

Common Misconceptions

Main  Page

There are some commonly held misconceptions about bioluminescence. Here we try to clear up the confusion.

MYTHS	FACTS
<p>Myth: Bioluminescence is mostly caused by bacteria.</p>	<p>FACT: Bacteria can be luminous, and some organisms like fish and squid do have bacteria in their light organs. However, by far the majority of animals are able to produce light with chemicals that they have stored in their bodies.</p>
<p>Myth: Bioluminescence is the same as "fluorescence" (or "phosphorescence", or "chemiluminescence").</p>	<p>FACT: All of the terms apply to the production of light from chemicals, but bioluminescence is only similar to chemiluminescence.</p> <p>In fluorescence, the energy from an external source of light is absorbed and almost immediately reemitted. (See Chemistry for more detail.) Because energy must be conserved, the wavelength that comes out is longer (=redder, =less energy) than what went in. This is how laundry detergents can get things "whiter than white": by absorbing non-visible UV light and fluorescing in the visible spectrum.</p> <p>Phosphorescence is similar to fluorescence except that the excited product is more stable, so that the time until the energy is released is much longer, resulting in a glow after the light has been removed. This is the basis behind glow-in-the-dark stickers.</p> <p>Chemiluminescence is a general term for production of light when the excitation energy has come from a chemical reaction (as opposed to the absorption of photons, in fluorescence).</p> <p>Bioluminescence is a subset of chemiluminescence, where the light-producing chemical reaction occurs inside an organism.</p>
<p>Myth: All comb jellies luminesce and they make the colors of the rainbow (or red).</p>	<p>FACT: Nearly all comb-jellies (Phylum Ctenophora) can make light, but the best-known species <i>Pleurobrachia</i> has not been found to luminesce. Because ctenophores can produce brilliant colors from diffraction through their comb plates, people get the impression that they are seeing bioluminescence. Even marine biology books sometimes mention the red luminescence.</p>
<p> The ctenophore <i>Deiropoea</i> showing iridescence from plates of cilia.</p> <p>© S. Haddock</p>	
<p>Myth: Arrow-worms are about the only plankton that doesn't bioluminesce.</p>	<p>FACT: All the arrow-worms (Phylum Chaetognatha) that you are likely to encounter are non-luminous, but there is one deep-sea species which puts off a sparkling display of luminescence when disturbed.</p> <p>The main planktonic invertebrates (as distinct from protists) that don't luminesce are the heteropods and pteropods (although many other molluscs can make light).</p>
MYTHS	FACTS