Jonathan T Butcher

List of Publications by Citations

124 papers	6,164 citations	39 h-index	77 g-index
138 ext. papers	7,165 ext. citations	6.8 avg, IF	6.08 L-index

#	Paper	IF	Citations
124	3D bioprinting of heterogeneous aortic valve conduits with alginate/gelatin hydrogels. *Journal of Biomedical Materials Research - Part A*, **2013**, 101, 1255-64	5.4	665
123	Rapid 3D printing of anatomically accurate and mechanically heterogeneous aortic valve hydrogel scaffolds. *Biofabrication*, **2012**, 4, 035005	10.5	475
122	Three-dimensional printed trileaflet valve conduits using biological hydrogels and human valve interstitial cells. *Acta Biomaterialia*, **2014**, 10, 1836-46	10.8	302
121	Unique morphology and focal adhesion development of valvular endothelial cells in static and fluid flow environments. *Arteriosclerosis, Thrombosis, and Vascular Biology*, **2004**, 24, 1429-34	9.4	224
120	Matrix stiffening promotes a tumor vasculature phenotype. *Proceedings of the National Academy of Sciences of the United States of America*, **2017**, 114, 492-497	11.5	197
119	Mitral valve disease--morphology and mechanisms. *Nature Reviews Cardiology*, **2015**, 12, 689-710	14.8	172
118	Valvular endothelial cells regulate the phenotype of interstitial cells in co-culture: effects of steady shear stress. *Tissue Engineering*, **2006**, 12, 905-15		165
117	Arterial and aortic valve calcification inversely correlates with osteoporotic bone remodelling: a role for inflammation. *European Heart Journal*, **2010**, 31, 1975-84	9.5	152
116	Transcriptional profiles of valvular and vascular endothelial cells reveal phenotypic differences: influence of shear stress. *Arteriosclerosis, Thrombosis, and Vascular Biology*, **2006**, 26, 69-77	9.4	151
115	Inflammatory cytokines promote mesenchymal transformation in embryonic and adult valve endothelial cells. *Arteriosclerosis, Thrombosis, and Vascular Biology*, **2013**, 33, 121-30	9.4	144
114	Periostin promotes atrioventricular mesenchyme matrix invasion and remodeling mediated by integrin signaling through Rho/PI 3-kinase. *Developmental Biology*, **2007**, 302, 256-66	3.1	142
113	Aortic valve disease and treatment: the need for naturally engineered solutions. *Advanced Drug Delivery Reviews*, **2011**, 63, 242-68	18.5	141
112	Transitions in early embryonic atrioventricular valvular function correspond with changes in cushion biomechanics that are predictable by tissue composition. *Circulation Research*, **2007**, 100, 1503-11	15.7	122
111	Valvulogenesis: the moving target. *Philosophical Transactions of the Royal Society B: Biological Sciences*, **2007**, 362, 1489-503	5.8	115
110	Mechanobiology of the aortic heart valve. *Journal of Heart Valve Disease*, **2008**, 17, 62-73		115
109	Current progress in tissue engineering of heart valves: multiscale problems, multiscale solutions. *Expert Opinion on Biological Therapy*, **2015**, 15, 1155-72	5.4	113
108	Neonatal and adult cardiovascular pathophysiological remodeling and repair: developmental role of periostin. *Annals of the New York Academy of Sciences*, **2008**, 1123, 30-40	6.5	111

107	Side-specific endothelial-dependent regulation of aortic valve calcification: interplay of hemodynamics and nitric oxide signaling. *American Journal of Pathology*, **2013**, 182, 1922-31	5.8	109
106	Stiffness and adhesivity control aortic valve interstitial cell behavior within hyaluronic acid based hydrogels. *Acta Biomaterialia*, **2013**, 9, 7640-50	10.8	106
105	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		100
104	Valvular endothelial cells and the mechanoregulation of valvular pathology. *Philosophical Transactions of the Royal Society B: Biological Sciences*, **2007**, 362, 1445-57	5.8	96
103	Naturally Engineered Maturation of Cardiomyocytes. *Frontiers in Cell and Developmental Biology*, **2017**, 5, 50	5.7	92
102	Cyclic strain anisotropy regulates valvular interstitial cell phenotype and tissue remodeling in three-dimensional culture. *Acta Biomaterialia*, **2012**, 8, 1710-9	10.8	92
101	Effects of shear stress pattern and magnitude on mesenchymal transformation and invasion of aortic valve endothelial cells. *Biotechnology and Bioengineering*, **2014**, 111, 2326-37	4.9	87
100	Mechanical regulation of cardiac development. *Frontiers in Physiology*, **2014**, 5, 318	4.6	84
99	Fabrication of Aligned Nanofiber Polymer Yarn Networks for Anisotropic Soft Tissue Scaffolds. *ACS Applied Materials & Interfaces*, **2016**, 8, 16950-60	9.5	76
98	Quantitative optimization of solid freeform deposition of aqueous hydrogels. *Biofabrication*, **2013**, 5, 035001	10.5	66
97	Active tissue stiffness modulation controls valve interstitial cell phenotype and osteogenic potential in 3D culture. *Acta Biomaterialia*, **2016**, 36, 42-54	10.8	64
96	Living nano-micro fibrous woven fabric/hydrogel composite scaffolds for heart valve engineering. *Acta Biomaterialia*, **2017**, 51, 89-100	10.8	62
95	Heart function and hemodynamic analysis for zebrafish embryos. *Developmental Dynamics*, **2017**, 246, 868-880	2.9	61
94	Hemodynamic patterning of the avian atrioventricular valve. *Developmental Dynamics*, **2011**, 240, 23-35	2.9	59
93	Optimizing Photo-Encapsulation Viability of Heart Valve Cell Types in 3D Printable Composite Hydrogels. *Annals of Biomedical Engineering*, **2017**, 45, 360-377	4.7	57
92	Quantitative volumetric analysis of cardiac morphogenesis assessed through micro-computed tomography. *Developmental Dynamics*, **2007**, 236, 802-9	2.9	56
91	ROBO4 variants predispose individuals to bicuspid aortic valve and thoracic aortic aneurysm. *Nature Genetics*, **2019**, 51, 42-50	36.3	56
90	The living aortic valve: From molecules to function. *Global Cardiology Science & Practice*, **2014**, 2014, 52-77	0.7	51

89	Equibiaxial strain stimulates fibroblastic phenotype shift in smooth muscle cells in an engineered tissue model of the aortic wall. *Biomaterials*, **2006**, 27, 5252-8	15.6	48
88	Endothelial-derived oxidative stress drives myofibroblastic activation and calcification of the aortic valve. *PLoS ONE*, **2015**, 10, e0123257	3.7	44
87	Quantitative in vivo imaging of embryonic development: opportunities and challenges. *Differentiation*, **2012**, 84, 149-62	3.5	43
86	Notch-Tnf signalling is required for development and homeostasis of arterial valves. *European Heart Journal*, **2017**, 38, 675-686	9.5	39
85	Developmental Mechanisms of Aortic Valve Malformation and Disease. *Annual Review of Physiology* , **2017**, 79, 21-41	23.1	37
84	Quantitative three-dimensional imaging of live avian embryonic morphogenesis via micro-computed tomography. *Developmental Dynamics*, **2011**, 240, 1949-57	2.9	36
83	Isolation of valvular endothelial cells. *Journal of Visualized Experiments*, **2010**,	1.6	36
82	An ex-ovo chicken embryo culture system suitable for imaging and microsurgery applications. *Journal of Visualized Experiments*, **2010**,	1.6	36
81	Cadherin-11 Overexpression Induces Extracellular Matrix Remodeling and Calcification in Mature Aortic Valves. *Arteriosclerosis, Thrombosis, and Vascular Biology*, **2016**, 36, 1627-37	9.4	35
80	Heterogeneous susceptibility of valve endothelial cells to mesenchymal transformation in response to TNF *Annals of Biomedical Engineering*, **2014**, 42, 149-61	4.7	33
79	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	2.9	31
78	Cadherin-11 coordinates cellular migration and extracellular matrix remodeling during aortic valve maturation. *Developmental Biology*, **2015**, 407, 145-57	3.1	31
77	Computational fluid dynamics of developing avian outflow tract heart valves. *Annals of Biomedical Engineering*, **2012**, 40, 2212-27	4.7	30
76	Interactions between TGF and cyclic strain in modulation of myofibroblastic differentiation of canine mitral valve interstitial cells in 3D culture. *Journal of Veterinary Cardiology*, **2012**, 14, 211-21	1.9	30
75	Cyclic strain regulates pro-inflammatory protein expression in porcine aortic valve endothelial cells. *Journal of Heart Valve Disease*, **2008**, 17, 571-7; discussion 578		30
74	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, H1728-35	5.2	29
73	Inflammatory regulation of valvular remodeling: the good(?), the bad, and the ugly. *International Journal of Inflammation*, **2011**, 2011, 721419	6.4	27
72	Quantitative Three-Dimensional Analysis of Embryonic Chick Morphogenesis Via Microcomputed Tomography. *Anatomical Record*, **2011**, 294, 1-10	2.1	27

71	3D-Printed Hydrogel Technologies for Tissue-Engineered Heart Valves. *3D Printing and Additive Manufacturing*, **2014**, 1, 122-136	4	26
70	Cyclic Mechanical Loading Is Essential for Rac1-Mediated Elongation and Remodeling of the Embryonic Mitral Valve. *Current Biology*, **2016**, 26, 27-37	6.3	24
69	Growth and hemodynamics after early embryonic aortic arch occlusion. *Biomechanics and Modeling in Mechanobiology*, **2015**, 14, 735-51	3.8	23
68	Transforming growth factor 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, 3375-83	3.9	23
67	Crystallinity of hydroxyapatite drives myofibroblastic activation and calcification in aortic valves. *Acta Biomaterialia*, **2018**, 71, 24-36	10.8	22
66	Computational simulation of hemodynamic-driven growth and remodeling of embryonic atrioventricular valves. *Biomechanics and Modeling in Mechanobiology*, **2012**, 11, 1205-17	3.8	22
65	Quantification of embryonic atrioventricular valve biomechanics during morphogenesis. *Journal of Biomechanics*, **2012**, 45, 895-902	2.9	22
64	Toxicity models of pulsed copper exposure to Pimephales promelas and Daphnia magna. *Environmental Toxicology and Chemistry*, **2006**, 25, 2541-50	3.8	22
63	Spatiotemporal single-cell RNA sequencing of developing chicken hearts identifies interplay between cellular differentiation and morphogenesis. *Nature Communications*, **2021**, 12, 1771	17.4	22
62	Valve interstitial cell tensional homeostasis directs calcification and extracellular matrix remodeling processes via RhoA signaling. *Biomaterials*, **2016**, 105, 25-37	15.6	22
61	The mechanobiology of mitral valve function, degeneration, and repair. *Journal of Veterinary Cardiology*, **2012**, 14, 47-58	1.9	21
60	Cadherin-11 expression patterns in heart valves associate with key functions during embryonic cushion formation, valve maturation and calcification. *Cells Tissues Organs*, **2013**, 198, 300-10	2.1	21
59	Effects of pulsed contaminant exposures on early life stages of the fathead minnow. *Archives of Environmental Contamination and Toxicology*, **2005**, 49, 511-9	3.2	21
58	Serotonin potentiates transforming growth factor-beta3 induced biomechanical remodeling in avian embryonic atrioventricular valves. *PLoS ONE*, **2012**, 7, e42527	3.7	19
57	Quantitative three-dimensional analysis of embryonic chick morphogenesis via microcomputed tomography. *Anatomical Record*, **2011**, 294, 1-10	2.1	19
56	Endothelial retention and phenotype on carbonized cardiovascular implant surfaces. *Biomaterials*, **2014**, 35, 7714-23	15.6	17
55	Population Heterogeneity in the Epithelial to Mesenchymal Transition Is Controlled by NFAT and Phosphorylated Sp1. *PLoS Computational Biology*, **2016**, 12, e1005251	5	17
54	Calpain 9 as a therapeutic target in TGF nduced mesenchymal transition and fibrosis. *Science Translational Medicine*, **2019**, 11,	17.5	16

53	The next frontier in cardiovascular developmental biology--an integrated approach to adult disease?. *Nature Clinical Practice Cardiovascular Medicine*, **2007**, 4, 60-1		15
52	Projected Hydrologic Changes Under Mid-21st Century Climatic Conditions in a Sub-arctic Watershed. *Water Resources Management*, **2015**, 29, 1467-1487	3.7	14
51	Nanofiber-structured hydrogel yarns with pH-response capacity and cardiomyocyte-drivability for bio-microactuator application. *Acta Biomaterialia*, **2017**, 60, 144-153	10.8	13
50	Multi-scale biomechanical remodeling in aging and genetic mutant murine mitral valve leaflets: insights into Marfan syndrome. *PLoS ONE*, **2012**, 7, e44639	3.7	13
49	Award Winner in the Young Investigator Category, 2017 Society for Biomaterials Annual Meeting and Exposition, Minneapolis, MN, April 05-08, 2017: Lymph node stiffness-mimicking hydrogels regulate human B-cell lymphoma growth and cell surface receptor expression in a molecular subtype-specific manner. *Journal of Biomedical Materials Research - Part A*, **2017**, 105, 1833-1844	5.4	12
48	Micro/nano-computed tomography technology for quantitative dynamic, multi-scale imaging of morphogenesis. *Methods in Molecular Biology*, **2015**, 1189, 47-61	1.4	12
47	Cardiac developmental toxicity. *Birth Defects Research Part C: Embryo Today Reviews*, **2011**, 93, 291-7		11
46	Bioprinting of Cardiac Tissues **2015**, 351-370		10
45	JuPOETs: a constrained multiobjective optimization approach to estimate biochemical model ensembles in the Julia programming language. *BMC Systems Biology*, **2017**, 11, 10	3.5	10
44	Mechanotransduction Mechanisms in Mitral Valve Physiology and Disease Pathogenesis. *Frontiers in Cardiovascular Medicine*, **2017**, 4, 83	5.4	10
43	NFB (Nuclear Factor Light-Chain Enhancer of Activated B Cells) Activity Regulates Cell-Type-Specific and Context-Specific Susceptibility to Calcification in the Aortic Valve. *Arteriosclerosis, Thrombosis, and Vascular Biology*, **2020**, 40, 638-655	9.4	10
42	Extracting physiological information in experimental biology via Eulerian video magnification. *BMC Biology*, **2019**, 17, 103	7.3	10
41	Cardiac regeneration following cryoinjury in the adult zebrafish targets a maturation-specific biomechanical remodeling program. *Scientific Reports*, **2018**, 8, 15661	4.9	10
40	Valvular heart diseases in the developing world: developmental biology takes center stage. *Journal of Heart Valve Disease*, **2012**, 21, 234-40		9
39	The cycle of form and function in cardiac valvulogenesis. *Aswan Heart Centre Science & Practice Series*, **2011**, 2011,		9
38	Monocytes and Macrophages in Heart Valves: Uninvited Guests or Critical Performers?. *Current Opinion in Biomedical Engineering*, **2018**, 5, 82-89	4.4	8
37	Induction of aortic valve calcification by celecoxib and its COX-2 independent derivatives is glucocorticoid-dependent. *Cardiovascular Pathology*, **2020**, 46, 107194	3.8	8
36	Spatial Regulation of Valve Interstitial Cell Phenotypes within Three-Dimensional Micropatterned Hydrogels. *ACS Biomaterials Science and Engineering*, **2019**, 5, 1416-1425	5.5	7

35	Hierarchical approaches for systems modeling in cardiac development. *Wiley Interdisciplinary Reviews: Systems Biology and Medicine*, **2013**, 5, 289-305	6.6	7
34	Cohort-based multiscale analysis of hemodynamic-driven growth and remodeling of the embryonic pharyngeal arch arteries. *Development (Cambridge)*, **2018**, 145,	6.6	7
33	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	5	6
32	Inflammatory and Biomechanical Drivers of Endothelial-Interstitial Interactions in Calcific Aortic Valve Disease. *Circulation Research*, **2021**, 128, 1344-1370	15.7	6
31	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	3.7	5
30	Targeted Knock-Out Mice with Cardiac Hypertrophy Exhibit Structural Mitral Valve Abnormalities. *Journal of Cardiovascular Development and Disease*, **2015**, 2, 48-65	4.2	5
29	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	3.8	5
28	The root problem of heart valve engineering. *Science Translational Medicine*, **2018**, 10,	17.5	4
27	Valve endothelial-interstitial interactions drive emergent complex calcific lesion formation in vitro. *Biomaterials*, **2021**, 269, 120669	15.6	4
26	Incorporating nanocrystalline cellulose into a multifunctional hydrogel for heart valve tissue engineering applications. *Journal of Biomedical Materials Research - Part A*, **2022**, 110, 76-91	5.4	4
25	Tri-layered and gel-like nanofibrous scaffolds with anisotropic features for engineering heart valve leaflets.. *Advanced Healthcare Materials*, **2022**, e2200053	10.1	4
24	Age related extracellular matrix and interstitial cell phenotype in pulmonary valves. *Scientific Reports*, **2020**, 10, 21338	4.9	3
23	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	0.3	3
22	Isolation and culture of avian embryonic valvular progenitor cells. *Journal of Visualized Experiments*, **2010**,	1.6	3
21	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	2.1	3
20	Comparative analysis of metallic nanoparticles as exogenous soft tissue contrast for live in vivo micro-computed tomography imaging of avian embryonic morphogenesis. *Developmental Dynamics* , **2016**, 245, 1001-10	2.9	2
19	Method for non-optical quantification of in situ local soft tissue biomechanics. *Journal of Biomechanics*, **2013**, 46, 1938-42	2.9	2
18	Translational paradigms in scientific and clinical imaging of cardiac development. *Birth Defects Research Part C: Embryo Today Reviews*, **2013**, 99, 106-20		2

17	Interfacing DNA hydrogels with ceramics for biofunctional architectural materials. *Materials Today*, **2021**,	21.8	2
16	Spatiotemporal single-cell RNA sequencing of developing hearts reveals interplay between cellular differentiation and morphogenesis		2
15	JuPOETs: A Constrained Multiobjective Optimization Approach to Estimate Biochemical Model Ensembles in the Julia Programming Language		2
14	The optimal shape of an aortic heart valve replacement on the road to the consensus. *QScience Connect*, **2017**, 2017,	0.8	1
13	OCT4-mediated inflammation induces cell reprogramming at the origin of cardiac valve development and calcification. *Science Advances*, **2021**, 7, eabf7910	14.3	1
12	NFkB activation drives mesenchymal transformation and susceptibility to calcification in aortic valve endothelial cells. *FASEB Journal*, **2013**, 27, 386.10	0.9	1
11	The Cell-specific Engagement of Notch and Wnt Pathways in Calcific Aortic Valve Disease. *Structural Heart*, **2021**, 5, 25-25	0.6	1
10	Hydrostatic mechanical stress regulates growth and maturation of the atrioventricular valve. *Development (Cambridge)*, **2021**, 148,	6.6	1
9	Local fluid shear stress operates a molecular switch to drive fetal semilunar valve extension. *Developmental Dynamics*, **2021**,	2.9	1
8	Biofabrication of thick vascularized neo-pedicle flaps for reconstructive surgery. *Translational Research*, **2019**, 211, 84-122	11	0
7	Bioprinting Cardiovascular Organs **2018**, 163-187		0
6	Rac1 mediates Cadherin-11 induced cellular pathogenic processes in aortic valve calcification.. *Cardiovascular Pathology*, **2022**, 58, 107414	3.8	0
5	Uncovering transcriptional dark matter via gene annotation independent single-cell RNA sequencing analysis. *Nature Communications*, **2021**, 12, 2158	17.4	0
4	Assessing Early Cardiac Outflow Tract Adaptive Responses Through Combined Experimental-Computational Manipulations. *Annals of Biomedical Engineering*, **2021**, 1	4.7	0
3	Quantitative volumetric analysis of cardiac morphogenesis assessed through micro-computed tomography. *Developmental Dynamics*, **2007**, 236, spc1-spc1	2.9	
2	Role of Bone Morphogenetic Proteins in Valvulogenesis **2013**, 307-315		
1	TNF-a induced eNOS uncoupling mediates endothelial dysfunction through elevated reactive oxygen species. *FASEB Journal*, **2013**, 27, 379.5	0.9	