

X-ray crystallography of bovine rhodopsin

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Introduction

Rhodopsin is the 40 kDa light-transducing membrane protein in mammalian visual systems. One response of this visual pigment to light is a conformational change in the retinal cofactor that eventually leads to the formation of a complex of rhodopsin with transducin and the hydrolysis of cyclic GMP. We hope to determine the structure of the protein in its various photoactive states.

Methods and Materials

Okada has obtained crystals of bovine rhodopsin in a tetragonal space group ($a = b = 96.3 \text{ \AA}$, $c = 148.2 \text{ \AA}$). The crystals are light sensitive, so the experimental hutch was darkened. Red lights are sufficient for crystal alignment.

Results

Multiwavelength anomalous dispersion data sets were collected for a methyl-Hg-acetate co-crystal in December 1999. Data were collected to 3.0 \AA resolution. The R_{sym} values for the three data sets are 0.154 ($\lambda = 1.00547$), 0.174 ($\lambda = 1.00902 \text{ \AA}$), and 0.159 ($\lambda = 1.05969 \text{ \AA}$). In addition, two other data sets were collected for Hg derivatives. One of these diffracted to 5.0 \AA resolution while the other diffracted to 2.8 \AA resolution. The R_{sym} values for these other data sets are 0.113 and 0.129, respectively.

Discussion

We are attempting to solve the structure.

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