

# Michelle L Oyen

## List of Publications by Year in descending order

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144  
papers

8,380  
citations

47006

47  
h-index

48315

88  
g-index

151  
all docs

151  
docs citations

151  
times ranked

10840  
citing authors

#	ARTICLE	IF	CITATIONS
1	Extracellular-matrix tethering regulates stem-cell fate. <i>Nature Materials</i> , 2012, 11, 642-649.	27.5	1,346
2	Applications of Alginate-Based Bioinks in 3D Bioprinting. <i>International Journal of Molecular Sciences</i> , 2016, 17, 1976.	4.1	454
3	Mechanical characterisation of hydrogel materials. <i>International Materials Reviews</i> , 2014, 59, 44-59.	19.3	442
4	Biomimetic layer-by-layer assembly of artificial nacre. <i>Nature Communications</i> , 2012, 3, 966.	12.8	303
5	Load-displacement behavior during sharp indentation of viscoelastic-plastic materials. <i>Journal of Materials Research</i> , 2003, 18, 139-150.	2.6	288
6	Comparative materials differences revealed in engineered bone as a function of cell-specific differentiation. <i>Nature Materials</i> , 2009, 8, 763-770.	27.5	223
7	Spherical Indentation Creep Following Ramp Loading. <i>Journal of Materials Research</i> , 2005, 20, 2094-2100.	2.6	211
8	A practical guide for analysis of nanoindentation data. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2009, 2, 396-407.	3.1	185
9	Analytical techniques for indentation of viscoelastic materials. <i>Philosophical Magazine</i> , 2006, 86, 5625-5641.	1.6	172
10	Composite electrospun gelatin fiber-alginate gel scaffolds for mechanically robust tissue engineered cornea. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2013, 21, 185-194.	3.1	166
11	Spherical indentation load-relaxation of soft biological tissues. <i>Journal of Materials Research</i> , 2006, 21, 2003-2010.	2.6	165
12	Nanofibrous hydrogel composites as mechanically robust tissue engineering scaffolds. <i>Trends in Biotechnology</i> , 2014, 32, 564-570.	9.3	143
13	Nanoindentation hardness of mineralized tissues. <i>Journal of Biomechanics</i> , 2006, 39, 2699-2702.	2.1	123
14	Viscoelastic properties of bone as a function of hydration state determined by nanoindentation. <i>Philosophical Magazine</i> , 2006, 86, 5691-5703.	1.6	117
15	Cell death after cartilage impact occurs around matrix cracks. <i>Journal of Orthopaedic Research</i> , 2003, 21, 881-887.	2.3	116
16	Poroelastic nanoindentation responses of hydrated bone. <i>Journal of Materials Research</i> , 2008, 23, 1307-1314.	2.6	109
17	Viscoelastic and poroelastic mechanical characterization of hydrated gels. <i>Journal of Materials Research</i> , 2009, 24, 973-979.	2.6	109
18	Raman Spectroscopy Reveals New Insights into the Zonal Organization of Native and Tissue-Engineered Articular Cartilage. <i>ACS Central Science</i> , 2016, 2, 885-895.	11.3	103

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19	Nanoindentation of Biological and Biomimetic Materials. <i>Experimental Techniques</i> , 2013, 37, 73-87.	1.5	98
20	On the relationship between indentation hardness and modulus, and the damage resistance of biological materials. <i>Acta Biomaterialia</i> , 2017, 57, 373-383.	8.3	96
21	Insight into differences in nanoindentation properties of bone. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2013, 18, 90-99.	3.1	94
22	Separating viscoelasticity and poroelasticity of gels with different length and time scales. <i>Acta Mechanica Sinica/Lixue Xuebao</i> , 2014, 30, 20-27.	3.4	90
23	Hydration effects on the micro-mechanical properties of bone. <i>Journal of Materials Research</i> , 2006, 21, 1962-1968.	2.6	89
24	Sensitivity of polymer nanoindentation creep measurements to experimental variables. <i>Acta Materialia</i> , 2007, 55, 3633-3639.	7.9	89
25	Strong and tough nanofibrous hydrogel composites based on biomimetic principles. <i>Materials Science and Engineering C</i> , 2017, 72, 220-227.	7.3	85
26	Ultra-structural defects cause low bone matrix stiffness despite high mineralization in osteogenesis imperfecta mice. <i>Bone</i> , 2012, 50, 1317-1323.	2.9	80
27	Separating poroviscoelastic deformation mechanisms in hydrogels. <i>Applied Physics Letters</i> , 2013, 102, .	3.3	80
28	Transplantation of human fetal blood stem cells in the osteogenesis imperfecta mouse leads to improvement in multiscale tissue properties. <i>Blood</i> , 2011, 117, 1053-1060.	1.4	78
29	Hydrogel Composite Materials for Tissue Engineering Scaffolds. <i>Jom</i> , 2013, 65, 505-516.	1.9	78
30	Premature rupture of the fetal membranes: Is the amnion the major determinant?. <i>American Journal of Obstetrics and Gynecology</i> , 2006, 195, 510-515.	1.3	76
31	Collagen type IV at the fetal-maternal interface. <i>Placenta</i> , 2015, 36, 59-68.	1.5	74
32	Composite bounds on the elastic modulus of bone. <i>Journal of Biomechanics</i> , 2008, 41, 2585-2588.	2.1	70
33	Microstructure and Mechanics of the Chorion Membrane with an Emphasis on Fracture Properties. <i>Annals of the New York Academy of Sciences</i> , 2007, 1101, 166-185.	3.8	68
34	Indentation stiffness of aging human costal cartilage. <i>Acta Biomaterialia</i> , 2008, 4, 97-103.	8.3	68
35	A microfluidics assay to study invasion of human placental trophoblast cells. <i>Journal of the Royal Society Interface</i> , 2017, 14, 20170131.	3.4	68
36	Tissue stiffness at the human maternal-fetal interface. <i>Human Reproduction</i> , 2019, 34, 1999-2008.	0.9	68

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37	The Compelling Case for Indentation as a Functional Exploratory and Characterization Tool. <i>Journal of the American Ceramic Society</i> , 2015, 98, 2671-2680.	3.8	67
38	Nanoindentation of hydrated materials and tissues. <i>Current Opinion in Solid State and Materials Science</i> , 2015, 19, 317-323.	11.5	62
39	Viscoelastic properties of the cervical spinal ligaments under fast strain-rate deformations. <i>Acta Biomaterialia</i> , 2008, 4, 117-125.	8.3	59
40	Mechanical failure of human fetal membrane tissues. <i>Journal of Materials Science: Materials in Medicine</i> , 2004, 15, 651-658.	3.6	58
41	Failure mechanisms in fibrous scaffolds. <i>Acta Biomaterialia</i> , 2013, 9, 7326-7334.	8.3	58
42	Uniaxial and biaxial mechanical behavior of human amnion. <i>Journal of Materials Research</i> , 2005, 20, 2902-2909.	2.6	57
43	Multi-scale mechanical response of freeze-dried collagen scaffolds for tissue engineering applications. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2015, 42, 19-25.	3.1	56
44	Examination of local variations in viscous, elastic, and plastic indentation responses in healing bone. <i>Journal of Materials Science: Materials in Medicine</i> , 2007, 18, 623-628.	3.6	54
45	Deformation mechanisms of human amnion: Quantitative studies based on second harmonic generation microscopy. <i>Journal of Biomechanics</i> , 2015, 48, 1606-1613.	2.1	53
46	Three-dimensional modeling of human placental terminal villi. <i>Placenta</i> , 2016, 43, 54-60.	1.5	51
47	Structural determinants of hydration, mechanics and fluid flow in freeze-dried collagen scaffolds. <i>Acta Biomaterialia</i> , 2016, 41, 193-203.	8.3	51
48	Composite hydrogels for nucleus pulposus tissue engineering. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2012, 11, 16-26.	3.1	49
49	Viscous-elastic-plastic behavior of bone using Berkovich nanoindentation. <i>Mechanics of Time-Dependent Materials</i> , 2010, 14, 111-124.	4.4	46
50	Size effects in indentation of hydrated biological tissues. <i>Journal of Materials Research</i> , 2012, 27, 245-255.	2.6	45
51	Measuring the compressive viscoelastic mechanical properties of human cervical tissue using indentation. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2014, 34, 18-26.	3.1	42
52	Viscoelastic Properties of Membranes Measured by Spherical Indentation. <i>Cellular and Molecular Bioengineering</i> , 2009, 2, 49-56.	2.1	40
53	Nanoindentation of the insertional zones of human meniscal attachments into underlying bone. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2009, 2, 339-347.	3.1	38
54	Poroviscoelastic characterization of particle-reinforced gelatin gels using indentation and homogenization. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2011, 4, 610-617.	3.1	38

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55	Branching toughens fibrous networks. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2012, 12, 74-82.	3.1	38
56	Function and failure of the fetal membrane: Modelling the mechanics of the chorion and amnion. <i>PLoS ONE</i> , 2017, 12, e0171588.	2.5	38
57	Indentation responses of time-dependent films on stiff substrates. <i>Journal of Materials Research</i> , 2004, 19, 2487-2497.	2.6	37
58	Biomimetic bone-like composites fabricated through an automated alternate soaking process. <i>Acta Biomaterialia</i> , 2011, 7, 3586-3594.	8.3	36
59	Relationship between permeability and diffusivity in polyethylene glycol hydrogels. <i>AIP Advances</i> , 2018, 8, 105006.	1.3	36
60	Failure Properties of Cervical Spinal Ligaments Under Fast Strain Rate Deformations. <i>Spine</i> , 2007, 32, E7-E13.	2.0	35
61	The Materials Science of Bone: Lessons from Nature for Biomimetic Materials Synthesis. <i>MRS Bulletin</i> , 2008, 33, 49-55.	3.5	35
62	Uniaxial stress-relaxation and stress-strain responses of human amnion. <i>Journal of Materials Science: Materials in Medicine</i> , 2004, 15, 619-624.	3.6	33
63	Mechanical behaviour of electrospun fibre-reinforced hydrogels. <i>Journal of Materials Science: Materials in Medicine</i> , 2014, 25, 681-690.	3.6	33
64	Mechanical measurements of heterogeneity and length scale effects in PEG-based hydrogels. <i>Soft Matter</i> , 2015, 11, 7191-7200.	2.7	33
65	Estimating material elasticity by spherical indentation load-relaxation tests on viscoelastic samples of finite thickness. <i>IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control</i> , 2011, 58, 1418-1429.	3.0	32
66	Nanoindentation behavior and mechanical properties measurement of polymeric materials. <i>International Journal of Materials Research</i> , 2007, 98, 370-378.	0.3	31
67	Systematic mechanical evaluation of electrospun gelatin meshes. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2017, 69, 412-419.	3.1	30
68	Mechanical properties and cytocompatibility of biomimetic hydroxyapatite-gelatin nanocomposites. <i>Journal of Materials Research</i> , 2006, 21, 3090-3098.	2.6	29
69	Do we know the strength of the chorioamnion?. <i>European Journal of Obstetrics, Gynecology and Reproductive Biology</i> , 2009, 144, S128-S133.	1.1	29
70	Technique for estimating fracture resistance of cultured neocartilage. <i>Journal of Materials Science: Materials in Medicine</i> , 2001, 12, 327-332.	3.6	28
71	Computational modeling of the structure-function relationship in human placental terminal villi. <i>Journal of Biomechanics</i> , 2016, 49, 3780-3787.	2.1	27
72	Abnormal fetal muscle forces result in defects in spinal curvature and alterations in vertebral segmentation and shape. <i>Journal of Orthopaedic Research</i> , 2017, 35, 2135-2144.	2.3	27

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73	Cartilage-like electrostatic stiffening of responsive cryogel scaffolds. <i>Scientific Reports</i> , 2017, 7, 42948.	3.3	27
74	Spherical indentation of a finite poroelastic coating. <i>Applied Physics Letters</i> , 2008, 93, .	3.3	26
75	Indentation across interfaces between stiff and compliant tissues. <i>Acta Biomaterialia</i> , 2017, 56, 36-43.	8.3	26
76	Permeability and shear modulus of articular cartilage in growing mice. <i>Biomechanics and Modeling in Mechanobiology</i> , 2016, 15, 205-212.	2.8	25
77	Micromechanical poroelastic and viscoelastic properties of ex-vivo soft tissues. <i>Journal of Biomechanics</i> , 2020, 113, 110090.	2.1	25
78	Applications of Alginate-Based Bioinks in 3D Bioprinting. <i>International Journal of Molecular Sciences</i> , 2016, 17, 1976.	4.1	24
79	Toughening in electrospun fibrous scaffolds. <i>APL Materials</i> , 2015, 3, .	5.1	22
80	Indentation variability of natural nanocomposite materials. <i>Journal of Materials Research</i> , 2008, 23, 760-767.	2.6	21
81	Investigation of the intrinsic permeability of ice-templated collagen scaffolds as a function of their structural and mechanical properties. <i>Acta Biomaterialia</i> , 2019, 83, 189-198.	8.3	20
82	Nanomechanical properties of modern and fossil bone. <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i> , 2010, 289, 25-32.	2.3	19
83	Time-dependent fracture toughness of cornea. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2014, 34, 116-123.	3.1	19
84	Interrelated chemical-microstructural-nanomechanical variations in the structural units of the cuttlebone of <i>Sepia officinalis</i> . <i>APL Materials</i> , 2017, 5, .	5.1	19
85	Age-related changes in mouse bone permeability. <i>Journal of Biomechanics</i> , 2014, 47, 1110-1116.	2.1	18
86	Investigation of the Young's modulus and thermal expansion of amorphous titania-doped tantalum films. <i>Applied Optics</i> , 2014, 53, 3196.	1.8	17
87	Viscoelastic effects in small-scale indentation of biological materials. <i>International Journal of Surface Science and Engineering</i> , 2007, 1, 180.	0.4	16
88	Viscoelastic analysis of single-component and composite PEG and alginate hydrogels. <i>Acta Mechanica Sinica/Lixue Xuebao</i> , 2014, 30, 7-14.	3.4	14
89	Award Winner in the Young Investigator Category, 2014 Society for Biomaterials Annual Meeting and Exposition, Denver, Colorado, April 16-19, 2014: Periodically perforated core-shell collagen biomaterials balance cell infiltration, bioactivity, and mechanical properties. <i>Journal of Biomedical Materials Research - Part A</i> , 2014, 102, 917-927.	4.0	13
90	Bioengineering Approaches for Placental Research. <i>Annals of Biomedical Engineering</i> , 2021, 49, 1805-1818.	2.5	13

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91	Preparation of polymeric samples containing a graduated modulus region and development of nanoindentation linescan techniques. <i>Polymer Testing</i> , 2010, 29, 494-502.	4.8	11
92	Biomimetic calcium carbonate-gelatin composites as a model system for eggshell mineralization. <i>Journal of Materials Research</i> , 2012, 27, 3157-3164.	2.6	11
93	Villous Tree Model with Active Contractions for Estimating Blood Flow Conditions in the Human Placenta. <i>Open Biomedical Engineering Journal</i> , 2017, 11, 36-48.	0.5	11
94	Compressive failure of hydrogel spheres. <i>Journal of Materials Research</i> , 2020, 35, 1227-1235.	2.6	11
95	Stiffening by Osmotic Swelling Constraint in Cartilage-Like Cell Culture Scaffolds. <i>Macromolecular Bioscience</i> , 2018, 18, e1800247.	4.1	10
96	Fracture toughness of human amniotic membranes. <i>Interface Focus</i> , 2019, 9, 20190012.	3.0	10
97	Hard-Soft Tissue Interface Engineering. <i>Advances in Experimental Medicine and Biology</i> , 2015, 881, 187-204.	1.6	10
98	Relating viscoelastic nanoindentation creep and load relaxation experiments. <i>International Journal of Materials Research</i> , 2008, 99, 823-828.	0.3	9
99	Special issue on nanoindentation of biological materials. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2009, 2, 311.	3.1	9
100	Gelatin nanofiber-reinforced alginate gel scaffolds for corneal tissue engineering. , 2013, 2013, 6671-4.		9
101	Patellar tendon augmentation after removal of its central third limits joint tissue changes. <i>Journal of Orthopaedic Research</i> , 1999, 17, 28-36.	2.3	8
102	Electrospun Fiber - Hydrogel Composites for Nucleus Pulposus Tissue Engineering. <i>Materials Research Society Symposia Proceedings</i> , 2012, 1417, 42.	0.1	8
103	An interpenetrating network composite for a regenerative spinal disc application. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2017, 65, 842-848.	3.1	8
104	The viscoelastic response of electrospun poly(vinyl alcohol) mats. <i>Journal of the Mechanical Behavior of Biomedical Materials</i> , 2018, 77, 383-388.	3.1	8
105	On the failure and fracture of hydrogels for cartilage replacement. <i>JPhys Materials</i> , 2021, 4, 021001.	4.2	8
106	A poroelastic master curve for time-dependent and multiscale mechanics of hydrogels. <i>Journal of Materials Research</i> , 2021, 36, 2582-2590.	2.6	8
107	Engineering Approaches for Understanding Osteogenesis: Hydrogels as Synthetic Bone Microenvironments. <i>Hormone and Metabolic Research</i> , 2016, 48, 726-736.	1.5	7
108	A Model for Nonlinear Viscoelastic Mechanical Responses of Collagenous Soft Tissues. <i>Materials Research Society Symposia Proceedings</i> , 2005, 898, 1.	0.1	6

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109	Creep properties from indentation tests by analytical and numerical techniques. International Journal of Materials Research, 2009, 100, 954-959.	0.3	6
110	Poroelastic Indentation Analysis for Hydrated Biological Tissues. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	5
111	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
112	Tuneable bioinspired lens. Bioinspiration and Biomimetics, 2015, 10, 046004.	2.9	4
113	Premature Rupture of Membranes and Severe Weather Systems. Frontiers in Physiology, 2020, 11, 524.	2.8	4
114	Load-Relaxation Characteristics of Chemical and Physical Hydrogels as Soft Tissue Mimics. Experimental Mechanics, 2021, 61, 939-949.	2.0	4
115	Spherical Indentation Creep Following Ramp Loading. Materials Research Society Symposia Proceedings, 2004, 841, R5.9.1.	0.1	3
116	Finite Element Modeling of Bone Ultrastructure as a Two-phase Composite. Materials Research Society Symposia Proceedings, 2004, 844, 1.	0.1	3
117	Elastic Modulus and Mineral Density of Dentine and Enamel in Natural Caries Lesions. Materials Research Society Symposia Proceedings, 2005, 874, 1.	0.1	3
118	Bioengineering in women's health: part I. Interface Focus, 2019, 9, 20190042.	3.0	3
119	Computational modeling in pregnancy biomechanics research. Journal of the Mechanical Behavior of Biomedical Materials, 2022, 128, 105099.	3.1	3
120	Indentation of Nonlinearly Viscoelastic Solids. Materials Research Society Symposia Proceedings, 2007, 1049, 1.	0.1	2
121	Viscoelastic Behavior of a Centrally Loaded Circular Film Being Clamped at the Circumference. Materials Research Society Symposia Proceedings, 2007, 1049, 1.	0.1	2
122	Fracture Resistance of Human Amnion. , 2007, , 841.		2
123	3D surface reconstruction of human terminal villi and the fetal capillary bed. Placenta, 2014, 35, A8-A9.	1.5	2
124	Correlating Microstructure to in situ Micromechanical Behaviour and Toughening Strategies in Biological Materials. Microscopy and Microanalysis, 2019, 25, 372-373.	0.4	2
125	Bioengineering in women's health, volume 2: pregnancy"from implantation to parturition. Interface Focus, 2019, 9, 20190081.	3.0	2
126	Uniaxial and Biaxial Mechanical Behavior of Human Amnion. Materials Research Society Symposia Proceedings, 2004, 844, 1.	0.1	1



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127	Effects of gelatin on mechanical properties of hydroxyapatite-gelatin nano-composites. Materials Research Society Symposia Proceedings, 2005, 898, 1.	0.1	1
128	Nanoindentation Measurements of Bone Viscoelasticity as a Function of Hydration State. Materials Research Society Symposia Proceedings, 2005, 898, 1.	0.1	1
129	Effect of Water on Mechanical Properties of Mineralized Tissue Composites. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	1
130	Quantitative modelling of viscoelasticity of isotropic fibrous composites with viscoelastic matrices. Theoretical and Applied Mechanics Letters, 2011, 1, 052006.	2.8	1
131	Multi-Scale Permeability of Murine Bone Measured by Nanoindentation. , 2013, , .		1
132	Nanobiomechanics of living materials. Interface Focus, 2014, 4, 20140001.	3.0	1
133	Towards the Development of a Cartilage-like Nanofiber-Hydrogel Composite. MRS Advances, 2020, 5, 1783-1790.	0.9	1
134	Multiscale Mechanics of Eggshell and Shell Membrane. Jom, 2021, 73, 1676-1683.	1.9	1
135	Bone Composite Mechanics Related to Collagen Hydration State. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2010, , 269-276.	0.2	1
136	Variability of Nanoindentation Responses of Bone and Artificial Bone-Like Composites. , 2004, , .		1
137	Time-Dependent Indentation Response of Human Cervical Tissue. , 2012, , .		1
138	A poroelastic master curve for time-dependent and multiscale mechanics of hydrogels. Journal of Materials Research, 2021, 36, 1-9.	2.6	1
139	Constitutive model development of fetal membrane mechanics: Mechanical testing and numerical simulation. American Journal of Obstetrics and Gynecology, 2005, 193, S112.	1.3	0
140	Fracture and Energy Partitioning in Uncooked and Cooked Noodles. Materials Research Society Symposia Proceedings, 2006, 975, 1.	0.1	0
141	Interest in Bone-Like Materials Includes Thermal Qualities. MRS Bulletin, 2008, 33, 725-725.	3.5	0
142	Biomimetic Mineral-Protein Composites formed by an Automated Alternate Soaking Process. Materials Research Society Symposia Proceedings, 2012, 1419, 1.	0.1	0
143	<i>In vitro</i> characterisation 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
144	Inverse Finite Element Analysis of the Indentation Response of Human Cervical Tissue. , 2013, , .		0