Biophys. Struct. Mechanism 3, 121 (1977)

Biophysics of Structure and Mechanism

Structure of the Purple Membrane from *Halobacterium Halobium**

R. Henderson and P. N. T. Unwin

MRC Laboratory of Molecular Biology, Hills Road, Cambridge, U.K.

The current state of the structural analysis of the purple membrane protein ("bacteriorhodopsin") will be discussed. The polypeptide of each protein molecule is basically arranged into seven, 40 Å long, helical segments which traverse the membrane from the inside to the outside of the cell in a compact arrangement. The lipid is thought to occur in small regions with a bilayer configuration. The width of the lipid bilayer is about the same (45 Å) as the thickness of each protein molecule and the two fit together neatly to form a membrane with an unusually flat surface. The position of the retinal is not yet known, but the sequence round the retinal-lysine residue that forms the site of attachment of the chromophore (Bridgen and Walker, 1976) suggests it is near one side of the membrane. Although very little is known about how the molecule changes its conformation during the photochemical cycle, an attempt will be made to discuss what is known, what suggestive evidence exists and what the future prospects are for getting a more detailed view of any structural changes induced by light.

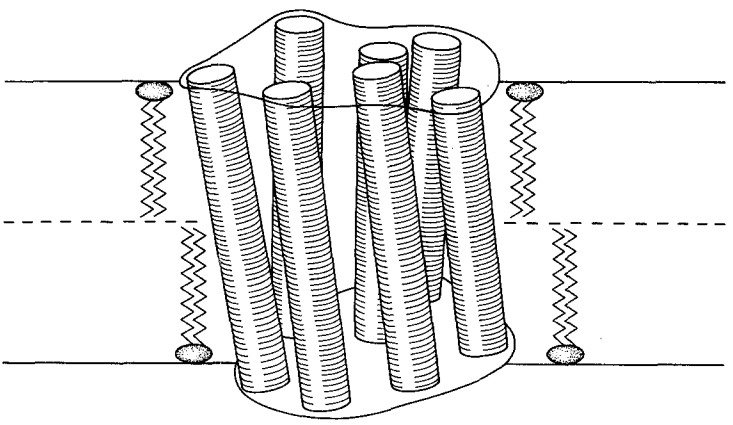

Fig. 1

* Presented at the EMBO-Workshop on Transduction Mechanism of Photoreceptors, Jülich, Germany, October 4–8, 1976