Jonathan T Butcher

List of Publications by Year
in descending order

#	Article	IF	Citations
1	3D Bioprinting of heterogeneous aortic valve conduits with alginate/gelatin hydrogels. Journal of Biomedical Materials Research - Part A, 2013, 101A, 1255-1264.	2.1	818
2	Rapid 3D printing of anatomically accurate and mechanically heterogeneous aortic valve hydrogel scaffolds. Biofabrication, 2012, 4, 035005.	3.7	570
3	Three-dimensional printed trileaflet valve conduits using biological hydrogels and human valve interstitial cells. Acta Biomaterialia, 2014, 10, 1836-1846.	4.1	369
4	Matrix stiffening promotes a tumor vasculature phenotype. Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, 492-497.	3.3	295
5	Mitral valve diseaseâ€"morphology and mechanisms. Nature Reviews Cardiology, 2015, 12, 689-710.	6.1	281
6	Unique Morphology and Focal Adhesion Development of Valvular Endothelial Cells in Static and Fluid Flow Environments. Arteriosclerosis, Thrombosis, and Vascular Biology, 2004, 24, 1429-1434.	1.1	251
7	Valvular Endothelial Cells Regulate the Phenotype of Interstitial Cells in Co-culture: Effects of Steady Shear Stress. Tissue Engineering, 2006, 12, 905-915.	4.9	185
8	Arterial and aortic valve calcification inversely correlates with osteoporotic bone remodelling: a role for inflammation. European Heart Journal, 2010, 31, 1975-1984.	1.0	180
9	Inflammatory Cytokines Promote Mesenchymal Transformation in Embryonic and Adult Valve Endothelial Cells. Arteriosclerosis, Thrombosis, and Vascular Biology, 2013, 33, 121-130.	1.1	176
10	Transcriptional Profiles of Valvular and Vascular Endothelial Cells Reveal Phenotypic Differences. Arteriosclerosis, Thrombosis, and Vascular Biology, 2006, 26, 69-77.	1.1	172
11	Aortic valve disease and treatment: The need for naturally engineered solutions. Advanced Drug Delivery Reviews, 2011, 63, 242-268.	6.6	168
12	Periostin promotes atrioventricular mesenchyme matrix invasion and remodeling mediated by integrin signaling through Rho/PI 3-kinase. Developmental Biology, 2007, 302, 256-266.	0.9	159
13	Naturally Engineered Maturation of Cardiomyocytes. Frontiers in Cell and Developmental Biology, 2017, 5, 50.	1.8	147
14	Current progress in tissue engineering of heart valves: multiscale problems, multiscale solutions. Expert Opinion on Biological Therapy, 2015, 15, 1155-1172.	1.4	139
15	Side-Specific Endothelial-Dependent Regulation of Aortic Valve Calcification. American Journal of Pathology, 2013, 182, 1922-1931.	1.9	137
16	Transitions in Early Embryonic Atrioventricular Valvular Function Correspond With Changes in Cushion Biomechanics That Are Predictable by Tissue Composition. Circulation Research, 2007, 100, 1503-1511.	2.0	136
17	Valvulogenesis: the moving target. Philosophical Transactions of the Royal Society B: Biological Sciences, 2007, 362, 1489-1503.	1.8	132
18	Stiffness and adhesivity control aortic valve interstitial cell behavior within hyaluronic acid based hydrogels. Acta Biomaterialia, 2013, 9, 7640-7650.	4.1	123

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19	Mechanical regulation of cardiac development. Frontiers in Physiology, 2014, 5, 318.	1.3	119
20	Mechanobiology of the aortic heart valve. Journal of Heart Valve Disease, 2008, 17, 62-73.	0.5	119
21	Neonatal and Adult Cardiovascular Pathophysiological Remodeling and Repair. Annals of the New York Academy of Sciences, 2008, 1123, 30-40.	1.8	118
22	Heart function and hemodynamic analysis for zebrafish embryos. Developmental Dynamics, 2017, 246, 868-880.	0.8	118
23	Valvular endothelial cells and the mechanoregulation of valvular pathology. Philosophical Transactions of the Royal Society B: Biological Sciences, 2007, 362, 1445-1457.	1.8	112
24	Effects of shear stress pattern and magnitude on mesenchymal transformation and invasion of aortic valve endothelial cells. Biotechnology and Bioengineering, 2014, 111, 2326-2337.	1.7	110
25	Spatiotemporal single-cell RNA sequencing of developing chicken hearts identifies interplay between cellular differentiation and morphogenesis. Nature Communications, 2021, 12, 1771.	5.8	109
26	Cyclic strain anisotropy regulates valvular interstitial cell phenotype and tissue remodeling in three-dimensional culture. Acta Biomaterialia, 2012, 8, 1710-1719.	4.1	105
27	Porcine aortic valve interstitial cells in three-dimensional culture: comparison of phenotype with aortic smooth muscle cells. Journal of Heart Valve Disease, 2004, 13, 478-85; discussion 485-6.	0.5	105
28	Fabrication of Aligned Nanofiber Polymer Yarn Networks for Anisotropic Soft Tissue Scaffolds. ACS Applied Materials & Interfaces, 2016, 8, 16950-16960.	4.0	102
29	ROBO4 variants predispose individuals to bicuspid aortic valve and thoracic aortic aneurysm. Nature Genetics, 2019, 51, 42-50.	9.4	101
30	Quantitative optimization of solid freeform deposition of aqueous hydrogels. Biofabrication, 2013, 5, 035001.	3.7	84
31	Active tissue stiffness modulation controls valve interstitial cell phenotype and osteogenic potential in 3D culture. Acta Biomaterialia, 2016, 36, 42-54.	4.1	84
32	Living nano-micro fibrous woven fabric/hydrogel composite scaffolds for heart valve engineering. Acta Biomaterialia, 2017, 51, 89-100.	4.1	81
33	Optimizing Photo-Encapsulation Viability of Heart Valve Cell Types in 3D Printable Composite Hydrogels. Annals of Biomedical Engineering, 2017, 45, 360-377.	1.3	71
34	Quantitative volumetric analysis of cardiac morphogenesis assessed through micro-computed tomography. Developmental Dynamics, 2007, 236, 802-809.	0.8	67
35	Hemodynamic patterning of the avian atrioventricular valve. Developmental Dynamics, 2011, 240, 23-35.	0.8	67
36	The living aortic valve: From molecules to function. Global Cardiology Science & Practice, 2014, 2014, 11.	0.3	63

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37	Developmental Mechanisms of Aortic Valve Malformation and Disease. Annual Review of Physiology, 2017, 79, 21-41.	5.6	62
38	Equibiaxial strain stimulates fibroblastic phenotype shift in smooth muscle cells in an engineered tissue model of the aortic wall. Biomaterials, 2006, 27, 5252-5258.	5.7	53
39	Isolation of Valvular Endothelial Cells. Journal of Visualized Experiments, 2010, , .	0.2	53
40	Endothelial-Derived Oxidative Stress Drives Myofibroblastic Activation and Calcification of the Aortic Valve. PLoS ONE, 2015, 10, e0123257.	1.1	52
41	Notch-Tnf signalling is required for development and homeostasis of arterial valves. European Heart Journal, 2017, 38, ehv520.	1.0	49
42	Quantitative in vivo imaging of embryonic development: Opportunities and challenges. Differentiation, 2012, 84, 149-162.	1.0	48
43	An ex-ovo Chicken Embryo Culture System Suitable for Imaging and Microsurgery Applications. Journal of Visualized Experiments, 2010, , .	0.2	46
44	Heterogeneous Susceptibility of Valve Endothelial Cells to Mesenchymal Transformation in Response to TNFÎ±. Annals of Biomedical Engineering, 2014, 42, 149-161.	1.3	44
45	Cadherin-11 Overexpression Induces Extracellular Matrix Remodeling and Calcification in Mature Aortic Valves. Arteriosclerosis, Thrombosis, and Vascular Biology, 2016, 36, 1627-1637.	1.1	44
46	Cadherin-11 coordinates cellular migration and extracellular matrix remodeling during aortic valve maturation. Developmental Biology, 2015, 407, 145-157.	0.9	43
47	Quantitative threeâ€dimensional imaging of live avian embryonic morphogenesis via microâ€computed tomography. Developmental Dynamics, 2011, 240, 1949-1957.	0.8	42
48	Inflammatory Regulation of Valvular Remodeling: The Good(?), the Bad, and the Ugly. International Journal of Inflammation, 2011, 2011, 1-13.	0.9	41
49	Cyclic Mechanical Loading Is Essential for Rac1-Mediated Elongation and Remodeling of the Embryonic Mitral Valve. Current Biology, 2016, 26, 27-37.	1.8	40
50	Comparison of Mesenchymal Stem Cell Source Differentiation Toward Human Pediatric Aortic Valve Interstitial Cells within 3D Engineered Matrices. Tissue Engineering - Part C: Methods, 2015, 21, 795-807.	1.1	36
51	Quantitative Threeâ€Dimensional Analysis of Embryonic Chick Morphogenesis Via Microcomputed Tomography. Anatomical Record, 2011, 294, 1-10.	0.8	35
52	Computational Fluid Dynamics of Developing Avian Outflow Tract Heart Valves. Annals of Biomedical Engineering, 2012, 40, 2212-2227.	1.3	35
53	NFÎºB (Nuclear Factor Îº-Light-Chain Enhancer of Activated B Cells) Activity Regulates Cell-Typeâ€“Specific and Context-Specific Susceptibility to Calcification in the Aortic Valve. Arteriosclerosis, Thrombosis, and Vascular Biology, 2020, 40, 638-655.	1.1	35
54	Interactions between TGFÎ²1 and cyclic strain in modulation of myofibroblastic differentiation of canine mitral valve interstitial cells in 3D culture. Journal of Veterinary Cardiology, 2012, 14, 211-221.	0.3	34

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55	Growth and hemodynamics after early embryonic aortic arch occlusion. Biomechanics and Modeling in Mechanobiology, 2015, 14, 735-751.	1.4	34
56	Two-photon microscopy-guided femtosecond-laser photoablation of avian cardiogenesis: noninvasive creation of localized heart defects. American Journal of Physiology - Heart and Circulatory Physiology, 2010, 299, H1728-H1735.	1.5	32
57	Inflammatory and Biomechanical Drivers of Endothelial-Interstitial Interactions in Calcific Aortic Valve Disease. Circulation Research, 2021, 128, 1344-1370.	2.0	32
58	3D-Printed Hydrogel Technologies for Tissue-Engineered Heart Valves. 3D Printing and Additive Manufacturing, 2014, 1, 122-136.	1.4	31
59	Cyclic strain regulates pro-inflammatory protein expression in porcine aortic valve endothelial cells. Journal of Heart Valve Disease, 2008, 17, 571-7; discussion 578.	0.5	31
60	Calpain 9 as a therapeutic target in TGFÎ²-induced mesenchymal transition and fibrosis. Science Translational Medicine, 2019, 11, .	5.8	30
61	Computational simulation of hemodynamic-driven growth and remodeling of embryonic atrioventricular valves. Biomechanics and Modeling in Mechanobiology, 2012, 11, 1205-1217.	1.4	29
62	The mechanobiology of mitral valve function, degeneration, and repair. Journal of Veterinary Cardiology, 2012, 14, 47-58.	0.3	29
63	Quantification of embryonic atrioventricular valve biomechanics during morphogenesis. Journal of Biomechanics, 2012, 45, 895-902.	0.9	28
64	Valve interstitial cell tensional homeostasis directs calcification and extracellular matrix remodeling processes via RhoA signaling. Biomaterials, 2016, 105, 25-37.	5.7	28
65	Crystallinity of hydroxyapatite drives myofibroblastic activation and calcification in aortic valves. Acta Biomaterialia, 2018, 71, 24-36.	4.1	27
66	Cadherin-11 Expression Patterns in Heart Valves Associate with Key Functions during Embryonic Cushion Formation, Valve Maturation and Calcification. Cells Tissues Organs, 2013, 198, 300-310.	1.3	26
67	Population Heterogeneity in the Epithelial to Mesenchymal Transition Is Controlled by NFAT and Phosphorylated Sp1. PLoS Computational Biology, 2016, 12, e1005251.	1.5	26
68	Extracting physiological information in experimental biology via Eulerian video magnification. BMC Biology, 2019, 17, 103.	1.7	26
69	Incorporating nanocrystalline cellulose into a multifunctional hydrogel for heart valve tissue engineering applications. Journal of Biomedical Materials Research - Part A, 2022, 110, 76-91.	2.1	26
70	Effects of Pulsed Contaminant Exposures on Early Life Stages of the Fathead Minnow. Archives of Environmental Contamination and Toxicology, 2005, 49, 511-519.	2.1	25
71	TOXICITY MODELS OF PULSED COPPER EXPOSURE TO PIMEPHALES PROMELAS AND DAPHNIA MAGNA. Environmental Toxicology and Chemistry, 2006, 25, 2541.	2.2	25
72	Quantitative Three-Dimensional Analysis of Embryonic Chick Morphogenesis Via Microcomputed Tomography. Anatomical Record, 2011, 294, spc1-spc1.	0.8	25

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73	Transforming Growth Factor Î², Bone Morphogenetic Protein, and Vascular Endothelial Growth Factor Mediate Phenotype Maturation and Tissue Remodeling by Embryonic Valve Progenitor Cells: Relevance for Heart Valve Tissue Engineering. Tissue Engineering - Part A, 2010, 16, 3375-3383.	1.6	24
74	Award Winner in the Young Investigator Category, 2017 Society for Biomaterials Annual Meeting and Exposition, Minneapolis, MN, April 05â€"08, 2017: Lymph node stiffnessâ€mimicking hydrogels regulate human Bâ€cell lymphoma growth and cell surface receptor expression in a molecular subtypeâ€specific manner. Journal of Biomedical Materials Research - Part A, 2017, 105, 1833-1844.	2.1	23
75	Endothelial retention and phenotype on carbonized cardiovascular implant surfaces. Biomaterials, 2014, 35, 7714-7723.	5.7	21
76	The next frontier in cardiovascular developmental biologyâ€"an integrated approach to adult disease?. Nature Clinical Practice Cardiovascular Medicine, 2007, 4, 60-61.	3.3	20
77	Serotonin Potentiates Transforming Growth Factor-beta3 Induced Biomechanical Remodeling in Avian Embryonic Atrioventricular Valves. PLoS ONE, 2012, 7, e42527.	1.1	20
78	The root problem of heart valve engineering. Science Translational Medicine, 2018, 10, .	5.8	19
79	Triâ€Layered and Gelâ€Like Nanofibrous Scaffolds with Anisotropic Features for Engineering Heart Valve Leaflets. Advanced Healthcare Materials, 2022, 11, e2200053.	3.9	19
80	Cardiac developmental toxicity. Birth Defects Research Part C: Embryo Today Reviews, 2011, 93, 291-297.	3.6	18
81	Multi-Scale Biomechanical Remodeling in Aging and Genetic Mutant Murine Mitral Valve Leaflets: Insights into Marfan Syndrome. PLoS ONE, 2012, 7, e44639.	1.1	18
82	Projected Hydrologic Changes Under Mid-21st Century Climatic Conditions in a Sub-arctic Watershed. Water Resources Management, 2015, 29, 1467-1487.	1.9	18
83	Mechanotransduction Mechanisms in Mitral Valve Physiology and Disease Pathogenesis. Frontiers in Cardiovascular Medicine, 2017, 4, 83.	1.1	18
84	Effect of left atrial ligation-driven altered inflow hemodynamics on embryonic heart development: clues for prenatal progression of hypoplastic left heart syndrome. Biomechanics and Modeling in Mechanobiology, 2021, 20, 733-750.	1.4	18
85	Valve endothelial-interstitial interactions drive emergent complex calcific lesion formation in vitro. Biomaterials, 2021, 269, 120669.	5.7	17
86	Nanofiber-structured hydrogel yarns with pH-response capacity and cardiomyocyte-drivability for bio-microactuator application. Acta Biomaterialia, 2017, 60, 144-153.	4.1	16
87	Cardiac regeneration following cryoinjury in the adult zebrafish targets a maturation-specific biomechanical remodeling program. Scientific Reports, 2018, 8, 15661.	1.6	16
88	Prosthetic aortic graft replacement of the ascending thoracic aorta alters biomechanics of the native descending aorta as assessed by transthoracic echocardiography. PLoS ONE, 2020, 15, e0230208.	1.1	16
89	Monocytes and macrophages in heart valves: Uninvited guests or critical performers?. Current Opinion in Biomedical Engineering, 2018, 5, 82-89.	1.8	14
90	Spatial Regulation of Valve Interstitial Cell Phenotypes within Three-Dimensional Micropatterned Hydrogels. ACS Biomaterials Science and Engineering, 2019, 5, 1416-1425.	2.6	13

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91	Micro/Nano-Computed Tomography Technology for Quantitative Dynamic, Multi-scale Imaging of Morphogenesis. Methods in Molecular Biology, 2015, 1189, 47-61.	0.4	13
92	Bioprinting of Cardiac Tissues. , 2015, , 351-370.		11
93	JuPOETs: a constrained multiobjective optimization approach to estimate biochemical model ensembles in the Julia programming language. BMC Systems Biology, 2017, 11, 10.	3.0	11
94	Cohort-based multiscale analysis of hemodynamic-driven growth and remodeling of the embryonic pharyngeal arch arteries. Development (Cambridge), 2018, 145, .	1.2	10
95	The cycle of form and function in cardiac valvulogenesis. Aswan Heart Centre Science & Practice Series, 2011, 2011, .	0.3	10
96	Valvular heart diseases in the developing world: developmental biology takes center stage. Journal of Heart Valve Disease, 2012, 21, 234-40.	0.5	10
97	Targeted Mybpc3 Knock-Out Mice with Cardiac Hypertrophy Exhibit Structural Mitral Valve Abnormalities. Journal of Cardiovascular Development and Disease, 2015, 2, 48-65.	0.8	9
98	Induction of aortic valve calcification by celecoxib and its COX-2 independent derivatives is glucocorticoid-dependent. Cardiovascular Pathology, 2020, 46, 107194.	0.7	9
99	Age related extracellular matrix and interstitial cell phenotype in pulmonary valves. Scientific Reports, 2020, 10, 21338.	1.6	9
100	Uncovering transcriptional dark matter via gene annotation independent single-cell RNA sequencing analysis. Nature Communications, 2021, 12, 2158.	5.8	9
101	Hierarchical approaches for systems modeling in cardiac development. Wiley Interdisciplinary Reviews: Systems Biology and Medicine, 2013, 5, 289-305.	6.6	8
102	The influence of external free energy and homeostasis on growth and shape change. Journal of the Mechanics and Physics of Solids, 2014, 64, 338-350.	2.3	8
103	OCT4-mediated inflammation induces cell reprogramming at the origin of cardiac valve development and calcification. Science Advances, 2021, 7, eabf7910.	4.7	7
104	Interfacing DNA hydrogels with ceramics for biofunctional architectural materials. Materials Today, 2022, 53, 98-105.	8.3	7
105	A SOX17-PDGFB signaling axis regulates aortic root development. Nature Communications, 2022, 13, .	5.8	5
106	Multidisciplinary Inquiry-Based Investigation Learning Using an Ex Ovo Chicken Culture Platform: Role of Vitamin A on Embryonic Morphogenesis. American Biology Teacher, 2012, 74, 636-643.	0.1	4
107	Systematic Analysis of the Smooth Muscle Wall Phenotype of the Pharyngeal Arch Arteries During Their Reorganization into the Great Vessels and Its Association with Hemodynamics. Anatomical Record, 2019, 302, 153-162.	0.8	4
108	Assessing Early Cardiac Outflow Tract Adaptive Responses Through Combined Experimental-Computational Manipulations. Annals of Biomedical Engineering, 2021, 49, 3227-3242.	1.3	4

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109	Hydrostatic mechanical stress regulates growth and maturation of the atrioventricular valve. Development (Cambridge), 2021, 148, .	1.2	4
110	Rac1 mediates cadherin-11 induced cellular pathogenic processes in aortic valve calcification. Cardiovascular Pathology, 2022, 58, 107414.	0.7	4
111	Isolation and Culture of Avian Embryonic Valvular Progenitor Cells. Journal of Visualized Experiments, 2010, , .	0.2	3
112	The optimal shape of an aortic heart valve replacement â€“ on the road to the consensus. QScience Connect, 2017, 2017, .	0.2	3
113	Local fluid shear stress operates a molecular switch to drive fetal semilunar valve extension. Developmental Dynamics, 2021, , .	0.8	3
114	Biological Response to Sintered Titanium in Left Ventricular Assist Devices: Pseudoneointima, Neointima, and Pannus. ASAIO Journal, 2023, 69, 1-10.	0.9	3
115	Method for non-optical quantification of in situ local soft tissue biomechanics. Journal of Biomechanics, 2013, 46, 1938-1942.	0.9	2
116	Translational paradigms in scientific and clinical imaging of cardiac development. Birth Defects Research Part C: Embryo Today Reviews, 2013, 99, 106-120.	3.6	2
117	Comparative analysis of metallic nanoparticles as exogenous soft tissue contrast for live in vivo microâ€computed tomography imaging of avian embryonic morphogenesis. Developmental Dynamics, 2016, 245, 1001-1010.	0.8	2
118	Bioprinting Cardiovascular Organs. , 2018, , 163-187.		1
119	Biofabrication of thick vascularized neo-pedicle flaps for reconstructive surgery. Translational Research, 2019, 211, 84-122.	2.2	1
120	The Cell-specific Engagement of Notch and Wnt Pathways in Calcific Aortic Valve Disease. Structural Heart, 2021, 5, 25-25.	0.2	1
121	NFkB activation drives mesenchymal transformation and susceptibility to calcification in aortic valve endothelial cells. FASEB Journal, 2013, 27, 386.10.	0.2	1
122	Quantitative volumetric analysis of cardiac morphogenesis assessed through micro-computed tomography. Developmental Dynamics, 2007, 236, spc1-spc1.	0.8	0
123	Anisotropic Strain Fields Enhance Matrix Remodeling Through Elevated TGF-Î² Signaling. , 2011, , .		0
124	A Three-Dimensional Tissue Engineered Platform to Simulate Various Microvascular Shear Stress Conditions. Journal of the American College of Surgeons, 2016, 223, e190.	0.2	0
125	Forming effective relationships between academia and the medical devices industry with a focus on launching a smart heart valve prosthesis for pediatric patients. Translational Medicine Communications, 2019, 4, .	0.5	0
126	Inflammation Drives Endothelial-to-Mesenchymal Transition and Interstitial Calcification in 3D in Vitro Culture. , 2012, , .		0

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127	Regulation of Abnormal Atrioventricular Valve Development. , 2012, , .		0
128	Role of Bone Morphogenetic Proteins in Valvulogenesis. , 2013, , 307-315.		0
129	TNFâ€a induced eNOS uncoupling mediates endothelial dysfunction through elevated reactive oxygen species. FASEB Journal, 2013, 27, 379.5.	0.2	0
130	Abstract 371: TNFÎ± Drives Endothelial Dysfunction and Oxidative Stress via eNOS Uncoupling in Aortic Valve Disease. Arteriosclerosis, Thrombosis, and Vascular Biology, 2014, 34, .	1.1	0
131	Abstract 4049: Stromal Wnt/Î²-catenin antagonism with DKK1 promotes clonal expansion of multiple myeloma is identified using hyaluronic acid based 3D hydrogel. , 2014, , .		0