

## Fungi make gold nanoparticles

In India, researchers at the National Chemical Laboratory, Pune, Armed Forces Medical College, Pune, and Central Institute for Medicinal and Aromatic Plants, Lucknow, have found a non-toxic way to make gold nanoparticles using eukaryotic organisms. Aqueous gold chloride ions ( $\text{AuCl}_4^-$ ) are exposed to the fungus *Verticillium* sp., which reduces the ions and forms gold particles of 25 nm diameter. The work would fill a growing need to develop “green” ways of synthesizing nanoparticles. As gold particles form inside the fungal cells, the cells change from golden yellow to bright purple. UV-visible spectroscopy and X-ray diffraction confirmed that no extracellular particle formation occurs. The particle size was estimated from the diffraction pattern. Scanning electron microscopy confirmed that the mycelia were covered with well-dispersed gold nanoparticles. Based on these data, the researchers speculated on the mechanism of reduction and particle formation. Fungi are known to secrete higher levels of protein than bacteria and thus synthesize more particles. The process has potential use in producing catalysts or precursors to electronic coatings. (Environmental Science & Technology, 1 December 2001)