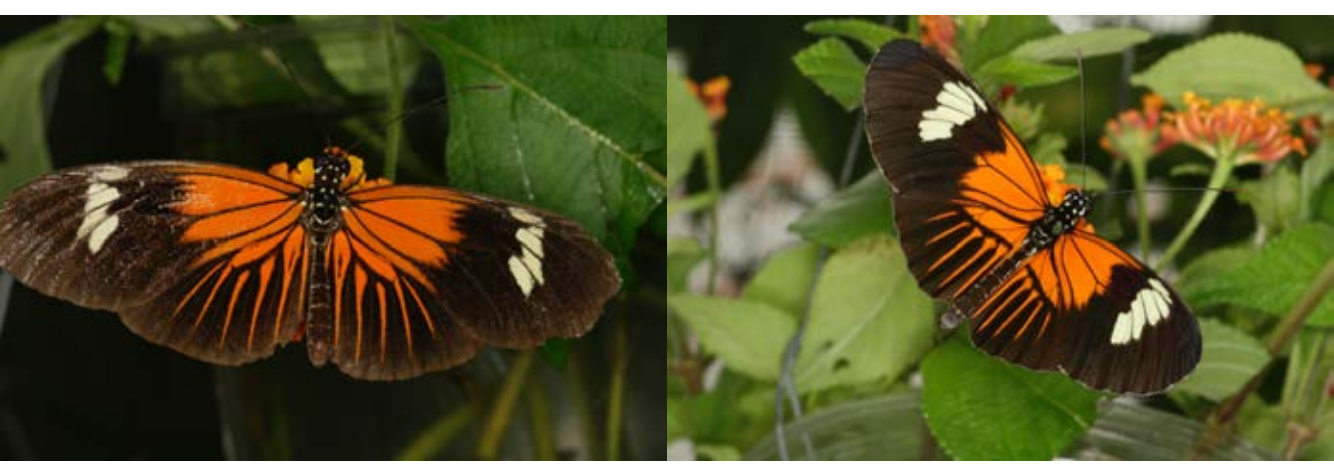
Mimicry

Distantly related species of *Heliconius* often have very similar wings.

For example, ***H. melpomene*** and ***H. erato*** are five times more distantly related than humans and chimpanzees, but have almost identical wing patterns.



H. erato (left) and H. melpomene (right).
Can you see any differences between them?

These butterflies are poisonous due to toxins from the plants they eat when they are caterpillars.

Birds taste the butterflies and learn to associate their bright, bold wing pattern with poison. Experiments have shown they avoid poisonous butterflies after only a single taste.

Species mimic each other to gain safety in numbers. The more butterflies with the same pattern, the quicker the predators learn.

Warning patterns and their mimicry are great examples of evolution by natural selection.

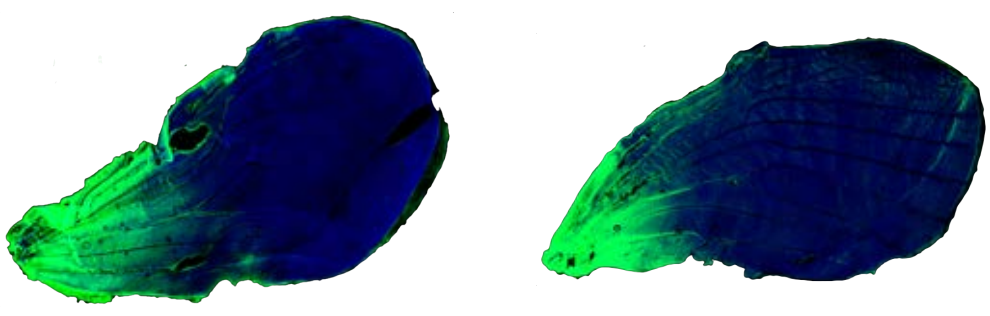
Wing Pattern Genes

Butterfly wing patterns are produced by a small number of patterning genes.

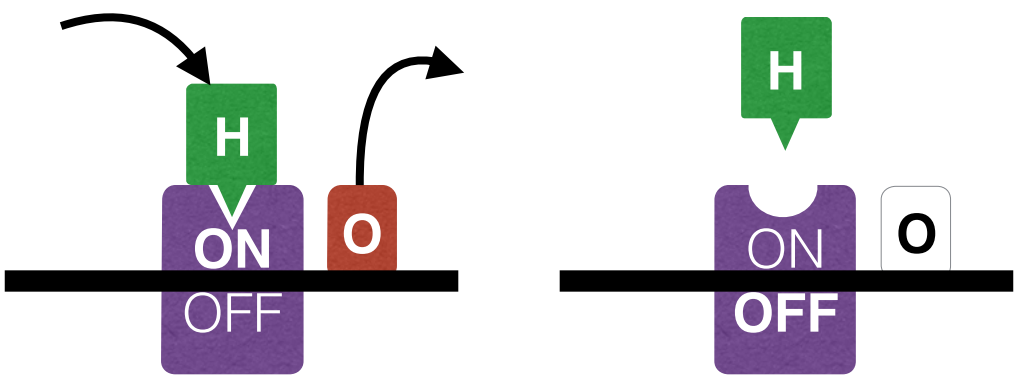
For example, a gene called ***optix*** produces red colour. Another gene called ***homothorax*** is expressed near the body.

In butterflies with Dennis patches, ***optix*** has a ***homothorax*** switch, so is turned on to produce red.

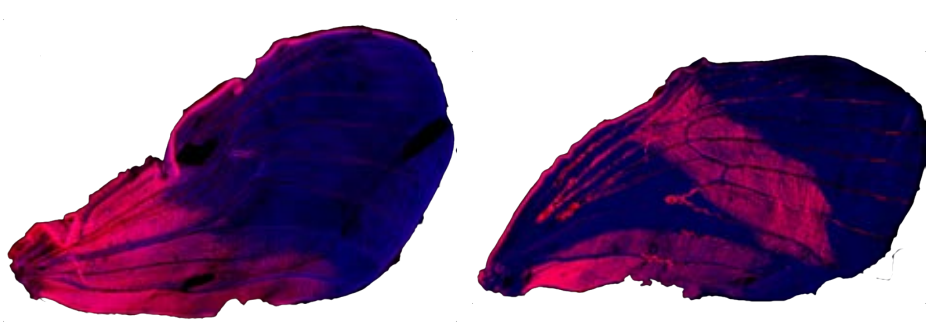
But in other butterflies, ***optix*** does not have a ***homothorax*** switch, so isn't turned on near the body.



homothorax is turned on in forewings…



homothorax turns optix on in some butterflies but not others, because they have different switches…



… and optix makes red patches.

(We don't know which gene turns optix on in red bands yet…)