American Biologist Martin Chalfie shared the 2008 Nobel Prize in Chemistry with Roger Tsien and Osamu Shimomura for their discovery and development of the Green Fluorescent Protein (GFP).

Martin Chalfie was born in Chicago in 1947 and grew up in Skokie Illinois. Although he had an interest in science from a young age-- learning the names of the planets and reading books about dinosaurs-- his journey to a career in biological science was circuital. In high school, Chalfie enjoyed his AP Chemistry course, but his other science courses did not make much of an impression on him, and he began his undergraduate studies at Harvard uncertain of what he wanted to study. He immediately became very excited about the idea of expressing the fluorescent protein in the nematode, hoping to figure out where the genes were expressed in the live organism. At the time, all methods of examining localization, such as antibody staining or in situ hybridization, required fixation of the tissue or cells, revealing the location of proteins only at fixed points in time.

In September 1992, after obtaining GFP DNA from Douglas Prasher, Chalfie asked his rotation student, Ghia Euskirchen to express GFP in E. coli, unaware that several other labs were also trying to express the protein, without success. Chalfie and Euskirchen used PCR to amplify only the coding sequence of GFP, which they placed in an expression vector and expressed in E. coli. Because of her engineering background, Euskirchen knew that the microscope in the Chalfie lab was not good enough to use for this type of experiment, so she captured images of green bacteria using the microscope from her former engineering lab. This work demonstrated that GFP fluorescence requires no component other than GFP itself. In 1994, Ghia Euskirchen, unaware that several other labs were also trying to express the protein, without success. Chalfie and Euskirchen used PCR to amplify only the coding sequence of GFP, which they placed in an expression vector and expressed in E. coli. Because of her engineering background, Euskirchen knew that the microscope in the Chalfie lab was not good enough to use for this type of experiment, so she captured images of green bacteria using the microscope from her former engineering lab. This work demonstrated that GFP fluorescence requires no component other than GFP itself. In fact, the difficulty that other labs had encountered stemmed from their use of restriction enzyme digestions for subcloning, which brought along an extra sequence that prevented GFP's fluorescent expression. Following Euskirchen's successful expression in E. coli, Chalfie's technician Yuan Tu went on to express GFP in C. elegans, and Chalfie published the findings in Science in 1994.

Through the study of C. elegans and GFP, Chalfie feels there is an important lesson to be learned about the importance basic research. Though there has been a recent push for clinically-relevant or patent-producing (translational) research, Chalfie warns that taking this approach alone is a mistake, given how "woefully little" we know about biology. He points out the vast expanse of the unknowns in biology, noting that important discoveries such as GFP are very frequently made through basic research using a diverse set of model organisms. Indeed, the study of GFP bioluminescence did not originally have a direct application to human health. Our understanding of it, however, has led to a wide array of clinically-relevant discoveries and developments. Chalfie believes we should not limit ourselves: "We should be a little freer and investigate things in different directions, and be a little bit awed by what we're going to find."