

# The Last Phase of the Reprotonation Switch in Bacteriorhodopsin: the M-Type and the N-Type Protein Conformation Dependence

Biochemistry

36, 12282-12287

DOI: [10.1021/bi9712302](https://doi.org/10.1021/bi9712302)

Citation Report

#	ARTICLE	IF	CITATIONS
2	The structure and mechanism of the family of retinal proteins from halophilic archaea. <i>Current Opinion in Structural Biology</i> , 1998, 8, 489-500.	2.6	270
3	Understanding Structure and Function in the Light-Driven Proton Pump Bacteriorhodopsin. <i>Journal of Structural Biology</i> , 1998, 124, 164-178.	1.3	114
4	Structural Characterization of the L-to-M Transition of the Bacteriorhodopsin Photocycle. <i>Biophysical Journal</i> , 1998, 75, 1446-1454.	0.2	41
5	Thermal Motions in Bacteriorhodopsin at Different Hydration Levels Studied by Neutron Scattering: Correlation with Kinetics and Light-Induced Conformational Changes. <i>Biophysical Journal</i> , 1998, 75, 1945-1952.	0.2	144
6	Light-induced denaturation of bacteriorhodopsin solubilized by octyl- $\beta$ -glucoside. <i>Protein Engineering, Design and Selection</i> , 1999, 12, 755-759.	1.0	39
7	CLOSING IN ON BACTERIORHODOPSIN: Progress in Understanding the Molecule. <i>Annual Review of Biophysics and Biomolecular Structure</i> , 1999, 28, 367-399.	18.3	545
8	Structural Changes in Bacteriorhodopsin During Ion Transport at $\approx$ Angstrom Resolution. <i>Science</i> , 1999, 286, 255-260.	6.0	548
9	Bacteriorhodopsin. <i>International Review of Cytology</i> , 1999, 187, 161-202.	6.2	49
10	Distortion of the L $\rightarrow$ M transition in the photocycle of the bacteriorhodopsin mutant D96N: a time-resolved step-scan FTIR investigation. <i>FEBS Letters</i> , 1999, 445, 14-18.	1.3	17
11	Two forms of N intermediate (Nopen and Nclosed) in the bacteriorhodopsin photocycle. <i>FEBS Letters</i> , 1999, 451, 147-151.	1.3	12
12	Conformational Change of Helix G in the Bacteriorhodopsin Photocycle: Investigation with Heavy Atom Labeling and X-Ray Diffraction. <i>Biophysical Journal</i> , 1999, 76, 1018-1023.	0.2	40
13	Time-Resolved Step-Scan Fourier Transform Infrared Spectroscopy Reveals Differences between Early and Late M Intermediates of Bacteriorhodopsin. <i>Biophysical Journal</i> , 1999, 76, 2687-2701.	0.2	96
14	Protein conformational changes in the bacteriorhodopsin photocycle 1 Edited by B. Honig. <i>Journal of Molecular Biology</i> , 1999, 287, 145-161.	2.0	244
15	Structure of bacteriorhodopsin at 1.55 Å... resolution. <i>Journal of Molecular Biology</i> , 1999, 291, 899-911.	2.0	1,435
16	Time resolved X-ray diffraction study of M-type to N-type structural transition in bacteriorhodopsin photocycle.. <i>Seibutsu Butsuri</i> , 1999, 39, S80.	0.0	0
17	Molecular mechanism of vectorial proton translocation by bacteriorhodopsin. <i>Nature</i> , 2000, 406, 653-657.	13.7	451
18	Structure of the bacteriorhodopsin mutant F219L N intermediate revealed by electron crystallography. <i>EMBO Journal</i> , 2000, 19, 2152-2160.	3.5	125
19	Time-resolved x-ray diffraction reveals multiple conformations in the M-N transition of the bacteriorhodopsin photocycle. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2000, 97, 14278-14282.	3.3	45

#	ARTICLE	IF	CITATIONS
20	A Reaction-induced Fourier Transform-Infrared Spectroscopic Study of the Lactose Permease. <i>Journal of Biological Chemistry</i> , 2000, 275, 28695-28700.	1.6	3
21	A triangle lattice model that predicts transmembrane helix configuration using a polar jigsaw puzzle. <i>Protein Engineering, Design and Selection</i> , 2000, 13, 771-778.	1.0	13
22	Coupling photoisomerization of retinal to directional transport in bacteriorhodopsin11 Edited by D. C. Rees. <i>Journal of Molecular Biology</i> , 2000, 300, 1237-1255.	2.0	213
23	Reconciling crystallography and mutagenesis: a synthetic approach to the creation of a comprehensive model for proton pumping by bacteriorhodopsin. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 49-59.	0.5	17
24	Chemical and physical evidence for multiple functional steps comprising the M state of the bacteriorhodopsin photocycle. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 106-118.	0.5	32
25	Lipidic cubic phase crystallization of bacteriorhodopsin and cryotrapping of intermediates: towards resolving a revolving photocycle. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 119-132.	0.5	35
26	Crystallographic analysis of protein conformational changes in the bacteriorhodopsin photocycle. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 157-165.	0.5	44
27	Structures of photointermediates and their implications for the proton pump mechanism. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 166-176.	0.5	23
28	Water and bacteriorhodopsin: structure, dynamics, and function. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 192-203.	0.5	90
29	Electrogenic processes and protein conformational changes accompanying the bacteriorhodopsin photocycle. <i>Biochimica Et Biophysica Acta - Bioenergetics</i> , 2000, 1460, 204-219.	0.5	35
30	Alteration of Conformation and Dynamics of Bacteriorhodopsin Induced by Protonation of Asp 85 and Deprotonation of Schiff Base as Studied by <sup>13</sup> C NMR. <i>Biochemistry</i> , 2000, 39, 14472-14480.	1.2	34
31	Molecular Mechanism of Ion Transport in Bacteriorhodopsin: Insights from Crystallographic, Spectroscopic, Kinetic, and Mutational Studies. <i>Journal of Physical Chemistry B</i> , 2000, 104, 11441-11448.	1.2	124
32	X-ray crystallography of bacteriorhodopsin and its photointermediates: insights into the mechanism of proton transport. <i>Biochemistry (Moscow)</i> , 2001, 66, 1192-1196.	0.7	16
33	From structure to mechanism: electron crystallographic studies of bacteriorhodopsin. <i>Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences</i> , 2002, 360, 859-874.	1.6	36
34	Time-Resolved X-Ray Diffraction Reveals Movement of F Helix of D96N Bacteriorhodopsin during M-MN Transition at Neutral pH. <i>Biophysical Journal</i> , 2002, 82, 2610-2616.	0.2	21
35	Hydration-Induced Proton Transfer in the Solid State of Norfloxacin. <i>Journal of Pharmaceutical Sciences</i> , 2002, 91, 1351-1357.	1.6	42
36	Structural insights into the mechanism of proton pumping by bacteriorhodopsin. <i>FEBS Letters</i> , 2003, 545, 2-8.	1.3	35
37	Deuterium Solid-State NMR Investigations of Exchange Labeled Oriented Purple Membranes at Different Hydration Levels. <i>Biophysical Journal</i> , 2003, 85, 361-369.	0.2	8

#	ARTICLE	IF	CITATIONS
38	Molecular Mechanism Of Light-Driven Proton Pump Of Bacteriorhodopsin. AIP Conference Proceedings, 2004, , .	0.3	0
39	Significance of low-frequency local fluctuation motions in the transmembrane B and C $\alpha$ -helices of bacteriorhodopsin, to facilitate efficient proton uptake from the cytoplasmic surface, as revealed by site-directed solid-state $^{13}\text{C}$ NMR. European Biophysics Journal, 2004, 33, 580-588.	1.2	15
40	Dynamics of Proton Transfer in Bacteriorhodopsin. Journal of the American Chemical Society, 2004, 126, 2225-2230.	6.6	58
41	Time-Resolved Linear Dichroism and Linear Birefringence of Bacteriorhodopsin at Alkaline pH: Identification of Two N Substates with Different Orientations of the Transition Dipole Moment. Journal of Physical Chemistry B, 2004, 108, 2076-2086.	1.2	6
42	Bacteriorhodopsin. Annual Review of Physiology, 2004, 66, 665-688.	5.6	538
43	Crystal Structure of the M Intermediate of Bacteriorhodopsin: Allosteric Structural Changes Mediated by Sliding Movement of a Transmembrane Helix. Journal of Molecular Biology, 2004, 341, 1023-1037.	2.0	92
44	Regeneration and inhibition of proton pumping activity of bacteriorhodopsin blue membrane by cationic amine anesthetics. Biochimica Et Biophysica Acta - Biomembranes, 2005, 1669, 17-25.	1.4	5
45	Can the Low-Resolution Structures of Photointermediates of Bacteriorhodopsin Explain Their Crystal Structures?. Biophysical Journal, 2005, 88, 1925-1931.	0.2	5
46	Structural Transition of Bacteriorhodopsin Is Preceded by Deprotonation of Schiff Base: Microsecond Time-Resolved X-Ray Diffraction Study of Purple Membrane. Biophysical Journal, 2005, 88, 436-442.	0.2	12
47	Propagating Structural Perturbation Inside Bacteriorhodopsin: Crystal Structures of the M State and the D96A and T46V Mutants. Biochemistry, 2006, 45, 12003-12010.	1.2	16
48	Site-Directed Solid-State NMR on Membrane Proteins. Annual Reports on NMR Spectroscopy, 2006, 57, 99-175.	0.7	12
49	Structural Changes in the L Photointermediate of Bacteriorhodopsin. Journal of Molecular Biology, 2007, 365, 1379-1392.	2.0	81
50	Studies of the Bacteriorhodopsin Photocycle without the Use of Light: Clues to Proton Transfer Coupled Reactions. Journal of Molecular Microbiology and Biotechnology, 2007, 12, 210-217.	1.0	12
51	Terahertz Spectroscopy of Bacteriorhodopsin and Rhodopsin: Similarities and Differences. Biophysical Journal, 2008, 94, 3217-3226.	0.2	69
52	Protein Conformational Changes in the Bacteriorhodopsin Photocycle: Comparison of Findings from Electron and X-Ray Crystallographic Analyses. PLoS ONE, 2009, 4, e5769.	1.1	38
53	Structural Changes in the N and N $^{\epsilon}$ States of the Bacteriorhodopsin Photocycle. Biophysical Journal, 2009, 96, 2779-2788.	0.2	13
54	Kinetics of the M Intermediate in the Photocycle of Bacteriorhodopsin upon Chemical Modification with Surfactants. Photochemistry and Photobiology, 2010, 86, 316-323.	1.3	10
55	Suppressed or recovered intensities analysis in site-directed $^{13}\text{C}$ NMR: Assessment of low-frequency fluctuations in bacteriorhodopsin and D85N mutants revisited. Biochimica Et Biophysica Acta - Biomembranes, 2010, 1798, 167-176.	1.4	5

#	ARTICLE	IF	CITATIONS
56	Bacteriorhodopsin: Would the real structural intermediates please stand up?. <i>Biochimica Et Biophysica Acta - General Subjects</i> , 2015, 1850, 536-553.	1.1	97
57	Mechanism of the light-driven proton pump of bacteriorhodopsin based on the consistency principle. <i>Biophysics and Physicobiology</i> , 2019, 16, 274-279.	0.5	5
58	NMR Studies on Structurally or Dynamically Heterogeneous Systems. <i>Annual Reports on NMR Spectroscopy</i> , 2011, 74, 1-88.	0.7	2
59	Schiff Base Switch II Precedes the Retinal Thermal Isomerization in the Photocycle of Bacteriorhodopsin. <i>PLoS ONE</i> , 2013, 8, e69882.	1.1	7
60	Structural studies of bacteriorhodopsin in BC era. <i>Biophysics and Physicobiology</i> , 2023, , .	0.5	0