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Signaling for survival

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Rhodopsin is essential for photoreceptor survival. In the 8 December *Science* Chang and Ready report that rhodopsin's essential function is to organize actin and thus direct the photoreceptor's morphogenesis (*Science* 2000, **290**:1978-1980). An actin structure separates the photosensitive rhabdomere membranes from the rest of the cell; without this structure the cell collapses in on itself. Chang and Ready find that a dominant-negative *Drosophila* Rho guanosine triphosphatase, Drac1, mimics these degenerative effects of a rhodopsin mutation, whereas a dominant-active Drac1 can rescue both the morphogenesis and survival defects of rhodopsin mutant cells. Thus a sensory protein molds the cell so the cell can carry out its specific task. Some mutant rhodopsins involved in human retinitis pigmentosa may cause photoreceptor degeneration because of an inability to organize the actin cytoskeleton.

References

1. Morphological, physiological, and biochemical changes in rhodopsin knockout mice.
2. *Science*, [<http://www.sciencemag.org/>]