

J Crawford Downs

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102
papers

6,161
citations

43
h-index

78
g-index

114
ext. papers

6,810
ext. citations

4.3
avg, IF

5.84
L-index

#	Paper	IF	Citations
102	The optic nerve head as a biomechanical structure: a new paradigm for understanding the role of IOP-related stress and strain in the pathophysiology of glaucomatous optic nerve head damage. <i>Progress in Retinal and Eye Research</i> , 2005 , 24, 39-73	20.5	794
101	Deformation of the lamina cribrosa and anterior scleral canal wall in early experimental glaucoma. <i>Investigative Ophthalmology and Visual Science</i> , 2003 , 44, 623-37		309
100	3-D histomorphometry of the normal and early glaucomatous monkey optic nerve head: lamina cribrosa and peripapillary scleral position and thickness. <i>Investigative Ophthalmology and Visual Science</i> , 2007 , 48, 4597-607		220
99	Viscoelastic material properties of the peripapillary sclera in normal and early-glaucoma monkey eyes. <i>Investigative Ophthalmology and Visual Science</i> , 2005 , 46, 540-6		201
98	Scleral biomechanics in the aging monkey eye 2009 , 50, 5226-37		174
97	Biomechanical changes in the sclera of monkey eyes exposed to chronic IOP elevations 2011 , 52, 5656-69		169
96	Three-dimensional reconstruction of normal and early glaucoma monkey optic nerve head connective tissues. <i>Investigative Ophthalmology and Visual Science</i> , 2004 , 45, 4388-99		168
95	Mechanical environment of the optic nerve head in glaucoma. <i>Optometry and Vision Science</i> , 2008 , 85, 425-35	2.1	167
94	Premise and prediction-how optic nerve head biomechanics underlies the susceptibility and clinical behavior of the aged optic nerve head. <i>Journal of Glaucoma</i> , 2008 , 17, 318-28	2.1	167
93	Remodeling of the connective tissue microarchitecture of the lamina cribrosa in early experimental glaucoma 2009 , 50, 681-90		164
92	Glaucomatous cupping of the lamina cribrosa: a review of the evidence for active progressive remodeling as a mechanism. <i>Experimental Eye Research</i> , 2011 , 93, 133-40	3.7	161
91	Three-dimensional histomorphometry of the normal and early glaucomatous monkey optic nerve head: neural canal and subarachnoid space architecture. <i>Investigative Ophthalmology and Visual Science</i> , 2007 , 48, 3195-208		155
90	3-D histomorphometry of the normal and early glaucomatous monkey optic nerve head: prelaminar neural tissues and cupping. <i>Investigative Ophthalmology and Visual Science</i> , 2007 , 48, 5068-84		144
89	Posterior (outward) migration of the lamina cribrosa and early cupping in monkey experimental glaucoma 2011 , 52, 7109-21		130
88	IOP-induced lamina cribrosa displacement and scleral canal expansion: an analysis of factor interactions using parameterized eye-specific models 2011 , 52, 1896-907		130
87	Correlation between local stress and strain and lamina cribrosa connective tissue volume fraction in normal monkey eyes 2010 , 51, 295-307		113
86	Peripapillary and posterior scleral mechanics--part II: experimental and inverse finite element characterization. <i>Journal of Biomechanical Engineering</i> , 2009 , 131, 051012	2.1	112

85	Deformation of the early glaucomatous monkey optic nerve head connective tissue after acute IOP elevation in 3-D histomorphometric reconstructions 2011 , 52, 345-63		107
84	24-hour IOP telemetry in the nonhuman primate: implant system performance and initial characterization of IOP at multiple timescales 2011 , 52, 7365-75		107
83	Deformation of the normal monkey optic nerve head connective tissue after acute IOP elevation within 3-D histomorphometric reconstructions 2009 , 50, 5785-99		105
82	IOP-induced lamina cribrosa deformation and scleral canal expansion: independent or related? 2011 , 52, 9023-32		96
81	Age- and race-related differences in human scleral material properties. <i>Investigative Ophthalmology and Visual Science</i> , 2014 , 55, 8163-72		94
80	Detection of optic nerve head neural canal opening within histomorphometric and spectral domain optical coherence tomography data sets 2009 , 50, 214-23		91
79	Peripapillary and posterior scleral mechanics--part I: development of an anisotropic hyperelastic constitutive model. <i>Journal of Biomechanical Engineering</i> , 2009 , 131, 051011	2.1	91
78	Optic nerve head biomechanics in aging and disease. <i>Experimental Eye Research</i> , 2015 , 133, 19-29	3.7	90
77	Viscoelastic characterization of peripapillary sclera: material properties by quadrant in rabbit and monkey eyes. <i>Journal of Biomechanical Engineering</i> , 2003 , 125, 124-31	2.1	90
76	Lamina Cribrosa Thickening in Early Glaucoma Predicted by a Microstructure Motivated Growth and Remodeling Approach. <i>Mechanics of Materials</i> , 2012 , 44, 99-109	3.3	81
75	Changes in the biomechanical response of the optic nerve head in early experimental glaucoma 2010 , 51, 5675-84		80
74	Age-related changes in human peripapillary scleral strain. <i>Biomechanics and Modeling in Mechanobiology</i> , 2014 , 13, 551-63	3.8	77
73	Material properties of the posterior human sclera. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2014 , 29, 602-17	4.1	72
72	The role of matricellular proteins in glaucoma. <i>Matrix Biology</i> , 2014 , 37, 174-82	11.4	64
71	Human scleral structural stiffness increases more rapidly with age in donors of African descent compared to donors of European descent 2014 , 55, 7189-98		62
70	Regional variations in mechanical strain in the posterior human sclera 2012 , 53, 5326-33		62
69	Lamina cribrosa in glaucoma. <i>Current Opinion in Ophthalmology</i> , 2017 , 28, 113-119	5.1	59
68	Comparison of clinical and three-dimensional histomorphometric optic disc margin anatomy 2009 , 50, 2165-74		59

67	The effect of acute intraocular pressure elevation on peripapillary retinal thickness, retinal nerve fiber layer thickness, and retardance 2009 , 50, 4719-26		57
66	Perspectives on biomechanical growth and remodeling mechanisms in glaucoma(). <i>Mechanics Research Communications</i> , 2012 , 42, 92-106	2.2	54
65	Impact of systemic blood pressure on the relationship between intraocular pressure and blood flow in the optic nerve head of nonhuman primates 2009 , 50, 2154-60		54
64	Physiologic intereye differences in monkey optic nerve head architecture and their relation to changes in early experimental glaucoma 2009 , 50, 224-34		49
63	Effects of storage time on the mechanical properties of rabbit peripapillary sclera after enucleation. <i>Current Eye Research</i> , 2007 , 32, 465-70	2.9	49
62	Anterior scleral canal geometry in pressurised (IOP 10) and non-pressurised (IOP 0) normal monkey eyes. <i>British Journal of Ophthalmology</i> , 2003 , 87, 1284-90	5.5	49
61	Biomechanical aspects of axonal damage in glaucoma: A brief review. <i>Experimental Eye Research</i> , 2017 , 157, 13-19	3.7	46
60	Peripapillary choroidal thickness variation with age and race in normal eyes 2015 , 56, 1872-9		46
59	Biological aspects of axonal damage in glaucoma: A brief review. <i>Experimental Eye Research</i> , 2017 , 157, 5-12	3.7	42
58	Variation in the Three-Dimensional Histomorphometry of the Normal Human Optic Nerve Head With Age and Race: Lamina Cribrosa and Peripapillary Scleral Thickness and Position 2017 , 58, 3759-3769		40
57	Intraocular pressure magnitude and variability as predictors of rates of structural change in non-human primate experimental glaucoma. <i>Experimental Eye Research</i> , 2012 , 103, 1-8	3.7	40
56	Morphing methods to parameterize specimen-specific finite element model geometries. <i>Journal of Biomechanics</i> , 2010 , 43, 254-62	2.9	35
55	Peripapillary scleral thickness in perfusion-fixed normal monkey eyes. <i>Investigative Ophthalmology and Visual Science</i> , 2002 , 43, 2229-35		34
54	Age-related differences in longitudinal structural change by spectral-domain optical coherence tomography in early experimental glaucoma 2014 , 55, 6409-20		32
53	Segmentation of trabeculated structures using an anisotropic Markov random field: application to the study of the optic nerve head in glaucoma. <i>IEEE Transactions on Medical Imaging</i> , 2006 , 25, 245-55	11.7	32
52	Transient Intraocular Pressure Fluctuations: Source, Magnitude, Frequency, and Associated Mechanical Energy 2019 , 60, 2572-2582		29
51	Variation of lamellar depth in normal eyes with age and race. <i>Investigative Ophthalmology and Visual Science</i> , 2014 , 55, 8123-33		29
50	IOP telemetry in the nonhuman primate. <i>Experimental Eye Research</i> , 2015 , 141, 91-8	3.7	28

49	A forward incremental prestressing method with application to inverse parameter estimations and eye-specific simulations of posterior scleral shells. <i>Computer Methods in Biomechanics and Biomedical Engineering</i> , 2013 , 16, 768-80	2.1	28
48	Experimental surface strain mapping of porcine peripapillary sclera due to elevations of intraocular pressure. <i>Journal of Biomechanical Engineering</i> , 2008 , 130, 041017	2.1	28
47	Physical Factors Affecting Outflow Facility Measurements in Mice 2015 , 56, 8331-9		27
46	High-Magnitude and/or High-Frequency Mechanical Strain Promotes Peripapillary Scleral Myofibroblast Differentiation 2015 , 56, 7821-30		23
45	Time scale for periosteal readhesion after brow lift. <i>Laryngoscope</i> , 2004 , 114, 50-5	3.6	22
44	Multiscale finite element modeling of the lamina cribrosa microarchitecture in the eye. <i>Annual International Conference of the IEEE Engineering in Medicine and Biology Society IEEE Engineering in Medicine and Biology Society Annual International Conference</i> , 2009 , 2009, 4277-80	0.9	21
43	A Novel Tree Shrew (<i>Tupaia belangeri</i>) Model of Glaucoma 2018 , 59, 3136-3143		20
42	Tethered protein/peptide-surface-modified hydrogels. <i>Journal of Biomaterials Science, Polymer Edition</i> , 2004 , 15, 905-16	3.5	20
41	Lamina cribrosa microarchitecture in normal monkey eyes part 1: methods and initial results. <i>Investigative Ophthalmology and Visual Science</i> , 2015 , 56, 1618-37		18
40	The Magnitude and Time Course of IOP Change in Response to Body Position Change in Nonhuman Primates Measured Using Continuous IOP Telemetry 2017 , 58, 6232-6240		17
39	The Magnitude of Intraocular Pressure Elevation Associated with Eye Rubbing. <i>Ophthalmology</i> , 2019 , 126, 171-172	7.3	17
38	Periosteal readhesion after brow-lift in New Zealand white rabbits. <i>Archives of Facial Plastic Surgery</i> , 2002 , 4, 248-51		16
37	Diurnal Cycle of Translaminar Pressure in Nonhuman Primates Quantified With Continuous Wireless Telemetry 2020 , 61, 37		15
36	Schiotz tonometry accurately measures intraocular pressure in Boston type 1 keratoprosthesis eyes. <i>Cornea</i> , 2015 , 34, 682-5	3.1	15
35	Compensation method for obtaining accurate, sub-micrometer displacement measurements of immersed specimens using electronic speckle interferometry. <i>Biomedical Optics Express</i> , 2012 , 3, 407-17 ^{3.5}		13
34	Effect of Anesthesia on Intraocular Pressure Measured With Continuous Wireless Telemetry in Nonhuman Primates 2019 , 60, 3830-3834		12
33	A mesh-free approach to incorporate complex anisotropic and heterogeneous material properties into eye-specific finite element models. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2020 , 358, 112654	5.7	12
32	Analysis of the effects of finite element type within a 3D biomechanical model of a human optic nerve head and posterior pole. <i>Computer Methods and Programs in Biomedicine</i> , 2021 , 198, 105794	6.9	12

31	The Thrombospondin1-TGF- β Pathway and Glaucoma. <i>Journal of Ocular Pharmacology and Therapeutics</i> , 2015 , 31, 371-5	2.6	11
30	IOP, IOP Transient Impulse, Ocular Perfusion Pressure, and Mean Arterial Pressure Relationships in Nonhuman Primates Instrumented With Telemetry 2018 , 59, 4496-4505		11
29	Cyclic Pattern of Intraocular Pressure (IOP) and Transient IOP Fluctuations in Nonhuman Primates Measured with Continuous Wireless Telemetry. <i>Current Eye Research</i> , 2019 , 44, 1244-1252	2.9	10
28	Modeling the biomechanics of the lamina cribrosa microstructure in the human eye. <i>Acta Biomaterialia</i> , 2021 , 134, 357-378	10.8	10
27	Acute Stress Increases Intraocular Pressure in Nonhuman Primates. <i>Ophthalmology Glaucoma</i> , 2019 , 2, 210-214	2.2	8
26	Bayesian Semiparametric Functional Mixed Models for Serially Correlated Functional Data, with Application to Glaucoma Data. <i>Journal of the American Statistical Association</i> , 2019 , 114, 495-513	2.8	7
25	The Relationship Between Scleral Strain Change and Differential Cumulative Intraocular Pressure Exposure in the Nonhuman Primate Chronic Ocular Hypertension Model 2019 , 60, 4141-4150		7
24	Histologic validation of optical coherence tomography-based three-dimensional morphometric measurements of the human optic nerve head: Methodology and preliminary results. <i>Experimental Eye Research</i> , 2021 , 205, 108475	3.7	6
23	Continuum-Level Finite Element Modeling of the Optic Nerve Head Using a Fabric Tensor Based Description of the Lamina Cribrosa 2007 ,		5
22	A Mesh-Free Approach to Incorporate Complex Anisotropic and Heterogeneous Material Properties into Eye-Specific Finite Element Models. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2020 , 358,	5.7	5
21	Glaucoma and Structure-Based Mechanics of the Lamina Cribrosa at Multiple Scales 2016 , 93-122		4
20	Biomechanical changes of the optic disc 2010 , 153-164		4
19	Effect of Body Position on Intraocular Pressure (IOP), Intracranial Pressure (ICP), and Translaminar Pressure (TLP) Via Continuous Wireless Telemetry in Nonhuman Primates (NHPs) 2020 , 61, 18		3
18	Intra-Subject Variability and Diurnal Cycle of Ocular Perfusion Pressure as Characterized by Continuous Telemetry in Nonhuman Primates 2020 , 61, 7		3
17	Ocular biomechanics due to ground blast reinforcement. <i>Computer Methods and Programs in Biomedicine</i> , 2021 , 211, 106425	6.9	3
16	Neural coupling of intracranial pressure and aqueous humour outflow facility: A potential new therapeutic target for intraocular pressure management. <i>Journal of Physiology</i> , 2020 , 598, 1429-1430	3.9	2
15	The Magnitude of Hypotony and Time Course of Intraocular Pressure Recovery Following Anterior Chamber Cannulation in Nonhuman Primates 2017 , 58, 3225-3230		2
14	Mechanical Strain and Restructuring of the Optic Nerve Head 2015 , 67-87		2

13	Finite Element Modeling of the Lamina Cribrosa Microarchitecture in the Normal and Early Glaucoma Monkey Optic Nerve Head 2007 ,		2
12	Quantification of Translaminar Pressure Gradient (TLPG) With Continuous Wireless Telemetry in Nonhuman Primates (NHPs). <i>Translational Vision Science and Technology</i> , 2020 , 9, 18	3.3	2
11	Biomechanics of human trabecular meshwork in healthy and glaucoma eyes via dynamic Schlemm's canal pressurization. <i>Computer Methods and Programs in Biomedicine</i> , 2022 , 221, 106921	6.9	2
10	Comparison of extraocular and intraocular pressure transducers for measurement of transient intraocular pressure fluctuations using continuous wireless telemetry. <i>Scientific Reports</i> , 2020 , 10, 20893	4.9	1
9	Scleral Biomechanics in the Glaucomatous Monkey Eye 2009 ,		1
8	Finite element modeling of the complex anisotropic mechanical behavior of the human sclera and pia mater.. <i>Computer Methods and Programs in Biomedicine</i> , 2022 , 215, 106618	6.9	1
7	Strain by virtual extensometers and video-imaging optical coherence tomography as a repeatable metric for IOP-Induced optic nerve head deformations. <i>Experimental Eye Research</i> , 2021 , 211, 108724	3.7	0
6	Modeling the biomechanics of the conventional aqueous outflow pathway microstructure in the human eye. <i>Computer Methods and Programs in Biomedicine</i> , 2022 , 221, 106922	6.9	0
5	Measuring Mean Cup Depth in the Optic Nerve Head. <i>Computer-Aided Design and Applications</i> , 2016 , 13, 693-700	1.4	
4	FEM Validation of a Spectral Viscoelastic Model of Posterior Sclera 2002 , 443		
3	Ocular Biomechanics in Glaucoma 2008 , 471-489		
2	Clinical Cupping: Lamellar and Prelamellar Components 2010 , 185-194		
1	What Are the Characteristic Changes to the Optic Nerve Head in Glaucoma and how Do they Evolve over Time? 2021 , 17-37		