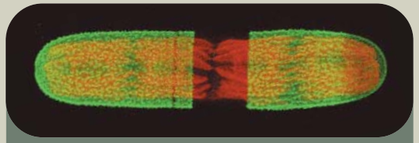
Small Things Considered



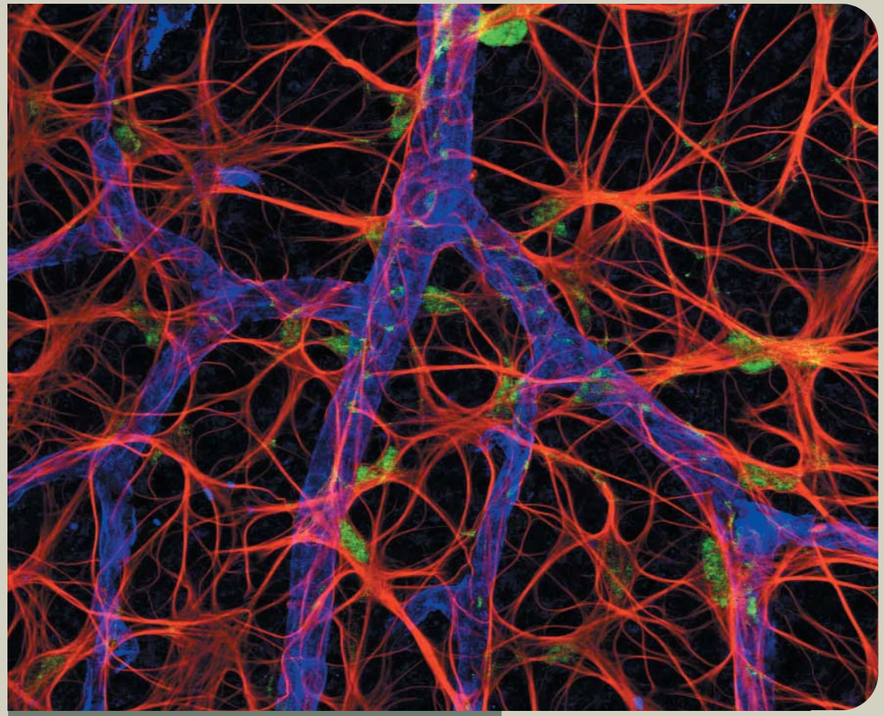
Cell wall of a green alga was dyed fluorescent green and then allowed to grow for a day before being photographed. The filaments inside the algal cell are chloroplasts, and appear red independently of the green dye. Thus, the space between the two parts of the green cell wall shows a day of new growth, indicating that the cell grows from the middle outward. The image was made by David S. Domozych of Skidmore College in Saratoga Springs, New York; it is magnified ×380.

Microscopy has come a long way since the seventeenth century, when the English polymath Robert Hooke peered through a primitive compound microscope of his own design and realized that cork is made up of what he termed "cells." Today's techniques—live-cell imaging, fluorescent probes, the use of light beyond the visible reaches of the spectrum—have continued to open up worlds within worlds that Hooke could not have imagined.

But perhaps even more significant than the progress in microscopy itself are the advances in the ways of recording images—specifically by means of photography. Beginning with Hooke and continuing until well into the twentieth century, microscopists had to rely on verbal and written descriptions and drawings to describe the wonders they observed. Photomicrography changed all that. Photographic methods have become an essential part of scientific investigation, not to mention the vital role they play in making images that can be shared with one's colleagues.

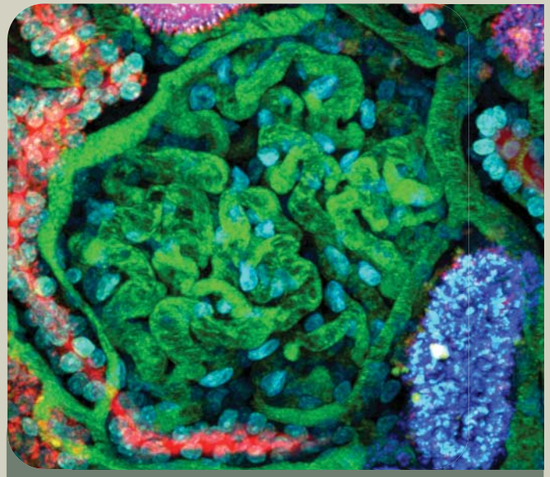
The light micrographs here—among the top prizewinners in the Olympus BioScapes 2005 Digital Imaging Competition, organized by Olympus America Inc. of Melville, New York—represent an eclectic range of subject matter, as briefly detailed in the captions. Mostly, however, the pictures can stand on their own, as icons of technical scientific virtuosity, and as works of art.

—THE EDITORS

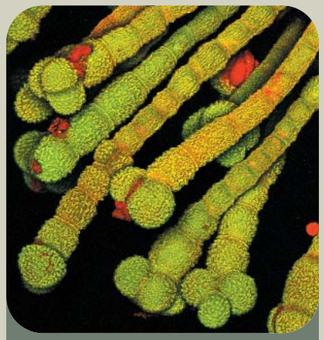


Retinal blood vessels surround local astrocytes—supportive cells of the nervous system—in the eye of an aged (two-year-old) rat. Blood vessels are shown in blue, astrocyte cell bodies in green, and extended portions of astrocyte cells are stained red. Changes in astrocytes as organisms grow older contribute to disease and degeneration. The image was made by Hussein Mansour of the University of Sydney in Australia; it is magnified ×25.

Tapering filaments of the cyanobacterium Gloeotrichia *sp. arrange themselves in starlike spherical colonies. Large numbers of such colonies often collect in freshwater lakes, forming blooms. The image was made by Spike (M.I.) Walker of Penkridge, Staffordshire, UK; it is magnified ×20.*



Filtering system known as the glomulerus (from the Latin for "little ball of yarn") is depicted inside the kidney of a living rat. The green tubes are the capillary loops of the glomulerus; the blue spots among them are cell nuclei. The image was made by Ruben M. Sandoval of the Indiana University School of Medicine in Indianapolis; it is magnified ×530.



Fringed edge of an anther, or pollen-bearing organ, of the creeping vine Thunbergia *is magnified ×250. The image was made by Shirley A. Owens of Michigan State University in East Lansing.*

Testis cell of a crane fly undergoes the first stage of meiosis, part of the process that produces sperm. The movement of chromosomes (center) during meiosis depends on spindle fibers (white contrast), which attach chromosomes to the spindle poles (where the spindle fibers converge). The image was made by Rudolf Oldenbourg of the Marine Biological Laboratory in Woods Hole, Massachusetts, and James LaFountain of the State University of New York at Buffalo. The image is magnified ×2,400; in reality, the spindle poles are only about a thousandth of an inch apart.