J Crawford Downs

List of Publications by Year
in descending order

112 papers	7,540 citations	185998 28 h-index	161609 54 g-index
114 all docs	114 docs citations	114 times ranked	2863 citing authors

#	Article	IF	Citations
1	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.	7.3	960
2	Deformation of the Lamina Cribrosa and Anterior Scleral Canal Wall in Early Experimental Glaucoma. , 2003, 44, 623.		349
3	3-D Histomorphometry of the Normal and Early Glaucomatous Monkey Optic Nerve Head: Lamina Cribrosa and Peripapillary Scleral Position and Thickness. , 2007, 48, 4597.		236
4	Viscoelastic Material Properties of the Peripapillary Sclera in Normal and Early-Glaucoma Monkey Eyes. , 2005, 46, 540.		228
5	Mechanical Environment of the Optic Nerve Head in Glaucoma. Optometry and Vision Science, 2008, 85, E425-E435.	0.6	219
6	Scleral Biomechanics in the Aging Monkey Eye. , 2009, 50, 5226.		201
7	Biomechanical Changes in the Sclera of Monkey Eyes Exposed to Chronic IOP Elevations. , 2011, 52, 5656.		201
8	Glaucomatous cupping of the lamina cribrosa: A review of the evidence for active progressive remodeling as a mechanism. Experimental Eye Research, 2011, 93, 133-140.	1.2	199
9	Remodeling of the Connective Tissue Microarchitecture of the Lamina Cribrosa in Early Experimental Glaucoma. , 2009, 50, 681.		194
10	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, 318-328.	0.8	191
11	Three-Dimensional Reconstruction of Normal and Early Glaucoma Monkey Optic Nerve Head Connective Tissues. , 2004, 45, 4388.		185
12	Three-Dimensional Histomorphometry of the Normal and Early Glaucomatous Monkey Optic Nerve Head: Neural Canal and Subarachnoid Space Architecture. , 2007, 48, 3195.		169
13	3-D Histomorphometry of the Normal and Early Glaucomatous Monkey Optic Nerve Head: Prelaminar Neural Tissues and Cupping. , 2007, 48, 5068.		163
14	Posterior (Outward) Migration of the Lamina Cribrosa and Early Cupping in Monkey Experimental Glaucoma. , 2011, 52, 7109.		159
15	IOP-Induced Lamina Cribrosa Displacement and Scleral Canal Expansion: An Analysis of Factor Interactions Using Parameterized Eye-Specific Models. , 2011, 52, 1896.		147
16	Peripapillary and Posterior Scleral Mechanicsâ€"Part II: Experimental and Inverse Finite Element Characterization. Journal of Biomechanical Engineering, 2009, 131, 051012.	0.6	132
17	Peripapillary and Posterior Scleral Mechanicsâ€"Part I: Development of an Anisotropic Hyperelastic Constitutive Model. Journal of Biomechanical Engineering, 2009, 131, 051011.	0.6	123
18	Correlation between Local Stress and Strain and Lamina Cribrosa Connective Tissue Volume Fraction in Normal Monkey Eyes. , 2010, 51, 295.		123

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19	24-Hour IOP Telemetry in the Nonhuman Primate: Implant System Performance and Initial Characterization of IOP at Multiple Timescales. , 2011, 52, 7365.		120
20	Deformation of the Early Glaucomatous Monkey Optic Nerve Head Connective Tissue after Acute IOP Elevation in 3-D Histomorphometric Reconstructions. , 2011, 52, 345.		119
21	Age- and Race-Related Differences in Human Scleral Material Properties. Investigative Ophthalmology and Visual Science, 2014, 55, 8163-8172.	3.3	117
22	Deformation of the Normal Monkey Optic Nerve Head Connective Tissue after Acute IOP Elevation within 3-D Histomorphometric Reconstructions. , 2009, 50, 5785.		115
23	Viscoelastic Characterization of Peripapillary Sclera: Material Properties by Quadrant in Rabbit and Monkey Eyes. Journal of Biomechanical Engineering, 2003, 125, 124-131.	0.6	114
24	IOP-Induced Lamina Cribrosa Deformation and Scleral Canal Expansion: Independent or Related?. , 2011, 52, 9023.		114
25	Optic nerve head biomechanics in aging and disease. Experimental Eye Research, 2015, 133, 19-29.	1.2	114
26	Material properties of the posterior human sclera. Journal of the Mechanical Behavior of Biomedical Materials, 2014, 29, 602-617.	1.5	106
27	Detection of Optic Nerve Head Neural Canal Opening within Histomorphometric and Spectral Domain Optical Coherence Tomography Data Sets. , 2009, 50, 214.		102
28	Lamina cribrosa thickening in early glaucoma predicted by a microstructure motivated growth and remodeling approach. Mechanics of Materials, 2012, 44, 99-109.	1.7	97
29	Changes in the Biomechanical Response of the Optic Nerve Head in Early Experimental Glaucoma. , 2010, 51, 5675.		93
30	Lamina cribrosa in glaucoma. Current Opinion in Ophthalmology, 2017, 28, 113-119.	1.3	92
31	Age-related changes in human peripapillary scleral strain. Biomechanics and Modeling in Mechanobiology, 2014, 13, 551-563.	1.4	88
32	Biomechanical aspects of axonal damage in glaucoma: A brief review. Experimental Eye Research, 2017, 157, 13-19.	1.2	88
33	The role of matricellular proteins in glaucoma. Matrix Biology, 2014, 37, 174-182.	1.5	83
34	Human Scleral Structural Stiffness Increases More Rapidly With Age in Donors of African Descent Compared to Donors of European Descent. , 2014, 55, 7189.		71
35	Regional Variations in Mechanical Strain in the Posterior Human Sclera. , 2012, 53, 5326.		70
36	Comparison of Clinical and Three-Dimensional Histomorphometric Optic Disc Margin Anatomy. , 2009, 50, 2165.		69

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37	The Effect of Acute Intraocular Pressure Elevation on Peripapillary Retinal Thickness, Retinal Nerve Fiber Layer Thickness, and Retardance. , 2009, 50, 4719.		69
38	Perspectives on biomechanical growth and remodeling mechanisms in glaucoma. Mechanics Research Communications, 2012, 42, 92-106.	1.0	68
39	Biological aspects of axonal damage in glaucoma: A brief review. Experimental Eye Research, 2017, 157, 5-12.	1.2	61
40	Anterior scleral canal geometry in pressurised (IOP 10) and non-pressurised (IOP 0) normal monkey eyes. British Journal of Ophthalmology, 2003, 87, 1284-1290.	2.1	59
41	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.		58
42	Effects of Storage Time on the Mechanical Properties of Rabbit Peripapillary Sclera After Enucleation. Current Eye Research, 2007, 32, 465-470.	0.7	55
43	Transient Intraocular Pressure Fluctuations: Source, Magnitude, Frequency, and Associated Mechanical Energy. , 2019, 60, 2572.		55
44	Peripapillary Choroidal Thickness Variation With Age and Race in Normal Eyes. , 2015, 56, 1872.		54
45	Physiologic Intereye Differences in Monkey Optic Nerve Head Architecture and Their Relation to Changes in Early Experimental Glaucoma. , 2009, 50, 224.		52
46	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.		52
47	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.	1.2	44
48	Morphing methods to parameterize specimen-specific finite element model geometries. Journal of Biomechanics, 2010, 43, 254-262.	0.9	43
49	Variation of Laminar Depth in Normal Eyes With Age and Race. Investigative Ophthalmology and Visual Science, 2014, 55, 8123-8133.	3.3	41
50	IOP telemetry in the nonhuman primate. Experimental Eye Research, 2015, 141, 91-98.	1.2	40
51	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, 768-780.	0.9	38
52	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, 245-255.	5.4	37
53	Experimental Surface Strain Mapping of Porcine Peripapillary Sclera Due to Elevations of Intraocular Pressure. Journal of Biomechanical Engineering, 2008, 130, 041017.	0.6	35
54	Age-Related Differences in Longitudinal Structural Change by Spectral-Domain Optical Coherence Tomography in Early Experimental Glaucoma. , 2014, 55, 6409.		35

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55	Peripapillary scleral thickness in perfusion-fixed normal monkey eyes. Investigative Ophthalmology and Visual Science, 2002, 43, 2229-35.	3.3	35
56	Physical Factors Affecting Outflow Facility Measurements in Mice. , 2015, 56, 8331.		33
57	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.	2.6	31
58	Time Scale for Periosteal Readhesion After Brow Lift. Laryngoscope, 2004, 114, 50-55.	1.1	29
59	Modeling the biomechanics of the lamina cribrosa microstructure in the human eye. Acta Biomaterialia, 2021, 134, 357-378.	4.1	29
60	The Magnitude of Intraocular Pressure Elevation Associated with Eye Rubbing. Ophthalmology, 2019, 126, 171-172.	2.5	28
61	High-Magnitude and/or High-Frequency Mechanical Strain Promotes Peripapillary Scleral Myofibroblast Differentiation. , 2015, 56, 7821.		27
62	Lamina Cribrosa Microarchitecture in Normal Monkey Eyes Part 1: Methods and Initial Results. Investigative Ophthalmology and Visual Science, 2015, 56, 1618-1637.	3.3	27
63	Multiscale finite element modeling of the lamina cribrosa microarchitecture in the eye. , 2009, 2009, 4277-80.		26
64	A Novel Tree Shrew (<i>Tupaia belangeri</i>) Model of Glaucoma. , 2018, 59, 3136.		26
65	Tethered protein/peptide-surface-modified hydrogels. Journal of Biomaterials Science, Polymer Edition, 2004, 15, 905-916.	1.9	24
66	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.	3.4	24
67	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.		23
68	Periosteal Readhesion After Brow-lift in New Zealand White Rabbits. Archives of Facial Plastic Surgery, 2002, 4, 248-251.	0.8	21
69	Effect of Anesthesia on Intraocular Pressure Measured With Continuous Wireless Telemetry in Nonhuman Primates. , 2019, 60, 3830.		19
70	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.	0.7	19
71	Diurnal Cycle of Translaminar Pressure in Nonhuman Primates Quantified With Continuous Wireless Telemetry. , 2020, 61, 37.		19
72	Schiotz Tonometry Accurately Measures Intraocular Pressure in Boston Type 1 Keratoprosthesis Eyes. Cornea, 2015, 34, 682-685.	0.9	17

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73	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.	1.8	16
74	Acute Stress Increases Intraocular Pressure inÂNonhuman Primates. Ophthalmology Glaucoma, 2019, 2, 210-214.	0.9	16
75	Compensation method for obtaining accurate, sub-micrometer displacement measurements of immersed specimens using electronic speckle interferometry. Biomedical Optics Express, 2012, 3, 407.	1.5	15
76	The Thrombospondin1-TGF-Î² Pathway and Glaucoma. Journal of Ocular Pharmacology and Therapeutics, 2015, 31, 371-375.	0.6	15
77	IOP, IOP Transient Impulse, Ocular Perfusion Pressure, and Mean Arterial Pressure Relationships in Nonhuman Primates Instrumented With Telemetry. , 2018, 59, 4496.		15
78	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.	2.6	14
79	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.	1.2	13
80	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.	2.6	12
81	Biomechanical changes of the optic disc. , 2010, , 153-164.		11
82	The Relationship Between Scleral Strain Change and Differential Cumulative Intraocular Pressure Exposure in the Nonhuman Primate Chronic Ocular Hypertension Model. , 2019, 60, 4141.		11
83	Ocular biomechanics due to ground blast reinforcement. Computer Methods and Programs in Biomedicine, 2021, 211, 106425.	2.6	11
84	Continuum-Level Finite Element Modeling of the Optic Nerve Head Using a Fabric Tensor Based Description of the Lamina Cribrosa. , 2007, , .		10
85	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.		8
86	Ocular biomechanics during improvised explosive device blast: A computational study using eye-specific models. Injury, 2022, 53, 1401-1415.	0.7	8
87	Modeling the biomechanics of the conventional aqueous outflow pathway microstructure in the human eye. Computer Methods and Programs in Biomedicine, 2022, 221, 106922.	2.6	7
88	Finite Element Modeling of the Lamina Cribrosa Microarchitecture in the Normal and Early Glaucoma Monkey Optic Nerve Head. , 2007, , .		6
89	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.	1.2	5
90	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, .	3.4	5

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91	Mechanical Strain and Restructuring of the Optic Nerve Head. , 2015, , 67-87.		4
92	Glaucoma and Structure-Based Mechanics of the Lamina Cribrosa at Multiple Scales. , 2016, , 93-122.		4
93	Quantification of Translaminar Pressure Gradient (TLPG) With Continuous Wireless Telemetry in Nonhuman Primates (NHPs). Translational Vision Science and Technology, 2020, 9, 18.	1.1	4
94	Intra-Subject Variability and Diurnal Cycle of Ocular Perfusion Pressure as Characterized by Continuous Telemetry in Nonhuman Primates. , 2020, 61, 7.		4
95	The Magnitude of Hypotony and Time Course of Intraocular Pressure Recovery Following Anterior Chamber Cannulation in Nonhuman Primates. , 2017, 58, 3225.		3
96	Comparison of extraocular and intraocular pressure transducers for measurement of transient intraocular pressure fluctuations using continuous wireless telemetry. Scientific Reports, 2020, 10, 20893.	1.6	3
97	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.	1.3	3
98	Age-Related Changes in the Non-Linear Mechanical Strain Response of Human Peripapillary Sclera. , 2013, , .		3
99	Scleral Biomechanics in the Glaucomatous Monkey Eye. , 2009, , .		2
100	The Influence of Material Properties and Geometry on Optic Nerve Head Biomechanics. , 2009, , .		2
101	Clinical Cupping: Laminar and Prelaminar Components. , 2010, , 185-194.		2
102	Unmet Needs in the Detection, Diagnosis, Monitoring, Treatment, and Understanding of Primary Open-Angle Glaucoma: A Position Statement of the American Glaucoma Society and the American Society of Cataract and Refractive Surgery. Ophthalmology Glaucoma, 2022, 5, 465-465.	0.9	1
103	FEM Validation of a Spectral Viscoelastic Model of Posterior Sclera. , 2002, , 443.		0
104	Biomechanics of the Posterior Pole During the Remodeling Progression From Normal to Early Experimental Glaucoma. , 2009, , .		0
105	Nycthemeral Rhythm of the Frequency and Biomechanical Energy of High Frequency Intraocular Pressure Fluctuations. , 2013, , .		0
106	The Promise of Prediction. Journal of Neuro-Ophthalmology, 2014, 34, 321-323.	0.4	0
107	Measuring mean cup depth in the optic nerve head. Computer-Aided Design and Applications, 2016, 13, 693-700.	0.4	0
108	What Are the Characteristic Changes to the Optic Nerve Head in Glaucoma and how Do they Evolve over Time?. , 2021, , 17-37.		0

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109	Finite Element Modeling of the Connective Tissues of the Optic Nerve Head in Bilaterally Normal Monkeys. , 2009, , .		0
110	Analysis of Experimental IOP-Induced Scleral Deformations at the Sub-Micrometer Scale Using Electronic Speckle Interferometry. , 2011, , .		0
111	Microstructure Motivated Growth and Remodeling of the Lamina Cribrosa in Early Glaucoma. , 2011, , .		0
112	Racial Differences in the Aging Human Sclera. , 2013, , .		0