TABLE I

Physical parameters of the three principal proteins of phototransduction

The total numbers of molecules are based upon a rhodopsin density of 3 mM referenced to the outer segment envelope volume [116]; see also Ref. 118. G-protein numbers have been computed from (G-protein)/rhodopsin ratios of 1/10 for amphibian rods [76], and 1/8 for mammalian rods [167]. PDE numbers have been computed from PDE/rhodopsin ratios of 1/150 for amphibian rods [76]; see also [149], and 1/50 for mammalian rods [167]. Note that throughout the text PDE_{tot} refers to the total number of PDE catalytic subunits, which is twice the total number of holo-PDEs. The bracketed entries for diffusion coefficients indicate rough estimates, as described in the text.

	Rhodopsin	G-protein			PDE				
1. Structure	7-transmembrane helices	heterotrimer			heterotetramer				
2. A. MW (kDa)	39	85			210–230				
B. MW of subunits		α	β	γ	α	β	γ	γ	
		39	36	6.5 (toad)[129]	95	94	13	13	(frog, toad)[129,199]
		40	37	8 (bovine)[64,9]	88	84	11	11	(bovine)[8,88]
		41	–	– (bovine cone)[114]	94	(84)	11	11	(bovine cone)[89,69]

3. Total number of molecules per outer segment

	Rh_{tot}	G_{tot}		$\frac{1}{2}PDE_{tot}$	
A. salamander	$4 \cdot 10^9$	$4 \cdot 10^8$	(1/10)	$3 \cdot 10^7$	(1/150)
B. toad/frog	$3 \cdot 10^9$	$3 \cdot 10^8$	(1/10)	$2 \cdot 10^7$	(1/150)
C. mammal	$7 \cdot 10^7$	$9 \cdot 10^6$	(1/8)	$1 \cdot 10^6$	(1/50)

4. Density in or on membranes (μm^{-2})

	C_{Rh}	C_G	C_{PDE}
A. amphibian	25 000	2500	167
B. mammal	25 000	3000	500

5. Lateral diffusion coefficient ($\mu m^2 \, s^{-1}$)

	D_{Rh}	D_G	$D_{Gi\alpha}$	D_{PDE}
A. 22°C	0.7	(1.2)	(1.5)	(0.8)
B. 37°C	1.5	(1.8)	(2.2)	(1.2)