CAROTENOID REPLACEMENT IN *Drosophila*: FREEZE-FRACTURE. W.S.Stark*, G.Brown, D.Hombs, J.S.Christianson & R.White±. Div. Biol. Sci., Univ. of Missouri, Columbia, MO 65211 & ±Dept. of Biology, Univ. of Massachusetts, Boston, MA 02125.

Carotenoid deprivation in *Drosophila* reduces visual pigment, opsin, size of the rhabdomere and P-face particle density; replacement by feeding carrot juice rapidly restores visual pigment (Sapp et al., 1991, *Exp.Eye Res.* 53:71). Our data indicate that this effect is mediated by retinoid-activated opsin gene transcription (Stark et al., 1992, *Invest. Ophthal. Vis. Sci.* 33: 1398). Here we report that P-face particle density also increases in rhabdomeric microvilli in the early days of replacement therapy to 3000 particles/μm^2 by 1 day, reaching the control level of over 4000 by day 2. Our vistas reveal a continuity of the microvilli with the adjacent retinula cell plasmalemma between the adhering junction and the rhabdomere. This plasmalemma reflects the rhabdomeric P-face particle density. Freeze-fracture preparations of *Drosophila* photoreceptors also displayed autophagic coated pits budding from bases of microvilli and from plasmalemma as well as multivesicular bodies and Golgi apparatus. Recovery in *Drosophila* is considerably faster and more complete than recovery induced by 11-*cis* retinal in similarly deprived *Manduca* (Bennett & White, 1991, *Vis. Neurosci.* 6: 473). Further, there are substantial differences in the endomembrane traffic in deprivation vs. replacement. Support: NSF BNS8811062 & NIH EY07192 (WSS) & NSF BNS91 10672 (RW).