

*Brooklyn College Department of Psychology
Graduate Colloquium Series Presents:*

A "photosynthesis": Polarized Light and the Neurochemical Organization of the Visual System in an Octopus Brain

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ABSTRACT: Cephalopods are highly visual animals that use eyesight to hunt prey and avoid predation, as well as to find mates and communicate with conspecifics. Although superficially similar, the elaborate and very capable visual systems of cephalopods and vertebrates evolved independently, resulting in one of the most stunning examples of convergent evolution. The octopus eye appears astonishingly similar anatomically to our own, but possessed unique capabilities, such as the ability to detect polarized light, that have

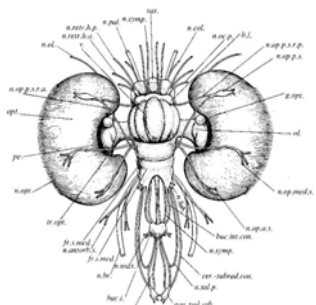


FIG. 1.6. Diagrammatic drawing of central nervous system of *O. bimaculoides* from above (modified from Young 1984a).

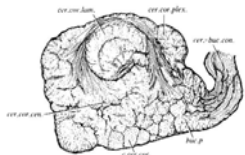


FIG. 1.7. Section of central nervous system of *O. bimaculoides* stained by Golgi's method (from Young 1984a).

developed to help the animal cope with the visual challenges of the underwater world. Using electrophysiology, we documented the initial stages of polarized light processing in the retina of *Octopus bimaculoides*, and found that even on the level of retinal output, octopuses appear to have the potential for not only polarization sensitivity, but true polarization vision. Using in-situ hybridization to explore further into the visual processing system, we characterized cholinergic and glutamatergic pathways in the optic lobe, which will allow us to better understand the higher levels of cortical organization in this fascinating, and highly capable, visual system.

TIME: Tuesday October 7th, 12:30-1:30 PM,
LOCATION: 5301 James Hall*,
Brooklyn College Campus

For more information about this or any talks in the Psychology Department series contact FGrasso@brooklyn.cuny.edu.

*Note location is not the usual departmental seminar room.