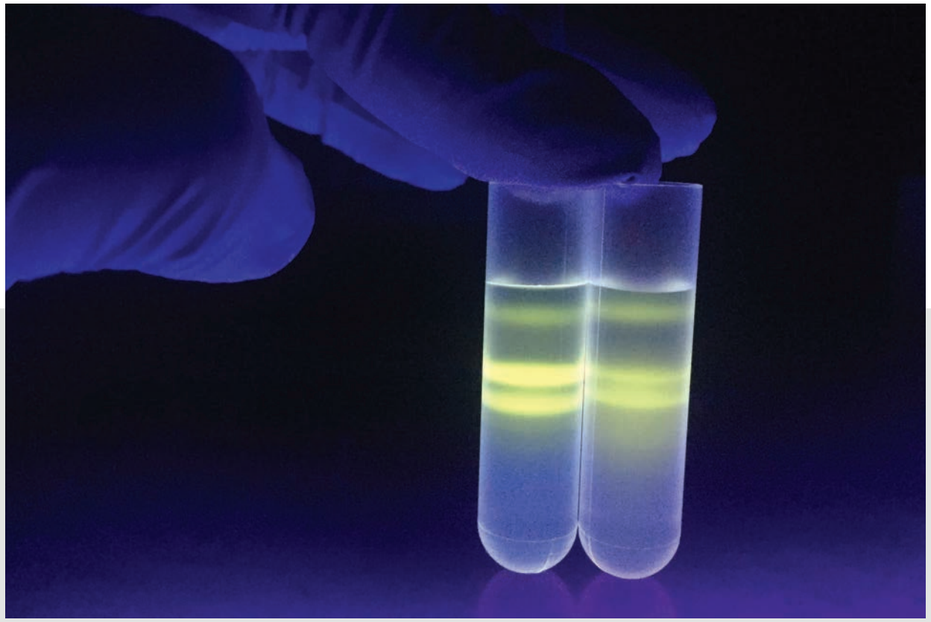
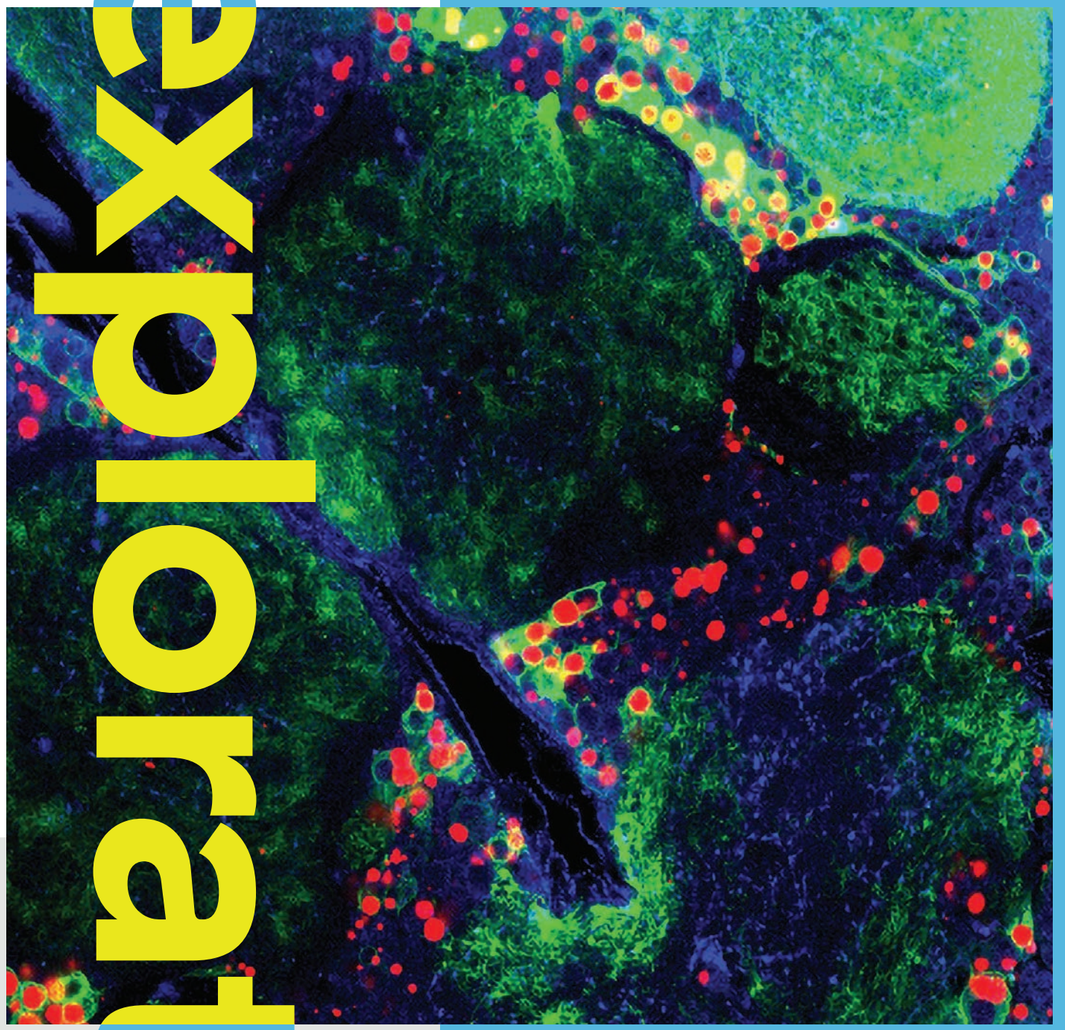
Images of Exploration and Discovery

There are many ways of capturing the phenomenon and processes that biomedical researchers investigate. Steady advances in imaging technologies provide windows into microscopic forms and functions—views that can be appreciated, in different ways, by scientists and nonscientists alike. Here are a small sample of the images that emerge from the work of Jefferson researchers. ■

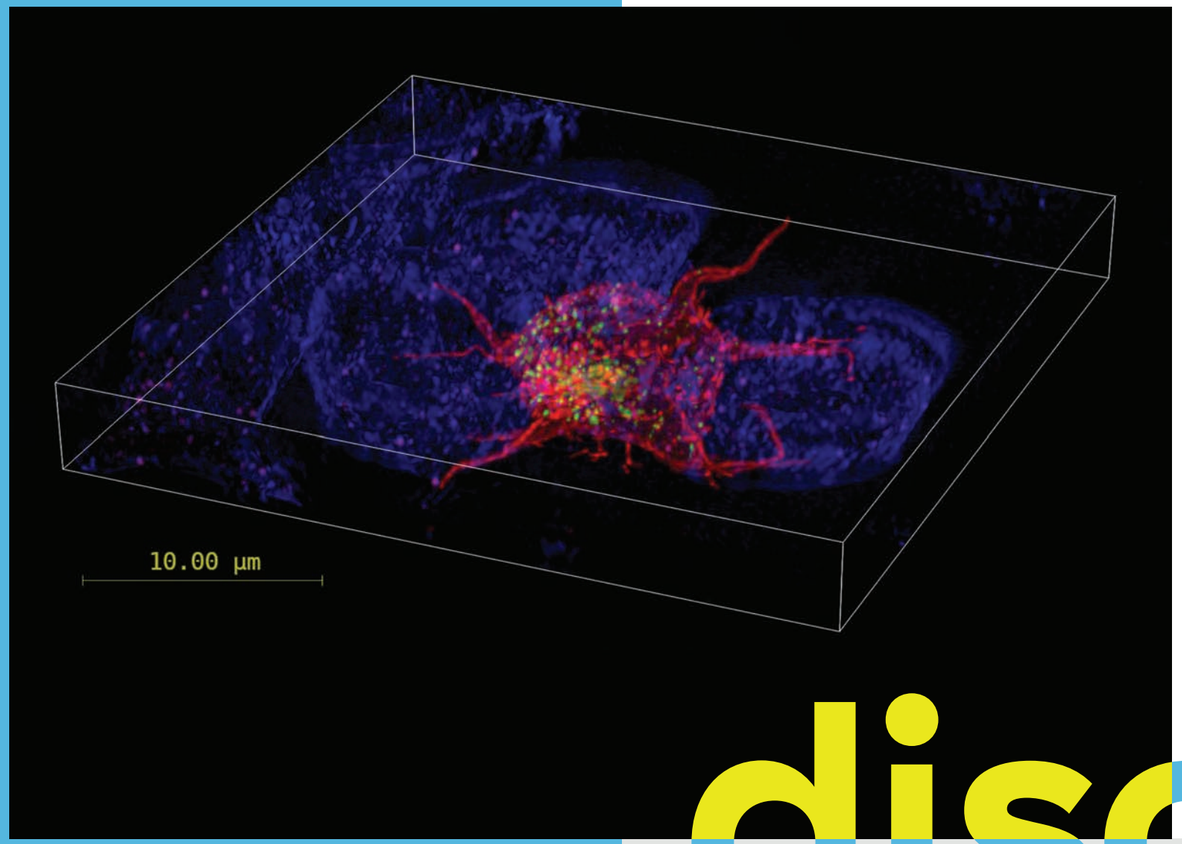


↑ Postdoctoral and graduate student researchers in the lab of **Dmitry Temiakov, PhD**, associate professor of biochemistry and molecular biology, are investigating how transcription and replication of mitochondrial DNA is regulated in different types of human cells. This unmagnified image shows highly purified human mitochondrial DNA—which the researchers isolated using density gradient centrifugation—glowing under the UV light.

exploration



↑ The lab of **Tim Mosca, PhD**, assistant professor of neuroscience, studies fruit fly olfaction as a means to understand how connections in the brain form and function. To tell the difference between different smells in the environment, the brain uses specific neurons—called interneurons—to compare environmental signals. As seen in this confocal microscopy image of the fruit fly brain, interneurons (red) express particular chemicals (blue) to communicate with the rest of the brain (green).

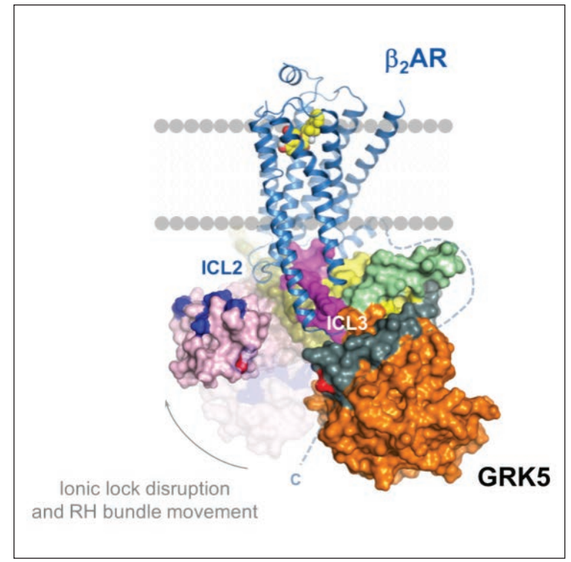


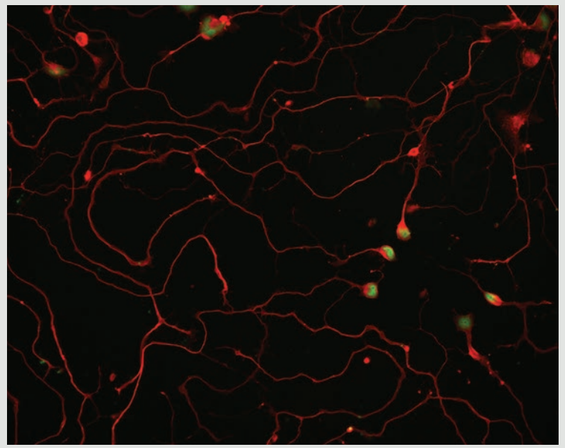
discovery

↑ Researchers in the lab of **Claudio Giraudo, PhD**, associate professor of microbiology and immunology, used super-resolution stimulated emission depletion (STED) microscopy to create this 3D projection of an engineered human CD8 Lymphocyte (in red) releasing the content of cytotoxic granules (green) during the destruction of tumor cells (blue).

→

Jeffrey Benovic, PhD, Thomas Eakins Endowed Professor of Biochemistry and Molecular Biology, and his research colleagues are renowned for discoveries on the function, signaling and regulation of G Protein-Coupled Receptors (GPCR), which are important in processes that ultimately control cell growth, cell motility and other functions. This molecular model—developed through mass spectrometry analysis and hydrogen deuterium exchange-mass spectrometry studies—is enabling scientists to suggest new strategies to regulate GPCR signaling in human disease.





←

This automated fluorescence microscopy image—created by a neuroscience doctoral student in the lab of **Diane Merry, PhD**, professor and vice chair of biochemistry and molecular biology—captures the state of induced pluripotent stem cells (red) as they differentiate into mature motor neurons (green). This work is part of the lab's evaluation of the mechanisms underlying motor neuron degeneration in spinal and bulbar muscular atrophy.