Russell N Van Gelder

List of Publications by Year in Descending Order

160 papers	7,587 citations	41 h-index	84 g-index
216 ext. papers	8,873 ext. citations	7.5 avg, IF	5.98 L-index

#	Paper	IF	Citations
160	Machine learning prediction of adenovirus D8 conjunctivitis complications from viral whole genome sequence. *Ophthalmology Science*, **2022**, 100166		
159	Clocks, cancer, and chronochemotherapy. *Science*, **2021**, 371,	33.3	41
158	Molecular and Clinical Characterization of Human Adenovirus E4-Associated Conjunctivitis. *American Journal of Ophthalmology*, **2021**, 233, 227-242	4.9	1
157	Inefficiencies in Residency Matching Associated with Gale-Shapley Algorithms. *Journal of Academic Ophthalmology (2017)*, **2021**, 13, e175-e182	0.7	
156	Refractive Outcomes After Immediate Sequential vs Delayed Sequential Bilateral Cataract Surgery. *JAMA Ophthalmology*, **2021**, 139, 876-885	3.9	9
155	Endophthalmitis Rate in Immediately Sequential versus Delayed Sequential Bilateral Cataract Surgery within the Intelligent Research in Sight (IRIS) Registry Data. *Ophthalmology*, **2021**,	7.3	5
154	Elevated levels of Merkel cell polyoma virus in the anophthalmic conjunctiva. *Scientific Reports*, **2021**, 11, 15366	4.9	1
153	Relationships Between Sleep, Activity, and Burnout in Ophthalmology Residents. *Journal of Surgical Education*, **2021**, 78, 1035-1040	3.4	5
152	Gene Therapy Approaches to Slow or Reverse Blindness From Inherited Retinal Degeneration: Growth Factors and Optogenetics. *International Ophthalmology Clinics*, **2021**, 61, 209-228	1.7	0
151	Hospitalization and mortality associated with SARS-CoV-2 viral clades in COVID-19. *Scientific Reports*, **2021**, 11, 4802	4.9	28
150	Evolutionary Constraint on Visual and Nonvisual Mammalian Opsins. *Journal of Biological Rhythms*, **2021**, 36, 109-126	3.2	4
149	Anti-adalimumab Antibodies in Patients with Non-infectious Ocular Inflammatory Disease: A Case Series. *Ocular Immunology and Inflammation*, **2021**, 1-5	2.8	0
148	Rational laboratory testing in uveitis: A Bayesian analysis. *Survey of Ophthalmology*, **2021**, 66, 802-825	6.1	2
147	Approach to Cataract Surgery in an Ebola Virus Disease Survivor with Prior Ocular Viral Persistence. *Emerging Infectious Diseases*, **2020**, 26, 1553-1556	10.2	0
146	Wounding Induces Facultative Opn5-Dependent Circadian Photoreception in the Murine Cornea **2020**, 61, 37		3
145	Adaptive Thermogenesis in Mice Is Enhanced by Opsin 3-Dependent Adipocyte Light Sensing. *Cell Reports*, **2020**, 30, 672-686.e8	10.6	26
144	Bioluminescence for in vivo detection of cell-type-specific inflammation in a mouse model of uveitis. *Scientific Reports*, **2020**, 10, 11377	4.9	5

143	Violet-light suppression of thermogenesis by opsin 5 hypothalamic neurons. *Nature*, **2020**, 585, 420-425	50.4	32
142	Prognostic Utility of Whole-Genome Sequencing and Polymerase Chain Reaction Tests of Ocular Fluids in Postprocedural Endophthalmitis. *American Journal of Ophthalmology*, **2020**, 217, 325-334	4.9	7
141	Uveitis Therapy With Shark Variable Novel Antigen Receptor Domains Targeting Tumor Necrosis Factor Alpha or Inducible T-Cell Costimulatory Ligand. *Translational Vision Science and Technology*, **2019**, 8, 11	3.3	4
140	Photopharmacologic Vision Restoration Reduces Pathological Rhythmic Field Potentials in Blind Mouse Retina. *Scientific Reports*, **2019**, 9, 13561	4.9	10
139	An opsin 5-dopamine pathway mediates light-dependent vascular development in the eye. *Nature Cell Biology*, **2019**, 21, 420-429	23.4	26
138	Neuropsin (OPN5) Mediates Local Light-Dependent Induction of Circadian Clock Genes and Circadian Photoentrainment in Exposed Murine Skin. *Current Biology*, **2019**, 29, 3478-3487.e4	6.3	39
137	Infectious corneal ulceration: a proposal for neglected tropical disease status. *Bulletin of the World Health Organization*, **2019**, 97, 854-856	8.2	29
136	RESPONSE OF INFLAMMATORY CYSTOID MACULAR EDEMA TO TREATMENT USING ORAL ACETAZOLAMIDE. *Retina*, **2019**, 39, 948-955	3.6	8
135	Swept-Source OCT Angiography of Serpiginous Choroiditis. *Ophthalmology Retina*, **2018**, 2, 712-719	3.8	29
134	Determinants of Outcomes of Adenoviral Keratoconjunctivitis. *Ophthalmology*, **2018**, 125, 1344-1353	7.3	26
133	Melanopsin expression in the cornea. *Visual Neuroscience*, **2018**, 35, E004	1.7	16
132	Use of En Face Swept-Source Optical Coherence Tomography Angiography in Identifying Choroidal Flow Voids in 3 Patients With Birdshot Chorioretinopathy. *JAMA Ophthalmology*, **2018**, 136, 1288-1292	3.9	26
131	Adrenal and Glucocorticoid Effects on the Circadian Rhythm of Murine Intraocular Pressure **2018**, 59, 5641-5647		7
130	Potential Role of Ocular Microbiome, Host Genotype, Tear Cytokines, and Environmental Factors in Corneal Infiltrative Events in Contact Lens Wearers **2018**, 59, 5752-5761		14
129	Comparison of Aqueous and Vitreous Lymphocyte Populations From Two Rat Models of Experimental Uveitis **2018**, 59, 2504-2511		15
128	Animal Cryptochromes: Divergent Roles in Light Perception, Circadian Timekeeping and Beyond. *Photochemistry and Photobiology*, **2017**, 93, 128-140	3.6	48
127	An LHX1-Regulated Transcriptional Network Controls Sleep/Wake Coupling and Thermal Resistance of the Central Circadian Clockworks. *Current Biology*, **2017**, 27, 128-136	6.3	22
126	Uveitis-The Tortured Tale of the Tubercle. *JAMA Ophthalmology*, **2017**, 135, 1328-1329	3.9	1

125	Light entrainment of the murine intraocular pressure circadian rhythm utilizes non-local mechanisms. *PLoS ONE*, **2017**, 12, e0184790	3.7	14
124	In Vivo Bioluminescence Imaging for Longitudinal Monitoring of Inflammation in Animal Models of Uveitis **2017**, 58, 1521-1528		20
123	Reply. *Ophthalmology*, **2017**, 124, e65-e66	7.3	
122	Sarcoid, Bayes, and the Challenges of Laboratory Testing for Uveitis. *JAMA Ophthalmology*, **2017**, 135, 1359-1360	3.9	
121	Global rise of potential health hazards caused by blue light-induced circadian disruption in modern aging societies. *Npj Aging and Mechanisms of Disease*, **2017**, 3, 9	5.5	75
120	Photopharmacological control of bipolar cells restores visual function in blind mice. *Journal of Clinical Investigation*, **2017**, 127, 2598-2611	15.9	37
119	Evaluating Access to Eye Care in the Contiguous United States by Calculated Driving Time in the United States Medicare Population. *Ophthalmology*, **2016**, 123, 2456-2461	7.3	27
118	Ocular Photoreception for Circadian Rhythm Entrainment in Mammals. *Annual Review of Vision Science*, **2016**, 2, 153-169	8.2	21
117	Melanopsin: The Tale of the Tail. *Neuron*, **2016**, 90, 909-11	13.9	3
116	Multimodal Imaging in Wagner Syndrome. *Ophthalmic Surgery Lasers and Imaging Retina*, **2016**, 47, 574-9	1.4	3
115	Quantitative Assessment of Anterior Segment Inflammation in a Rat Model of Uveitis Using Spectral-Domain Optical Coherence Tomography **2016**, 57, 3567-75		19
114	Paucibacterial Microbiome and Resident DNA Virome of the Healthy Conjunctiva **2016**, 57, 5116-5126		111
113	Scalable metagenomics alignment research tool (SMART): a scalable, rapid, and complete search heuristic for the classification of metagenomic sequences from complex sequence populations. *BMC Bioinformatics*, **2016**, 17, 292	3.6	18
112	Wide-field optical coherence tomography based microangiography for retinal imaging. *Scientific Reports*, **2016**, 6, 22017	4.9	89
111	Patterns of Laboratory Testing Utilization Among Uveitis Specialists. *American Journal of Ophthalmology*, **2016**, 170, 161-167	4.9	17
110	Vision: Melanopsin and the Pharmacology of Photons. *Current Biology*, **2016**, 26, R804-6	6.3	1
109	Urinary 2-Microglobulin Testing in Pediatric Uveitis: A Case Report of a 9-Year-Old Boy with Renal and Ocular Sarcoidosis. *Case Reports in Ophthalmology*, **2015**, 6, 101-5	0.7	13
108	Vision Science: Can Rhodopsin Cure Blindness?. *Current Biology*, **2015**, 25, R713-5	6.3	

107	Type I intrinsically photosensitive retinal ganglion cells of early post-natal development correspond to the M4 subtype. *Neural Development*, **2015**, 10, 17	3.9	18
106	Emerging techniques for pathogen discovery in endophthalmitis. *Current Opinion in Ophthalmology*, **2015**, 26, 221-5	5.1	25
105	A Rayleigh Scatter-Based Ocular Flare Analysis Meter for Flare Photometry of the Anterior Chamber. *Translational Vision Science and Technology*, **2015**, 4, 7	3.3	5
104	G-Protein Coupled Receptor Kinase 2 Minimally Regulates Melanopsin Activity in Intrinsically Photosensitive Retinal Ganglion Cells. *PLoS ONE*, **2015**, 10, e0128690	3.7	12
103	Primed Mycobacterial Uveitis (PMU): Histologic and Cytokine Characterization of a Model of Uveitis in Rats **2015**, 56, 8438-48		19
102	Comparative Proteomic Analysis of Two Uveitis Models in Lewis Rats **2015**, 56, 8449-56		13
101	Neuropsin (OPN5)-mediated photoentrainment of local circadian oscillators in mammalian retina and cornea. *Proceedings of the National Academy of Sciences of the United States of America*, **2015**, 112, 13093-8	11.5	81
100	Photochemical approaches to vision restoration. *Vision Research*, **2015**, 111, 134-41	2.1	17
99	Identification of torque teno virus in culture-negative endophthalmitis by representational deep DNA sequencing. *Ophthalmology*, **2015**, 122, 524-30	7.3	68
98	A tablet that shifts the clock. *Proceedings of the National Academy of Sciences of the United States of America*, **2015**, 112, 946-7	11.5	8
97	Restoring visual function to blind mice with a photoswitch that exploits electrophysiological remodeling of retinal ganglion cells. *Neuron*, **2014**, 81, 800-13	13.9	134
96	Expert panel recommendations for the use of anti-tumor necrosis factor biologic agents in patients with ocular inflammatory disorders. *Ophthalmology*, **2014**, 121, 785-96.e3	7.3	308
95	Author reply: To PMID 24359625. *Ophthalmology*, **2014**, 121, e58-9	7.3	
94	Retinal neovascularization and endogenous fungal endophthalmitis in intravenous drug users. *Ophthalmology*, **2014**, 121, 1847-8.e2	7.3	6
93	HLA-B27 and human β-microglobulin affect the gut microbiota of transgenic rats. *PLoS ONE*, **2014**, 9, e105684	3.7	167
92	Local photic entrainment of the retinal circadian oscillator in the absence of rods, cones, and melanopsin. *Proceedings of the National Academy of Sciences of the United States of America*, **2014**, 111, 8625-30	11.5	32
91	The making of the master clock. *ELife*, **2014**, 3, e04014	8.9	2
90	A diagnostic dilemma: infectious versus noninfectious multifocal choroiditis with panuveitis. *Journal of Ophthalmic Inflammation and Infection*, **2013**, 3, 26	2.3	5

89	Role of molecular diagnostics in ocular microbiology. *Current Ophthalmology Reports*, **2013**, 1, 181	1.8	46
88	Acute Retinal Necrosis Syndrome **2013**, 1523-1531		1
87	Ramshackle (Brwd3) promotes light-induced ubiquitylation of Drosophila Cryptochrome by DDB1-CUL4-ROC1 E3 ligase complex. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 4980-5	11.5	45
86	Photochemical restoration of visual responses in blind mice. *Neuron*, **2012**, 75, 271-82	13.9	178
85	Uveitis is a subspeciality. *Ophthalmology*, **2012**, 119, 887-8; author reply 888	7.3	1
84	Efficacy and potential complications of difluprednate use for pediatric uveitis. *American Journal of Ophthalmology*, **2012**, 153, 932-8	4.9	56
83	Effect of circadian clock gene mutations on nonvisual photoreception in the mouse **2012**, 53, 454-60		15
82	Postcataract surgical inflammation. *Current Opinion in Ophthalmology*, **2012**, 23, 12-8	5.1	28
81	Melanopsin and mechanisms of non-visual ocular photoreception. *Journal of Biological Chemistry*, **2012**, 287, 1649-56	5.4	54
80	Melanopsin is highly resistant to light and chemical bleaching in vivo. *Journal of Biological Chemistry* , **2012**, 287, 20888-97	5.4	40
79	Diagnostic and therapeutic challenges. *Retina*, **2012**, 32, 1028-32	3.6	1
78	Biome representational in silico karyotyping. *Genome Research*, **2011**, 21, 626-33	9.7	14
77	Ocular sarcoidosis **2010**, 666-671		
76	Melanopsin-dependent light avoidance in neonatal mice. *Proceedings of the National Academy of Sciences of the United States of America*, **2010**, 107, 17374-8	11.5	105
75	Ocular pathogens for the twenty-first century. *American Journal of Ophthalmology*, **2010**, 150, 595-7	4.9	11
74	Journal Watch 18(1). *Ocular Immunology and Inflammation*, **2010**, 18, 66-68	2.8	
73	Diagnostic and therapeutic challenges. Acute onset panuveitis. *Retina*, **2010**, 30, 364-8	3.6	1
72	Has the polymerase chain reaction come of age for ophthalmology?. *American Journal of Ophthalmology*, **2009**, 147, 5-7	4.9	6

71	Cataract surgery in the setting of uveitis. *Current Opinion in Ophthalmology*, **2009**, 20, 42-5	5.1	40
70	Non-visual photoreception: sensing light without sight. *Current Biology*, **2008**, 18, R38-9	6.3	15
69	Idiopathic no more: clues to the pathogenesis of Fuchs heterochromic iridocyclitis and glaucomatocyclitic crisis. *American Journal of Ophthalmology*, **2008**, 145, 769-71	4.9	33
68	Absence of long-wavelength photic potentiation of murine intrinsically photosensitive retinal ganglion cell firing in vitro. *Journal of Biological Rhythms*, **2008**, 23, 387-91	3.2	37
67	Actinomyces israelii endogenous endophthalmitis. *British Journal of Ophthalmology*, **2008**, 92, 427-8	5.5	8
66	Cryptochromes and Inner Retinal Non-Visual Irradiance Detection. *Novartis Foundation Symposium*, **2008**, 31-51		4
65	Aqueous and vitreous concentrations following topical administration of 1% voriconazole in humans. *JAMA Ophthalmology*, **2008**, 126, 18-22		82
64	Posterior Segment Uveitis **2008**, 301-315		
63	Prospective comparison of microbial culture and polymerase chain reaction in the diagnosis of corneal ulcer. *American Journal of Ophthalmology*, **2008**, 146, 714-23, 723.e1	4.9	52
62	The imprinted gene Magel2 regulates normal circadian output. *Nature Genetics*, **2007**, 39, 1266-72	36.3	148
61	Melanopsin-dependent persistence and photopotentiation of murine pupillary light responses. *Investigative Ophthalmology and Visual Science*, **2007**, 48, 1268-75		41
60	Action spectrum of Drosophila cryptochrome. *Journal of Biological Chemistry*, **2007**, 282, 10561-6	5.4	46
59	Colin pittendrigh: The lion in winter **2006**, 11, 14-21		
58	Abnormal anterior chamber associated immune deviation (ACAID) in 129-strain mice. *Ocular Immunology and Inflammation*, **2006**, 14, 7-12	2.8	
57	Inner retinal photoreception independent of the visual retinoid cycle. *Proceedings of the National Academy of Sciences of the United States of America*, **2006**, 103, 10426-10431	11.5	51
56	Timeless genes and jetlag. *Proceedings of the National Academy of Sciences of the United States of America*, **2006**, 103, 17583-4	11.5	3
55	Metaplastic squamous epithelial downgrowth after clear corneal cataract surgery. *American Journal of Ophthalmology*, **2006**, 142, 695-7	4.9	10
54	Rubeosis and anterior segment ischemia associated with systemic cryoglobulinemia. *American Journal of Ophthalmology*, **2006**, 142, 689-90	4.9	10

53	Impact of being "on call". *Ophthalmology*, **2006**, 113, 889-90.e2	7.3	4
52	Acute Retinal Necrosis Syndrome **2006**, 1673-1681		
51	Diagnostic and Therapeutic Vitrectomy for Uveitis **2006**, 2277-2282		
50	Journal watch. *Ocular Immunology and Inflammation*, **2005**, 13, 493-6	2.8	
49	Physiologic diversity and development of intrinsically photosensitive retinal ganglion cells. *Neuron*, **2005**, 48, 987-99	13.9	185
48	Sleep Disturbances: Author reply. *Ophthalmology*, **2005**, 112, 1848-1849	7.3	
47	Presumed ocular histoplasmosis syndrome. *Current Opinion in Ophthalmology*, **2005**, 16, 364-8	5.1	21
46	Animal Cryptochromes **2005**, 259-276		2
45	Journal watch. *Ocular Immunology and Inflammation*, **2005**, 13, 261-3	2.8	
44	Pharmacological and rAAV gene therapy rescue of visual functions in a blind mouse model of Leber congenital amaurosis. *PLoS Medicine*, **2005**, 2, e333	11.6	104
43	Bilateral choroiditis from Prototheca wickerhamii algaemia. *JAMA Ophthalmology*, **2005**, 123, 1138-41		12
42	Nonvisual ocular photoreception in the mammal. *Methods in Enzymology*, **2005**, 393, 746-55	1.7	25
41	Lecithin-retinol acyltransferase is essential for accumulation of all-trans-retinyl esters in the eye and in the liver. *Journal of Biological Chemistry*, **2004**, 279, 10422-32	5.4	273
40	Effect of vitamin A depletion on nonvisual phototransduction pathways in cryptochromeless mice. *Journal of Biological Rhythms*, **2004**, 19, 504-17	3.2	22
39	Clean thoughts about dirty genes. *Journal of Biological Rhythms*, **2004**, 19, 3-9	3.2	9
38	Journal watch. *Ocular Immunology and Inflammation*, **2004**, 12, 159-162	2.8	
37	Nonvisual photoreception in the chick iris. *Science*, **2004**, 306, 129-31	33.3	47
36	Resetting the clock: Dexras1 defines a path. *Neuron*, **2004**, 43, 603-4	13.9	4

35	Sleep disturbances in young subjects with visual dysfunction. *Ophthalmology*, **2004**, 111, 297-302; discussion 302-3	7.3	45
34	Diagnosis of microsporidia keratitis by polymerase chain reaction. *JAMA Ophthalmology*, **2004**, 122, 283-4		16
33	Recent insights into mammalian circadian rhythms. *Sleep*, **2004**, 27, 166-71	1.1	16
32	Reduced pupillary light responses in mice lacking cryptochromes. *Science*, **2003**, 299, 222	33.3	75
31	Cme review: polymerase chain reaction diagnostics for posterior segment disease. *Retina*, **2003**, 23, 445-58	3.6	27
30	Melanopsin is required for non-image-forming photic responses in blind mice. *Science*, **2003**, 301, 525-7	33.3	567
29	Correlation of visual and refractive outcomes between eyes after same-session bilateral laser in situ keratomileusis surgery. *American Journal of Ophthalmology*, **2003**, 135, 577-83	4.9	4
28	Making (a) sense of non-visual ocular photoreception. *Trends in Neurosciences*, **2003**, 26, 458-61	13.3	34
27	Circadian rhythms: in the loop at last. *Science*, **2003**, 300, 1534-5	33.3	62
26	Cryptochromes and inner retinal non-visual irradiance detection. *Novartis Foundation Symposium*, **2003**, 253, 31-42; discussion 42-55, 102-9, 281-4		1
25	Muscle expression of human retinol-binding protein (RBP). Suppression of the visual defect of RBP knockout mice. *Journal of Biological Chemistry*, **2002**, 277, 30191-7	5.4	40
24	Influence of the period-dependent circadian clock on diurnal, circadian, and aperiodic gene expression in Drosophila melanogaster. *Proceedings of the National Academy of Sciences of the United States of America*, **2002**, 99, 9562-7	11.5	162
23	Tales from the crypt(ochromes). *Journal of Biological Rhythms*, **2002**, 17, 110-20	3.2	30
22	Real-time quantitative polymerase chain reaction diagnosis of infectious posterior uveitis. *JAMA Ophthalmology*, **2002**, 120, 1534-9		60
21	Koch's postulates and the polymerase chain reaction. *Ocular Immunology and Inflammation*, **2002**, 10, 235-8	2.8	9
20	Pleiotropic effects of cryptochromes 1 and 2 on free-running and light-entrained murine circadian rhythms. *Journal of Neurogenetics*, **2002**, 16, 181-203	1.6	27
19	Comparison of photorefractive keratectomy, astigmatic PRK, laser in situ keratomileusis, and astigmatic LASIK in the treatment of myopia. *Journal of Cataract and Refractive Surgery*, **2002**, 28, 462-76	2.3	32
18	Astigmatic changes after excimer laser refractive surgery. *Journal of Cataract and Refractive Surgery*, **2002**, 28, 477-84	2.3	3

17	Loss of photic entrainment and altered free-running circadian rhythms in math5-/- mice. *Journal of Neuroscience*, **2002**, 22, 10427-33	6.6	49
16	Preservation of light signaling to the suprachiasmatic nucleus in vitamin A-deficient mice. *Proceedings of the National Academy of Sciences of the United States of America*, **2001**, 98, 11708-13	11.5	59
15	Herpes simplex virus type 2 as a cause of acute retinal necrosis syndrome in young patients. *Ophthalmology*, **2001**, 108, 869-76	7.3	123
14	Applications of the polymerase chain reaction to diagnosis of ophthalmic disease. *Survey of Ophthalmology*, **2001**, 46, 248-58	6.1	74
13	Frontiers of polymerase chain reaction diagnostics for uveitis. *Ocular Immunology and Inflammation*, **2001**, 9, 67-73	2.8	5
12	Non-visual ocular photoreception. *Ophthalmic Genetics*, **2001**, 22, 195-205	1.2	22
11	Guidelines for the use of immunosuppressive drugs in patients with ocular inflammatory disorders: recommendations of an expert panel. *American Journal of Ophthalmology*, **2000**, 130, 492-513	4.9	711
10	Discussion by Russell N. Van Gelder MD, PhD. *Ophthalmology*, **2000**, 107, 1051-1052	7.3	15
9	Functional redundancy of cryptochromes and classical photoreceptors for nonvisual ocular photoreception in mice. *Proceedings of the National Academy of Sciences of the United States of America*, **2000**, 97, 14697-702	11.5	151
8	Neural network computer program to determine photorefractive keratectomy nomograms. *Journal of Cataract and Refractive Surgery*, **1998**, 24, 917-24	2.3	11
7	Application of the polymerase chain reaction to the diagnosis of uveitis. *Ocular Immunology and Inflammation*, **1998**, 6, 129-34	2.8	6
6	Partners in time. Circadian rhythms. *Current Biology*, **1996**, 6, 244-6	6.3	6
5	Extent and character of circadian gene expression in Drosophila melanogaster: identification of twenty oscillating mRNAs in the fly head. *Current Biology*, **1995**, 5, 1424-36	6.3	56
4	Real-time automated sleep scoring: validation of a microcomputer-based system for mice. *Sleep*, **1991**, 14, 48-55	1.1	49
3	Amplified RNA synthesized from limited quantities of heterogeneous cDNA. *Proceedings of the National Academy of Sciences of the United States of America*, **1990**, 87, 1663-7	11.5	1086
2	Factors affecting plasma benzo[a]pyrene levels in environmental studies. *Environmental Research*, **1983**, 32, 104-10	7.9	26
1	An adipocyte light-Opsin 3 pathway regulates the circadian clock and energy balance		1