

TABLE V

Experimental estimates of the kinetic parameters of photoreceptor phosphodiesterases

In this paper we employ the symbol $2k_{\text{cat}}$ to denote the turnover number of the fully-liganded holo-PDE with both catalytic subunits activated. On the assumption of independent activation of subunits, the symbol k_{cat} represents the turnover number of a single catalytic subunit. Entries for $2k_{\text{cat}}$ marked with * were computed with the assumption that the ratio of (holo-PDE)/rhodopsin in amphibian rods is 1/150 (see Table I); entries marked with + indicate midpoint of cited range of values; entries for $2k_{\text{cat}}$ in () brackets were assumed by the authors on the basis of other studies cited in their report; entries in [] brackets adjacent to the principal entry are values cited by the authors as the highest observed in individual experiments on the enzyme. Values in bold type for the ratio $2k_{\text{cat}}/K_m$ indicate experiments in which light- or G_{α} -GTP γ S were used to activate PDE in native membranes.

| Study | Species | Activation method | <i>T</i> (°C) | <i>K_m</i> (μM) | $2k_{\text{cat}}$ (s ⁻¹) | $2k_{\text{cat}}/K_m$ (M ⁻¹ s ⁻¹) | Reference |
|-------|-------------|------------------------------|---------------|---------------------------|--------------------------------------|--|-----------|
| 1. | Frog | protamine | 30 | 70 | 800 | $1.1 \cdot 10^7$ | [129] |
| 2. | Frog | light | 22 | 80 | 1700 * | $1 \cdot 10^7$ | [203] |
| 3. | Frog | dark | room | 100 | - | - | [151] |
| | | light | room | 900 | 250 | $3 \cdot 10^5$ | |
| 4. | Frog | dark | room | 130 | - | - | [97] |
| | | light | room | 1000 | 1800 * | $2 \cdot 10^6$ | |
| | | trypsin | 30 | 60 | 2600 * | - | |
| 5. | Toad | light | 24 | 580 | 1600 * | $3 \cdot 10^6$ | [10] |
| 6. | Toad | dark | 22 | 26 | - | - | [51] |
| | | light | 22 | 550 | - | - | |
| 7. | Frog | trypsin | 30 | 110 | (1000) | $9 \cdot 10^6$ | [195] |
| | | G_{α} -GTP γ S | 30 | 202 | (1000) | $5 \cdot 10^6$ | |
| 8. | Bovine | trypsin | 37 | 150 | 2100 | $1.4 \cdot 10^7$ | [8] |
| 9. | Bovine | trypsin | 30 | 40 | 3600 [4200] | $9 \cdot 10^7$ | [88] |
| 10. | Bovine | light | 37 | 1100 | 600 | $5 \cdot 10^5$ | [167] |
| | | trypsin | 37 | 140 | 1200 [4044] | $8.6 \cdot 10^6$ | |
| | | (purified PDE) | 37 | 160 | 1300+ [4166] | $8.1 \cdot 10^6$ | |
| 11. | Bovine | trypsin | 23 | 70 | (4200) | $6 \cdot 10^7$ | [190] |
| | | G_{α} -GTP γ S | | 70 | (4200) | $6 \cdot 10^7$ | |
| 12. | Bovine | trypsin | 20 | - | 1000 | - | [52] |
| 13. | Bovine | trypsin | | | | | |
| | | (purified PDE) | 37 | 17 | 7400 | $4.4 \cdot 10^8$ | [69] |
| 14. | Bovine | trypsin | 20 | - | 1050 [1400] | - | [21] |
| | | trypsin | 35 | - | 5000 [5500] | - | |
| 15. | Bovine | trypsin | 30 | 110 | (1000) | $9 \cdot 10^6$ | [195] |
| | | G_{α} -GTP γ S | 30 | 110 | (1000) | $9 \cdot 10^6$ | |
| 16. | Bovine | trypsin | room | - | 4000 | - | [124] |
| 17. | Bovine cone | trypsin | 37 | 17 | 4200 | $2.5 \cdot 10^8$ | [69] |
| | | (purified PDE) | 37 | 17 | 5270 | $3.1 \cdot 10^8$ | |