

Chromatophore

Definition

- Chromatophores are pigment-containing and light-reflecting cells found in amphibians, fish, reptiles, crustaceans, and cephalopods. They are largely responsible for generating skin and eye colour in cold-blooded animals and are generated in the neural crest during embryonic development.
 - xanthophores (yellow),
 - erythrophores (red),
 - iridophores (reflective / iridescent),
 - leucophores (white),
 - melanophores (black/brown) and
 - cyanophores (blue).

Control

- Some species can rapidly change colour through mechanisms that translocate pigment and reorient reflective plates within chromatophores. This process, often used as a type of camouflage, is called physiological colour change.
 - Cephalopods such as octopus have complex chromatophore organs controlled by muscles to achieve this, while vertebrates such as
 - chameleons generate a similar effect by cell signaling. Such signals can be hormones or neurotransmitters and may be initiated by changes in mood, temperature, stress or visible changes in local environment.

Types

- The colour-related biochemicals fall into distinct classes: biochromes and schemochromes. The biochromes include true pigments, such as carotenoids and pteridines. These pigments selectively absorb parts of the visible light spectrum that makes up white light while permitting other wavelengths to reach the eye of the observer. Schemochromes have a significant effect on the perceived colours of cells although they are not actually pigments themselves. Instead, the schemochromes, though colourless, produce iridescent colours, notably silver and gold, by diffusion, interference, and scattering of light.

Xanthophores and erythrophores

- Chromatophores that contain large amounts of yellow pteridine pigments are named xanthophores and those with an excess of red/orange carotenoids termed erythrophores. It was discovered that pteridine and carotenoid containing vesicles are sometimes found within the same cell, and that the overall colour depends on the ratio of red and yellow pigments.

Iridophores and leucophores

- Iridophores, sometimes also called guanophores, are pigment cells that reflect light using plates of crystalline schemochromes made from guanine. When illuminated they generate iridescent colours because of the diffraction of light within the stacked plates. Orientation of the schemochrome determines the nature of the colour observed.

Melanophores

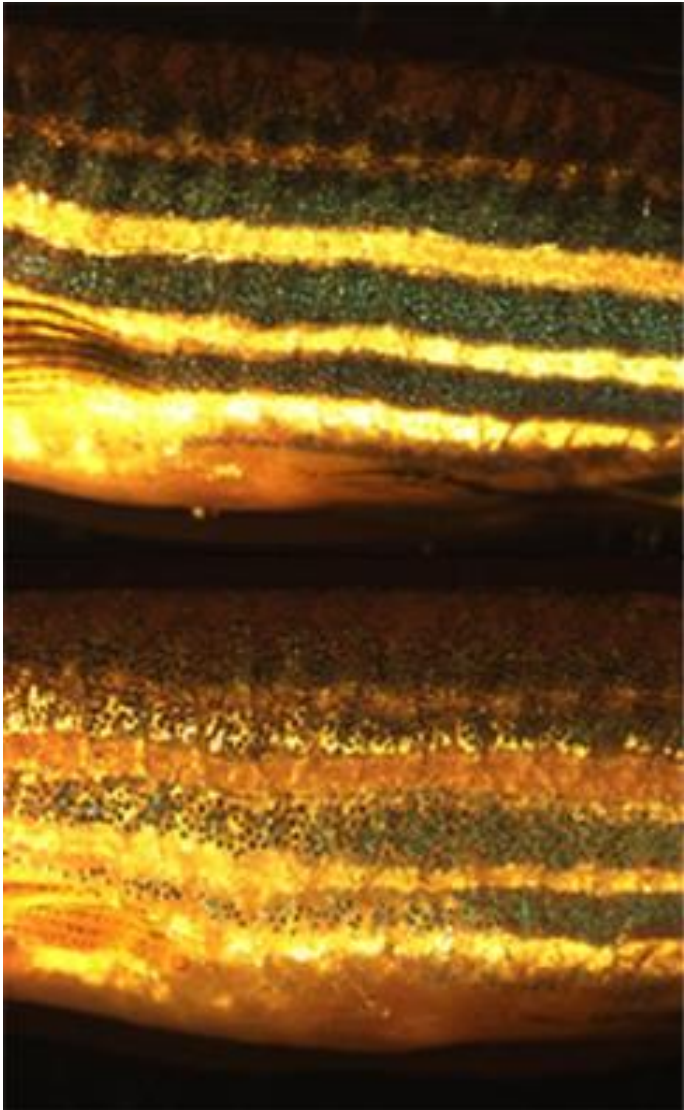
- Melanophores contain eumelanin, a type of melanin, that appears black or dark brown because of its light absorbing qualities

Cyanophores

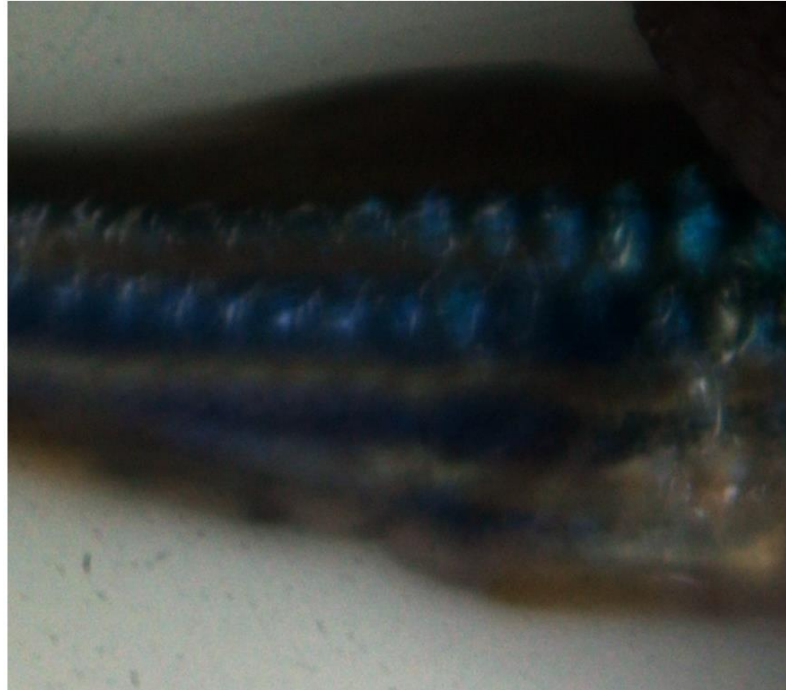
- a cyan biochrome of unknown chemical nature is responsible. This pigment, found within vesicles in at least two species callionymid fish, is highly unusual in the animal kingdom, as all other blue colourings thus far investigated are schemochromatic.

Read : <https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/c/Chromatophore.htm>

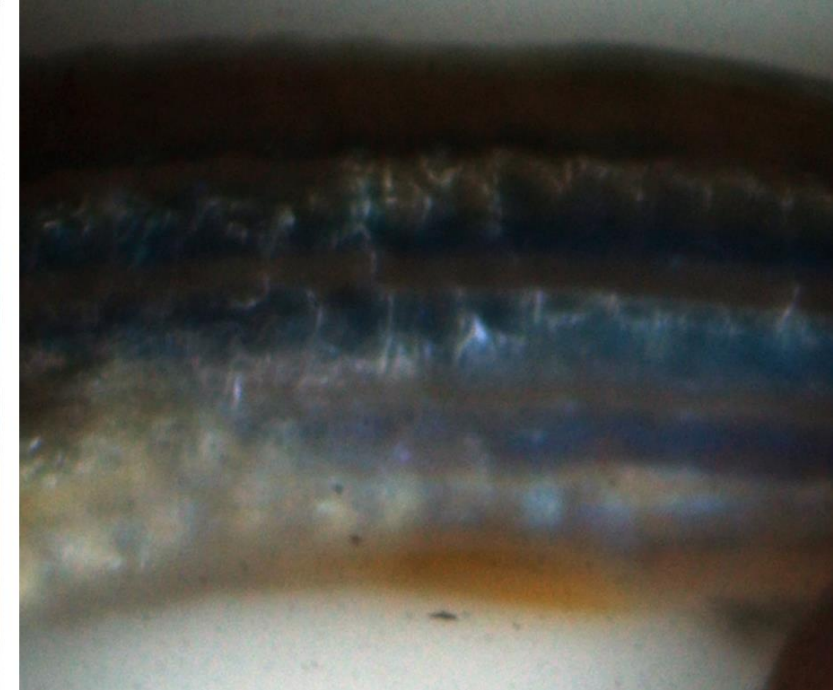
Expected



Actual



Light



dark

Note: I was wrong about male and female colorations. I was told that's because of a mutation. Please look up online how to identify gender in zebrafish. Sorry