J Crawford Downs

List of Publications by Year in Descending Order

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	Finite element modeling of the complex anisotropic mechanical behavior of the human sclera and pia mater.. *Computer Methods and Programs in Biomedicine*, **2022**, 215, 106618	6.9	1
101	Modeling the biomechanics of the conventional aqueous outflow pathway microstructure in the human eye. *Computer Methods and Programs in Biomedicine*, **2022**, 221, 106922	6.9	0
100	Biomechanics of human trabecular meshwork in healthy and glaucoma eyes via dynamic Schlemm's canal pressurization. *Computer Methods and Programs in Biomedicine*, **2022**, 221, 106921	6.9	2
99	Histologic validation of optical coherence tomography-based three-dimensional morphometric measurements of the human optic nerve head: Methodology and preliminary results. *Experimental Eye Research*, **2021**, 205, 108475	3.7	6
98	Analysis of the effects of finite element type within a 3D biomechanical model of a human optic nerve head and posterior pole. *Computer Methods and Programs in Biomedicine*, **2021**, 198, 105794	6.9	12
97	What Are the Characteristic Changes to the Optic Nerve Head in Glaucoma and how Do they Evolve over Time? **2021**, 17-37		
96	Modeling the biomechanics of the lamina cribrosa microstructure in the human eye. *Acta Biomaterialia*, **2021**, 134, 357-378	10.8	10
95	Strain by virtual extensometers and video-imaging optical coherence tomography as a repeatable metric for IOP-Induced optic nerve head deformations. *Experimental Eye Research*, **2021**, 211, 108724	3.7	0
94	Ocular biomechanics due to ground blast reinforcement. *Computer Methods and Programs in Biomedicine*, **2021**, 211, 106425	6.9	3
93	Comparison of extraocular and intraocular pressure transducers for measurement of transient intraocular pressure fluctuations using continuous wireless telemetry. *Scientific Reports*, **2020**, 10, 20893	4.9	1
92	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
91	Intra-Subject Variability and Diurnal Cycle of Ocular Perfusion Pressure as Characterized by Continuous Telemetry in Nonhuman Primates **2020**, 61, 7		3
90	Diurnal Cycle of Translaminar Pressure in Nonhuman Primates Quantified With Continuous Wireless Telemetry **2020**, 61, 37		15
89	Neural coupling of intracranial pressure and aqueous humour outflow facility: A potential new therapeutic target for intraocular pressure management. *Journal of Physiology*, **2020**, 598, 1429-1430	3.9	2
88	A Mesh-Free Approach to Incorporate Complex Anisotropic and Heterogeneous Material Properties into Eye-Specific Finite Element Models. *Computer Methods in Applied Mechanics and Engineering*, **2020**, 358,	5.7	5
87	Quantification of Translaminar Pressure Gradient (TLPG) With Continuous Wireless Telemetry in Nonhuman Primates (NHPs). *Translational Vision Science and Technology*, **2020**, 9, 18	3.3	2
86	A mesh-free approach to incorporate complex anisotropic and heterogeneous material properties into eye-specific finite element models. *Computer Methods in Applied Mechanics and Engineering*, **2020**, 358, 112654	5.7	12

85	Effect of Anesthesia on Intraocular Pressure Measured With Continuous Wireless Telemetry in Nonhuman Primates **2019**, 60, 3830-3834		12
84	Transient Intraocular Pressure Fluctuations: Source, Magnitude, Frequency, and Associated Mechanical Energy **2019**, 60, 2572-2582		29
83	Cyclic Pattern of Intraocular Pressure (IOP) and Transient IOP Fluctuations in Nonhuman Primates Measured with Continuous Wireless Telemetry. *Current Eye Research*, **2019**, 44, 1244-1252	2.9	10
82	Bayesian Semiparametric Functional Mixed Models for Serially Correlated Functional Data, with Application to Glaucoma Data. *Journal of the American Statistical Association*, **2019**, 114, 495-513	2.8	7
81	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
80	Acute Stress Increases Intraocular Pressure in Nonhuman Primates. *Ophthalmology Glaucoma*, **2019**, 2, 210-214	2.2	8
79	The Magnitude of Intraocular Pressure Elevation Associated with Eye Rubbing. *Ophthalmology*, **2019**, 126, 171-172	7.3	17
78	A Novel Tree Shrew (Tupaia belangeri) Model of Glaucoma **2018**, 59, 3136-3143		20
77	IOP, IOP Transient Impulse, Ocular Perfusion Pressure, and Mean Arterial Pressure Relationships in Nonhuman Primates Instrumented With Telemetry **2018**, 59, 4496-4505		11
76	Biological aspects of axonal damage in glaucoma: A brief review. *Experimental Eye Research*, **2017**, 157, 5-12	3.7	42
75	Biomechanical aspects of axonal damage in glaucoma: A brief review. *Experimental Eye Research*, **2017**, 157, 13-19	3.7	46
74	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
73	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
72	Lamina cribrosa in glaucoma. *Current Opinion in Ophthalmology*, **2017**, 28, 113-119	5.1	59
71	The Magnitude of Hypotony and Time Course of Intraocular Pressure Recovery Following Anterior Chamber Cannulation in Nonhuman Primates **2017**, 58, 3225-3230		2
70	Measuring Mean Cup Depth in the Optic Nerve Head. *Computer-Aided Design and Applications*, **2016**, 13, 693-700	1.4	
69	Glaucoma and Structure-Based Mechanics of the Lamina Cribrosa at Multiple Scales **2016**, 93-122		4
68	Optic nerve head biomechanics in aging and disease. *Experimental Eye Research*, **2015**, 133, 19-29	3.7	90

67	The Thrombospondin1-TGF-Pathway and Glaucoma. *Journal of Ocular Pharmacology and Therapeutics*, **2015**, 31, 371-5	2.6	11
66	IOP telemetry in the nonhuman primate. *Experimental Eye Research*, **2015**, 141, 91-8	3.7	28
65	Schiotz tonometry accurately measures intraocular pressure in Boston type 1 keratoprosthesis eyes. *Cornea*, **2015**, 34, 682-5	3.1	15
64	Peripapillary choroidal thickness variation with age and race in normal eyes **2015**, 56, 1872-9		46
63	High-Magnitude and/or High-Frequency Mechanical Strain Promotes Peripapillary Scleral Myofibroblast Differentiation **2015**, 56, 7821-30		23
62	Lamina cribrosa microarchitecture in normal monkey eyes part 1: methods and initial results. *Investigative Ophthalmology and Visual Science*, **2015**, 56, 1618-37		18
61	Physical Factors Affecting Outflow Facility Measurements in Mice **2015**, 56, 8331-9		27
60	Mechanical Strain and Restructuring of the Optic Nerve Head **2015**, 67-87		2
59	The role of matricellular proteins in glaucoma. *Matrix Biology*, **2014**, 37, 174-82	11.4	64
58	Material properties of the posterior human sclera. *Journal of the Mechanical Behavior of Biomedical Materials*, **2014**, 29, 602-17	4.1	72
57	Variation of laminar depth in normal eyes with age and race. *Investigative Ophthalmology and Visual Science*, **2014**, 55, 8123-33		29
56	Age-related differences in longitudinal structural change by spectral-domain optical coherence tomography in early experimental glaucoma **2014**, 55, 6409-20		32
55	Age- and race-related differences in human scleral material properties. *Investigative Ophthalmology and Visual Science*, **2014**, 55, 8163-72		94
54	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
53	Age-related changes in human peripapillary scleral strain. *Biomechanics and Modeling in Mechanobiology*, **2014**, 13, 551-63	3.8	77
52	A forward incremental prestressing method with application to inverse parameter estimations and eye-specific simulations of posterior scleral shells. *Computer Methods in Biomechanics and Biomedical Engineering*, **2013**, 16, 768-80	2.1	28
51	Lamina Cribrosa Thickening in Early Glaucoma Predicted by a Microstructure Motivated Growth and Remodeling Approach. *Mechanics of Materials*, **2012**, 44, 99-109	3.3	81
50	Perspectives on biomechanical growth and remodeling mechanisms in glaucoma(). *Mechanics Research Communications*, **2012**, 42, 92-106	2.2	54

49	Intraocular pressure magnitude and variability as predictors of rates of structural change in non-human primate experimental glaucoma. *Experimental Eye Research*, **2012**, 103, 1-8	3.7	40
48	Regional variations in mechanical strain in the posterior human sclera **2012**, 53, 5326-33		62
47	Compensation method for obtaining accurate, sub-micrometer displacement measurements of immersed specimens using electronic speckle interferometry. *Biomedical Optics Express*, **2012**, 3, 407-17	3.5	13
46	Glaucomatous cupping of the lamina cribrosa: a review of the evidence for active progressive remodeling as a mechanism. *Experimental Eye Research*, **2011**, 93, 133-40	3.7	161
45	Biomechanical changes in the sclera of monkey eyes exposed to chronic IOP elevations **2011**, 52, 5656-69		169
44	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
43	24-hour IOP telemetry in the nonhuman primate: implant system performance and initial characterization of IOP at multiple timescales **2011**, 52, 7365-75		107
42	Posterior (outward) migration of the lamina cribrosa and early cupping in monkey experimental glaucoma **2011**, 52, 7109-21		130
41	IOP-induced lamina cribrosa displacement and scleral canal expansion: an analysis of factor interactions using parameterized eye-specific models **2011**, 52, 1896-907		130
40	IOP-induced lamina cribrosa deformation and scleral canal expansion: independent or related? **2011**, 52, 9023-32		96
39	Biomechanical changes of the optic disc **2010**, 153-164		4
38	Correlation between local stress and strain and lamina cribrosa connective tissue volume fraction in normal monkey eyes **2010**, 51, 295-307		113
37	Changes in the biomechanical response of the optic nerve head in early experimental glaucoma **2010**, 51, 5675-84		80
36	Morphing methods to parameterize specimen-specific finite element model geometries. *Journal of Biomechanics*, **2010**, 43, 254-62	2.9	35
35	Clinical Cupping: Laminar and Prelaminar Components **2010**, 185-194		
34	Physiologic intereye differences in monkey optic nerve head architecture and their relation to changes in early experimental glaucoma **2009**, 50, 224-34		49
33	Deformation of the normal monkey optic nerve head connective tissue after acute IOP elevation within 3-D histomorphometric reconstructions **2009**, 50, 5785-99		105
32	Detection of optic nerve head neural canal opening within histomorphometric and spectral domain optical coherence tomography data sets **2009**, 50, 214-23		91

31	Comparison of clinical and three-dimensional histomorphometric optic disc margin anatomy **2009**, 50, 2165-74		59
30	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
29	Multiscale finite element modeling of the lamina cribrosa microarchitecture in the eye. *Annual International Conference of the IEEE Engineering in Medicine and Biology Society IEEE Engineering in Medicine and Biology Society Annual International Conference*, **2009**, 2009, 4277-80	0.9	21
28	Remodeling of the connective tissue microarchitecture of the lamina cribrosa in early experimental glaucoma **2009**, 50, 681-90		164
27	Scleral biomechanics in the aging monkey eye **2009**, 50, 5226-37		174
26	Peripapillary and posterior scleral mechanics--part II: experimental and inverse finite element characterization. *Journal of Biomechanical Engineering*, **2009**, 131, 051012	2.1	112
25	Peripapillary and posterior scleral mechanics--part I: development of an anisotropic hyperelastic constitutive model. *Journal of Biomechanical Engineering*, **2009**, 131, 051011	2.1	91
24	Scleral Biomechanics in the Glaucomatous Monkey Eye **2009**,		1
23	The effect of acute intraocular pressure elevation on peripapillary retinal thickness, retinal nerve fiber layer thickness, and retardance **2009**, 50, 4719-26		57
22	Experimental surface strain mapping of porcine peripapillary sclera due to elevations of intraocular pressure. *Journal of Biomechanical Engineering*, **2008**, 130, 041017	2.1	28
21	Mechanical environment of the optic nerve head in glaucoma. *Optometry and Vision Science*, **2008**, 85, 425-35	2.1	167
20	Premise and prediction-how optic nerve head biomechanics underlies the susceptibility and clinical behavior of the aged optic nerve head. *Journal of Glaucoma*, **2008**, 17, 318-28	2.1	167
19	Ocular Biomechanics in Glaucoma **2008**, 471-489		
18	3-D histomorphometry of the normal and early glaucomatous monkey optic nerve head: lamina cribrosa and peripapillary scleral position and thickness. *Investigative Ophthalmology and Visual Science*, **2007**, 48, 4597-607		220
17	3-D histomorphometry of the normal and early glaucomatous monkey optic nerve head: prelaminar neural tissues and cupping. *Investigative Ophthalmology and Visual Science*, **2007**, 48, 5068-84		144
16	Three-dimensional histomorphometry of the normal and early glaucomatous monkey optic nerve head: neural canal and subarachnoid space architecture. *Investigative Ophthalmology and Visual Science*, **2007**, 48, 3195-208		155
15	Finite Element Modeling of the Lamina Cribrosa Microarchitecture in the Normal and Early Glaucoma Monkey Optic Nerve Head **2007**,		2
14	Effects of storage time on the mechanical properties of rabbit peripapillary sclera after enucleation. *Current Eye Research*, **2007**, 32, 465-70	2.9	49

13	Continuum-Level Finite Element Modeling of the Optic Nerve Head Using a Fabric Tensor Based Description of the Lamina Cribrosa **2007**,		5
12	Segmentation of trabeculated structures using an anisotropic Markov random field: application to the study of the optic nerve head in glaucoma. *IEEE Transactions on Medical Imaging*, **2006**, 25, 245-55	11.7	32
11	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. *Progress in Retinal and Eye Research*, **2005**, 24, 39-73	20.5	794
10	Viscoelastic material properties of the peripapillary sclera in normal and early-glaucoma monkey eyes. *Investigative Ophthalmology and Visual Science*, **2005**, 46, 540-6		201
9	Three-dimensional reconstruction of normal and early glaucoma monkey optic nerve head connective tissues. *Investigative Ophthalmology and Visual Science*, **2004**, 45, 4388-99		168
8	Tethered protein/peptide-surface-modified hydrogels. *Journal of Biomaterials Science, Polymer Edition*, **2004**, 15, 905-16	3.5	20
7	Time scale for periosteal readhesion after brow lift. *Laryngoscope*, **2004**, 114, 50-5	3.6	22
6	Deformation of the lamina cribrosa and anterior scleral canal wall in early experimental glaucoma. *Investigative Ophthalmology and Visual Science*, **2003**, 44, 623-37		309
5	Viscoelastic characterization of peripapillary sclera: material properties by quadrant in rabbit and monkey eyes. *Journal of Biomechanical Engineering*, **2003**, 125, 124-31	2.1	90
4	Anterior scleral canal geometry in pressurised (IOP 10) and non-pressurised (IOP 0) normal monkey eyes. *British Journal of Ophthalmology*, **2003**, 87, 1284-90	5.5	49
3	FEM Validation of a Spectral Viscoelastic Model of Posterior Sclera **2002**, 443		
2	Periosteal readhesion after brow-lift in New Zealand white rabbits. *Archives of Facial Plastic Surgery* , **2002**, 4, 248-51		16
1	Peripapillary scleral thickness in perfusion-fixed normal monkey eyes. *Investigative Ophthalmology and Visual Science*, **2002**, 43, 2229-35		34