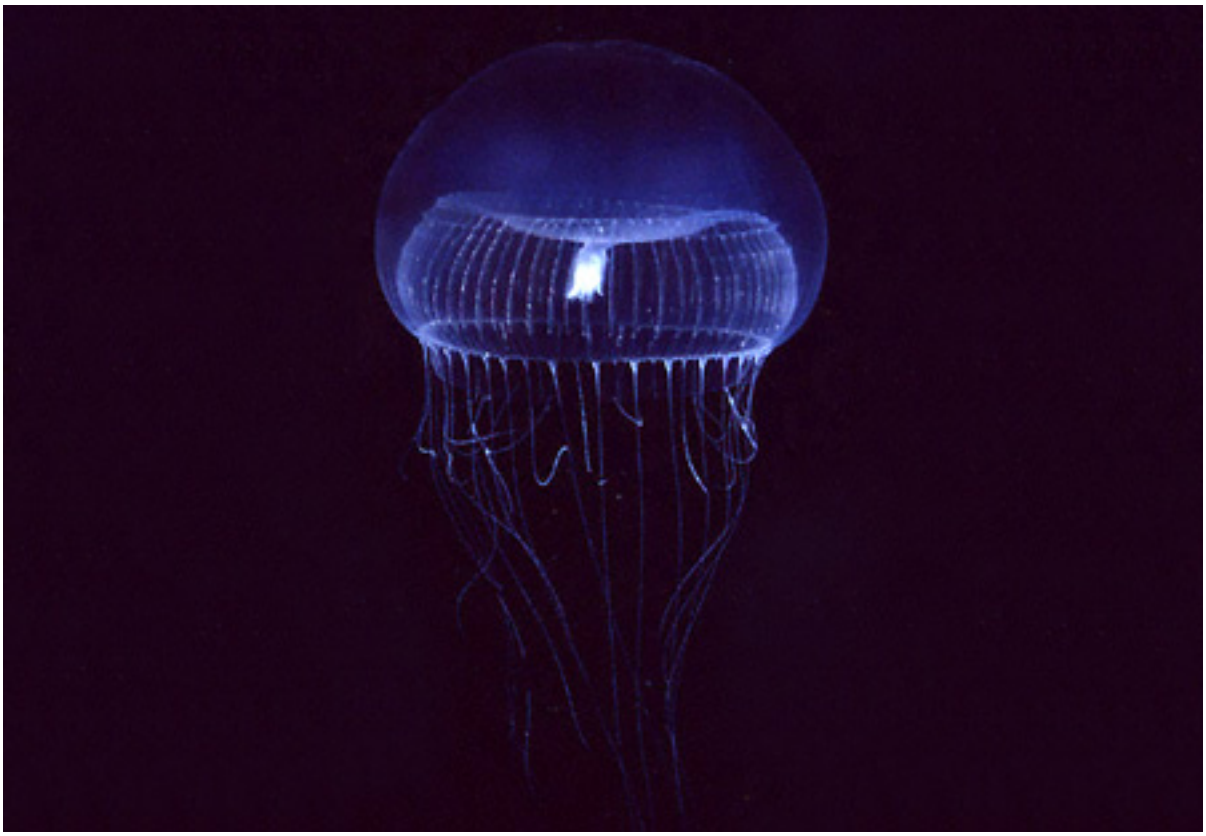
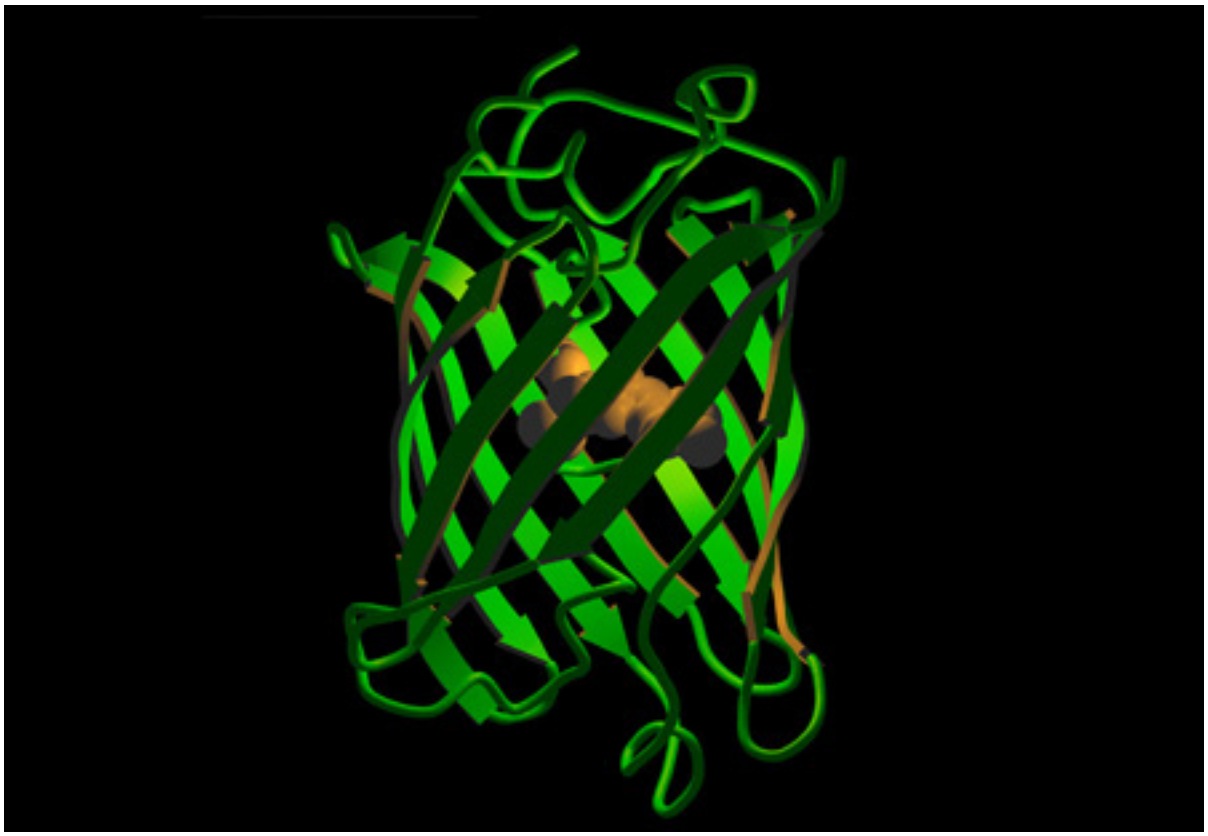


Fifty years ago, green fluorescent protein (GFP)—now a cornerstone of cell and molecular biology—existed only inside the gossamer "umbrella" of the jellyfish *Aequoria victoria*, a native of the Northwest Pacific.

Photo credit: Steven Haddock/Trevor Rivers, MBARI

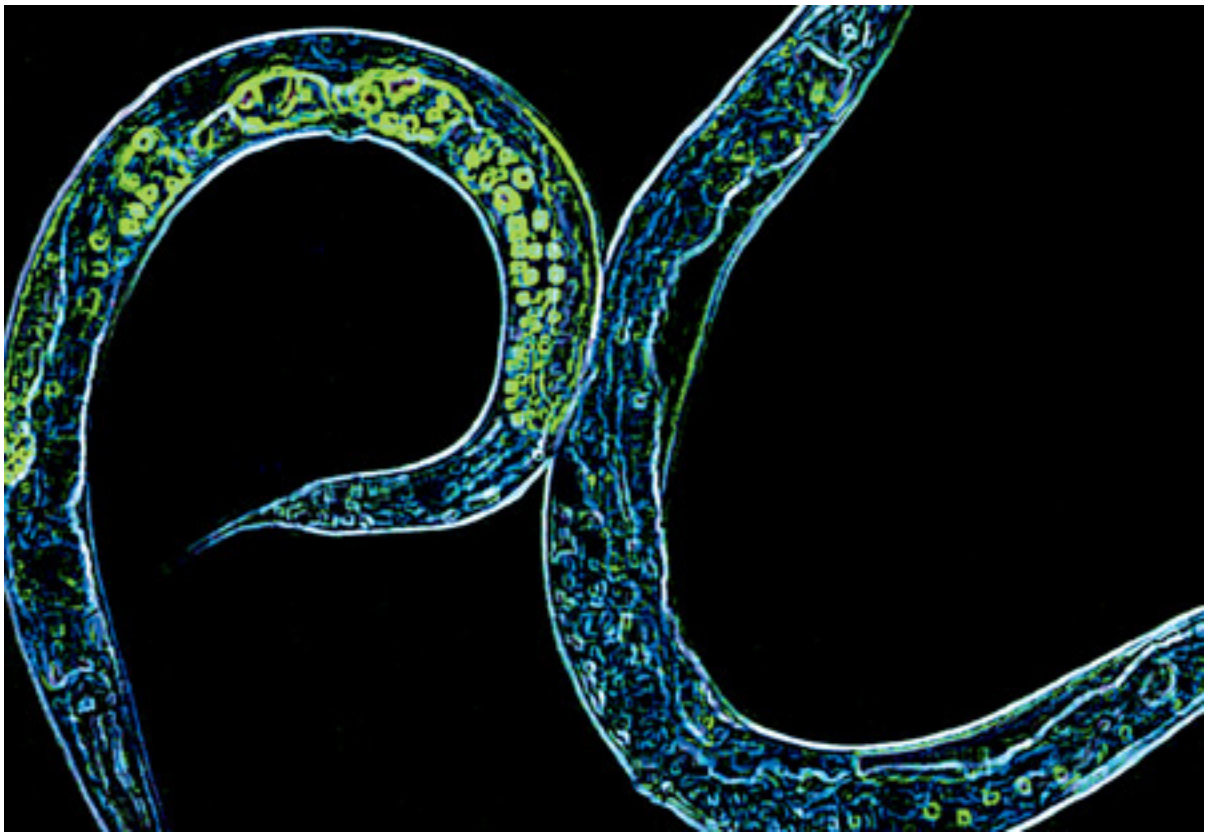
Martin Chalfie (left), Osamu Shimomura (center), and Roger Y. Tsien (right) appear after delivering their Nobel Lectures at the Aula Magna at Stockholm University on December 8, 2008. The three were awarded the Nobel Prize in Chemistry for the discovery and development of GFP.

"If there's anyone who's underappreciated, it's Douglas Prasher," Tsien has said. Prasher (center) was first to clone GFP and made the DNA available for further study by Tsien and Chalfie (left and right, respectively). Though Prasher did not share in receiving the Nobel, Tsien and Chalfie flew him and his wife Virginia Eckenrode to Sweden for the Nobel ceremony.



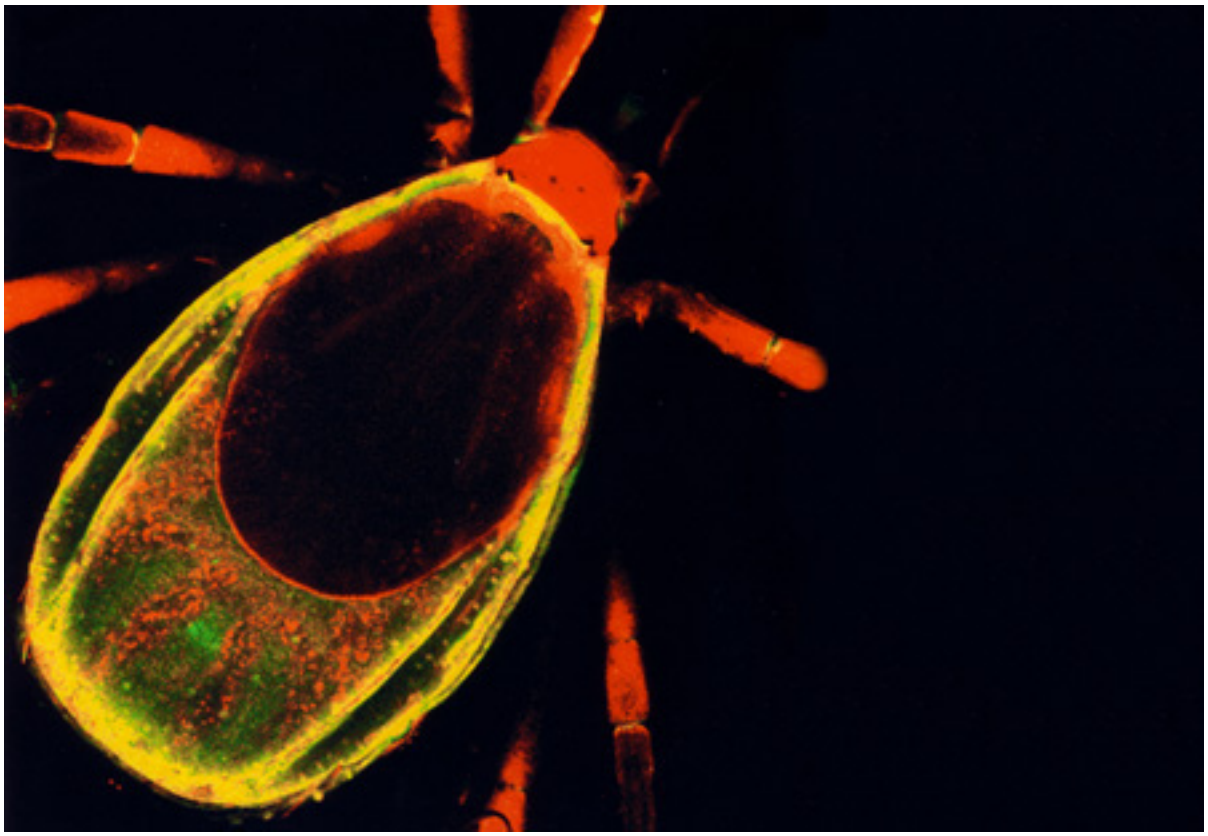
This image shows the barrel-shaped structure of GFP. The chromophore, which is responsible for the protein's fluorescent properties, is located in the middle of the barrel, and is sometimes referred to as the "light in the can."

Photo credit: Courtesy of Tsien Lab



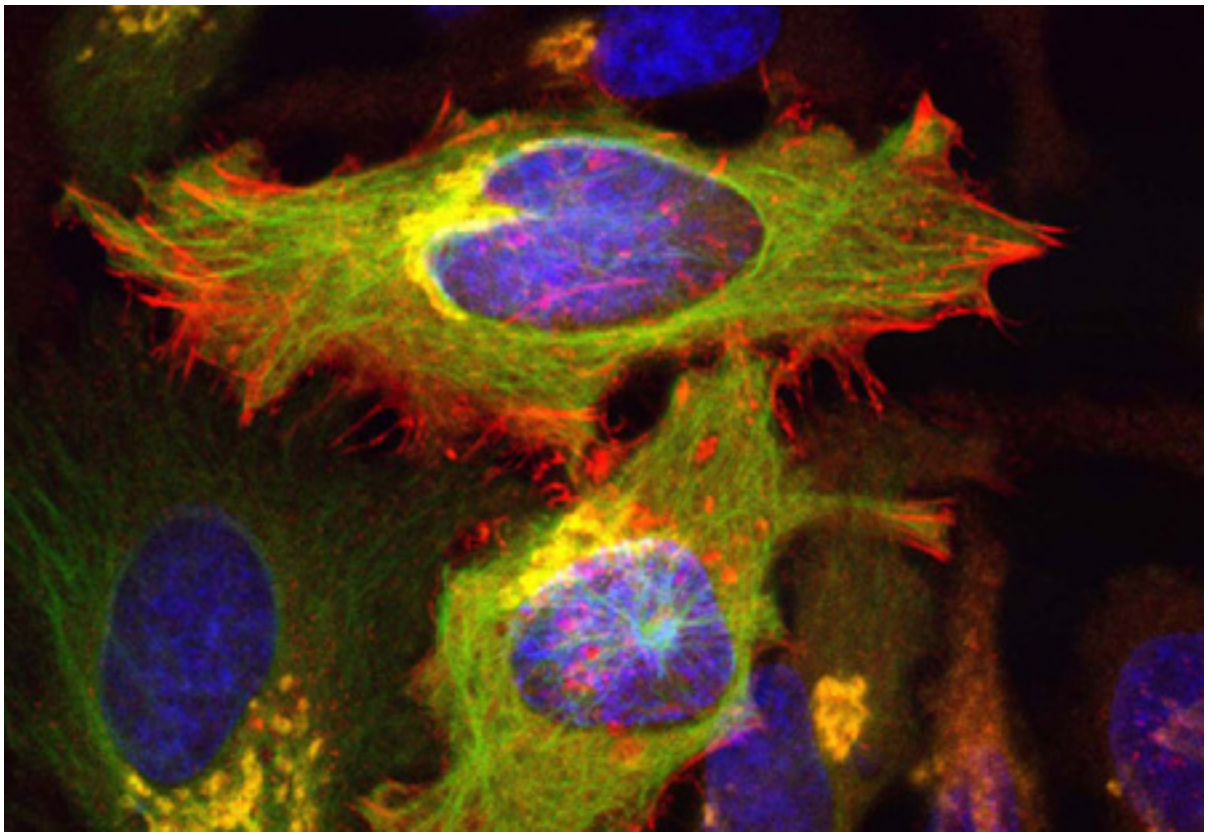
The use of fluorescent proteins has transformed biological research by allowing scientists to see when individual proteins are made, and to watch where they go. In a mutant *C. elegans* worm (left), a GFP-labeled histone H2B protein fluoresces bright green under ultraviolet light.

Photo credit: Jessica Vasale/Mello Lab

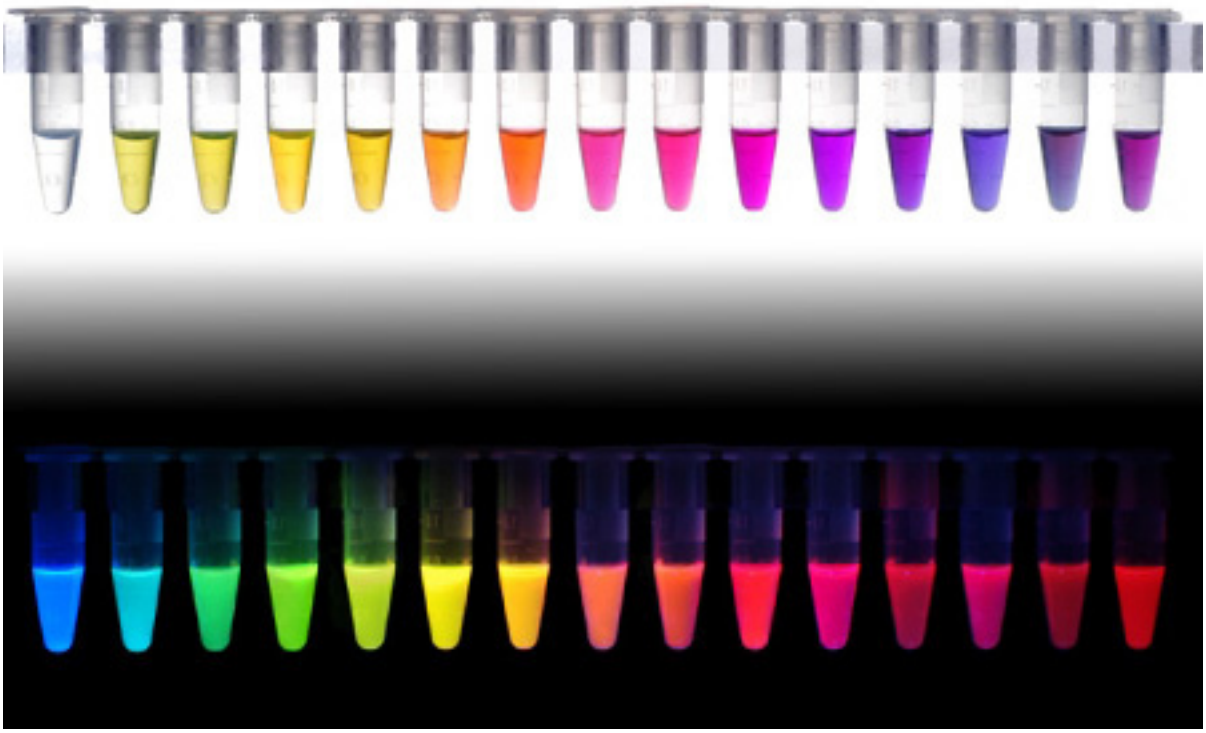


Using GFP, HHMI investigator Erol Fikrig and colleagues at Yale University generated this laser scanning confocal fluorescent microscopy image of an *Ixodes scapularis* tick.

Photo credit: Utpal Pal, Ruth R. Montgomery, Erol Fikrig

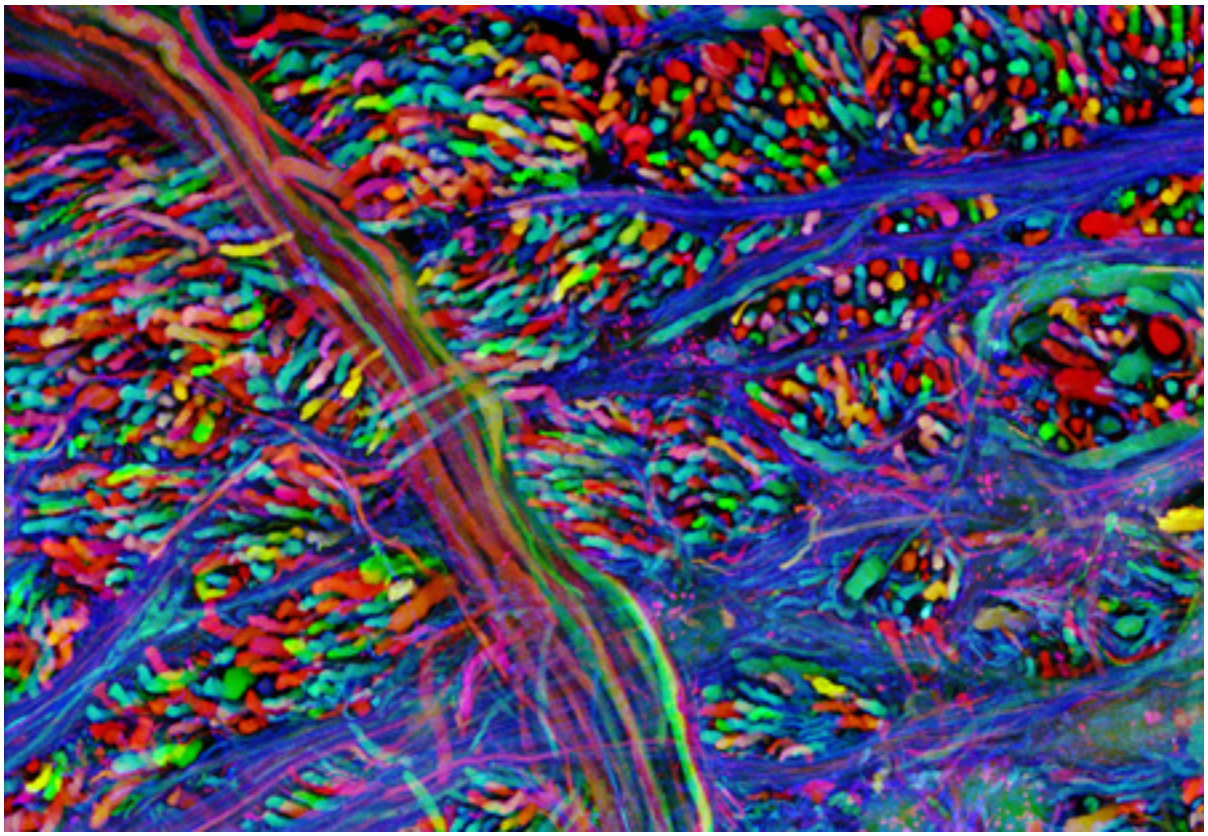


A variety of new and old methods are used to see the components of this cultured human adenocarcinoma (HeLa) cell. The nucleus is labeled with a small-molecule dye (blue), the Golgi apparatus is immunolabeled with quantum dots (yellow), microtubules are tagged with GFP (green), and the actin cytoskeleton is labeled with a tetracysteine/biarsenical dye (red).



Roger Tsien's laboratory has created a vibrant palette of fluorescent proteins with names such as plum, tangerine, cherry, and tomato.

Photo credit: Courtesy of Roger Tsien Lab



Scientists at Harvard University have activated multiple fluorescent proteins in neurons, rendering the cells in a dazzling array of colors.

Photo credit: Livet, Sanes, Lichtman Center for Brain Science, Harvard University, Cambridge MA

A petri dish marked with green fluorescent protein.

Photo credit: Courtesy of Roger Tsien Lab