RECEPTOR DEMISE FROM ALTERATION OF GLYCOSYLATION SITE IN *Drosophila* OPSIN. D.-M. Chen, J. S. Christianson, G. Brown, and W. S. Stark. Div. Biological Sciences, University of Missouri-Columbia, MO 65211.

O'Tousa (*Vis. Neurosci.*, in press) transfected an opsin deleted strain to produce a *Drosophila* stock, ΔAsn_{20}, with the N-linked glycosylation site of opsin (position 20) changed from Asn to Ile. Positive controls, called *w9*, were also transfected, but with the wild type R1-6 opsin gene. We studied these flies using electroretinography (ERG), microspectrophotometry (MSP) and EM morphometry. Analysis of ΔAsn_{20}'s sensitivity and Prolonged Depolarizing Afterpotential (PDA) shows that R1-6 function is drasticly lower than wild type's from the outset. Analysis of the intensity-responsivity of ERG waveforms shows a diminution of R1-6 function from .5 to 7 days; only R7 and R8 function remains at 11 days. MSP showed no functional visual pigment in ΔAsn_{20} (over a 144 hour time course); by contrast, *w9* flies had near normal visual pigment. Since the ERG varies logarithmically while MSP varies linearly, these data suggest that visual pigment is reduced over 10-fold but that what is correctly routed to its rhabdomeric destination is functional (in newly emerged flies before further demise). Image analysis of R1-6 rhabdomeres showed a decrease in size with age in ΔAsn_{20} flies. This decrease was not as drastic as in a negative control, *ora* (=*o*uter *r*habdomeres *a*bsent, see Stark & Sapp, *J. Neurogenet.* **4** 227, 1987). *Ora* is an opsin nonsense mutant (Washburn & O'Tousa. *J. Biol. Chem.* **264** 15464, 1989). For positive control, rhabdomeres in *w9* remain constant or even increase with age. R7 rhabdomeres, an internal control since they express different opsin genes, did not differ in size between ΔAsn_{20} and *w9*. Interestingly, ΔAsn_{20} and *ora* have a similar elaboration of surplus septate desmosome - like plasmalemma between retinula cells central to the belt desmosome in ommatidia (see Stark & Sapp, 1987). Though opsin mRNA levels in ΔAsn_{20} are not different from those of wild type (O'Tousa, 1991), there is not the proliferation of rough endoplasmic reticulum as in *ninaA* which interferes with opsin folding (Colley *et al.*, *Cell* **67** 255, 1991). Glycosylation affects final synthesis or routing of opsin into the rhabdomere.

Supported by NSF grant BNS 8811062 and NIH grant RO1 EY07192

Abstract of paper presentation at the Association for Research in Vision and Ophthalmology (ARVO) 1992 meeting at Sarasota, FL. Session: "Photoreceptors: Membranes and Metabolism" Sunday, May 3, 1992, 10:30 am, Opera House, Program # 240. *Investigative Ophthalmology and Visual Science 33*, p. 739, 1992.