

## Supplementary Table II:

PDB structures used in the study grouped according to protein. In multiple chain structures only chain A is used.

**Table 1:** Bacteriorhodopsin structures.

PDB code	Title	Resolution (Å)	Reference
1ap9	X-RAY STRUCTURE OF BR FROM MICROCRYSTALS GROWN IN LIPIDIC CUBIC PHASES	2.35	1
1brt	X-RAY STRUCTURE OF THE BACTERIORHODOPSIN TRIMER/LIPID COMPLEX	2.90	2
1brx	BACTERIORHODOPSIN/LIPID COMPLEX	2.30	3
1c3w	BACTERIORHODOPSIN/LIPID COMPLEX AT 1.55 Å RESOLUTION	1.55	4
1c8r	BACTERIORHODOPSIN D96M BR STATE AT 2.0 Å RESOLUTION	1.80	5
1cwq	M INTERMEDIATE STRUCTURE OF THE WILD TYPE BR IN COMBINATION WITH THE GROUND STATE STRUCTURE	2.25	6
1dze	STRUCTURE OF THE M INTERMEDIATE OF BACTERIORHODOPSIN TRAPPED AT 100K	2.5	7
1e0p	L INTERMEDIATE OF BACTERIORHODOPSIN	2.10	8
1f4z	BACTERIORHODOPSIN-M PHOTOINTERMEDIATE STATE OF THE E204Q MUTANT AT 1.8 Å RESOLUTION	1.80	9
1f50	BACTERIORHODOPSIN-BR STATE OF THE E204Q MUTANT AT 1.7 Å RESOLUTION	1.70	10
1iw6	CRYSTAL STRUCTURE OF THE GROUND STATE OF BACTERIORHODOPSIN	2.30	11
1iw9	CRYSTAL STRUCTURE OF THE M INTERMEDIATE OF BACTERIORHODOPSIN	2.50	12
1ixf	CRYSTAL STRUCTURE OF THE K INTERMEDIATE OF BACTERIORHODOPSIN	2.60	13
1jgj	CRYSTAL STRUCTURE OF SENSORY RHODOPSIN II AT 2.4 Å: INSIGHTS	2.40	14

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1jv6	BACTERIORHODOPSIN D85S/F219L DOUBLE MUTANT AT 2.00 ANGSTROM RESOLUTION	2.00	15
1jv7	BACTERIORHODOPSIN O-LIKE INTERMEDIATE STATE OF THE D85S MUTANT AT 2.25 ANGSTROM RESOLUTION	2.25	15
1kg8	X-RAY STRUCTURE OF AN EARLY-M INTERMEDIATE OF BACTERIORHODOPSIN	2.00	16
1kg9	STRUCTURE OF A "MOCK-TRAPPED" EARLY-M INTERMEDIATE OF BACTERIORHOSOPSIN	1.81	16
1kgb	STRUCTURE OF GROUND-STATE BACTERIORHODOPSIN	1.65	16
1kme	CRYSTAL STRUCTURE OF BACTERIORHODOPSIN CRYSTALLIZED FROM BICELLES	2.00	17
1m0k	BACTERIORHODOPSIN K INTERMEDIATE AT 1.43 A RESOLUTION	1.43	18
1m0l	BACTERIORHODOPSIN/LIPID COMPLEX AT 1.47 A RESOLUTION	1.47	18
1m0m	BACTERIORHODOPSIN M1 INTERMEDIATE AT 1.43 A RESOLUTION	1.43	19
1o0a	BACTERIORHODOPSIN L INTERMEDIATE AT 1.62 A RESOLUTION	1.62	20
1p8h	BACTERIORHODOPSIN M1 INTERMEDIATE PRODUCED AT ROOM TEMPERATURE	1.52	21
1p8i	F219L BACTERIORHODOPSIN MUTANT	1.86	21
1p8u	BACTERIORHODOPSIN N' INTERMEDIATE AT 1.62 A RESOLUTION	1.62	21
1pxr	STRUCTURE OF PRO50ALA MUTANT OF BACTERIORHODOPSIN	1.7	17
1pxs	STRUCTURE OF MET56ALA MUTANT OF BACTERIORHODOPSIN	2.20	17
1py6	BACTERIORHODOPSIN CRYSTALLIZED FROM BICELLS	1.80	17
1q5i	CRYSTAL STRUCTURE OF BACTERIORHODOPSIN MUTANT P186A CRYSTALLIZED FROM BICELLES	2.30	22
1q5j	CRYSTAL STRUCTURE OF BACTERIORHODOPSIN MUTANT P91A CRYSTALLIZED FROM BICELLES	2.10	22
1qhj	X-RAY STRUCTURE OF BACTERIORHODOPSIN GROWN IN LIPIDIC CUBIC PHASES	1.90	23

1qko	HIGH RESOLUTION X-RAY STRUCTURE OF AN EARLY INTERMEDIATE IN THE BACTERIORHODOPSIN PHOTOCYCLE	2.10	24
1qkp	HIGH RESOLUTION X-RAY STRUCTURE OF AN EARLY INTERMEDIATE IN THE BACTERIORHODOPSIN PHOTOCYCLE	2.10	24
1qm8	STRUCTURE OF BACTERIORHODOPSIN AT 100 K	2.50	25
1s51	THR24SER BACTERIORHODOPSIN	2.00	26
1s52	THR24VAL BACTERIORHODOPSIN	2.30	26
1s53	THR46SER BACTERIORHODOPSIN	2.0	26
1s54	THR24ALA BACTERIORHODOPSIN	2.20	26
1tn0	STRUCTURE OF BACTERORHODOPSIN MUTANT A51P	2.50	27
1tn5	STRUCTURE OF BACTERORHODOPSIN MUTANT K41P	2.20	27
1ucq	CRYSTAL STRUCTURE OF THE L INTERMEDIATE OF BACTERIORHODOPSIN	2.40	29
1x0i	CRYSTAL STRUCTURE OF THE ACID BLUE FORM OF BACTERIORHODOPSIN	2.30	30
1x0k	CRYSTAL STRUCTURE OF BACTERIORHODOPSIN AT PH 10	2.60	30
1x0s	CRYSTAL STRUCTURE OF THE 13-CIS ISOMER OF BACTERIORHODOPSIN	2.50	31
1xji	BACTERIORHODOPSIN CRYSTALLIZED IN BICELLES AT ROOM TEMPERATURE	2.20	28

**Table 2:** Mammalian Rhodopsin structures.

PDB code	Title	Resolution (Å)	Reference
1f88	CRYSTAL STRUCTURE OF BOVINE RHODOPSIN	2.80	32
1gzm	STRUCTURE OF BOVINE RHODOPSIN IN A TRIGONAL CRYSTAL FORM	2.65	33
1hzx	CRYSTAL STRUCTURE OF BOVINE RHODOPSIN	2.80	34
119h	CRYSTAL STRUCTURE OF BOVINE RHODOPSIN AT 2.6 ANGSTROMS RESOLUTION	2.60	35
1u19	CRYSTAL STRUCTURE OF BOVINE RHODOPSIN AT 2.2 ANGSTROMS RESOLUTION	2.20	36

**Table 3:** Halorhodopsin structures.

PDB code	Title	Resolution (Å)	Reference
1e12	HALORHODOPSIN, A LIGHT-DRIVEN CHLORIDE PUMP	1.80	37

**Table 4:** Sensory Rhodopsin structures

PDB code	Title	Resolution (Å)	Reference
1xio	Anabaena sensory rhodopsin	2.00	38

**Table 5:** Sensory Rhodopsin II structures.

PDB code	Title	Resolution (Å)	Reference
1gu8	SENSORY RHODOPSIN II	2.27	39
1gue	SENSORY RHODOPSIN II, K STATE	2.27	39
1h68	SENSORY RHODOPSIN II	2.10	40
1jgj	CRYSTAL STRUCTURE OF SENSORY RHODOPSIN II AT 2.4 ANGSTROMS: INSIGHTS INTO COLOR TUNING AND TRANSDUCER INTERACTION	2.40	41

**Table6:** Sensory Rhodopsin II with the transducer structures.

PDB code	Title	Resolution (Å)	Reference
1h2s	MOLECULAR BASIS OF TRANSMENBRANE SIGNALLING BY SENSORY RHODOPSIN II-TRANSDUCER COMPLEX	1.93	42

2f93	K INTERMEDIATE STRUCTURE OF SENSORY RHODOPSIN II/TRANSDUCER COMPLEX IN COMBINATION WITH THE GROUND STATE STRUCTURE .	2.00	43
2f95	M INTERMEDIATE STRUCTURE OF SENSORY RHODOPSIN II/TRANSDUCER COMPLEX IN COMBINATION WITH THE GROUND STATE STRUCTURE	2.20	43

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