

## IMAGES

### A Bird in Hand

For a nifty take on how museum collections can benefit from cyberspace, check out this digital specimen case from the Zoological Museum Amsterdam in the Netherlands. The site supplies three-dimensional (3-D) images of 151 avian type specimens from around the world—the original examples taxonomists used to describe the species. You can rotate or tilt animals ranging from crows and owls to this black-capped lory (*Lorius lory viridicrissalis*, right) from Indonesia. The pages also describe where and when the birds were collected, provide their measurements, and compare them to other specimens. The museum plans to post similar 3-D images of its cache of shells and skulls.

[www.science.uva.nl/ZMA/3dpics](http://www.science.uva.nl/ZMA/3dpics)



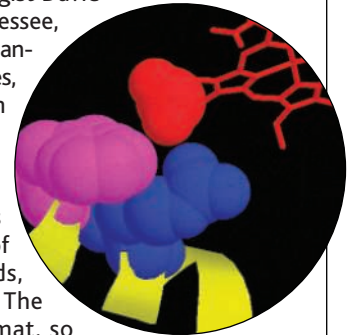
## DATABASE

### Cytochrome Central

People who inherit a particular version of the gene *CYP2D6* don't get help from standard doses of the pain reliever codeine and can suffer side effects from many other medications. The problem is a sluggish drug-detoxifying enzyme from the cytochrome P450 family. This database from molecular biologist David Nelson of the University of Tennessee, Memphis, can help researchers get a handle on this sprawling group of enzymes, which take part in everything from breaking down Prozac and caffeine to synthesizing cholesterol.

The site lists more than 4000 versions of cytochrome P450 enzymes gleaned from published genomes of humans, honeybees, slime molds, bacteria, and other creatures. The sequences come in standard format, so you can plug them directly into genome analysis software or compare your sequences to those already on the site. For more information about cytochrome P450s, check out transcripts of Nelson's lectures or take a guided tour of some P450 molecules (above, *CYP2C5*).

[drnelson.utmem.edu/CytochromeP450.html](http://drnelson.utmem.edu/CytochromeP450.html)



## EDUCATION

### Fire Up the Virtual Bunsen Burner

Demonstrating chemical reactions in class is a great way to spark students' interest—assuming the procedures work, everyone can see the lab bench, and nobody gets hurt. An alternative that eliminates these potential problems is this library of some 200 experiments for undergraduate labs from the Swiss Federal Institute of Technology in Zurich. You can search the experiment list by topic, keyword, or element to find everything from instructions for identifying metals by burning them to the synthesis of nylon. Movies of the reactions highlight important chemical transformations. Other features include a synopsis of the reaction, still photos of stages in the procedure, safety precautions, and references. Although some descriptions are in German, most experiments include English translations.

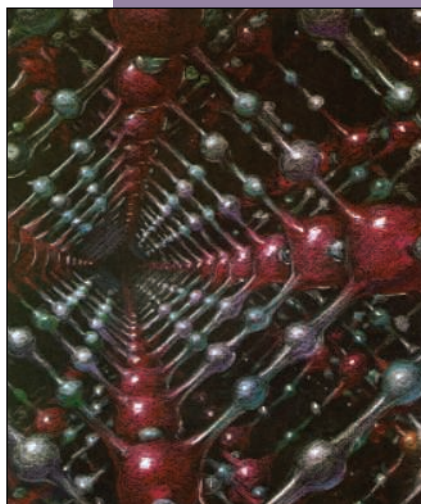
[www.cci.ethz.ch/index.html](http://www.cci.ethz.ch/index.html)

## TOOLS

### Sifting Through SNPs

Researchers trawling for SNPs, or single-letter changes in the DNA code that might signal vulnerability to ailments such as cancer and heart disease, have a new tool to speed their search. The Ensembl human genome browser from the European Bioinformatics Institute now lets you chart how often particular SNPs travel together. Known as haplotypes, these patterns can help researchers choose the most informative SNPs to study. Access the feature, which lets you view data from several human populations, by searching for particular SNPs.

[www.ensembl.org](http://www.ensembl.org)



## EXHIBIT

### The Making of the Atomic Bond

When Linus Pauling (1901-1994) was an undergraduate in chemistry, he began doubting the then-current notion that bonds form when tiny hooks on one atom slip into eyes on another. Pauling would go on to revolutionize our understanding of how atoms link up by sharing electrons, winning the Nobel Prize in 1954. A new site from Oregon State University in Corvallis, Pauling's alma mater, recounts this intellectual odyssey.

Pauling startled chemists in 1928 by announcing that he could use the new field of quantum mechanics to explain the long-standing question of why a carbon atom with four bonds forms a pyramid shape. You can browse the manuscript he published 3 years later that lays out his solution, listing six rules that describe electron sharing by atoms. The site includes other key publications—by the early 1930s, Pauling was writing a significant paper about every 5 weeks—along with stacks of photos, letters, and other memorabilia.

[osulibrary.orst.edu/specialcollections/coll/pauling/bond/index.html](http://osulibrary.orst.edu/specialcollections/coll/pauling/bond/index.html)

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