

EDUCATION

Adding Life to Bio 101

Undergraduate biology students struggling to understand the inheritance of sex-linked traits or instructors looking for an engaging activity for teaching DNA structure can find help at the Biology Project from the University of Arizona, Tucson. The Web tutorial hits the essentials of first-year biology, including biochemistry, cell biology, development, immunology, and genetics. Flexible lessons let students check their bio savvy with preliminary quizzes, then focus their efforts on the topics they don't understand. Interactive investigations highlight real-world issues. For instance, students model the spread of HIV with a simple computer simulation and perform a virtual pathology exam on lung tissue from mice exposed to cigarette smoke. The project is undergoing renovation and will soon be adding materials for upper division courses.

www.biology.arizona.edu

RESOURCES

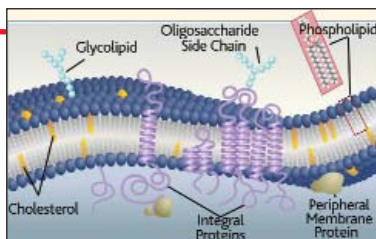
When Proteins Go Awry

Proteins are the cell's proletariat. Their labors keep a cell in shape and allow it to move, divide, break down food, and chat with other cells. Researchers trying

to unravel how these hard-working molecules accomplish the tasks of living or trigger illness can find a wealth of data at the Human Protein Reference Database, a joint production of Johns Hopkins University in Baltimore, Maryland, and the Institute of Bioinformatics in Bangalore, India.

Profiling nearly 3000 proteins, including more than 1400 blamed for human maladies, the new site supplies data such as which tissues a particular protein is active in, what other proteins it interacts with, its target molecules, and its role in diseases. Project head Akhilesh Pandey of Johns Hopkins and colleagues gleaned the information from the disease-genes storehouse Online Mendelian Inheritance in Man, more than 100,000 published papers, and other protein databases. By carefully sorting and comparing, they could spot unrecognized links between proteins and weed out shaky findings. (For details, see this month's issue of *Genome Research*.) Along with entries on individual molecules, you can call up maps that illustrate the interconnections among proteins (above). The results are free for noncommercial users. The site will hold 10,000 entries by year's end.

www.hprd.org



DATABASE

The Little Molecules That Could

Need the lowdown on the structure and function of particular bioactive compounds? Check out this new chemical database, an early offering from the ChemBank initiative at Harvard Medical School. The site caches data on molecules with biological effects. You can look up the chemical formula, structure, and activities for several hundred existing drugs and other small molecules, from the virus-blocker abacavir to the antibiotic Zovox. Chemists could use the information as a guide for designing new compounds, for example, and biologists can locate molecules that spur a particular cellular reaction, helping reveal its mechanism.

chembank.med.harvard.edu/bioactives

EXHIBITS

Blasts From the Past

The atomic age turned 58 on 16 July, the anniversary of the first A-bomb test. Don't melt down if you still haven't had time to read Richard Rhodes's mammoth histories *The Making of the Atomic Bomb* and *Dark Sun*. Check out a shorter account of the nuclear weapons story at the Atomic Archive, a collection of documents, historic images, and other materials from San Diego-based AJ Software & Multimedia, which sells a jazzed-up version of the archive on CD-ROM.

A timeline that spans the years 1895 to 2003 provides a crash course on the origin, use, and control of nukes. Mini-bios introduce more than 30 prominent figures in atomic history, from New Zealand-born physicist Ernest Rutherford, who deduced that atoms have a nucleus, to Julius and Ethel Rosenberg, who were executed in 1953 for passing secrets to the Soviet Union. A trove of documents includes Einstein's famous 1939 letter to Franklin D. Roosevelt warning that uranium could furnish raw material for a devastating bomb. Maps, period photos, and footage enhance the story. For example, one chart shows that fallout from the 1945 Trinity test in New Mexico barely missed Albuquerque but sprinkled on Santa Fe. Below, the mushroom cloud from "Mike," the first thermonuclear or fusion bomb, rises over Eniwetok Atoll in the Pacific Ocean in 1952.

www.atomicarchive.com



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