



Life, through a Lens

What You Can Learn about Biology Simply by Looking

Lecture by **Sanford M. Simon**, Professor



**Monday,
December 29,
2008**

10:30 a.m. – 2:30 p.m.

Lunch served
12 – 1 p.m.

Lecture will be held
in **Caspary Auditorium**

The Rockefeller University
1230 York Avenue
(at East 66th Street)
New York, NY 10065

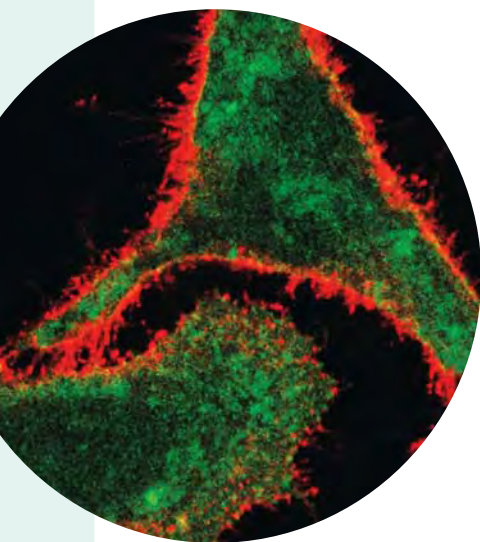
“In biology, many interesting things happen momentarily. They are transients in space or time. If you’re not looking, you’ll miss them.”

If you want to understand something, it helps to know what it looks like. So for over three centuries, biologists have been using microscopes to study the basic elements of life: tissues, cells, chromosomes, genes, proteins. The last few years, however, have seen an explosion in microscope technology, with new advances capturing images that could scarcely be imagined just 20 years ago — giving scientists dramatic new insights into the nature of life.

Today’s light microscopes have capabilities that a mere few years ago were thought impossible. They can zoom in and follow single molecules that are 100,000 times smaller than the width of a human hair and 100 times smaller even than the wavelength of light. They can focus below the surface of the skin to follow single stem cells as they move to repair damage or individual tumor cells as they metastasize and try to colonize new tissues. They even allow scientists to selectively activate molecules using light and trigger biological reactions.

And the results are more than just pretty pictures. Imaging studies allow scientists to understand biology not merely as a series of averages and chemicals but as a sequence of individual events. Sometimes the most meaningful actions happen in a momentary flash, involving single cells or single molecules. A protein may spend 95 percent of its time in one location, but what it does during the remaining five percent is what is truly significant for life. Study only the average behavior, and you may miss critical information. Whether you’re talking about molecules, cells or humans, there is much to be learned from observing individuals.

Dr. Simon, a pioneer in imaging techniques, has spent three decades using imaging studies in live cells to understand physiological processes of biology, such as how molecules cross living membranes, how cells communicate and how viruses and tumor cells attack our bodies. Join Dr. Simon for a multimedia tour of how advanced techniques in imaging are breaking new scientific ground and changing the way we understand life.



Left: Human cancer cell
Middle: Ebola viruses
Right: Single proteins in a cell

