Beadle and Ephrussi’s Technique to Transplant Optic Discs between Fruit Fly Larvae [1]

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In 1935, George Beadle and Boris Ephrussi developed a technique to transplant optic discs between fruit fly larvae. They
developed it while at the California Institute of Technology in Pasadena, California. Optic discs are tissues from which the adult
eyes develop. Beadle and Ephrussi used their technique to study the development of the eye and eye pigment. (1) The
experimenter dissects a donor larva, which is in the third instar stage of development, and removes the optic disc (colored red)
with a micropipette. Because the antenna disc is attached to the optic disc, they are often removed and transplanted together.
(2) The experimenter then implants the optic disc into a host larva, in the part of the host that will develop into an adult
abdomen. As the host larva matures to adulthood, the implanted optic disc develops into an eye inside the body cavity of the
adult. (3) The adult host has an eye within its body, which Beadle and Ephrussi found by dissecting the adult hosts. If the
antenna disc was also transplanted, sometimes the resulting eye developed with an antenna attached.