

CURRICULUM VITAE
Joshua D. Hutcheson, Ph.D.
 Assistant Professor of Biomedical Engineering
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A. Education/Training

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Georgia Institute of Technology, Atlanta, GA	B.S.	12/2005	Chemical Engineering
Georgia Institute of Technology, Atlanta, GA	M.S.	08/2008	Chemical Engineering
Vanderbilt University, Nashville, TN	Ph.D.	12/2012	Biomedical Engineering
Brigham and Women's Hospital, Boston, MA	Postdoctoral	08/2016	Cardiovascular

B. Positions and Honors

Positions and Employment

2005-2006	Research Scientist, Department of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia
2006-2008	Graduate Research Assistant, Department of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia
2008-2009	Graduate Research Assistant, Department of Biomedical Engineering, University of Alabama at Birmingham, Birmingham, Alabama
2009-2010	Graduate Research Assistant, Department of Biomedical Engineering, Vanderbilt University, Nashville, Tennessee
2010-2012	American Heart Association Predoctoral Fellow, Department of Biomedical Engineering, Vanderbilt University, Nashville, Tennessee
2012-2016	Postdoctoral Research Fellow, Division of Cardiovascular Medicine, Brigham and Women's Hospital, Boston, Massachusetts
2012-2016	Postdoctoral Research Fellow, Harvard Medical School, Boston, Massachusetts
2016-	Assistant Professor, Department of Biomedical Engineering, Florida International University, Miami, Florida
2020-	Assistant Professor, Department of Human and Molecular Genetics, Florida International University, Miami, Florida

Other Experience and Professional Memberships

2010-	Member, Biomedical Engineering Society (BMES)
2013-	Member, North American Vascular Biology Organization (NAVBO)
2013-	Member, American Heart Association (AHA)
2013-	Webinar Outreach Committee, International Society of Applied Cardiovascular Biology (ISACB)
2016-	Editor of eCirculator Newsletter, ISACB
2018-	ISACB Executive Committee Member
2020-	Associate Editor, Frontiers in Cardiovascular Medicine

Honors

2005	President's Undergraduate Research Award, Georgia Institute of Technology
2006	GAAN Fellowship, Department of Education

2008	Engineering Scholars Award, University of Alabama at Birmingham
2010	Predoctoral Fellowship, AHA
2013	Outstanding Poster Award, NAVBO
2013	ATVB Young Investigator Travel Award, AHA
2014	Innovation Award, Center for Interdisciplinary Cardiovascular Sciences
2015	Innovation Award, Center for Interdisciplinary Cardiovascular Sciences
2018	Researcher of the Year Award, Florida Heart Research Foundation

C. Contributions to Science

- I. The aortic valve is maintained by a specialized cellular population known as valve interstitial cells. These cells exhibit a phenotypic plasticity that allows them to differentiate to myofibroblasts that regenerate extracellular matrix in response to injury. Pathologic cues, however, lead to persistence of the myofibroblast phenotype and fibrocalcific remodeling of the valve apparatus. Much of my work has centered on understanding valve interstitial cell phenotype and searching for potential therapeutic targets that can be used to modulate the pathologic differentiation. This work led to a patent for the targeting of the identified pathways and has led to new insight into the molecular mechanisms of valve interstitial cell function.
 1. **Hutcheson JD**, Venkataraman R, Baudenbacher FJ, Merryman WD. Intracellular Ca(2+) accumulation is strain-dependent and correlates with apoptosis in aortic valve fibroblasts. *Journal of Biomechanics* 2012; 45(5): 888-894; PMID: 22176709.
 2. **Hutcheson JD**, Ryzhova L, Setola V, Merryman WD. 5-HT_{2B} antagonism arrests non-canonical TGF- β 1-induced myofibroblast differentiation. *Journal of Molecular and Cellular Cardiology* 2012; 53(5): 707-714; PMID: 22940605.
 3. **Hutcheson JD**, Chen J, Sewell-Loftin MK, Ryzhova L, Fisher CI, Su YR, Merryman WD. Cadherin-11 regulates cell-cell tension necessary for calcific nodule formation by valvular myofibroblasts. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2013; 33(1): 114-20; PMID: 23162011.
 4. **Hutcheson JD**, Aikawa E, Merryman WD. Potential drug targets for calcific aortic valve disease. *Nature Reviews Cardiology* 2014; 11(4): 218-31; PMID: 24445487.
- II. My recent work has focused on the role of extracellular vesicles in serving as nucleating foci for calcific mineral formation. A majority of work in calcification has centered on cellular signaling mechanisms associated with the pathological outcomes; however, knowledge about the physicochemical mechanisms of calcification nucleation and growth remains scant. Using advanced imaging and materials-based characterization techniques, I have visualized the earliest observable events of calcification. Extracellular vesicles also play a role in the transport of mediators of intercellular communication (e.g., microRNAs), and disruption of this communication due to calcification is believed to further negatively affect pathophysiological tissue remodeling.
 1. **Hutcheson JD**, Goettsch C, Bertazzo S, Maldonado N, Ruiz JL, Goh W, Yabusaki K, Faits T, Bouten C, Frank G, Quillard T, Libby P, Aikawa M, Weinbaum S, Aikawa E. Genesis and growth of extracellular-vesicle-derived microcalcification in atherosclerotic plaques. *Nature Materials* 2016; 15(3): 335-43; PMID: 26752654.
 2. Pokhrel R, Gerstman BS, **Hutcheson JD**, Chapagain PP. In silico investigations of calcium phosphate mineralization in extracellular vesicles. *The Journal of Physical Chemistry B* 2018; 122(14): 3782-3789; PMID: 29519123.
 3. **Hutcheson JD**, Maldonado N, Aikawa E. Small entities with large impact: microcalcifications and atherosclerotic plaque vulnerability. *Current Opinion in Lipidology* 2014; 25(5): 327-32; PMID: 25188916.
 4. **Hutcheson JD**, Goettsch C, Pham T, Aikawa M, Singh SA, Aikawa E. Enrichment of calcifying extracellular vesicles using density-based ultracentrifugation protocol. *Journal of Extracellular Vesicles* 2014; 3: 25129; PMID: 25491249.

III. I have followed up on this work by focusing on the molecular mechanisms through which calcifying extracellular vesicles are formed. Responding to cues such as changes in the extracellular matrix and elevated phosphate, specific intracellular trafficking mechanisms consolidate the cargo that leads to calcification of extracellular vesicles once they are released from cells. The interdisciplinary approach utilized in these studies has yielded new insight into potentially targetable pathways that could lead to therapies for cardiovascular calcification.

1. Krohn JB, **Hutcheson JD**, Martínez-Martínez E, Irvin WS, Bouten CV, Bertazzo S, Bendeck MP, Aikawa E. Discoidin Domain Receptor-1 regulates calcific extracellular vesicle release in vascular smooth muscle cell fibrocalcific response via transforming growth factor- β signaling. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2016; 36(3): 525-33; PMID: 26800565.
2. Goettsch C, **Hutcheson JD**, Aikawa M, Iwata H, Pham T, Nykjaer A, Kjolby M, Rogers M, Michel T, Shibasaki M, Hagita S, Kramann R, Rader DJ, Libby P, Singh SA, Aikawa E. Sortilin mediates vascular calcification via its recruitment into extracellular vesicles. *Journal of Clinical Investigation* 2016; 126(4): 1323-36; PMID: 26950419.
3. Ruiz JL, Weinbaum S, Aikawa E, **Hutcheson JD**. Zooming in on the genesis of atherosclerotic plaque microcalcifications. *Journal of Physiology* 2016; 594(11): 2915-27; PMID: 27040360.
4. **Hutcheson JD**, Goettsch C, Rogers MA, Aikawa E. Revisiting cardiovascular calcification: A multifaceted disease requiring a multidisciplinary approach. *Seminars in Cell and Developmental Biology* 2015; 46: 68-77; PMID: 26358815.

IV. A major challenge in translating basic mechanistic findings discovered in the laboratory to actual clinically implemented therapies lies in identifying appropriate patient populations, developing drugs for a specific molecular target, and delivering the therapeutics to the intended target within the body. I have had the opportunity during my research career to work with pharmacologists and pharmaceutical scientists to better understand the magnitude of this challenge, and much of my work has focused on trying to identify targetable proteins for manipulation of cell behavior. Additionally, my early research centered on developing drug delivery modalities to better transport therapeutics to the intended target. I utilized physical means to reversibly permeabilize cellular membranes. This was also my first introduction into the effects of physical forces on cell behavior, which guided me to my current interests on cell-matrix interactions. The work also utilized spectral analyses of acoustic signals similar to methods utilized for frequency analyses of heart sounds. Recently, I have also worked with a team of clinicians to develop a PET/CT based imaging protocol to identify high risk atherosclerotic plaques.

1. Schlicher RK, **Hutcheson JD**, Apkarian RP, Prausnitz MR. Changes in cell morphology due to plasma membrane wounding. *Ultrasound in Medicine and Biology* 2010; 36(4): 677-692; PMID: 20350691.
2. **Hutcheson JD**, Schlicher RK, Hicks HK, Prausnitz MR. Saving cells from ultrasound-induced apoptosis: quantification of cell death and uptake following sonication and effects of targeted calcium chelation. *Ultrasound in Medicine and Biology* 2010; 36(6): 1008-1021; PMID: 20447754.
3. Creager MD*, Hohl T*, **Hutcheson JD***, Moss AJ, Schlotter F, Blaser MC, Park MA, Lee LH, Singh SA, Alcaide-Corral CJ, Tavares AAS, Newby DE, Kijewski MF, Aikawa M, Di Carli M, Dweck MR, Aikawa E. ^{18}F -Fluoride signal amplification identifies microcalcifications associated with atherosclerotic plaque instability in positron emission tomography/computed tomography images. *Circulation: Cardiovascular Imaging* 2019; 12(1): e007835; PMID: 30642216; *co-first authors
4. **Hutcheson JD**, Setola V, Roth BL, Merryman WD. Serotonin receptors and heart valve disease-it was meant 2B. *Pharmacology & Therapeutics* 2011; 132(2): 146-157; PMID: 21440001.

D. List of Trainees

Current Trainees in Hutcheson Lab, Florida International University

2021-	Ana Valentin, PhD Student
2019-	Lin Tong, PhD Student
2019-	Anet Sanchez, Undergraduate Student
2019-	Paulina Alvarez, Undergraduate Student
2018-	Valentina Dargam, PhD Student

2018- Daniel Chaparro, PhD Student
 2018- Mohammad Shaver, PhD Student
 2017- Hooi Hooi Ng, Postdoctoral Fellow
 2017- Denise Hsu, PhD Student
 2017- Amirala Bakhshian Nik, PhD Student

Past Trainees in Hutcheson Lab, Florida International University

2019-2021 Daniel Cambron, Undergraduate Student
 2017-2020 Sana Nasim, PhD Student
 2016-2020 Jessica Molina, Undergraduate Student
 2016-2019 Rachel Montalvan, Master's Student
 2016-2019 Walter Heatherly, Undergraduate Student
 2016-2018 Daniela Medina, Undergraduate Student
 2016-2017 Jumana Afaghani, Undergraduate Student

Co-mentored Trainee in Dr. Elena Aikawa's Lab, Harvard Medical School

2014-2016 Jessica Ruiz, Medical Student

Co-mentored Trainees in Dr. W. David Merryman's Lab, Vanderbilt University

2011-2012 Stephanie Preston, Undergraduate Student
 2010-2012 Michael Duplessis, High School Teacher
 2010-2011 Chelsea Stowell, Undergraduate Student
 2010 Travis Meyer, Undergraduate Student
 2010 Corey Peak, Undergraduate Student
 2008-2009 Boris Simmons, Undergraduate Student, University of Alabama at Birmingham

E. Research Support

Ongoing

NSF PATHS-UP Engineering Research Center **Hutcheson J.D. (Faculty)** 10/01/2020-09/30/2021
 FIU Thrust 1.1 Research Project
 To develop a platform that stratifies cardiovascular risk in underserved populations. **Year 4 of expected 10-year funding mechanism.**

NSF I-Corps Program **Hutcheson J.D. (PI)** 10/01/2020-09/30/2021
 "Cardiacoustics: AI-based Heart Sound Screening for Early-Stage Heart Disease"
 To study the commercialization potential and perform customer discovery for new diagnostic techniques for aortic valve disease.

NSF PATHS-UP Engineering Research Center **Hutcheson J.D. (PI)** 9/01/2019-09/30/2021
 Seed Grant: "Development of a Biosensing Platform for Vascular Calcification"
 To study the extracellular vesicle-mediated mechanisms of vascular calcification and develop a platform that can diagnose the presence of these vesicles in blood serum.

Florida Heart Research Foundation **Hutcheson J.D. (PI)** 8/1/2021-7/31/2024
 "A Novel Small Molecule Therapy for Late-Stage Atherosclerosis"
 To study the therapeutic potential of a small molecule relaxin agonist to reverse late-stage arterial remodeling

Completed

Florida International University **Hutcheson J.D. (PI)** 05/01/2017-04/30/2019
 Seed Grant: "Exploring Neural Contributions to Aortic Valve Function and Disease"
 To study the unexplored neural contributions to aortic valve biomechanics and extracellular matrix regulation.

American Heart Association **Hutcheson J.D. (PI)** 07/01/2017-06/30/2020
 Scientist Development Grant: "Tracing the Therapeutic Efficacy of Bisphosphonates in Bone and Vascular Mineralization"
 To study the similarities and differences between bone and vascular mineralization and the use of bisphosphonates as a treatment strategy for each.

F. List of Publications

Original Research Articles

1. Iwata H, Osborn EA, Ughi GJ, Murakami K, Goettsch C, **Hutcheson JD**, Mauskapf A, Mattson PC, Libby P, Singh SA, Matamalas J, Aikawa E, Tearney GJ, Aikawa M, Jaffer FA. Highly Selective PPAR α (Peroxisome Proliferator-Activated Receptor α) Agonist Pemafibrate Inhibits Stent Inflammation and Restenosis Assessed by Multimodality Molecular-Microstructural Imaging. *Journal of the American Heart Association* In press.
2. **Hutcheson JD**, Schlotter F, Creager MD, Li X, Pham T, Vyas P, Higashi H, Body SC, Aikawa M, Singh SA, Kos L, Aikawa E. Elastogenesis Correlates with Pigment Production in Murine Aortic Valve Leaflets. *Frontiers in Cardiovascular Medicine* In press.
3. Ruiz JL, **Hutcheson JD**, Cardoso L, Bakhshian Nik A, Condado de Abreu A, Pham T, Buffolo F, Busatto S, Federici S, Ridolfi A, Aikawa M, Bertazzo S, Bergese P, Weinbaum S, Aikawa E. Nanoanalytical analysis of bisphosphonate-driven alterations of microcalcifications using a 3D hydrogel system and in vivo mouse model. *Proceedings of the National Academy of Science* 2021; 118(14): e1811725118; PMID: 33795519.
4. Rogers MA, **Hutcheson JD**, Okui T, Goettsch C, Singh SA, Halu A, Schlotter F, Higashi H, Wang L, Whelan MC, Mlynarchik AK, Daugherty A, Nomura M, Aikawa M, Aikawa E. Dynamin-related protein 1 inhibition reduces hepatic PCSK9 secretion. *Cardiovascular Research* 2021; cvab034; PMID: 33523181.
5. Boonya-Ananta T, Rodriguez AJ, Ajmal A, Du Le VN, Hansen AK, **Hutcheson JD**, Ramella-Roman JC. Synthetic photoplethysmography (PPG) of the radial artery through parallelized Monte Carlo and its correlation to body mass index (BMI). *Scientific Reports* 2021; 11(1): 2570; PMID: 33510428.
6. Schlotter F, de Freitas RCC, Rogers MA, Blaser MC, Wu PJ, Higashi H, Halu A, Iqbal F, Andraski AB, Rodia CN, Kuraoka S, Wen JR, Creager M, Pham T, **Hutcheson JD**, Body SC, Kohan AB, Sacks FM, Aikawa M, Singh SA, Aikawa E. ApoC-III is a novel inducer of calcification in human aortic valves. *Journal of Biological Chemistry* 2020; 296: 100193; PMID: 33334888.
7. Heuschkel MA, Skenteris NT, **Hutcheson JD**, van der Valk DD, Bremer J, Goody P, Hjortnaes J, Jansen F, Bouten CVC, van den Bogaerd A, Matic L, Marx N, Goettsch C. Integrative multi-omics analysis in calcific aortic valve disease reveals a link to the formation of amyloid-like deposits. *Cells* 2020; 9(10): 2164; PMID: 32987857.
8. Chaparro D, Dargam V, Alvarez P, Yeung J, Saytashev I, Bustillo J, Loganathan A, Ramella-Roman J, Agarwal A, **Hutcheson JD**. A method to quantify tensile biaxial properties of mouse aortic valve leaflets. *Journal of Biomechanical Engineering* 2020; doi: 10.1115/1.4046921; PMID: 32291440.
9. Jiang Z, Lai Y, Beaver JM, Tsegay PS, Zhao ML, Horton JK, Zamora M, Rein HL, Miralles F, Shaver M, **Hutcheson JD**, AgoulNIK I, Wilson SH, Liu Y. Oxidative DNA damage modulates DNA methylation pattern in human Breast Cancer 1 (BRCA1) gene via the crosstalk between DNA polymerase β and a de novo DNA methyltransferase. *Cells* 2020; 9(1): 225; PMID: 31963223.
10. Tesfamariam MD, Mirza AM, Chaparro D, Ali AZ, Montalvan R, Saytashev I, Gonzalez BA, Barreto A, Ramella-Roman J, **Hutcheson JD**, Ramaswamy S. Elastin-dependent aortic heart valve leaflet curvature changes during cyclic flexure. *Bioengineering (Basel)* 2019; 6(2): 39; PMID: 31067726.
11. Bhushan P, Umasankar Y, **Hutcheson JD**, Bhansali S. Toxicity assessment of wearable wound sensor constituents on keratinocytes. *Toxicology In Vitro* 2019; 58: 170-177; PMID: 30928693.
12. Creager MD,* Hohl T,* **Hutcheson JD**,* Moss AJ, Schlotter F, Blaser MC, Park MA, Lee LH, Singh SA, Alcaide-Corral CJ, Tavares AAS, Newby DE, Kijewski MF, Aikawa M, Di Carli M, Dweck MR, Aikawa E. ^{18}F -Fluoride signal amplification identifies microcalcifications associated with atherosclerotic plaque instability in positron emission tomography/computed tomography images. *Circulation: Cardiovascular Imaging* 2019; 12(1): e007835; PMID: 30642216; *co-first authorship.
13. RoyChoudhury S, Umasankar Y, **Hutcheson JD**, Lev-Tov HA, Kirsner RS, Bhansali S. Uricase based enzymatic biosensor for non-invasive detection of uric acid by entrapment in PVA-SbQ polymer matrix. *Electroanalysis* 2018; 30(10): 2374-2385.
14. Schlotter F, Halu A, Goto S, Blaser MC, Body SC, Lee LH, Higashi H, DeLaughter DM, **Hutcheson JD**, Vyas P, Pham T, Rogers MA, Sharma A, Seidman CE, Loscalzo J, Seidman JG, Aikawa M, Singh SA, Aikawa E. Spatiotemporal multi-omics mapping generates a molecular atlas of the aortic valve and reveals networks driving disease. *Circulation* 2018; 138(4): 377-393; PMID: 29588317.

15. Pokhrel R, Gerstman BS, **Hutcheson JD**, Chapagain PP. In silico investigations of calcium phosphate mineralization in extracellular vesicles. *The Journal of Physical Chemistry B* 2018; 122(14): 3782-3789; PMID: 29519123.
16. Rogers MA, Maldonado N, **Hutcheson JD**, Goettsch C, Goto S, Yamada I, Faits T, Sesaki H, Aikawa M, Aikawa E. Dynamin-Related Protein 1 inhibition attenuates cardiovascular calcification in the presence of oxidative stress. *Circulation Research* 2017; 121(3): 220-233; PMID: 28607103.
17. Goettsch C, Iwata H, **Hutcheson JD**, O'Donnell CJ, Chapurlat R, Cook NR, Aikawa M, Szulc P, Aikawa E. Serum sortilin associates with aortic calcification and cardiovascular risk in men. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2017; 37(5): 1005-1011; PMID: 28279970.
18. Yabusaki K, **Hutcheson JD**, Vyas P, Bertazzo S, Body SC, Aikawa M, Aikawa E. Quantification of calcified particles in human valve tissue reveals asymmetry of calcific aortic valve disease development. *Frontiers in Cardiovascular Medicine* 2017; 3: 44; PMID: 27867942.
19. Kramann R, Goettsch C, Wongboonsin J, Iwata H, Schneider RK, Kuppe C, Kaesler N, Chang-Panesso M, Machado FG, Gratwohl S, Madhurima K, **Hutcheson JD**, Jain S, Aikawa E, Humphreys BD. Adventitial MSC-like cells are progenitors of vascular smooth muscle cells and drive vascular calcification in chronic kidney disease. *Cell Stem Cell* 2016; 19(5): 628-642; PMID: 27618218.
20. Goettsch C,* **Hutcheson JD**,* Hagita S,* Rogers MA, Creager MD, Pham T, Choi J, Mlynarchik AK, Pieper B, Kjolby M, Aikawa M, Aikawa E. A single injection of gain-of-function mutant PCSK9 adeno-associated virus vector induces cardiovascular calcification in mice with no genetic modification. *Atherosclerosis* 2016; 251: 109-18; PMID: 27318830; *Equal Contribution.
21. O'Rourke C, Shelton G, **Hutcheson JD**, Burke MF, Martyn T, Thayer TE, Shakartzi HR, Buswell MD, Tainsh RE, Yu B, Bagchi A, Rhee DK, Wu C, Derwall M, Buys ES, Yu PB, Bloch KD, Aikawa E, Bloch DB, Malhotra R. Calcification of vascular smooth muscle cells and imaging of aortic calcification and inflammation. *Journal of Visualized Experiments* 2016; (111): 54017; PMID: 27284788.
22. Hjortnaes J, Goettsch C, **Hutcheson JD**, Camci-Unal G, Lax L, Scherer K, Body S, Schoen FJ, Kluin J, Khademhosseini A, Aikawa E. Simulating early calcific aortic valve disease within a 3D heart valve-like construct: A role for myofibroblast differentiation. *Journal of Molecular and Cellular Cardiology* 2016; 94: 13-20; PMID: 26996755.
23. Goettsch C, **Hutcheson JD**, Aikawa M, Iwata H, Pham T, Nykjaer A, Kjolby M, Rogers M, Michel T, Shibasaki M, Hagita S, Kramann R, Rader DJ, Libby P, Singh SA, Aikawa E. Sortilin mediates vascular calcification via its recruitment into extracellular vesicles. *Journal of Clinical Investigation* 2016; 126(4): 1323-36; PMID: 26950419.
24. West JD, Carrier EJ, Bloodworth NC, Schroer AK, Chen P, Ryzhova LM, Gladson S, Shay S, **Hutcheson JD**, Merryman WD. Serotonin 2B receptor antagonism prevents heritable pulmonary arterial hypertension. *PLoS One* 2016; 11(2): e0148657; PMID: 26863209.
25. Krohn JB, **Hutcheson JD**,* Martínez-Martínez E, Irvin WS, Bouten CV, Bertazzo S, Bendeck MP, Aikawa E.* Discoidin Domain Receptor-1 regulates calcific extracellular vesicle release in vascular smooth muscle cell fibrocalcific response via TGF- β signaling. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2016; 36(3): 525-33; PMID: 26800565. *Co-corresponding authors.
26. **Hutcheson JD**, Goettsch C, Bertazzo S, Maldonado N, Ruiz JL, Goh W, Yabusaki K, Faits T, Bouten C, Franck G, Quillard T, Libby P, Aikawa M, Weinbaum S, Aikawa E. High-resolution microscopic visualization of vascular calcification genesis, growth, and association with collagen in atherosclerotic plaques. *Nature Materials* 2016; 15(3): 335-43; PMID: 26752654.
27. Hjortnaes J, Shapero K, Goettsch C, **Hutcheson JD**, Keegan J, Kluin J, Mayer JE, Bischoff J, Aikawa E. Valvular interstitial cells suppress calcification of valvular endothelial cells. *Atherosclerosis* 2015; 242(1): 251-260; PMID: 26232165.
28. **Hutcheson JD**, Goettsch C, Pham T, Iwashita M, Aikawa M, Singh SA, Aikawa E. Enrichment of calcifying extracellular vesicles using density-based ultracentrifugation protocol. *Journal of Extracellular Vesicles* 2014; 3: 25129; PMID: 25491249.
29. Hjortnaes J, Camci-Unal G, **Hutcheson JD**, Jung SM, Schoen FJ, Kluin J, Aikawa E, Khademhosseini A. Directing valvular interstitial cell myofibroblast-like differentiation in a hybrid hydrogel platform. *Advanced Healthcare Materials* 2015; 4(1): 121-130; PMID: 24958085.

30. **Hutcheson JD**, Chen J, Sewell-Loftin MK, Ryzhova LM, Fisher CI, Su YR, Merryman WD. Cadherin-11 regulates cell-cell tension necessary for calcific nodule formation by valvular myofibroblasts. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2013; 33(1): 114-20; PMID: 23162011.
31. **Hutcheson JD**, Ryzhova LM, Setola V, Merryman WD. 5-HT2B antagonism arrests non-canonical TGF- β 1-induced myofibroblast differentiation. *Journal of Molecular and Cellular Cardiology* 2012; 53(5): 707-714; PMID: 22940605.
32. **Hutcheson JD**, Venkataraman R, Baudenbacher FJ, Merryman WD. Intracellular Ca(2+) accumulation is strain-dependent and correlates with apoptosis in aortic valve fibroblasts. *Journal of Biomechanics* 2012; 45(5): 888-894; PMID: 22176709.
33. Choi SO, Kim YC, Park JH, **Hutcheson JD**, Gill HS, Yoon YK, Prausnitz MR, Allen MG. An electrically active microneedle array for electroporation. *Biomedical Microdevices* 2010; 12(2): 263-273; PMID: 20012696.
34. **Hutcheson JD**, Schlicher RK, Hicks HK, Prausnitz MR. Saving cells from ultrasound-induced apoptosis: quantification of cell death and uptake following sonication and effects of targeted calcium chelation. *Ultrasound in Medicine and Biology* 2010; 36(6): 1008-1021; PMID: 20447754.
35. Schlicher RK, **Hutcheson JD**, Radhakrishna H, Apkarian RP, Prausnitz MR. Changes in cell morphology due to plasma membrane wounding. *Ultrasound in Medicine and Biology* 2010; 36(4): 677-692; PMID: 20350691.
36. Kamaev PP, **Hutcheson JD**, Wilson ML, Prausnitz MR. Quantification of optison bubble size and lifetime during sonication dominant role of secondary cavitation bubbles causing acoustic bioeffects. *Journal of the Acoustical Society of America* 2004; 115: 1818-1825; PMID: 15101659.

Reviews and Editorials

1. Hsu CD, **Hutcheson JD**, Ramaswamy S. Oscillatory fluid-induced mechanobiology in heart valves with parallels to the vasculature. *Vascular Biology* 2020; 2(1): R59-R71; PMID: 32923975.
2. **Hutcheson JD**, Goergen CJ, Schoen FJ, Aikawa M, Zilla P, Aikawa E, Gaudette GR. After 50 years of heart transplants: What does the next 50 years hold for cardiovascular medicine? A perspective from the international Society for Applied Cardiovascular Biology. *Frontiers in Cardiovascular Medicine* 2019; 6: 8; PMID: 30838213.
3. **Hutcheson JD**, Aikawa E. Extracellular vesicles in cardiovascular homeostasis and disease. *Current Opinion in Cardiology* 2018; 33(3): 290-297; PMID: 29465447.
4. Bakhshian Nik A, **Hutcheson JD**, Aikawa E. Extracellular vesicles as mediators of cardiovascular calcification. *Frontiers in Cardiovascular Medicine* 2017; 4: 78; PMID: 29322046.
5. **Hutcheson JD**, Blaser MC, Aikawa E. Giving calcification its due: Recognition of a diverse disease: A first attempt to standardize the field. *Circulation Research* 2017; 120(2): 270-273; PMID: 28104767.
6. Ruiz JL, Weinbaum S, Aikawa E, **Hutcheson JD**. Zooming in on the genesis of atherosclerotic plaque microcalcifications. *Journal of Physiology* 2016; 594(11): 2915-27; PMID: 27040360.
7. Krohn JB, **Hutcheson JD**, Martínez-Martínez E, Aikawa E. Extracellular vesicles in cardiovascular calcification: expanding current paradigms. *Journal of Physiology* 2016; 594(11): 2895-903; PMID: 26824781.
8. **Hutcheson JD**, Goettsch C, Rogers MA, Aikawa E. Revisiting cardiovascular calcification: A multifaceted disease requiring a multidisciplinary approach. *Seminars in Cells & Developmental Biology* 2015; 46: 68-77; PMID: 26358815.
9. Ruiz JL, **Hutcheson JD**, Aikawa E. Cardiovascular calcification: current controversies and novel concepts. *Cardiovascular Pathology* 2015; 24(4): 207-12; PMID: 25797772.
10. **Hutcheson JD**, Maldonado N, Aikawa E. Small entities with large impact: microcalcifications and atherosclerotic plaque vulnerability. *Current Opinion in Lipidology* 2014; 25(5): 327-32; PMID: 25188916.
11. **Hutcheson JD**, Aikawa E, Merryman WD. Potential drug targets for calcific aortic valve disease. *Nature Reviews Cardiology* 2014; 11(4): 218-31; PMID: 24445487.
12. Goettsch C, **Hutcheson JD**, Aikawa E. MicroRNA in cardiovascular calcification: Focus on targets and extracellular vesicle delivery mechanisms. *Circulation Research* 2013; 112(7): 1073-84; PMID: 23538277.
13. Aikawa E, Gardiner C, **Hutcheson JD**, Ochiya T, Osteikoetxea X, Pegtel M, Piper M, Quesenberry P, Schiffelers RM, Szabó TG, Buzas EI. International Society for Extracellular Vesicles: Second Annual

Meeting, 12-20 April 2013, Boston, MA (ISEV 2013). *Journal of Extracellular Vesicles* 2013; 2: 23070; PMID: 26082318.

14. **Hutcheson JD**, Setola V, Roth BL, Merryman WD. Serotonin receptors and heart valve disease - it was meant 2B. *Pharmacology & Therapeutics* 2011; 132(2): 146-157; PMID: 21440001.

Book Chapters

1. **Hutcheson JD** and Aikawa E. The History of Cardiovascular Calcification, Cardiovascular Calcification and Bone Mineralization ed. by **Joshua D. Hutcheson** and Elena Aikawa, Springer 2020.
2. Ng HH, Molina JE, and **Hutcheson JD**. Calcifying Extracellular Vesicles: Biology, Characterization and Mineral Formation, Cardiovascular Calcification and Bone Mineralization ed. by **Joshua D. Hutcheson** and Elena Aikawa, Springer 2020.
3. **Hutcheson JD** and Aikawa E. Pathobiology and optical imaging of calcific aortic valve disease, Cardiovascular Imaging - Arterial and Aortic Valve Inflammation and Calcification ed. by Elena Aikawa, Springer, 2015.
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