

Chemobile Video Library

(Revised 3-25-98)

Agarose Gel Electrophoresis: In this standard method to separate fragments of DNA, newly designed electrophoresis apparatuses are used. The separation of fragments is then visualized by ultraviolet light after staining gels with ethidium bromide. Applications of different types of agarose are explained. The method for determining sizes of DNA fragments in the gel is shown. 19 minutes

Bacterial Transformation: Bacterial transformation, the process of cells taking up DNA, is important to molecularly clone DNA and to grow large quantities of DNA. The procedures shown include making transformation-competent bacterial cells by calcium chloride treatment, performing heat-shock transformation using commercially supplied cells, and performing transformation by electroporation. Principles are carefully illustrated with animation. 20 minutes

The Brain: Our Universe Within: Functional MRI and Pet Scans take the viewer inside an actual living brain, as the latest scientific techniques and theories are used to unveil and explore the intricacies of the brain. Three volume series: 1- Evolution and Perception (90 minutes); 2- Memory and Renewal (90 minutes); 3- Matter Over Mind (45 minutes).

Careers for Chemists: An American Chemical Society video highlighting careers in the chemical sciences, providing students with information required to make sound career decisions, and counselors and teachers with a tool to assist students in the career-planning process. The video is comprised of 15 four-minute segments focusing on a specific career area such as: organic/agricultural chemistry, geochemistry, forensic chemistry, chemical technology, environmental chemistry, analytical chemistry, chemical education, computational chemistry, biotechnology, colloid and emulsion chemistry, catalysis chemistry, chemical engineering, fiber science, polymer chemistry, and consumer products development. 60 minutes

Chemists in the Classroom: A teachers guide with suggestions on how to best incorporate chemists in your community with your classroom. 12 minutes

Chemobile Video: A short overview of the project that has been used on the weekly Purdue video magazine program and at half-time of network basketball games. 7 minutes

DNA Sequencing: The necessity to subclone fragments into appropriate vectors designed for sequencing can be substituted with the use of the PCR. This saves considerable time and effort. In the video, the plus and minus strands of PCR-amplified DNA were separated from each other. Magnetic beads coated with streptavidin were used to capture one of the PCR strands which had been labeled with biotin during the PCR. The strands were separated from each other by washing one strand away from the other strand which was attached to magnetic beads. These strands served as single-stranded templates for the labeling and

termination sequencing reactions. Electrophoresis of the reaction products and interpretation of the results were outlined. 29 minutes

Electrophoresis Theory And Practice: The video discusses the basic theory of electrophoresis and demonstrates step-by-step procedures for preparation, electrophoresis, and staining of agarose gels. Strongly recommended for those who have not performed electrophoresis previously. 25 minutes

General Chemistry Safety: Purdue University safety rules and practices are covered in a fun, “MTV” fashion. This video is specific to the Purdue labs, but some general practices are included. 25 minutes.

How to Measure pH with HACH One Technology: The contrast of hydrogen ion versus hydronium ion activity, the relationship between hydrogen ion molarity and pH, how a combination electrode works, when and how to calibrate a pH/ISE meter, and the benefits of HACH One free-flowing reference junction technology are covered. Built around the scenario of a railroad tanker derailment, this tape is suitable for anyone measuring pH in the field or in the lab. 20 minutes

The Immune System - Friend and Foe: A Howard Hughes Medical Institute Lectures on Science Series. Lecture 1 - How Immune Cells Create Trillions of Receptors from a Few Hundred Parts. Lecture 2 - How the Immune System Detects Invaders. Lecture 3 - How the Host Avoids ‘Friendly Fire’. Lecture 4 - Stalking the Elusive Pathogen. Total Series, 5 hours.

Instructional Scanning Tunneling Microscope: A quick understanding for system set-up, initial operation, and fundamentals of STM. This would be a nice introduction to the instrument. 15 minutes

An Introduction to Molecular Genetics: This video begins with a description of the electrophoresis of DNA. It then presents major concepts and techniques in biotechnology including determining the size of DNA molecules, restriction nuclease mapping, and transformation of bacteria. The video was designed to be used with the “Introduction to Molecular Genetics” laboratory program from Modern Biology, Inc., but can also serve as an independent unit in a classroom. 50 minutes

Inventing the Future: African American Contributions to Scientific Discovery and Invention: This video documents the work of the following men: Benjamin Bannaker, Louis Temple, James Fortin, Elijah “The Real McCoy” McCoy, Louis Latimer, Granville T. Woods, Garrett Morgan, and George Washington Carver. 20 minutes

It's All Chemistry: Our Body, Our Home, Our Environment: This video focuses on chemistry’s influence in our everyday lives by illustrating the important role chemistry plays in maintaining and improving our quality of life. Geared to the non-technical viewer, this video is filled with examples of chemistry in our homes, our bodies, and our environment.

Living Chemistry: A production of The Children's Museum of Indianapolis that talks about the chemistry that surrounds us in our bodies and environment. 20 minutes

Molecular Spectroscopy: Appropriate for use in a high school classroom as an introduction to spectroscopy. 15 minutes

People Who Took Chemistry, That's Who!: This video lets students see real people involved in the kind of chemistry that produces compact discs, fabrics and their dyes, recyclable soda bottles, and antiperspirants. It also shows chemists who use their science background in fields like ecotoxicology, publishing, and law. Comes with Teacher's Guide including Follow-Up Activities and ChemCom Career Vignettes. 15 minutes

* ***Can be used with the STM:*** A short section describes the manufacturing process of compact discs.

Plasmid DNA Preparation: Bacterial plasmids are used to clone DNA. In the video, large amounts of bacteria are cultured containing the plasmid. The numbers of plasmids in the bacteria are then amplified by the addition of chloramphenicol. Purification of the plasmid DNA is accomplished by the removal of the chromosomal DNA using cesium chloride density centrifugation, and the dialysis of the sample. Animation is used to illustrate concepts. 22 minutes

Polymerase Chain Reaction: The first part of the video explains what PCR is and how it works, using simple laminate paper models of DNA. Students actually see what is required for PCR to take place and what happens at the molecular level through four thermal cycles. The second part gives a step-by-step explanation of an exercise from Carolina's DNA Amplification by Polymerase Chain Reaction Kit. This is a simple experiment that introduces the techniques of PCR and can be done by anyone who has electrophoresis equipment. 41 minutes.

Probes-Southern Blot Hybridization: This video documents how radioactive nucleic acid probes are used to identify rare sequences of genomic DNA. Genomic DNA, fractionated by agarose gel electrophoresis, is transferred by capillary action onto nylon filters by alkaline transfer. The genomic DNA sequences of interest are identified by the presence of radioactivity of the probe. Results of restriction fragment length polymorphism, or RFLP, are analyzed. Principles of using probes are illustrated with animation. 25 minutes

The Race to Catch a Buckyball: Part of the NOVA series. This video describes the effort to isolate the third form of pure carbon, C₆₀. 60 minutes

Tippecanoe Laboratories of Eli Lilly and Company: A video tour of the facilities and products found at the Lafayette location. 10 minutes

Tracing the Path: African American Contributions to Chemistry in the Life Sciences: This video exposes young people to the significant accomplishments of African and African American people in the area of chemistry in the life sciences. It is geared toward motivating

students to study science and help convince them that chemistry, and science in general can be an interesting, worthwhile, and realistic option in their future. 18 minutes.

Understanding Colorimetric Measurement: Join two lab analysts as they visit the Hall of Light and Color to learn about basic properties of light and colorimetry. The program includes an explanation of Beer-Lambert's Law and its relationship to colorimetric chemistry and the contrast of optical systems in colorimeters and spectrophotometers. 20 minutes

Who Found the Missing Link? (Uranium): Lise Meitner accomplished a lot of firsts: she was among the first women to be admitted to the University of Vienna, to study science, to receive a teaching appointment and a lab-and to have a man take credit for her work. This program tells the story of Lise Meitner and the work that led to the splitting of the atom, among a cast that included Max Planck (Meitner was his assistant), Leo Szilard, Albert Einstein, Enrico Fermi, Fritz Strassmann, and Otto Hahn, who took credit for Meitner's work-and received the Nobel Prize for it. In following the progress of various experiments and measurements, the program traces the paths that led to controlled nuclear fission, and proves that great scientists are smart but not necessarily honorable human beings. 26 minutes