Roderick MacKinnon

List of Publications by Year
in descending order

103 papers	39,322 citations	8755 75 h-index	30087 103 g-index
128 all docs	128 docs citations	128 times ranked	17639 citing authors

#	Article	IF	Citations
1	The Structure of the Potassium Channel: Molecular Basis of K ⁺ Conduction and Selectivity. Science, 1998, 280, 69-77.	12.6	6,408
2	Crystal Structure of a Mammalian Voltage-Dependent Shaker Family K+ Channel. Science, 2005, 309, 897-903.	12.6	2,042
3	Chemistry of ion coordination and hydration revealed by a K+ channelâ€“Fab complex at 2.0â€‰Ã… resolution. Nature, 2001, 414, 43-48.	27.8	1,954
4	X-ray structure of a voltage-dependent K+ channel. Nature, 2003, 423, 33-41.	27.8	1,781
5	X-ray structure of a ClC chloride channel at 3.0â€‰Ã… reveals the molecular basis of anion selectivity. Nature, 2002, 415, 287-294.	27.8	1,529
6	Crystal structure and mechanism of a calcium-gated potassium channel. Nature, 2002, 417, 515-522.	27.8	1,325
7	Atomic structure of a voltage-dependent K+ channel in a lipid membrane-like environment. Nature, 2007, 450, 376-382.	27.8	1,313
8	The open pore conformation of potassium channels. Nature, 2002, 417, 523-526.	27.8	1,160
9	Voltage Sensor of Kv1.2: Structural Basis of Electromechanical Coupling. Science, 2005, 309, 903-908.	12.6	918
10	Determination of the subunit stoichiometry of a voltage-activated potassium channel. Nature, 1991, 350, 232-235.	27.8	915
11	Principles of Selective Ion Transport in Channels and Pumps. Science, 2005, 310, 1461-1465.	12.6	853
12	The principle of gating charge movement in a voltage-dependent K+ channel. Nature, 2003, 423, 42-48.	27.8	784
13	Energetic optimization of ion conduction rate by the K+ selectivity filter. Nature, 2001, 414, 37-42.	27.8	756
14	Gating the Selectivity Filter in ClC Chloride Channels. Science, 2003, 300, 108-112.	12.6	747
15	Contribution of the S4 Segment to Gating Charge in the Shaker K+ Channel. Neuron, 1996, 16, 1169-1177.	8.1	661
16	Structural basis of PIP2 activation of the classical inward rectifier K+ channel Kir2.2. Nature, 2011, 477, 495-498.	27.8	579
17	Potassium channel receptor site for the inactivation gate and quaternary amine inhibitors. Nature, 2001, 411, 657-661.	27.8	554
18	Crystal Structure and Functional Analysis of the HERG Potassium Channel N Terminus. Cell, 1998, 95, 649-655.	28.9	432

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19	A Gating Charge Transfer Center in Voltage Sensors. Science, 2010, 328, 67-73.	12.6	430
20	The Cavity and Pore Helices in the KcsA K+ Channel: Electrostatic Stabilization of Monovalent Cations. Science, 1999, 285, 100-102.	12.6	427
21	Crystal Structure of the Mammalian GIRK2 K+ Channel and Gating Regulation by G Proteins, PIP2, and Sodium. Cell, 2011, 147, 199-208.	28.9	422
22	Cryo-EM Structure of the Open Human Ether-Ã-go-go -Related K + Channel hERG. Cell, 2017, 169, 422-430.e10.	28.9	407
23	Potassium channels. FEBS Letters, 2003, 555, 62-65.	2.8	398
24	Phospholipids and the origin of cationic gating charges in voltage sensors. Nature, 2006, 444, 775-779.	27.8	378
25	The Occupancy of Ions in the K+ Selectivity Filter: Charge Balance and Coupling of Ion Binding to a Protein Conformational Change Underlie High Conduction Rates. Journal of Molecular Biology, 2003, 333, 965-975.	4.2	377
26	Crystal Structure of the Human K2P TRAAK, a Lipid- and Mechano-Sensitive K ⁺ Ion Channel. Science, 2012, 335, 436-441.	12.6	368
27	Quantitative analysis of mammalian GIRK2 channel regulation by G proteins, the signaling lipid PIP2 and Na+ in a reconstituted system. ELife, 2014, 3, e03671.	6.0	365
28	Potassium Channels and the Atomic Basis of Selective Ion Conduction (Nobel Lecture). Angewandte Chemie - International Edition, 2004, 43, 4265-4277.	13.8	329
29	Mechanosensitivity is mediated directly by the lipid membrane in TRAAK and TREK1 K ⁺ channels. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 3614-3619.	7.1	329
30	Lipids in the Structure, Folding, and Function of the KcsA K+Channelâ€. Biochemistry, 2002, 41, 10771-10777.	2.5	317
31	Electrostatic tuning of Mg2+ affinity in an inward-rectifier K+channel. Nature, 1994, 371, 243-246.	27.8	314
32	Crystal Structure of the Eukaryotic Strong Inward-Rectifier K ⁺ Channel Kir2.2 at 3.1 Ã… Resolution. Science, 2009, 326, 1668-1674.	12.6	311
33	Structures of the Human HCN1 Hyperpolarization-Activated Channel. Cell, 2017, 168, 111-120.e11.	28.9	294
34	Structure of the KvAP voltage-dependent K+ channel and its dependence on the lipid membrane. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 15441-15446.	7.1	292
35	Structure-based membrane dome mechanism for Piezo mechanosensitivity. ELife, 2017, 6, .	6.0	292
36	Structure of the RCK Domain from the E. coli K+ Channel and Demonstration of Its Presence in the Human BK Channel. Neuron, 2001, 29, 593-601.	8.1	290

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37	Structure of the Human BK Channel Ca ²⁺ -Activation Apparatus at 3.0 Ã… Resolution. Science, 2010, 329, 182-186.	12.6	284
38	Crystal structure of a Kir3.1-prokaryotic Kir channel chimera. EMBO Journal, 2007, 26, 4005-4015.	7.8	281
39	X-ray structure of the mammalian GIRK2â€“Î²Î³ G-protein complex. Nature, 2013, 498, 190-197.	27.8	281
40	Physical mechanism for gating and mechanosensitivity of the human TRAAK K+ channel. Nature, 2014, 516, 126-130.	27.8	274
41	Purification and Characterization of Three Inhibitors of Voltage-Dependent K+ Channels from Leiurus Quinquestriatus var. Hebraeus Venom. Biochemistry, 1994, 33, 6834-6839.	2.5	272
42	A membrane-access mechanism of ion channel inhibition by voltage sensor toxins from spider venom. Nature, 2004, 430, 232-235.	27.8	267
43	Structure of the voltage-gated K ⁺ channel Eag1 reveals an alternative voltage sensing mechanism. Science, 2016, 353, 664-669.	12.6	259
44	Cryo-EM Structure of a KCNQ1/CaM Complex Reveals Insights into Congenital Long QT Syndrome. Cell, 2017, 169, 1042-1050.e9.	28.9	257
45	Structure of a Eukaryotic CLC Transporter Defines an Intermediate State in the Transport Cycle. Science, 2010, 330, 635-641.	12.6	256
46	An inhibitor of the Kv2.1 potassium channel isolated from the venom of a Chilean tarantula. Neuron, 1995, 15, 941-949.	8.1	244
47	Hanatoxin Modifies the Gating of a Voltage-Dependent K+ Channel through Multiple Binding Sites. Neuron, 1997, 18, 665-673.	8.1	243
48	Mapping the Receptor Site for Hanatoxin, a Gating Modifier of Voltage-Dependent K+ Channels. Neuron, 1997, 18, 675-682.	8.1	229
49	Force-induced conformational changes in PIEZO1. Nature, 2019, 573, 230-234.	27.8	216
50	Functional analysis of an archaebacterial voltage-dependent K+ channel. Nature, 2003, 422, 180-185.	27.8	211
51	Cryo-EM structure of the open high-conductance Ca2+-activated K+ channel. Nature, 2017, 541, 46-51.	27.8	209
52	Structural and Thermodynamic Properties of Selective Ion Binding in a K+ Channel. PLoS Biology, 2007, 5, e121.	5.6	206
53	Calibrated Measurement of Gating-Charge Arginine Displacement in the KvAP Voltage-Dependent K+ Channel. Cell, 2005, 123, 463-475.	28.9	196
54	Structural Basis of Human KCNQ1 Modulation and Gating. Cell, 2020, 180, 340-347.e9.	28.9	188

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55	Structure of a pore-blocking toxin in complex with a eukaryotic voltage-dependent K+ channel. ELife, 2013, 2, e00594.	6.0	178
56	Structural basis for gating the high-conductance Ca2+-activated K+ channel. Nature, 2017, 541, 52-57.	27.8	173
57	Voltage-dependent K ⁺ channel gating and voltage sensor toxin sensitivity depend on the mechanical state of the lipid membrane. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 19276-19281.	7.1	147
58	Molecular structure of human KATP in complex with ATP and ADP. ELife, 2017, 6, .	6.0	141
59	Two Separate Interfaces between the Voltage Sensor and Pore Are Required for the Function of Voltage-Dependent K+ Channels. PLoS Biology, 2009, 7, e1000047.	5.6	138
60	Activation mechanism of a human SK-calmodulin channel complex elucidated by cryo-EM structures. Science, 2018, 360, 508-513.	12.6	135
61	Structure of a CLC chloride ion channel by cryo-electron microscopy. Nature, 2017, 541, 500-505.	27.8	132
62	Open structure of the Ca2+ gating ring in the high-conductance Ca2+-activated K+ channel. Nature, 2012, 481, 94-97.	27.8	129
63	Solution structure of the potassium channel inhibitor agitoxin 2: Caliper for probing channel geometry. Protein Science, 1995, 4, 1478-1489.	7.6	125
64	Electron microscopic analysis of KvAP voltage-dependent K+ channels in an open conformation. Nature, 2004, 430, 806-810.	27.8	125
65	Ion Selectivity in a Semisynthetic K+ Channel Locked in the Conductive Conformation. Science, 2006, 314, 1004-1007.	12.6	124
66	A Mutant KcsA K+ Channel with Altered Conduction Properties and Selectivity Filter Ion Distribution. Journal of Molecular Biology, 2004, 338, 839-846.	4.2	117
67	Structural Titration of Slo2.2, a Na + -Dependent K + Channel. Cell, 2017, 168, 390-399.e11.	28.9	115
68	Piezoâ€™s membrane footprint and its contribution to mechanosensitivity. ELife, 2018, 7, .	6.0	115
69	Cryo-electron microscopy structure of the Slo2.2 Na+-activated K+ channel. Nature, 2015, 527, 198-203.	27.8	107
70	Domain-swapped chain connectivity and gated membrane access in a Fab-mediated crystal of the human TRAAK K ⁺ channel. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 2129-2134.	7.1	105
71	Functional Reconstitution of Purified Human Hv1 H+ Channels. Journal of Molecular Biology, 2009, 387, 1055-1060.	4.2	97
72	Molecular structures of the human Slo1 K+ channel in complex with Î²4. ELife, 2019, 8, .	6.0	91

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73	Structure of the CLC-1 chloride channel from Homo sapiens. ELife, 2018, 7, .	6.0	90
74	Voltage Sensor Movements during Hyperpolarization in the HCN Channel. Cell, 2019, 179, 1582-1589.e7.	28.9	89
75	Solution Structure and Phospholipid Interactions of the Isolated Voltage-Sensor Domain from KvAP. Journal of Molecular Biology, 2010, 403, 591-606.	4.2	88
76	Novel cell-free high-throughput screening method for pharmacological tools targeting K ⁺ channels. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, 5748-5753.	7.1	83
77	Ion Binding Affinity in the Cavity of the KcsA Potassium Channel. Biochemistry, 2004, 43, 4978-4982.	2.5	82
78	Potassium Channels and the Atomic Basis of Selective Ion Conduction. Bioscience Reports, 2004, 24, 75-100.	2.4	81
79	Localization of the Voltage-Sensor Toxin Receptor on KvAPâ€. Biochemistry, 2004, 43, 10071-10079.	2.5	79
80	Molecular mechanism of proton transport in CLC Cl ⁻ /H ⁺ exchange transporters. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 11699-11704.	7.1	76
81	The mechanosensitive ion channel TRAAK is localized to the mammalian node of Ranvier. ELife, 2019, 8, .	6.0	74
82	A Gating Model for the Archeal Voltage-Dependent K+ Channel KvAP in DPhPC and POPE:POPG Decane Lipid Bilayers. Journal of Molecular Biology, 2009, 390, 902-912.	4.2	64
83	Piezo1 forms a slowly-inactivating mechanosensory channel in mouse embryonic stem cells. ELife, 2018, 7, .	6.0	61
84	Functional and structural analysis of the human SLO3 pH- and voltage-gated K ⁺ channel. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 19274-19279.	7.1	57
85	Structural and Functional Consequences of an Amide-to-Ester Substitution in the Selectivity Filter of a Potassium Channel. Journal of the American Chemical Society, 2006, 128, 11591-11599.	13.7	53
86	Phosphatidic acid modulation of Kv channel voltage sensor function. ELife, 2014, 3, .	6.0	52
87	Cryo-EM analysis of PIP2 regulation in mammalian GIRK channels. ELife, 2020, 9, .	6.0	52
88	A Snake Toxin Inhibitor of Inward Rectifier Potassium Channel ROMK1â€. Biochemistry, 1998, 37, 14867-14874.	2.5	49
89	Functional Analysis of Kv1.2 and Paddle Chimera Kv Channels in Planar Lipid Bilayers. Journal of Molecular Biology, 2008, 382, 24-33.	4.2	45
90	Purification, Characterization, and Synthesis of an Inward-Rectifier K+Channel Inhibitor from Scorpion Venomâ€. Biochemistry, 1997, 36, 6936-6940.	2.5	44

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91	Molecular structure of an open human K _{ATP} channel. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	7.1	44
92	Molecular basis of signaling specificity between GIRK channels and GPCRs. ELife, 2018, 7, .	6.0	43
93	Cooperative regulation by G proteins and Na+ of neuronal GIRK2 K+ channels. ELife, 2016, 5, .	6.0	42
94	STRUCTURAL BIOLOGY: Voltage Sensor Meets Lipid Membrane. Science, 2004, 306, 1304-1305.	12.6	30
95	STRUCTURAL BIOLOGY: Membrane Protein Insertion and Stability. Science, 2005, 307, 1425-1426.	12.6	26
96	Inferred Motions of the S3a Helix during Voltage-Dependent K+ Channel Gating. Journal of Molecular Biology, 2008, 381, 569-580.	4.2	25
97	Regulation of Eag1 gating by its intracellular domains. ELife, 2019, 8, .	6.0	25
98	Analysis of the mechanosensor channel functionality of TACAN. ELife, 2021, 10, .	6.0	24
99	Prokaryotes offer hope for potassium channel structural studies. Nature Structural and Molecular Biology, 1997, 4, 877-879.	8.2	17
100	Cryo-EM structure of the KvAP channel reveals a non-domain-swapped voltage sensor topology. ELife, 2019, 8, .	6.0	17
101	The GIRK1 subunit potentiates G protein activation of cardiac GIRK1/4 hetero-tetramers. ELife, 2016, 5, .	6.0	16
102	Correlation between structure and function in phosphatidylinositol lipidâ€“dependent Kir2.2 gating. Proceedings of the National Academy of Sciences of the United States of America, 2022, 119, e2114046119.	7.1	3
103	Potassium Channels and the Atomic Basis of Selective Ion Conduction. , 2008, , 431-461.		0