

Glowing Jellies

Imagine splashing in a calm ocean cove at night. As you splash, you notice green flashes in the water: glowing jellies! These are called crystal jellies. They can't sting humans, so you can swim and watch them glow green as you bump into them.

Where does this trait of being able to glow come from? In 1992, some scientists decided to find out. They examined the cells of crystal jellies and discovered that the glow comes from a protein. They gave the protein the name Green Fluorescent Protein, or GFP for short. To find out how these jellies make GFP, scientists investigated the jellies' genes. A gene is instructions for an organism's cells to make a particular protein. Scientists were able to find the gene that gave the jellies' cells instructions to make the GFP protein.

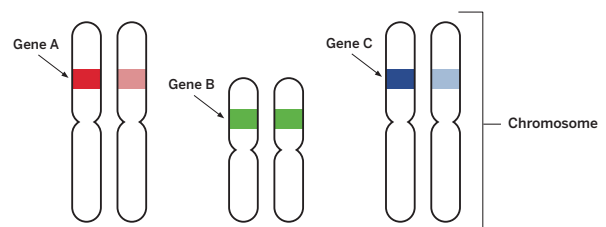
If a jelly has the GFP gene, its cells can make green fluorescent protein. If its cells make green fluorescent protein, the jelly can glow. The gene leads to the protein, which leads to the trait.

How does a jelly get the gene for glowing? When a pair of adult jellies reproduce, each one passes down genes to the offspring. Genes are found on chromosomes and chromosomes come in pairs. An organism has two copies of any given gene because there is one copy on each chromosome in a pair. However, the two copies of any particular gene can be the same version or different versions. These different versions of a gene are called alleles. When jellies reproduce sexually, each parent passes down one of each of their chromosomes (with all their genes on it) to the offspring. If at least one of the adult jellies has the version of the gene that is instructions for GFP, then that gene could be passed down to the offspring. Offspring with that gene will have cells that produce GFP, so they will glow, also.

Scientists think that jellies glow as a defense against predators. The bright glow might startle or confuse predators, or it might attract bigger predators that could scare away or eat the jelly's attacker! Glowing is an adaptive trait for jellies because it helps them survive in their environment.



A protein molecule called Green Fluorescent Protein (GFP) causes some jellies to glow in the dark!



This diagram shows three pairs of chromosomes. Chromosomes have many genes, but in this diagram only shows one for each chromosome. There are two copies of each gene, one on each chromosome of the pair. When an organism reproduces sexually, it gives the offspring one of each of its chromosomes and therefore one copy of each gene.