Roderick MacKinnon

List of Publications by Citations

109 papers	33,507 citations	73 h-index	128 g-index
128 ext. papers	37,024 ext. citations	25.4 avg, IF	7.59 L-index

#	Paper	IF	Citations
109	The structure of the potassium channel: molecular basis of K+ conduction and selectivity. *Science*, **1998**, 280, 69-77	33.3	5694
108	Crystal structure of a mammalian voltage-dependent Shaker family K+ channel. *Science*, **2005**, 309, 897-903	33.3	1835
107	Chemistry of ion coordination and hydration revealed by a K+ channel-Fab complex at 2.0 A resolution. *Nature*, **2001**, 414, 43-8	50.4	1713
106	X-ray structure of a voltage-dependent K+ channel. *Nature*, **2003**, 423, 33-41	50.4	1630
105	X-ray structure of a ClC chloride channel at 3.0 A reveals the molecular basis of anion selectivity. *Nature*, **2002**, 415, 287-94	50.4	1364
104	Crystal structure and mechanism of a calcium-gated potassium channel. *Nature*, **2002**, 417, 515-22	50.4	1227
103	Atomic structure of a voltage-dependent K+ channel in a lipid membrane-like environment. *Nature*, **2007**, 450, 376-82	50.4	1164
102	The open pore conformation of potassium channels. *Nature*, **2002**, 417, 523-6	50.4	1064
101	Determination of the subunit stoichiometry of a voltage-activated potassium channel. *Nature*, **1991**, 350, 232-5	50.4	853
100	Voltage sensor of Kv1.2: structural basis of electromechanical coupling. *Science*, **2005**, 309, 903-8	33.3	819
99	The principle of gating charge movement in a voltage-dependent K+ channel. *Nature*, **2003**, 423, 42-8	50.4	691
98	Principles of selective ion transport in channels and pumps. *Science*, **2005**, 310, 1461-5	33.3	672
97	Energetic optimization of ion conduction rate by the K+ selectivity filter. *Nature*, **2001**, 414, 37-42	50.4	660
96	Gating the selectivity filter in ClC chloride channels. *Science*, **2003**, 300, 108-12	33.3	659
95	Contribution of the S4 segment to gating charge in the Shaker K+ channel. *Neuron*, **1996**, 16, 1169-77	13.9	600
94	Potassium channel receptor site for the inactivation gate and quaternary amine inhibitors. *Nature*, **2001**, 411, 657-61	50.4	497
93	Structural basis of PIP2 activation of the classical inward rectifier K+ channel Kir2.2. *Nature*, **2011**, 477, 495-8	50.4	456

92	The cavity and pore helices in the KcsA K+ channel: electrostatic stabilization of monovalent cations. *Science*, **1999**, 285, 100-2	33.3	389
91	Crystal structure and functional analysis of the HERG potassium channel N terminus: a eukaryotic PAS domain. *Cell*, **1998**, 95, 649-55	56.2	385
90	A gating charge transfer center in voltage sensors. *Science*, **2010**, 328, 67-73	33.3	357
89	Potassium channels. *FEBS Letters*, **2003**, 555, 62-5	3.8	348
88	Crystal structure of the mammalian GIRK2 K+ channel and gating regulation by G proteins, PIP2, and sodium. *Cell*, **2011**, 147, 199-208	56.2	340
87	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, 965-75	6.5	340
86	Phospholipids and the origin of cationic gating charges in voltage sensors. *Nature*, **2006**, 444, 775-9	50.4	336
85	Crystal structure of the human K2P TRAAK, a lipid- and mechano-sensitive K+ ion channel. *Science*, **2012**, 335, 436-41	33.3	307
84	Lipids in the structure, folding, and function of the KcsA K+ channel. *Biochemistry*, **2002**, 41, 10771-7	3.2	295
83	Potassium channels and the atomic basis of selective ion conduction (Nobel Lecture). *Angewandte Chemie - International Edition*, **2004**, 43, 4265-77	16.4	293
82	Electrostatic tuning of Mg2+ affinity in an inward-rectifier K+ channel. *Nature*, **1994**, 371, 243-6	50.4	288
81	Crystal structure of the eukaryotic strong inward-rectifier K+ channel Kir2.2 at 3.1 A resolution. *Science*, **2009**, 326, 1668-74	33.3	274
80	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, 15441-6	11.5	265
79	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	13.9	264
78	Cryo-EM Structure of the Open Human Ether-à-go-go-Related K Channel hERG. *Cell*, **2017**, 169, 422-430.e10	56.2	262
77	Crystal structure of a Kir3.1-prokaryotic Kir channel chimera. *EMBO Journal*, **2007**, 26, 4005-15	13	257
76	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, 3614-9	11.5	249
75	Structure of the human BK channel Ca2+-activation apparatus at 3.0 A resolution. *Science*, **2010**, 329, 182-6	33.3	249

74	Purification and characterization of three inhibitors of voltage-dependent K+ channels from Leiurus quinquestriatus var. hebraeus venom. *Biochemistry*, **1994**, 33, 6834-9	3.2	243
73	A membrane-access mechanism of ion channel inhibition by voltage sensor toxins from spider venom. *Nature*, **2004**, 430, 232-5	50.4	239
72	An inhibitor of the Kv2.1 potassium channel isolated from the venom of a Chilean tarantula. *Neuron* , **1995**, 15, 941-9	13.9	228
71	Hanatoxin modifies the gating of a voltage-dependent K+ channel through multiple binding sites. *Neuron*, **1997**, 18, 665-73	13.9	226
70	X-ray structure of the mammalian GIRK2-βγ-protein complex. *Nature*, **2013**, 498, 190-7	50.4	218
69	Mapping the receptor site for hanatoxin, a gating modifier of voltage-dependent K+ channels. *Neuron*, **1997**, 18, 675-82	13.9	215
68	Structure of a eukaryotic CLC transporter defines an intermediate state in the transport cycle. *Science*, **2010**, 330, 635-41	33.3	207
67	Functional analysis of an archaebacterial voltage-dependent K+ channel. *Nature*, **2003**, 422, 180-5	50.4	193
66	Physical mechanism for gating and mechanosensitivity of the human TRAAK K+ channel. *Nature*, **2014**, 516, 126-30	50.4	190
65	Structure of the voltage-gated K+ channel Eag1 reveals an alternative voltage sensing mechanism. *Science*, **2016**, 353, 664-9	33.3	190
64	Structures of the Human HCN1 Hyperpolarization-Activated Channel. *Cell*, **2017**, 168, 111-120.e11	56.2	185
63	Structural and thermodynamic properties of selective ion binding in a K+ channel. *PLoS Biology*, **2007**, 5, e121	9.7	183
62	Cryo-EM Structure of a KCNQ1/CaM Complex Reveals Insights into Congenital Long QT Syndrome. *Cell*, **2017**, 169, 1042-1050.e9	56.2	182
61	Calibrated measurement of gating-charge arginine displacement in the KvAP voltage-dependent K+ channel. *Cell*, **2005**, 123, 463-75	56.2	182
60	Structure-based membrane dome mechanism for Piezo mechanosensitivity. *ELife*, **2017**, 6,	8.9	175
59	Structure of a pore-blocking toxin in complex with a eukaryotic voltage-dependent K(+) channel. *ELife*, **2013**, 2, e00594	8.9	139
58	Cryo-EM structure of the open high-conductance Ca-activated K channel. *Nature*, **2017**, 541, 46-51	50.4	134
57	Quantitative analysis of mammalian GIRK2 channel regulation by G proteins, the signaling lipid PIP2 and Na+ in a reconstituted system. *ELife*, **2014**, 3, e03671	8.9	133

56	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, 19276-81	11.5	133
55	Two separate interfaces between the voltage sensor and pore are required for the function of voltage-dependent K(+) channels. *PLoS Biology*, **2009**, 7, e47	9.7	125
54	Electron microscopic analysis of KvAP voltage-dependent K+ channels in an open conformation. *Nature*, **2004**, 430, 806-10	50.4	116
53	Ion selectivity in a semisynthetic K+ channel locked in the conductive conformation. *Science*, **2006**, 314, 1004-7	33.3	113
52	Solution structure of the potassium channel inhibitor agitoxin 2: caliper for probing channel geometry. *Protein Science*, **1995**, 4, 1478-89	6.3	112
51	Open structure of the Ca2+ gating ring in the high-conductance Ca2+-activated K+ channel. *Nature*, **2011**, 481, 94-7	50.4	109
50	Force-induced conformational changes in PIEZO1. *Nature*, **2019**, 573, 230-234	50.4	106
49	A mutant KcsA K(+) channel with altered conduction properties and selectivity filter ion distribution. *Journal of Molecular Biology*, **2004**, 338, 839-46	6.5	104
48	Structural basis for gating the high-conductance Ca-activated K channel. *Nature*, **2017**, 541, 52-57	50.4	103
47	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, 2129-34	11.5	91
46	Molecular structure of human KATP in complex with ATP and ADP. *ELife*, **2017**, 6,	8.9	89
45	Structure of a CLC chloride ion channel by cryo-electron microscopy. *Nature*, **2017**, 541, 500-505	50.4	87
44	Activation mechanism of a human SK-calmodulin channel complex elucidated by cryo-EM structures. *Science*, **2018**, 360, 508-513	33.3	87
43	Functional reconstitution of purified human Hv1 H+ channels. *Journal of Molecular Biology*, **2009**, 387, 1055-60	6.5	85
42	Structural Basis of Human KCNQ1 Modulation and Gating. *Cell*, **2020**, 180, 340-347.e9	56.2	85
41	Cryo-electron microscopy structure of the Slo2.2 Na(+)-activated K(+) channel. *Nature*, **2015**, 527, 198-203	50.4	83
40	Solution structure and phospholipid interactions of the isolated voltage-sensor domain from KvAP. *Journal of Molecular Biology*, **2010**, 403, 591-606	6.5	81
39	Localization of the voltage-sensor toxin receptor on KvAP. *Biochemistry*, **2004**, 43, 10071-9	3.2	76

38	Structural Titration of Slo2.2, a Na-Dependent K Channel. *Cell*, **2017**, 168, 390-399.e11	56.2	74
37	Ion binding affinity in the cavity of the KcsA potassium channel. *Biochemistry*, **2004**, 43, 4978-82	3.2	74
36	Piezo's membrane footprint and its contribution to mechanosensitivity. *ELife*, **2018**, 7,	8.9	67
35	Nobel Lecture. Potassium channels and the atomic basis of selective ion conduction. *Bioscience Reports*, **2004**, 24, 75-100	4.1	63
34	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, 5748-53	11.5	62
33	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, 902-12	6.5	58
32	Structure of the CLC-1 chloride channel from. *ELife*, **2018**, 7,	8.9	52
31	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, 11699-704	11.5	47
30	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, 11591-9	16.4	47
29	Kaliumkanäle und die atomare Basis der selektiven Ionenleitung (Nobel-Vortrag). *Angewandte Chemie*, **2004**, 116, 4363-4376	3.6	47
28	A snake toxin inhibitor of inward rectifier potassium channel ROMK1. *Biochemistry*, **1998**, 37, 14867-74	3.2	47
27	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, 19274-9	11.5	42
26	Purification, characterization, and synthesis of an inward-rectifier K+ channel inhibitor from scorpion venom. *Biochemistry*, **1997**, 36, 6936-40	3.2	42
25	Phosphatidic acid modulation of Kv channel voltage sensor function. *ELife*, **2014**, 3,	8.9	41
24	Voltage Sensor Movements during Hyperpolarization in the HCN Channel. *Cell*, **2019**, 179, 1582-1589.e7	56.2	41
23	Functional analysis of Kv1.2 and paddle chimera Kv channels in planar lipid bilayers. *Journal of Molecular Biology*, **2008**, 382, 24-33	6.5	38
22	Piezo1 forms a slowly-inactivating mechanosensory channel in mouse embryonic stem cells. *ELife*, **2018**, 7,	8.9	38
21	Molecular structures of the human Slo1 K channel in complex with β4. *ELife*, **2019**, 8,	8.9	35

20	The mechanosensitive ion channel TRAAK is localized to the mammalian node of Ranvier. *ELife*, **2019**, 8,	8.9	33
19	Structural biology. Voltage sensor meets lipid membrane. *Science*, **2004**, 306, 1304-5	33.3	30
18	Cooperative regulation by G proteins and Na(+) of neuronal GIRK2 K(+) channels. *ELife*, **2016**, 5,	8.9	26
17	Structural biology. Membrane protein insertion and stability. *Science*, **2005**, 307, 1425-6	33.3	25
16	Inferred motions of the S3a helix during voltage-dependent K+ channel gating. *Journal of Molecular Biology*, **2008**, 381, 569-80	6.5	23
15	Cryo-EM analysis of PIP regulation in mammalian GIRK channels. *ELife*, **2020**, 9,	8.9	21
14	Molecular basis of signaling specificity between GIRK channels and GPCRs. *ELife*, **2018**, 7,	8.9	20
13	Cryo-EM structure of the KvAP channel reveals a non-domain-swapped voltage sensor topology. *ELife*, **2019**, 8,	8.9	10
12	Regulation of Eag1 gating by its intracellular domains. *ELife*, **2019**, 8,	8.9	9
11	Molecular structure of an open human K channel. *Proceedings of the National Academy of Sciences of the United States of America*, **2021**, 118,	11.5	7
10	The GIRK1 subunit potentiates G protein activation of cardiac GIRK1/4 hetero-tetramers. *ELife*, **2016**, 5,	8.9	7
9	Analysis of the mechanosensor channel functionality of TACAN. *ELife*, **2021**, 10,	8.9	7
8	Author response: Structure-based membrane dome mechanism for Piezo mechanosensitivity **2017**,		3
7	Analysis of the Mechanosensor Channel Functionality of TACAN		3
6	Author response: Phosphatidic acid modulation of Kv channel voltage sensor function **2014**,		2
5	Author response: Piezo membrane footprint and its contribution to mechanosensitivity **2018**,		2
4	The mechanosensitive ion channel TRAAK is localized to the mammalian node of Ranvier		1
3	Correlation between structure and function in phosphatidylinositol lipid-dependent Kir2.2 gating		1

2	Correlation between structure and function in phosphatidylinositol lipid-dependent Kir2.2 gating.. *Proceedings of the National Academy of Sciences of the United States of America*, **2022**, 119, e2114046119	11.5	0
1	Potassium Channels and the Atomic Basis of Selective Ion Conduction **2008**, 431-461		