermediate Organic Chemistry, Physical Chemistry I and II, Genetics, Bioinformatics, Molecular & Cellular Biology.

APEX Presentation: "The Functional Differences Between the Two Acontias of *Agrobacterium Tumefaciens* C58"

Laboratory Skills

- ◆ Primer Creation (Primer3 website)
- ◆ Gel electrophoresis
- ◆ SDS-page gel
- ◆ Some bioinformatics (ORF finder programs, BLAST, and MFold)
- ◆ Cell culture and plate development
- ◆ Protein extraction and transposon work

Researcher May-August 2007 *Hiram Genomics Initiative*

Constructed a partial genetic map for the genome of nitrogen fixing *A. vinelandii*. Determined role of several enzymes in the metabolism of the soil bacterium and plant pathogen *A. tumefaciens*. Developed the mutants for two malate dehydrogenase genes in *A. tumefaciens*. Presently performing growth curves to determine the purpose of four mutants in *A. tumefaciens* for malate dehydrogenase.

Teaching Assistant Spring 2007 - Present *Organic Chemistry Course - Hiram College*

Monitored students laboratory activities. Assisted students with learning laboratory techniques. Provided out of class help to students having difficulties with course content. Examined lab notebooks for proper scientific format.

Student Researcher Fall 2005 *Molecular & Cellular Course - Hiram College*

Generated gene disruption mutations in *agrobacterium tumefaciens* and examined phenotype. Examined biochemical pathways of *agrobacterium tumefaciens* using bioinformatics tools.

- Magazine, newspaper, and television ads
- Catalogs, brochures, and newsletters
- Instruction manuals, technical literature
- Book and record jackets
- Web pages

Tasks

- Prepare reports and recommendations based upon research outcomes.
- Develop new methods to study the mechanisms of biological processes.
- Manage laboratory teams, and monitor the quality of a team's work.
- Share research findings by writing scientific articles and by making presentations at scientific conferences.
- Develop and execute tests to detect diseases, genetic disorders, or other abnormalities.
- Develop and test new drugs and medications intended for commercial distribution.
- Study the mutations in organisms that lead to cancer and other diseases.
- Study spatial configurations of submicroscopic molecules such as proteins, using x-rays and electron microscopes.
- Study the chemistry of living processes, such as cell development, breathing and digestion, and living energy changes such as growth, aging, and death.
- Determine the three-dimensional structure of biological macromolecules.

Tools used in this occupation:

Benchtop centrifuges — Continuous flow centrifuges; Cytospin centrifuges; Megafuge centrifuges; Tabletop centrifuges

Binocular light compound microscopes — Large upright microscopes; Microscopes; Transillumination microscopes; Video enhanced differential interference contrast microscopes

Lasers — Argon lasers; Neodymium-doped Yttrium Aluminum Garnet Nd:YAG lasers; Sapphire lasers; Solid state diode lasers

Light scattering equipment — Laser Doppler zeta potential analyzers; Laser particle sizers; Light scattering devices; Multi-angle elastic-light scattering systems

Spectrometers — Circular dichroism spectrometers; Laser induced temperature jump nanosecond relaxation spectrometer systems; Mossbauer spectrometers; Raman difference spectrometers

Technology used in this occupation:

Analytical or scientific software — Accelrys QAUNTA; SAS software; The Mathworks MATLAB; Wavefunction Titan

Computer aided design CAD software — 3D graphics software; Accelrys Insight II;

ChemInnovation Software Chem 4-D

Graphics or photo imaging software — Adobe Systems Adobe Photoshop software; GE Healthcare ImageQuant TL; Intelligent Imaging Innovations SlideBook; Molecular Simulations WebLab ViewerPro

Presentation software — Microsoft PowerPoint

Word processing software — Microsoft Word

Knowledge

Biology — Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.

Chemistry — Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.

Engineering and Technology — Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.

Education and Training — Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

English Language — Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

Administration and Management — Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.