Peter Hegemann

List of Publications by Year
in descending order

139 papers	20,977 citations	16451 64 h-index	11052 137 g-index
157 all docs	157 docs citations	157 times ranked	15032 citing authors

#	Article	IF	Citations
1	Channelrhodopsin-2, a directly light-gated cation-selective membrane channel. Proceedings of the National Academy of Sciences of the United States of America, 2003, 100, 13940-13945.	7.1	2,348
2	Neocortical excitation/inhibition balance in information processing and social dysfunction. Nature, 2011, 477, 171-178.	27.8	2,036
3	Channelrhodopsin-1: A Light-Gated Proton Channel in Green Algae. Science, 2002, 296, 2395-2398.	12.6	1,013
4	Microbial and Animal Rhodopsins: Structures, Functions, and Molecular Mechanisms. Chemical Reviews, 2014, 114, 126-163.	47.7	897
5	Ultrafast optogenetic control. Nature Neuroscience, 2010, 13, 387-392.	14.8	660
6	Genetically encoded calcium indicators for multi-color neural activity imaging and combination with optogenetics. Frontiers in Molecular Neuroscience, 2013, 6, 2.	2.9	629
7	Bi-stable neural state switches. Nature Neuroscience, 2009, 12, 229-234.	14.8	533
8	Crystal structure of the channelrhodopsin light-gated cation channel. Nature, 2012, 482, 369-374.	27.8	503
9	Fast noninvasive activation and inhibition of neural and network activity by vertebrate rhodopsin and green algae channelrhodopsin. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 17816-17821.	7.1	501
10	Red-shifted optogenetic excitation: a tool for fast neural control derived from Volvox carteri. Nature Neuroscience, 2008, 11, 631-633.	14.8	490
11	The Microbial Opsin Family of Optogenetic Tools. Cell, 2011, 147, 1446-1457.	28.9	471
12	High-efficiency channelrhodopsins for fast neuronal stimulation at low light levels. Proceedings of the National Academy of Sciences of the United States of America, 2011, 108, 7595-7600.	7.1	409
13	A Streptomyces rimosus aphVIII gene coding for a new type phosphotransferase provides stable antibiotic resistance to Chlamydomonas reinhardtii. Gene, 2001, 277, 221-229.	2.2	348
14	Conversion of Channelrhodopsin into a Light-Gated Chloride Channel. Science, 2014, 344, 409-412.	12.6	339
15	Light Modulation of Cellular cAMP by a Small Bacterial Photoactivated Adenylyl Cyclase, bPAC, of the Soil Bacterium Beggiatoa. Journal of Biological Chemistry, 2011, 286, 1181-1188.	3.4	337
16	Active cortical dendrites modulate perception. Science, 2016, 354, 1587-1590.	12.6	324
17	A synthetic gene coding for the green fluorescent protein (GFP) is a versatile reporter in Chlamydomonas reinhardtii+. Plant Journal, 1999, 19, 353-361.	5.7	286
18	Optogenetic Tools for Subcellular Applications in Neuroscience. Neuron, 2017, 96, 572-603.	8.1	274

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19	Targeting of Photoreceptor Genes in<i>Chlamydomonas reinhardtii</i>via Zinc-Finger Nucleases and CRISPR/Cas9. Plant Cell, 2017, 29, 2498-2518.	6.6	260
20	Crystal Structures and Molecular Mechanism of a Light-Induced Signaling Switch: The Phot-LOV1 Domain from Chlamydomonas reinhardtii. Biophysical Journal, 2003, 84, 2474-2482.	0.5	258
21	Rhodopsin-regulated calcium currents in Chlamydomonas. Nature, 1991, 351, 489-491.	27.8	251
22	Fast manipulation of cellular cAMP level by light in vivo. Nature Methods, 2007, 4, 39-42.	19.0	237
23	Phot-LOV1: Photocycle of a Blue-Light Receptor Domain from the Green Alga Chlamydomonas reinhardtii. Biophysical Journal, 2003, 84, 1192-1201.	0.5	227
24	Algal Sensory Photoreceptors. Annual Review of Plant Biology, 2008, 59, 167-189.	18.7	222
25	Hydrogen-bond switching through a radical pair mechanism in a flavin-binding photoreceptor. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 10895-10900.	7.1	213
26	The form and function of channelrhodopsin. Science, 2017, 357, .	12.6	212
27	Structural foundations of optogenetics: Determinants of channelrhodopsin ion selectivity. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, 822-829.	7.1	197
28	A blue-light photoreceptor mediates the feedback regulation of photosynthesis. Nature, 2016, 537, 563-566.	27.8	185
29	Biophysics of Channelrhodopsin. Annual Review of Biophysics, 2015, 44, 167-186.	10.0	172
30	Monitoring Light-induced Structural Changes of Channelrhodopsin-2 by UV-visible and Fourier Transform Infrared Spectroscopy. Journal of Biological Chemistry, 2008, 283, 35033-35041.	3.4	169
31	Engineering of a red-lightâ€“activated human cAMP/cGMP-specific phosphodiesterase. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 8803-8808.	7.1	163
32	Channelrhodopsin-1 Initiates Phototaxis and Photophobic Responses in<i>Chlamydomonas</i>by Immediate Light-Induced Depolarization. Plant Cell, 2008, 20, 1665-1677.	6.6	156
33	Nuclear gene targeting in <i><scp>C</scp>hlamydomonas</i> using engineered zincâ€finger nucleases. Plant Journal, 2013, 73, 873-882.	5.7	148
34	Color-tuned Channelrhodopsins for Multiwavelength Optogenetics. Journal of Biological Chemistry, 2012, 287, 31804-31812.	3.4	147
35	Photoactivation of Channelrhodopsin. Journal of Biological Chemistry, 2008, 283, 1637-1643.	3.4	146
36	On the Reaction Mechanism of Adduct Formation in LOV Domains of the Plant Blue-Light Receptor Phototropin. Journal of the American Chemical Society, 2004, 126, 11067-11076.	13.7	127

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37	Multiple Photocycles of Channelrhodopsin. Biophysical Journal, 2005, 89, 3911-3918.	0.5	127
38	Optogenetics: 10 years after ChR2 in neuronsâ€"views from the community. Nature Neuroscience, 2015, 18, 1202-1212.	14.8	122
39	Vision in microalgae. Planta, 1997, 203, 265-274.	3.2	119
40	Optogenetic acidification of synaptic vesicles and lysosomes. Nature Neuroscience, 2015, 18, 1845-1852.	14.8	113
41	Crystal structure of the red light-activated channelrhodopsin Chrimson. Nature Communications, 2018, 9, 3949.	12.8	112
42	Fluorescence quenching of flavin adenine dinucleotide in aqueous solution by pH dependent isomerisation and photo-induced electron transfer. Chemical Physics, 2003, 295, 137-149.	1.9	110
43	A Photochromic Histidine Kinase Rhodopsin (HKR1) That Is Bimodally Switched by Ultraviolet and Blue Light. Journal of Biological Chemistry, 2012, 287, 40083-40090.	3.4	106
44	In vitro identification of rhodopsin in the green alga Chlamydomonas. Biochemistry, 1991, 30, 3692-3697.	2.5	104
45	Hydrogen Bond Switching among Flavin and Amino Acid Side Chains in the BLUF Photoreceptor Observed by Ultrafast Infrared Spectroscopy. Biophysical Journal, 2008, 95, 4790-4802.	0.5	104
46	An improved chloride-conducting channelrhodopsin for light-induced inhibition of neuronal activity in vivo. Scientific Reports, 2015, 5, 14807.	3.3	102
47	Controlling fertilization and cAMP signaling in sperm by optogenetics. ELife, 2015, 4, .	6.0	99
48	Monitoring dynamic expression of nuclear genes in Chlamydomonas reinhardtii by using a synthetic luciferase reporter gene. Plant Molecular Biology, 2004, 55, 869-881.	3.9	96
49	Channelrhodopsin engineering and exploration of new optogenetic tools. Nature Methods, 2011, 8, 39-42.	19.0	93
50	Of ion pumps, sensors and channels â€" Perspectives on microbial rhodopsins between science and history. Biochimica Et Biophysica Acta - Bioenergetics, 2014, 1837, 533-545.	1.0	92
51	Quantum yield of triplet formation of riboflavin in aqueous solution and of flavin mononucleotide bound to the LOV1 domain of Phot1 from Chlamydomonas reinhardtii. Chemical Physics, 2003, 291, 97-114.	1.9	87
52	ALGAL SENSORY PHOTORECEPTORS. Journal of Phycology, 2001, 37, 668-676.	2.3	85
53	In Channelrhodopsin-2 Glu-90 Is Crucial for Ion Selectivity and Is Deprotonated during the Photocycle. Journal of Biological Chemistry, 2012, 287, 6904-6911.	3.4	84
54	From channelrhodopsins to optogenetics. EMBO Molecular Medicine, 2013, 5, 173-176.	6.9	84

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55	The rhodopsinâ€"guanylyl cyclase of the aquatic fungus <i>Blastocladiella emersonii</i> enables fast optical control of cGMP signaling. Science Signaling, 2015, 8, rs8.	3.6	84
56	Volvoxrhodopsin, a Light-Regulated Sensory Photoreceptor of the Spheroidal Green Alga Volvox carteri. Plant Cell, 1999, 11, 1473-1484.	6.6	81
57	Nuclear-Gene Targeting by Using Single-Stranded DNA Avoids Illegitimate DNA Integration in Chlamydomonas reinhardtii. Eukaryotic Cell, 2005, 4, 1264-1272.	3.4	79
58	â€œVisionâ€•in Single-Celled Algae. Physiology, 2004, 19, 133-137.	3.1	76
59	H+-Pumping Rhodopsin from the Marine Alga Acetabularia. Biophysical Journal, 2006, 91, 1471-1479.	0.5	75
60	In Vivo Generation of Flavoproteins with Modified Cofactors. Journal of Molecular Biology, 2009, 385, 1511-1518.	4.2	75
61	BiPOLES is an optogenetic tool developed for bidirectional dual-color control of neurons. Nature Communications, 2021, 12, 4527.	12.8	73
62	The Phot LOV2 Domain and Its Interaction with LOV1. Biophysical Journal, 2005, 89, 402-412.	0.5	72
63	Glu 87 of Channelrhodopsinâ€1 Causes pHâ€dependent Color Tuning and Fast Photocurrent Inactivation^{â€}. Photochemistry and Photobiology, 2009, 85, 564-569.	2.5	72
64	Early Formation of the Ionâ€Conducting Pore in Channelrhodopsinâ€2. Angewandte Chemie - International Edition, 2015, 54, 4953-4957.	13.8	72
65	Potassium channel-based optogenetic silencing. Nature Communications, 2018, 9, 4611.	12.8	71
66	Evolution of the Channelrhodopsin Photocycle Model. ChemPhysChem, 2010, 11, 1120-1126.	2.1	69
67	Ion Selectivity and Competition in Channelrhodopsins. Biophysical Journal, 2013, 105, 91-100.	0.5	68
68	Recording of Blue Light-Induced Energy and Volume Changes within the Wild-Type and Mutated Phot-LOV1 Domain from Chlamydomonas reinhardtii. Biophysical Journal, 2004, 86, 1051-1060.	0.5	66
69	Unifying photocycle model for light adaptation and temporal evolution of cation conductance in channelrhodopsin-2. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 9380-9389.	7.1	66
70	Nuclear gene targeting in Chlamydomonas as exemplified by disruption of the PHOT gene. Gene, 2009, 432, 91-96.	2.2	63
71	The Branched Photocycle of the Slow-Cycling Channelrhodopsin-2 Mutant C128T. Journal of Molecular Biology, 2010, 398, 690-702.	4.2	63
72	Phototropin Influence on Eyespot Development and Regulation of Phototactic Behavior in <i>Chlamydomonas reinhardtii</i>. Plant Cell, 2012, 24, 4687-4702.	6.6	63

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73	Towards an Understanding of Channelrhodopsin Function: Simulations Lead to Novel Insights of the Channel Mechanism. Journal of Molecular Biology, 2013, 425, 1795-1814.	4.2	62
74	Two Open States with Progressive Proton Selectivities in the Branched Channelrhodopsin-2 Photocycle. Biophysical Journal, 2010, 98, 753-761.	0.5	61
75	Two Light-Activated Conductances in the Eye of the Green Alga Volvox carteri. Biophysical Journal, 1999, 76, 1668-1678.	0.5	57
76	MerMAIDs: a family of metagenomically discovered marine anion-conducting and intensely desensitizing channelrhodopsins. Nature Communications, 2019, 10, 3315.	12.8	56
77	Identification of a Natural Green Light Absorbing Chloride Conducting Channelrhodopsin from Proteomonas sulcata. Journal of Biological Chemistry, 2016, 291, 4121-4127.	3.4	55
78	Rhodopsin-cyclases for photocontrol of cGMP/cAMP and 2.3â€‰Ã… structure of the adenylyl cyclase domain. Nature Communications, 2018, 9, 2046.	12.8	55
79	Bimodal Activation of Different Neuron Classes with the Spectrally Red-Shifted Channelrhodopsin Chimera C1V1 in Caenorhabditis elegans. PLoS ONE, 2012, 7, e46827.	2.5	55
80	Removal of mismatched bases from synthetic genes by enzymatic mismatch cleavage. Nucleic Acids Research, 2005, 33, e58-e58.	14.5	54
81	Lightâ€“Dark Adaptation of Channelrhodopsin Involves Photoconversion between the all-<i>trans</i> and 13-<i>cis</i> Retinal Isomers. Biochemistry, 2015, 54, 5389-5400.	2.5	54
82	Anion-conducting channelrhodopsins with tuned spectra and modified kinetics engineered for optogenetic manipulation of behavior. Scientific Reports, 2017, 7, 14957.	3.3	54
83	Unfolding of the C-Terminal JÎ± Helix in the LOV2 Photoreceptor Domain Observed by Time-Resolved Vibrational Spectroscopy. Journal of Physical Chemistry Letters, 2016, 7, 3472-3476.	4.6	52
84	Channelrhodopsins of<i>Volvox carteri</i>Are Photochromic Proteins That Are Specifically Expressed in Somatic Cells under Control of Light, Temperature, and the Sex Inducer. Plant Physiology, 2009, 151, 347-366.	4.8	51
85	Rectification of the Channelrhodopsin Early Conductance. Biophysical Journal, 2011, 101, 1057-1068.	0.5	51
86	Reaction dynamics of the chimeric channelrhodopsin C1C2. Scientific Reports, 2017, 7, 7217.	3.3	48
87	Light-dark Adaptation of Channelrhodopsin C128T Mutant. Journal of Biological Chemistry, 2013, 288, 10451-10458.	3.4	46
88	NeoR, a near-infrared absorbing rhodopsin. Nature Communications, 2020, 11, 5682.	12.8	45
89	Evidence for a Light-Induced H+ Conductance in the Eye of the Green Alga Chlamydomonas reinhardtii. Biophysical Journal, 2002, 82, 740-751.	0.5	44
90	Enzymerhodopsins: novel photoregulated catalysts for optogenetics. Current Opinion in Structural Biology, 2019, 57, 118-126.	5.7	44

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91	Electrical properties, substrate specificity and optogenetic potential of the engineered light-driven sodium pump eKR2. Scientific Reports, 2018, 8, 9316.	3.3	43
92	Lateral Gene Transfer of Anion-Conducting Channelrhodopsins between Green Algae and Giant Viruses. Current Biology, 2020, 30, 4910-4920.e5.	3.9	42
93	Time-resolved serial femtosecond crystallography reveals early structural changes in channelrhodopsin. ELife, 2021, 10, .	6.0	41
94	Active site structure and absorption spectrum of channelrhodopsin-2 wild-type and C128T mutant. Chemical Science, 2016, 7, 3879-3891.	7.4	40
95	Structural Model of Channelrhodopsin. Journal of Biological Chemistry, 2012, 287, 7456-7466.	3.4	39
96	An Efficient Visual Screen for CRISPR/Cas9 Activity in Arabidopsis thaliana. Frontiers in Plant Science, 2017, 08, 39.	3.6	39
97	Microbial Opsins: A Family of Single-Component Tools for Optical Control of Neural Activity. Cold Spring Harbor Protocols, 2011, 2011, top102.	0.3	38
98	Molecular determinants of proton selectivity and gating in the red-light activated channelrhodopsin Chrimson. Scientific Reports, 2017, 7, 9928.	3.3	37
99	Tip-Enhanced Infrared Difference-Nanospectroscopy of the Proton Pump Activity of Bacteriorhodopsin in Single Purple Membrane Patches. Nano Letters, 2019, 19, 3104-3114.	9.1	36
100	Gloeobacter Rhodopsin, Limitation of Proton Pumping at High Electrochemical Load. Biophysical Journal, 2013, 105, 2055-2063.	0.5	34
101	Time-resolved infrared spectroscopic techniques as applied to channelrhodopsin. Frontiers in Molecular Biosciences, 2015, 2, 38.	3.5	34
102	Optogenetic approaches addressing extracellular modulation of neural excitability. Scientific Reports, 2016, 6, 23947.	3.3	34
103	The Hydrogen-Bond Switch Reaction of the Blrb Bluf Domain of <i>Rhodobacter sphaeroides</i>. Journal of Physical Chemistry B, 2011, 115, 7963-7971.	2.6	31
104	Channelrhodopsin-1 Phosphorylation Changes with Phototactic Behavior and Responds to Physiological Stimuli in<i>Chlamydomonas</i>. Plant Cell, 2019, 31, 886-910.	6.6	30
105	Heterogeneity of the Transmembrane Protein Conformation in Purple Membranes Identified by Infrared Nanospectroscopy. Small, 2017, 13, 1701181.	10.0	29
106	Engineered Passive Potassium Conductance in the KR2 Sodium Pump. Biophysical Journal, 2019, 116, 1941-1951.	0.5	29
107	Color Tuning in Binding Pocket Models of the Chlamydomonas-Type Channelrhodopsins. Journal of Physical Chemistry B, 2011, 115, 15119-15128.	2.6	28
108	Sensory Photoreceptors and Light Control of Flagellar Activity. , 2009, , 395-429.		26

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109	Design of a light-gated proton channel based on the crystal structure of <i>Coccomyxa</i> rhodopsin. Science Signaling, 2019, 12, .	3.6	24
110	Photoadduct Formation from the FMN Singlet Excited State in the LOV2 Domain of <i>Chlamydomonas reinhardtii</i> Phototropin. Journal of Physical Chemistry Letters, 2016, 7, 4380-4384.	4.6	23
111	Dual Photoisomerization on Distinct Potential Energy Surfaces in a UV-Absorbing Rhodopsin. Journal of the American Chemical Society, 2020, 142, 11464-11473.	13.7	23
112	Rhodopsin-bestrophin fusion proteins from unicellular algae form gigantic pentameric ion channels. Nature Structural and Molecular Biology, 2022, 29, 592-603.	8.2	23
113	The two parallel photocycles of the Chlamydomonas sensory photoreceptor histidine kinase rhodopsin 1. Journal of Plant Physiology, 2017, 217, 77-84.	3.5	20
114	The chromophore structure of the long-lived intermediate of the C128T channelrhodopsin-2 variant. FEBS Letters, 2011, 585, 3998-4001.	2.8	19
115	Complex Photochemistry within the Green-Absorbing Channelrhodopsin ReaChR. Biophysical Journal, 2017, 112, 1166-1175.	0.5	18
116	Whole-cell Patch-clamp Recordings for Electrophysiological Determination of Ion Selectivity in Channelrhodopsins. Journal of Visualized Experiments, 2017, , .	0.3	18
117	Light-Induced Rearrangement of the Î²5 Strand in the BLUF Photoreceptor SyPixD (Slr1694). Journal of Physical Chemistry Letters, 2015, 6, 4749-4753.	4.6	17
118	Gene Editing in Green Alga Chlamydomonas reinhardtii via CRISPR-Cas9 Ribonucleoproteins. Methods in Molecular Biology, 2022, 2379, 45-65.	0.9	17
119	Photochemical chromophore isomerization in histidine kinase rhodopsin HKR1. FEBS Letters, 2015, 589, 1067-1071.	2.8	15
120	Collective exchange processes reveal an active site proton cage in bacteriorhodopsin. Communications Biology, 2020, 3, 4.	4.4	14
121	<i>Chlamydomonas</i> POLQ is necessary for CRISPR/Cas9-mediated gene targeting. G3: Genes, Genomes, Genetics, 2021, 11, .	1.8	13
122	Proton transfer reactions in the red light-activatable channelrhodopsin variant ReaChR and their relevance for its function. Journal of Biological Chemistry, 2017, 292, 14205-14216.	3.4	11
123	Absorption and Emission Spectroscopic Investigation of the Thermal Dynamics of the Archaerhodopsin 3 Based Fluorescent Voltage Sensor QuasAr1. International Journal of Molecular Sciences, 2019, 20, 4086.	4.1	10
124	FÃ©ry Infrared Spectrometer for Single-Shot Analysis of Protein Dynamics. Journal of Physical Chemistry Letters, 2019, 10, 7672-7677.	4.6	10
125	Altered N-glycan composition impacts flagella-mediated adhesion in Chlamydomonas reinhardtii. ELife, 2020, 9, .	6.0	10
126	The femtosecond-to-second photochemistry of red-shifted fast-closing anion channelrhodopsin <i>Ps</i>ACR1. Physical Chemistry Chemical Physics, 2017, 19, 30402-30409.	2.8	9

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127	Tracking Pore Hydration in Channelrhodopsin by Site-Directed Infrared-Active Azido Probes. Biochemistry, 2019, 58, 1275-1286.	2.5	8
128	Conformational changes of a membrane protein determined by infrared difference spectroscopy beyond the diffraction limit. Physical Review Applied, 2021, 16, .	3.8	8
129	Tailoring Organic LEDs for Bidirectional Optogenetic Control via Dualâ€Color Switching. Advanced Functional Materials, 2022, 32, 2110590.	14.9	8
130	Absorption and Emission Spectroscopic Investigation of Thermal Dynamics and Photo-Dynamics of the Rhodopsin Domain of the Rhodopsin-Guanylyl Cyclase from the Nematophagous Fungus Catenaria anguillulae. International Journal of Molecular Sciences, 2017, 18, 2099.	4.1	7
131	Absorption and emission spectroscopic characterization of photo-dynamics of photoactivated adenylyl cyclase mutant bPAC-Y7F of Beggiatoa sp.. Journal of Photochemistry and Photobiology B: Biology, 2014, 140, 182-193.	3.8	6
132	Photoreactions of the Histidine Kinase Rhodopsin Ot-HKR from the Marine Picoalga Ostreococcus tauri. Biochemistry, 2019, 58, 1878-1891.	2.5	6
133	Modulation of Light Energy Transfer from Chromophore to Protein in the Channelrhodopsin ReaChR. Biophysical Journal, 2020, 119, 705-716.	0.5	6
134	Optogenetic tools for manipulation of cyclic nucleotides functionally coupled to cyclic nucleotideâ€gated channels. British Journal of Pharmacology, 2022, 179, 2519-2537.	5.4	6
135	The inner mechanics of rhodopsin guanylyl cyclase during cGMP-formation revealed by real-time FTIR spectroscopy. ELife, 2021, 10, .	6.0	6
136	Aion is a bistable anion-conducting channelrhodopsin that provides temporally extended and reversible neuronal silencing. Communications Biology, 2022, 5, .	4.4	3
137	A cytoplasmic protein kinase couples engagement of <i>Chlamydomonas</i> ciliary receptors to cAMP-dependent cellular responses. Journal of Cell Science, 2022, 135, .	2.0	1
138	Inside Cover: Evolution of the Channelrhodopsin Photocycle Model (ChemPhysChem 6/2010). ChemPhysChem, 2010, 11, 1074-1074.	2.1	0
139	Photoactivated cyclases: In memoriam Masakatsu Watanabe. Photochemical and Photobiological Sciences, 2015, 14, 1781-1786.	2.9	0