Robert E Guldberg

List of Publications by Year
in descending order

111 papers	9,877 citations	70961 41 h-index	37111 96 g-index
115 all docs	115 docs citations	115 times ranked	13351 citing authors

#	Article	IF	Citations
1	Guidelines for assessment of bone microstructure in rodents using microâ€“computed tomography. Journal of Bone and Mineral Research, 2010, 25, 1468-1486.	3.1	3,449
2	An alginate-based hybrid system for growth factor delivery in the functional repair of large bone defects. Biomaterials, 2011, 32, 65-74.	5.7	454
3	Microarchitectural and mechanical characterization of oriented porous polymer scaffolds. Biomaterials, 2003, 24, 481-489.	5.7	352
4	Effects of protein dose and delivery system on BMP-mediated bone regeneration. Biomaterials, 2011, 32, 5241-5251.	5.7	281
5	Analysis of cartilage matrix fixed charge density and three-dimensional morphology via contrast-enhanced microcomputed tomography. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 19255-19260.	3.3	264
6	Quantitative assessment of scaffold and growth factor-mediated repair of critically sized bone defects. Journal of Orthopaedic Research, 2007, 25, 941-950.	1.2	226
7	Quantitative microcomputed tomography analysis of collateral vessel development after ischemic injury. American Journal of Physiology - Heart and Circulatory Physiology, 2004, 287, H302-H310.	1.5	207
8	Mechanical regulation of vascular growth and tissue regeneration in vivo. Proceedings of the National Academy of Sciences of the United States of America, 2011, 108, E674-80.	3.3	193
9	Gender-specific differential expression of exosomal miRNA in synovial fluid of patients with osteoarthritis. Scientific Reports, 2017, 7, 2029.	1.6	168
10	High-strength, surface-porous polyether-ether-ketone for load-bearing orthopedic implants. Acta Biomaterialia, 2015, 13, 159-167.	4.1	158
11	Bone regeneration using an alpha 2 beta 1 integrin-specific hydrogel as a BMP-2 delivery vehicle. Biomaterials, 2014, 35, 5453-5461.	5.7	156
12	Porous PEEK improves the bone-implant interface compared to plasma-sprayed titanium coating on PEEK. Biomaterials, 2018, 185, 106-116.	5.7	155
13	The Accuracy of Digital Image-Based Finite Element Models. Journal of Biomechanical Engineering, 1998, 120, 289-295.	0.6	150
14	Hydrogel delivery of lysostaphin eliminates orthopedic implant infection by Staphylococcus aureus and supports fracture healing. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E4960-E4969.	3.3	138
15	Spatiotemporal delivery of bone morphogenetic protein enhances functional repair of segmental bone defects. Bone, 2011, 49, 485-492.	1.4	135
16	Materials Science and Design Principles of Growth Factor Delivery Systems in Tissue Engineering and Regenerative Medicine. Advanced Healthcare Materials, 2019, 8, e1801000.	3.9	133
17	Design and Structureâ€“Function Characterization of 3D Printed Synthetic Porous Biomaterials for Tissue Engineering. Advanced Healthcare Materials, 2018, 7, e1701095.	3.9	111
18	Effects of in vivo mechanical loading on large bone defect regeneration. Journal of Orthopaedic Research, 2012, 30, 1067-1075.	1.2	107

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19	Delivery vehicle effects on bone regeneration and heterotopic ossification induced by high dose BMP-2. Acta Biomaterialia, 2017, 49, 101-112.	4.1	107
20	â€œDo-it-yourself in vitro vasculature that recapitulates in vivo geometries for investigating endothelial-blood cell interactionsâ€• Scientific Reports, 2015, 5, 12401.	1.6	100
21	Quantitative microcomputed tomography analysis of mineralization within three-dimensional scaffoldsin vitro. Journal of Biomedical Materials Research Part B, 2004, 69A, 97-104.	3.0	98
22	Simple coating with fibronectin fragment enhances stainless steel screw osseointegration in healthy and osteoporotic rats. Biomaterials, 2015, 63, 137-145.	5.7	91
23	Effect of porous orthopaedic implant material and structure on load sharing with simulated bone ingrowth: A finite element analysis comparing titanium and PEEK. Journal of the Mechanical Behavior of Biomedical Materials, 2018, 80, 68-76.	1.5	91
24	Mechanical Stimulation of Tissue Repair in the Hydraulic Bone Chamber. Journal of Bone and Mineral Research, 1997, 12, 1295-1302.	3.1	89
25	Heparin microparticle effects on presentation and bioactivity of bone morphogenetic protein-2. Biomaterials, 2014, 35, 7228-7238.	5.7	88
26	Heparin-mediated delivery of bone morphogenetic protein-2 improves spatial localization of bone regeneration. Science Advances, 2020, 6, eaay1240.	4.7	87
27	Oxidized alginate hydrogels for bone morphogenetic protein-2 delivery in long bone defects. Acta Biomaterialia, 2014, 10, 4390-4399.	4.1	82
28	Analyzing bone, blood vessels, and biomaterials with microcomputed tomography - A powerful tool for the evaluation and optimization of strategies for engineering tissues. IEEE Engineering in Medicine and Biology Magazine, 2003, 22, 77-83.	1.1	77
29	Microcomputed tomography imaging of skeletal development and growth. Birth Defects Research Part C: Embryo Today Reviews, 2004, 72, 250-259.	3.6	77
30	3D imaging of tissue integration with porous biomaterials. Biomaterials, 2008, 29, 3757-3761.	5.7	74
31	Attenuated Human Bone Morphogenetic Protein-2â€“Mediated Bone Regeneration in a Rat Model of Composite Bone and Muscle Injury. Tissue Engineering - Part C: Methods, 2013, 19, 316-325.	1.1	71
32	Getting PEEK to Stick to Bone: The Development of Porous PEEK for Interbody Fusion Devices. Techniques in Orthopaedics, 2017, 32, 158-166.	0.1	67
33	CONVERGENCE IN A MECHANICALLY COMPLEX PHENOTYPE: DETECTING STRUCTURAL ADAPTATIONS FOR CRUSHING IN CICHLID FISH. Evolution; International Journal of Organic Evolution, 2008, 62, 1587-1599.	1.1	66
34	Functional analysis of limb recovery following autograft treatment of volumetric muscle loss in the quadriceps femoris. Journal of Biomechanics, 2014, 47, 2013-2021.	0.9	65
35	Nanoengineered Particles for Enhanced Intraâ€Articular Retention and Delivery of Proteins. Advanced Healthcare Materials, 2014, 3, 1562-1567.	3.9	55
36	A rapid method for determining protein diffusion through hydrogels for regenerative medicine applications. APL Bioengineering, 2018, 2, 026110.	3.3	50

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37	One year of abaloparatide, a selective peptide activator of the PTH1 receptor, increased bone mass and strength in ovariectomized rats. Bone, 2017, 95, 143-150.	1.4	48
38	In Vivo Model for Evaluating the Effects of Mechanical Stimulation on Tissue-Engineered Bone Repair. Journal of Biomechanical Engineering, 2009, 131, 084502.	0.6	47
39	Porous methacrylate tissue engineering scaffolds: using carbon dioxide to control porosity and interconnectivity. Journal of Materials Science, 2006, 41, 4197.	1.7	46
40	Effects of controlled dual growth factor delivery on bone regeneration following composite bone-muscle injury. Acta Biomaterialia, 2020, 114, 63-75.	4.1	46
41	Spatiotemporal Delivery Strategies for Promoting Musculoskeletal Tissue Regeneration. Journal of Bone and Mineral Research, 2009, 24, 1507-1511.	3.1	45
42	Rapidly polymerizing injectable click hydrogel therapy to delay bone growth in a murine re-synostosis model. Biomaterials, 2014, 35, 9698-9708.	5.7	45
43	Extracellular matrix compression temporally regulates microvascular angiogenesis. Science Advances, 2020, 6, .	4.7	43
44	3D Printing of Microgelâ€Loaded Modular Microcages as Instructive Scaffolds for Tissue Engineering. Advanced Materials, 2020, 32, e2001736.	11.1	42
45	Hydrogel-based Delivery of rhBMP-2 Improves Healing of Large Bone Defects Compared With Autograft. Clinical Orthopaedics and Related Research, 2015, 473, 2885-2897.	0.7	41
46	Enhanced in vivo retention of low dose BMP-2 via heparin microparticle delivery does not accelerate bone healing in a critically sized femoral defect. Acta Biomaterialia, 2017, 59, 21-32.	4.1	41
47	The effect of conditional inactivation of beta 1 integrins using twist 2 Cre, Osterix Cre and osteocalcin Cre lines on skeletal phenotype. Bone, 2014, 68, 131-141.	1.4	40
48	Chondroitin Sulfate Glycosaminoglycan Scaffolds for Cell and Recombinant Protein-Based Bone Regeneration. Stem Cells Translational Medicine, 2019, 8, 575-585.	1.6	38
49	Effects of Local Antibiotic Delivery from Porous Space Maintainers on Infection Clearance and Induction of an Osteogenic Membrane in an Infected Bone Defect. Tissue Engineering - Part A, 2017, 23, 91-100.	1.6	37
50	Deformation and fatigue of tough 3D printed elastomer scaffolds processed by fused deposition modeling and continuous liquid interface production. Journal of the Mechanical Behavior of Biomedical Materials, 2017, 75, 1-13.	1.5	37
51	Effects of in vitro endochondral priming and pre-vascularisation of human MSC cellular aggregates in vivo. Stem Cell Research and Therapy, 2015, 6, 218.	2.4	36
52	Implantable Sensors for Regenerative Medicine. Journal of Biomechanical Engineering, 2017, 139, .	0.6	34
53	Osteogenic Differentiation of Mesenchymal Stem Cells by Mimicking the Cellular Niche of the Endochondral Template. Tissue Engineering - Part A, 2016, 22, 1176-1190.	1.6	33
54	Competitive Protein Binding Influences Heparin-Based Modulation of Spatial Growth Factor Delivery for Bone Regeneration. Tissue Engineering - Part A, 2017, 23, 683-695.	1.6	33

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55	<sup />Skeletal Myoblast-Seeded Vascularized Tissue Scaffolds in the Treatment of a Large Volumetric Muscle Defect in the Rat Biceps Femoris Muscle. Tissue Engineering - Part A, 2017, 23, 989-1000.	1.6	32
56	Decorin-supplemented collagen hydrogels for the co-delivery of bone morphogenetic protein-2 and microvascular fragments to a composite bone-muscle injury model with impaired vascularization. Acta Biomaterialia, 2019, 93, 210-221.	4.1	32
57	Biomaterial strategies for improved intraâ€articular drug delivery. Journal of Biomedical Materials Research - Part A, 2021, 109, 426-436.	2.1	30
58	Articular Cartilage- and Synoviocyte-Binding Poly(ethylene glycol) Nanocomposite Microgels as Intra-Articular Drug Delivery Vehicles for the Treatment of Osteoarthritis. ACS Biomaterials Science and Engineering, 2020, 6, 5084-5095.	2.6	29
59	Wireless Implantable Sensor for Noninvasive, Longitudinal Quantification of Axial Strain Across Rodent Long Bone Defects. Journal of Biomechanical Engineering, 2017, 139, .	0.6	28
60	Local deformation behavior of surface porous polyether-ether-ketone. Journal of the Mechanical Behavior of Biomedical Materials, 2017, 65, 522-532.	1.5	28
61	Intra-articular TSG-6 delivery from heparin-based microparticles reduces cartilage damage in a rat model of osteoarthritis. Biomaterials Science, 2018, 6, 1159-1167.	2.6	28
62	Mineralization of three-dimensional osteoblast cultures is enhanced by the interaction of 1Î±,25-dihydroxyvitamin D3 and BMP2 via two specific vitamin D receptors. Journal of Tissue Engineering and Regenerative Medicine, 2016, 10, 40-51.	1.3	26
63	Clinical potential of implantable wireless sensors for orthopedic treatments. Expert Review of Medical Devices, 2018, 15, 255-264.	1.4	25
64	Early systemic immune biomarkers predict bone regeneration after trauma. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	3.3	25
65	Triple growth factor delivery promotes functional bone regeneration following composite musculoskeletal trauma. Acta Biomaterialia, 2021, 127, 180-192.	4.1	25
66	Functional Restoration of Critically Sized Segmental Defects With Bone Morphogenetic Protein-2 and Heparin Treatment. Clinical Orthopaedics and Related Research, 2011, 469, 3111-3117.	0.7	24
67	Development of systemic immune dysregulation in a rat trauma model of biomaterial-associated infection. Biomaterials, 2021, 264, 120405.	5.7	24
68	Particulated Juvenile Articular Cartilage Implantation in the Knee. Cartilage, 2014, 5, 74-77.	1.4	23
69	Influence of structural load-bearing scaffolds on mechanical load- and BMP-2-mediated bone regeneration. Journal of the Mechanical Behavior of Biomedical Materials, 2016, 62, 169-181.	1.5	23
70	Thermo-mechanical behavior and structure of melt blown shape-memory polyurethane nonwovens. Journal of the Mechanical Behavior of Biomedical Materials, 2016, 62, 545-555.	1.5	23
71	Influence of scaffold properties on the inter-relationship between human bone marrow derived stromal cells and endothelial cells in pro-osteogenic conditions. Acta Biomaterialia, 2015, 25, 16-23.	4.1	22
72	Contrast enhanced Î¼CT imaging of early articular changes in a pre-clinical model of osteoarthritis. Osteoarthritis and Cartilage, 2018, 26, 118-127.	0.6	22

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73	BMP-2 delivery strategy modulates local bone regeneration and systemic immune responses to complex extremity trauma. Biomaterials Science, 2021, 9, 1668-1682.	2.6	22
74	Characterization of a small animal growth plate injury model using microcomputed tomography. Bone, 2010, 46, 1555-1563.	1.4	21
75	Wireless sensor enables longitudinal monitoring of regenerative niche mechanics during rehabilitation that enhance bone repair. Bone, 2020, 135, 115311.	1.4	21
76	Stem cell-synthesized extracellular matrix for bone repair. Journal of Materials Chemistry, 2010, 20, 8942.	6.7	20
77	Biological evaluation and finite-element modeling of porous poly(para-phenylene) for orthopaedic implants. Acta Biomaterialia, 2018, 72, 352-361.	4.1	19
78	Impaired bone healing following treatment of established nonunion correlates with serum cytokine expression. Journal of Orthopaedic Research, 2019, 37, 299-307.	1.2	19
79	Multiomics characterization of mesenchymal stromal cells cultured in monolayer and as aggregates. Biotechnology and Bioengineering, 2020, 117, 1761-1778.	1.7	18
80	Compressive cyclic ratcheting and fatigue of synthetic, soft biomedical polymers in solution. Journal of the Mechanical Behavior of Biomedical Materials, 2016, 54, 268-282.	1.5	17
81	An Embedded Wireless Temperature Sensor for Orthopedic Implants. IEEE Sensors Journal, 2017, , 1-1.	2.4	17
82	Effects of BMPâ€2 dose and delivery of microvascular fragments on healing of bone defects with concomitant volumetric muscle loss. Journal of Orthopaedic Research, 2019, 37, 553-561.	1.2	17
83	Quantitative pre-clinical screening of therapeutics for joint diseases using contrast enhanced micro-computed tomography. Osteoarthritis and Cartilage, 2016, 24, 1604-1612.	0.6	16
84	Microarchitectural and mechanical characterization of the sickle bone. Journal of the Mechanical Behavior of Biomedical Materials, 2015, 48, 220-228.	1.5	15
85	Supraspinatus tendon overuse results in degenerative changes to tendon insertion region and adjacent humeral cartilage in a rat model. Journal of Orthopaedic Research, 2017, 35, 1910-1918.	1.2	15
86	Regional gene expression analysis of multiple tissues in an experimental animal model of post-traumatic osteoarthritis. Osteoarthritis and Cartilage, 2019, 27, 294-303.	0.6	15
87	Decorin-containing collagen hydrogels as dimensionally stable scaffolds to study the effects of compressive mechanical loading on angiogenesis. MRS Communications, 2017, 7, 466-471.	0.8	15
88	Low Intensity, High Frequency Vibration Training to Improve Musculoskeletal Function in a Mouse Model of Duchenne Muscular Dystrophy. PLoS ONE, 2014, 9, e104339.	1.1	14
89	The effect of contouring on fatigue resistance of three types of fracture fixation plates. Journal of Orthopaedic Surgery and Research, 2016, 11, 107.	0.9	13
90	Magnetoelastic sensors for realâ€time tracking of cell growth. Biotechnology and Bioengineering, 2021, 118, 2380-2385.	1.7	12

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91	Aggregate mesenchymal stem cell delivery ameliorates the regenerative niche for muscle repair. Journal of Tissue Engineering and Regenerative Medicine, 2018, 12, 1867-1876.	1.3	11
92	Functional integration of tissue-engineered bone constructs. Journal of Musculoskeletal Neuronal Interactions, 2004, 4, 399-400.	0.1	11
93	Dynamic mass spectrometry probeÂfor electrospray ionization mass spectrometry monitoring of bioreactors for therapeutic cell manufacturing. Biotechnology and Bioengineering, 2019, 116, 121-131.	1.7	10
94	Magnetoelastic Sensor Optimization for Improving Mass Monitoring. Sensors, 2022, 22, 827.	2.1	10
95	Human platelet lysate supplementation of mesenchymal stromal cell delivery: issues of xenogenicity and species variability. Journal of Tissue Engineering and Regenerative Medicine, 2017, 11, 2876-2884.	1.3	8
96	Immunomodulatory strategies for immune dysregulation following severe musculoskeletal trauma. Journal of Immunology and Regenerative Medicine, 2018, 2, 21-35.	0.2	8
97	Effects of osteogenic ambulatory mechanical stimulation on early stages of BMP-2 mediated bone repair. Connective Tissue Research, 2022, 63, 16-27.	1.1	8
98	Localized Osteoarthritis Disease-Modifying Changes due to Intra-articular Injection of Micronized Dehydrated Human Amnion/Chorion Membrane. Regenerative Engineering and Translational Medicine, 2019, 5, 210-219.	1.6	7
99	Localized Sampling Enables Monitoring of Cell State via Inline Electrospray Ionization Mass Spectrometry. Biotechnology Journal, 2021, 16, e2000277.	1.8	5
100	Microcomputed Tomography. Springer Handbooks, 2019, , 1205-1236.	0.3	4
101	Tissue Engineering for Pediatric Applications. Tissue Engineering - Part A, 2016, 22, 195-196.	1.6	3
102	Models of composite bone and soft-tissue limb trauma. , 0, , 534-554.		2
103	A piezoelectric bone fixation plate for in vivo application and monitoring of mechanical loading during fracture healing. Measurement Science and Technology, 2020, 31, 095703.	1.4	2
104	A magnetoelastic bone fixation device for controlled mechanical stimulation at femoral fractures in rodents. Engineering Research Express, 2021, 3, 035028.	0.8	2
105	Implantable biosensors for musculoskeletal health. Connective Tissue Research, 2022, 63, 228-242.	1.1	2
106	Drug Delivery: Nanoengineered Particles for Enhanced Intra-Articular Retention and Delivery of Proteins (Adv. Healthcare Mater. 10/2014). Advanced Healthcare Materials, 2014, 3, 1561-1561.	3.9	1
107	Systemic Immune Modulation Alters Local Bone Regeneration in a Delayed Treatment Composite Model of Non-Union Extremity Trauma. Frontiers in Surgery, 0, 9, .	0.6	1
108	Quantitative volumetric analysis of cardiac morphogenesis assessed through micro-computed tomography. Developmental Dynamics, 2007, 236, spc1-spc1.	0.8	0

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109	Elastic properties and microstucture of external cortical bone in the craniofacial skeleton of the baboon. FASEB Journal, 2009, 23, 650.1.	0.2	0
110	Chondrogenic Differentiation of Rat BMSCs in Hydrogel. Manuals in Biomedical Research, 2014, , 9-16.	0.0	0
111	Amniotic membrane attenuates heterotopic ossification following highâ€dose bone morphogenetic proteinâ€2 treatment of segmental bone defects. Journal of Orthopaedic Research, 2022, , .	1.2	0