Supplementary Information

Low-Temperature FTIR Spectroscopy of the L/Q Switch of Proteorhodopsin

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aa No. GPR	108	109	110	111	112	2 113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	
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aa No. GPR	-	-	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	5
aa No. BPR	-	-	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	j i
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aa No. BPP	100	107	100	109	101	102	102	104	105	106	107	100	100	200	200	201	202	203	204	205	200	207	200	209	210	211	212	213	214	- 216	213	210	21/	210	213	-	220	221	222	225	-
aa NO. BPR	18/	188	189	190	191	192	193	194	195	190	197	198	199	200	201	202	203	204	205	200	207	208	209	210	211	212	213	214	215	210	21/	218	219	220	221	-		. 223	224	225	1
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aa No. GPR	224	225	226	227	228	3 229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	-	247	248	249	250	251	-	-	-	-	-	-	-	-	-	-	-	-
aa No. BPR	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	-	249	250	251	252	253	-	-	-	-	-	-	-	-	-	-	-	-
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BPR	N	L	Α	D	F	v	N	к	Т	L	F	G	L	Т	1	w	N	٧	Α	v	к	Е	s	-	S	N	Α	L	Е	-	-	-	-	-	-	-	-	-	-	-	-

Fig. S1 Sequence alignment of bacteriorhodopsin (HsBR), HOT0m_GPR (green-absorbing proteorhodopsin, GPR), and HOT75m_BPR (blue-absorbing proteorhodospin). The positions of transmembrane helices are indicated according to the X-ray crystallographic structure (PDB ID: 4KLY).



Fig. S2 UV-visible absorption spectra of hydrated films of GPR (black line), L105Q GPR (red line), and BPR (blue line) at pH 10 and 300 K.



Fig. S3 Light-induced difference FTIR spectra of GPR (black line in the top panel), L105Q GPR (red lines), and BPR (black line in the bottom panel) in $H_2O(A)$ and $D_2O(B)$. Data of (A) and (B) for each spectrum are from Fig. 3.



Fig. S4 Light-induced difference FTIR spectra of GPR (black line in the top panel), L105Q GPR (red lines), and BPR (black line in the bottom panel) in $H_2O(A)$ and $D_2O(B)$. Data of (A) and (B) for each spectrum are from Fig. 4.