Michelle L Oyen

List of Publications by Year
in descending order

144 papers	8,380 citations	47 h-index 47006	88 g-index 48315
151 all docs	151 docs citations	151 times ranked	10840 citing authors

#	Article	IF	Citations
1	Computational modeling in pregnancy biomechanics research. Journal of the Mechanical Behavior of Biomedical Materials, 2022, 128, 105099.	3.1	3
2	On the failure and fracture of hydrogels for cartilage replacement. JPhys Materials, 2021, 4, 021001.	4.2	8
3	Bioengineering Approaches for Placental Research. Annals of Biomedical Engineering, 2021, 49, 1805-1818.	2.5	13
4	A poroelastic master curve for timeâ€dependent and multiscale mechanics of hydrogels. Journal of Materials Research, 2021, 36, 2582-2590.	2.6	8
5	Load-Relaxation Characteristics of Chemical and Physical Hydrogels as Soft Tissue Mimics. Experimental Mechanics, 2021, 61, 939-949.	2.0	4
6	Multiscale Mechanics of Eggshell and Shell Membrane. Jom, 2021, 73, 1676-1683.	1.9	1
7	A poroelastic master curve for time-dependent and multiscale mechanics of hydrogels. Journal of Materials Research, 2021, 36, 1-9.	2.6	1
8	Micromechanical poroelastic and viscoelastic properties of ex-vivo soft tissues. Journal of Biomechanics, 2020, 113, 110090.	2.1	25
9	Towards the Development of a Cartilage-like Nanofiber-Hydrogel Composite. MRS Advances, 2020, 5, 1783-1790.	0.9	1
10	Premature Rupture of Membranes and Severe Weather Systems. Frontiers in Physiology, 2020, 11, 524.	2.8	4
11	Compressive failure of hydrogel spheres. Journal of Materials Research, 2020, 35, 1227-1235.	2.6	11
12	Bioengineering in women's health: part I. Interface Focus, 2019, 9, 20190042.	3.0	3
13	Fracture toughness of human amniotic membranes. Interface Focus, 2019, 9, 20190012.	3.0	10
14	Tissue stiffness at the human maternalâ€“fetal interface. Human Reproduction, 2019, 34, 1999-2008.	0.9	68
15	Correlating Microstructure to in situ Micromechanical Behaviour and Toughening Strategies in Biological Materials. Microscopy and Microanalysis, 2019, 25, 372-373.	0.4	2
16	Bioengineering in women's health, volume 2: pregnancyâ€”from implantation to parturition. Interface Focus, 2019, 9, 20190081.	3.0	2
17	Investigation of the intrinsic permeability of ice-templated collagen scaffolds as a function of their structural and mechanical properties. Acta Biomaterialia, 2019, 83, 189-198.	8.3	20
18	The viscoelastic response of electrospun poly(vinyl alcohol) mats. Journal of the Mechanical Behavior of Biomedical Materials, 2018, 77, 383-388.	3.1	8

#	Article	IF	Citations
19	Relationship between permeability and diffusivity in polyethylene glycol hydrogels. AIP Advances, 2018, 8, 105006.	1.3	36
20	Stiffening by Osmotic Swelling Constraint in Cartilageâ€Like Cell Culture Scaffolds. Macromolecular Bioscience, 2018, 18, e1800247.	4.1	10
21	Abnormal fetal muscle forces result in defects in spinal curvature and alterations in vertebral segmentation and shape. Journal of Orthopaedic Research, 2017, 35, 2135-2144.	2.3	27
22	Systematic mechanical evaluation of electrospun gelatin meshes. Journal of the Mechanical Behavior of Biomedical Materials, 2017, 69, 412-419.	3.1	30
23	On the relationship between indentation hardness and modulus, and the damage resistance of biological materials. Acta Biomaterialia, 2017, 57, 373-383.	8.3	96
24	A microfluidics assay to study invasion of human placental trophoblast cells. Journal of the Royal Society Interface, 2017, 14, 20170131.	3.4	68
25	Cartilage-like electrostatic stiffening of responsive cryogel scaffolds. Scientific Reports, 2017, 7, 42948.	3.3	27
26	Indentation across interfaces between stiff and compliant tissues. Acta Biomaterialia, 2017, 56, 36-43.	8.3	26
27	An interpenetrating network composite for a regenerative spinal disc application. Journal of the Mechanical Behavior of Biomedical Materials, 2017, 65, 842-848.	3.1	8
28	Strong and tough nanofibrous hydrogel composites based on biomimetic principles. Materials Science and Engineering C, 2017, 72, 220-227.	7.3	85
29	Interrelated chemical-microstructural-nanomechanical variations in the structural units of the cuttlebone of Sepia officinalis. APL Materials, 2017, 5, .	5.1	19
30	Function and failure of the fetal membrane: Modelling the mechanics of the chorion and amnion. PLoS ONE, 2017, 12, e0171588.	2.5	38
31	Villous Tree Model with Active Contractions for Estimating Blood Flow Conditions in the Human Placenta. Open Biomedical Engineering Journal, 2017, 11, 36-48.	0.5	11
32	Applications of Alginate-Based Bioinks in 3D Bioprinting. International Journal of Molecular Sciences, 2016, 17, 1976.	4.1	454
33	Engineering Approaches for Understanding Osteogenesis: Hydrogels as Synthetic Bone Microenvironments. Hormone and Metabolic Research, 2016, 48, 726-736.	1.5	7
34	Computational modeling of the structure-function relationship in human placental terminal villi. Journal of Biomechanics, 2016, 49, 3780-3787.	2.1	27
35	Raman Spectroscopy Reveals New Insights into the Zonal Organization of Native and Tissue-Engineered Articular Cartilage. ACS Central Science, 2016, 2, 885-895.	11.3	103
36	Three-dimensional modeling of human placental terminal villi. Placenta, 2016, 43, 54-60.	1.5	51

#	Article	IF	Citations
37	Structural determinants of hydration, mechanics and fluid flow in freeze-dried collagen scaffolds. Acta Biomaterialia, 2016, 41, 193-203.	8.3	51
38	Permeability and shear modulus of articular cartilage in growing mice. Biomechanics and Modeling in Mechanobiology, 2016, 15, 205-212.	2.8	25
39	Applications of Alginate-Based Bioinks in 3D Bioprinting. International Journal of Molecular Sciences, 2016, 17, 1976.	4.1	24
40	Toughening in electrospun fibrous scaffolds. APL Materials, 2015, 3, .	5.1	22
41	The Compelling Case for Indentation as a Functional Exploratory and Characterization Tool. Journal of the American Ceramic Society, 2015, 98, 2671-2680.	3.8	67
42	Collagen type IV at the fetalâ€“maternal interface. Placenta, 2015, 36, 59-68.	1.5	74
43	Deformation mechanisms of human amnion: Quantitative studies based on second harmonic generation microscopy. Journal of Biomechanics, 2015, 48, 1606-1613.	2.1	53
44	Tuneable bioinspired lens. Bioinspiration and Biomimetics, 2015, 10, 046004.	2.9	4
45	Nanoindentation of hydrated materials and tissues. Current Opinion in Solid State and Materials Science, 2015, 19, 317-323.	11.5	62
46	Mechanical measurements of heterogeneity and length scale effects in PEG-based hydrogels. Soft Matter, 2015, 11, 7191-7200.	2.7	33
47	Multi-scale mechanical response of freeze-dried collagen scaffolds for tissue engineering applications. Journal of the Mechanical Behavior of Biomedical Materials, 2015, 42, 19-25.	3.1	56
48	Hard-Soft Tissue Interface Engineering. Advances in Experimental Medicine and Biology, 2015, 881, 187-204.	1.6	10
49	Mechanical characterisation of hydrogel materials. International Materials Reviews, 2014, 59, 44-59.	19.3	442
50	Investigation of the Youngâ€™s modulus and thermal expansion of amorphous titania-doped tantala films. Applied Optics, 2014, 53, 3196.	1.8	17
51	In vitrocharacterisation of the elasticity and the permeability of the mouse cartilage during growth using microindentation. Computer Methods in Biomechanics and Biomedical Engineering, 2014, 17, 68-69.	1.6	0
52	Age-related changes in mouse bone permeability. Journal of Biomechanics, 2014, 47, 1110-1116.	2.1	18
53	Mechanical behaviour of electrospun fibre-reinforced hydrogels. Journal of Materials Science: Materials in Medicine, 2014, 25, 681-690.	3.6	33
54	Viscoelastic analysis of single-component and composite PEG and alginate hydrogels. Acta Mechanica Sinica/Lixue Xuebao, 2014, 30, 7-14.	3.4	14

#	Article	IF	Citations
55	Separating viscoelasticity and poroelasticity of gels with different length and time scales. Acta Mechanica Sinica/Lixue Xuebao, 2014, 30, 20-27.	3.4	90
56	Time-dependent fracture toughness of cornea. Journal of the Mechanical Behavior of Biomedical Materials, 2014, 34, 116-123.	3.1	19
57	Nanobiomechanics of living materials. Interface Focus, 2014, 4, 20140001.	3.0	1
58	Nanofibrous hydrogel composites as mechanically robust tissue engineering scaffolds. Trends in Biotechnology, 2014, 32, 564-570.	9.3	143
59	3D surface reconstruction of human terminal villi and the fetal capillary bed. Placenta, 2014, 35, A8-A9.	1.5	2
60	Measuring the compressive viscoelastic mechanical properties of human cervical tissue using indentation. Journal of the Mechanical Behavior of Biomedical Materials, 2014, 34, 18-26.	3.1	42
61	Award Winner in the Young Investigator Category, 2014 Society for Biomaterials Annual Meeting and Exposition, Denver, Colorado, April 16â€“19, 2014: Periodically perforated coreâ€“shell collagen biomaterials balance cell infiltration, bioactivity, and mechanical properties. Journal of Biomedical Materials Research - Part A, 2014, 102, 917-927.	4.0	13
62	Nanoindentation of Biological and Biomimetic Materials. Experimental Techniques, 2013, 37, 73-87.	1.5	98
63	Hydrogel Composite Materials for Tissue Engineering Scaffolds. Jom, 2013, 65, 505-516.	1.9	78
64	Failure mechanisms in fibrous scaffolds. Acta Biomaterialia, 2013, 9, 7326-7334.	8.3	58
65	Gelatin nanofiber-reinforced alginate gel scaffolds for corneal tissue engineering. , 2013, 2013, 6671-4.		9
66	Insight into differences in nanoindentation properties of bone. Journal of the Mechanical Behavior of Biomedical Materials, 2013, 18, 90-99.	3.1	94
67	Composite electrospun gelatin fiber-alginate gel scaffolds for mechanically robust tissue engineered cornea. Journal of the Mechanical Behavior of Biomedical Materials, 2013, 21, 185-194.	3.1	166
68	Separating poroviscoelastic deformation mechanisms in hydrogels. Applied Physics Letters, 2013, 102, .	3.3	80
69	Multi-Scale Permeability of Murine Bone Measured by Nanoindentation. , 2013, , .		1
70	Inverse Finite Element Analysis of the Indentation Response of Human Cervical Tissue. , 2013, , .		0
71	Biomimetic Mineral-Protein Composites formed by an Automated Alternate Soaking Process. Materials Research Society Symposia Proceedings, 2012, 1419, 1.	0.1	0
72	Electrospun Fiber - Hydrogel Composites for Nucleus Pulposus Tissue Engineering. Materials Research Society Symposia Proceedings, 2012, 1417, 42.	0.1	8

#	Article	IF	Citations
73	Size effects in indentation of hydrated biological tissues. Journal of Materials Research, 2012, 27, 245-255.	2.6	45
74	Biomimetic calcium carbonateâ€“gelatin composites as a model system for eggshell mineralization. Journal of Materials Research, 2012, 27, 3157-3164.	2.6	11
75	Branching toughens fibrous networks. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 12, 74-82.	3.1	38
76	Ultra-structural defects cause low bone matrix stiffness despite high mineralization in osteogenesis imperfecta mice. Bone, 2012, 50, 1317-1323.	2.9	80
77	Extracellular-matrix tethering regulates stem-cell fate. Nature Materials, 2012, 11, 642-649.	27.5	1,346
78	Biomimetic layer-by-layer assembly of artificial nacre. Nature Communications, 2012, 3, 966.	12.8	303
79	Composite hydrogels for nucleus pulposus tissue engineering. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 11, 16-26.	3.1	49
80	Time-Dependent Indentation Response of Human Cervical Tissue. , 2012, , .		1
81	Estimating material elasticity by spherical indentation load-relaxation tests on viscoelastic samples of finite thickness. IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 2011, 58, 1418-1429.	3.0	32
82	Transplantation of human fetal blood stem cells in the osteogenesis imperfecta mouse leads to improvement in multiscale tissue properties. Blood, 2011, 117, 1053-1060.	1.4	78
83	Biomimetic bone-like composites fabricated through an automated alternate soaking process. Acta Biomaterialia, 2011, 7, 3586-3594.	8.3	36
84	Poroviscoelastic characterization of particle-reinforced gelatin gels using indentation and homogenization. Journal of the Mechanical Behavior of Biomedical Materials, 2011, 4, 610-617.	3.1	38
85	Quantitative modelling of viscoelasticity of isotropic fibrous composites with viscoelastic matrices. Theoretical and Applied Mechanics Letters, 2011, 1, 052006.	2.8	1
86	Viscous-elastic-plastic behavior of bone using Berkovich nanoindentation. Mechanics of Time-Dependent Materials, 2010, 14, 111-124.	4.4	46
87	Preparation of polymeric samples containing a graduated modulus region and development of nanoindentation linescan techniques. Polymer Testing, 2010, 29, 494-502.	4.8	11
88	Nanomechanical properties of modern and fossil bone. Palaeogeography, Palaeoclimatology, Palaeoecology, 2010, 289, 25-32.	2.3	19
89	Bone Composite Mechanics Related to Collagen Hydration State. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 269-276.	0.2	1
90	Creep properties from indentation tests by analytical and numerical techniques. International Journal of Materials Research, 2009, 100, 954-959.	0.3	6

#	Article	IF	Citations
91	Special issue on nanoindentation of biological materials. Journal of the Mechanical Behavior of Biomedical Materials, 2009, 2, 311.	3.1	9
92	Viscoelastic Properties of Membranes Measured by Spherical Indentation. Cellular and Molecular Bioengineering, 2009, 2, 49-56.	2.1	40
93	Comparative materials differences revealed in engineered bone as a function of cell-specific differentiation. Nature Materials, 2009, 8, 763-770.	27.5	223
94	A practical guide for analysis of nanoindentation data. Journal of the Mechanical Behavior of Biomedical Materials, 2009, 2, 396-407.	3.1	185
95	Nanoindentation of the insertional zones of human meniscal attachments into underlying bone. Journal of the Mechanical Behavior of Biomedical Materials, 2009, 2, 339-347.	3.1	38
96	Do we know the strength of the chorioamnion?. European Journal of Obstetrics, Gynecology and Reproductive Biology, 2009, 144, S128-S133.	1.1	29
97	Viscoelastic and poroelastic mechanical characterization of hydrated gels. Journal of Materials Research, 2009, 24, 973-979.	2.6	109
98	Composite bounds on the elastic modulus of bone. Journal of Biomechanics, 2008, 41, 2585-2588.	2.1	70
99	Indentation stiffness of aging human costal cartilage. Acta Biomaterialia, 2008, 4, 97-103.	8.3	68
100	Viscoelastic properties of the cervical spinal ligaments under fast strain-rate deformations. Acta Biomaterialia, 2008, 4, 117-125.	8.3	59
101	Indentation variability of natural nanocomposite materials. Journal of Materials Research, 2008, 23, 760-767.	2.6	21
102	Poroelastic nanoindentation responses of hydrated bone. Journal of Materials Research, 2008, 23, 1307-1314.	2.6	109
103	The Materials Science of Bone: Lessons from Nature for Biomimetic Materials Synthesis. MRS Bulletin, 2008, 33, 49-55.	3.5	35
104	Relating viscoelastic nanoindentation creep and load relaxation experiments. International Journal of Materials Research, 2008, 99, 823-828.	0.3	9
105	Spherical indentation of a finite poroelastic coating. Applied Physics Letters, 2008, 93, .	3.3	26
106	Interest in Bone-Like Materials Includes Thermal Qualities. MRS Bulletin, 2008, 33, 725-725.	3.5	0
107	Indentation of Nonlinearly Viscoelastic Solids. Materials Research Society Symposia Proceedings, 2007, 1049, 1.	0.1	2
108	Viscoelastic effects in small-scale indentation of biological materials. International Journal of Surface Science and Engineering, 2007, 1, 180.	0.4	16

#	Article	IF	Citations
109	Viscoelastic Behavior of a Centrally Loaded Circular Film Being Clamped at the Circumference. Materials Research Society Symposia Proceedings, 2007, 1049, 1.	0.1	2
110	Nanoindentation behavior and mechanical properties measurement of polymeric materials. International Journal of Materials Research, 2007, 98, 370-378.	0.3	31
111	Fracture Resistance of Human Amnion. , 2007, , 841.		2
112	Failure Properties of Cervical Spinal Ligaments Under Fast Strain Rate Deformations. Spine, 2007, 32, E7-E13.	2.0	35
113	Sensitivity of polymer nanoindentation creep measurements to experimental variables. Acta Materialia, 2007, 55, 3633-3639.	7.9	89
114	Microstructure and Mechanics of the Chorioamnion Membrane with an Emphasis on Fracture Properties. Annals of the New York Academy of Sciences, 2007, 1101, 166-185.	3.8	68
115	Examination of local variations in viscous, elastic, and plastic indentation responses in healing bone. Journal of Materials Science: Materials in Medicine, 2007, 18, 623-628.	3.6	54
116	Mechanical properties and cytocompatibility of biomimetic hydroxyapatite-gelatin nanocomposites. Journal of Materials Research, 2006, 21, 3090-3098.	2.6	29
117	Analytical techniques for indentation of viscoelastic materials. Philosophical Magazine, 2006, 86, 5625-5641.	1.6	172
118	Premature rupture of the fetal membranes: Is the amnion the major determinant?. American Journal of Obstetrics and Gynecology, 2006, 195, 510-515.	1.3	76
119	Nanoindentation hardness of mineralized tissues. Journal of Biomechanics, 2006, 39, 2699-2702.	2.1	123
120	Viscoelastic properties of bone as a function of hydration state determined by nanoindentation. Philosophical Magazine, 2006, 86, 5691-5703.	1.6	117
121	Effect of Water on Mechanical Properties of Mineralized Tissue Composites. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	1
122	Poroelastic Indentation Analysis for Hydrated Biological Tissues. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	5
123	Fracture and Energy Partitioning in Uncooked and Cooked Noodles. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	0
124	Spherical indentation load-relaxation of soft biological tissues. Journal of Materials Research, 2006, 21, 2003-2010.	2.6	165
125	Hydration effects on the micro-mechanical properties of bone. Journal of Materials Research, 2006, 21, 1962-1968.	2.6	89
126	Constitutive model development of fetal membrane mechanics: Mechanical testing and numerical simulation. American Journal of Obstetrics and Gynecology, 2005, 193, S112.	1.3	0

#	Article	IF	Citations
127	A Model for Nonlinear Viscoelastic Mechanical Responses of Collagenous Soft Tissues. Materials Research Society Symposia Proceedings, 2005, 898, 1.	0.1	6
128	Uniaxial and biaxial mechanical behavior of human amnion. Journal of Materials Research, 2005, 20, 2902-2909.	2.6	57
129	Effects of gelatin on mechanical properties of hydroxyapatite-gelatin nano-composites. Materials Research Society Symposia Proceedings, 2005, 898, 1.	0.1	1
130	Elastic Modulus and Mineral Density of Dentine and Enamel in Natural Caries Lesions. Materials Research Society Symposia Proceedings, 2005, 874, 1.	0.1	3
131	Nanoindentation Measurements of Bone Viscoelasticity as a Function of Hydration State. Materials Research Society Symposia Proceedings, 2005, 898, 1.	0.1	1
132	Nanoindentation and Finite Element Analysis of Resin-Embedded Bone Samples as a Three-Phase Composite Material. Materials Research Society Symposia Proceedings, 2005, 874, 1.	0.1	4
133	Spherical Indentation Creep Following Ramp Loading. Journal of Materials Research, 2005, 20, 2094-2100.	2.6	211
134	Uniaxial and Biaxial Mechanical Behavior of Human Amnion. Materials Research Society Symposia Proceedings, 2004, 844, 1.	0.1	1
135	Spherical Indentation Creep Following Ramp Loading. Materials Research Society Symposia Proceedings, 2004, 841, R5.9.1.	0.1	3
136	Indentation responses of time-dependent films on stiff substrates. Journal of Materials Research, 2004, 19, 2487-2497.	2.6	37
137	Finite Element Modeling of Bone Ultrastructure as a Two-phase Composite. Materials Research Society Symposia Proceedings, 2004, 844, 1.	0.1	3
138	Uniaxial stressâ€“relaxation and stressâ€“strain responses of human amnion. Journal of Materials Science: Materials in Medicine, 2004, 15, 619-624.	3.6	33
139	Mechanical failure of human fetal membrane tissues. Journal of Materials Science: Materials in Medicine, 2004, 15, 651-658.	3.6	58
140	Variability of Nanoindentation Responses of Bone and Artificial Bone-Like Composites. , 2004, , .		1
141	Cell death after cartilage impact occurs around matrix cracks. Journal of Orthopaedic Research, 2003, 21, 881-887.	2.3	116
142	Loadâ€“displacement behavior during sharp indentation of viscousâ€“elasticâ€“plastic materials. Journal of Materials Research, 2003, 18, 139-150.	2.6	288
143	Technique for estimating fracture resistance of cultured neocartilage. Journal of Materials Science: Materials in Medicine, 2001, 12, 327-332.	3.6	28
144	Patellar tendon augmentation after removal of its central third limits joint tissue changes. Journal of Orthopaedic Research, 1999, 17, 28-36.	2.3	8