

**SHARAN RAMASWAMY  
BIOMEDICAL ENGINEERING**

**EDUCATION**

<b>Degree</b>	<b>Institution</b>	<b>Field</b>	<b>Dates</b>
PhD	University of Iowa	Biomedical Engineering	May 2003
M.Eng.	National University of Singapore	Biomaterials	December 1998
B.S.E.	Arizona State University	Bioengineering	August 1994

**FULL-TIME ACADEMIC EXPERIENCE (except where indicated)**

<b>Institution</b>	<b>Rank</b>	<b>Field</b>	<b>Dates (Month &amp; Year)</b>
Florida International University (FIU)	Assoc. Prof. with tenure	Biomedical Eng.	From Fall 2017
FIU	Asst. Prof./AP	Biomedical Eng.	12/2009 – 07/2017
The University of Pittsburgh	Visiting Research AP	Bioengineering	02/2007 – 12/2009
National Inst. Of Health	Visiting post-doc fellow	Tissue Eng./MRI	05/2003-01/2007
University of Iowa	Research Assistant*	Biomedical Eng.	08/1998 – 05/2003
Ecole Centrale De Lyon	French Gov't Scholar	Joint Replacement	10/1997 – 08/1998
National University of Singapore	Research Engineer	Biomaterials	09/1996 – 09/1997
National University of Singapore	Research Worker*	Biomaterials	09/1995 – 09/1996

*\* Indicates a part-time position.*

**EMPLOYMENT RECORD AT FIU**

<b>Rank</b>	<b>Dates</b>
Associate Professor with Tenure	08/21/2017 to Present
Assistant professor	12/30/2009 to 08/20/2017

## RESEARCH ACTIVITIES

**Laboratory Director (Sharan Ramaswamy)** - Cardiovascular Therapeutics Laboratory (CV-PEUTICS LAB); previously known as the Tissue Engineered Mechanics, Imaging and Materials Laboratory (TEMIM Lab) - 12/2009 – Present. The CV-PEUTICS LAB's primary research focus lies in the area of cell and engineered tissue mechanics with application in cardiovascular regenerative medicine. The CV-PEUTICS lab conducts both experimental and computational investigations in this area. A major goal of the lab is to develop functional valves with regenerative capacities (FVRC) using 1) porcine small intestinal submucosa (PSIS) substrates and 2) mechanically regulate stem cells for the FVRC application as well as for (3) broader application in cardiovascular regenerative medicine. Concurrently the CV-PEUTICS lab is also working towards the elucidation of mechanobiological cellular and molecular mechanisms that are involved in the etiology of valve diseases, particularly aortic valve calcification. A specific project in this area involves (4) the delineation of mechanosensitive fluid and structural conditions of the aortic valve due to elastin remodeling that may serve as an early indicator of calcific aortic valve disease (CAVD). In addition, at the cellular level, the lab is interested in identifying the fluid-induced mechanobiological responses of valve endothelial cells in valve homeostasis and in the development of CAVD. The research in the CV-PEUTICS lab has been supported by the AHA, NSF, the Florida Heart Research Foundation, industry and academic funding sources.

## PUBLICATIONS IN DISCIPLINE

(H-Index: 20; Citations: 6321; as of 09/2022, Source: Google Scholar)

For journal publications, proceedings, book chapters and publication work in progress:

#Undergraduate student under my supervision

\*Graduate student under my supervision

- 1) Wang B, Sierad LN, Mercuri JJ, Simionescu A, Simionescu DT, Williams LN, Vela R, Bajona P, Peltz M, **Ramaswamy S**, Hong Y, Liao J: Structural and biomechanical characterizations of acellular porcine mitral valve scaffolds: anterior leaflets, posterior leaflets, and chordae tendineae, *Engineered Regeneration*, 3(4), 2022, 374-386. Impact Factor (IF): Under Computation.
- 2) Copeland KM, Brazile BL, Butler JR, Cooley J, Brinkman-Ferguson E, Claude A, Lin S, Rais-Rohani S, Welch B, McMahan SR, Nguyen KT, Hong Y, **Ramaswamy S**, Liu Z-P, Bajona P, Peltz M, Liao J: Investigating the Transient Regenerative Potential of Cardiac Muscle Using a Neonatal Pig Partial Apical Resection Model. *Bioengineering*. 2022, 9(8), 401; <https://doi.org/10.3390/bioengineering9080401>. IF: 5.046.
- 3) C-P D Hsu\*, Tchir A#, Mirza A\*, Chaparro D, Herrera RE, Hutchinson JD, **Ramaswamy S**: Valve Endothelial Cell Exposure to High Levels of Flow Oscillations Exacerbates Valve Interstitial Cell Calcification. *Bioengineering*. 2022, 9(8), 393; <https://doi.org/10.3390/bioengineering9080393>. IF: 5.046.
- 4) Mirza A\*, **Ramaswamy S**: Importance of Non-Newtonian Computational Fluid Modeling on Severely Calcified Aortic Valve Geometries-Insights from Quasi-Steady State Simulations. *J Biomech Eng*. 2022 Nov 1;144(11):114501. doi: 10.1115/1.4054630. IF: 2.097.

- 5) Lin Y-M\*, Paolino L, Lou L, Herrera A\*, Pierre E#, Agarwal A, **Ramaswamy S**: Directional dependence on concomitant pressure and volume increases during left ventricular filling, *J Biomech.* June 2022, Volume 138, 111129. [IF: 2.712.](#)
- 6) Gonzalez BA\*, Gonzalez MP#, Scholl F, Bibevski S, Ladich E, Bibevski J, Morales P, Lopez J, Casares M, Brehier V, Hernandez L, **Ramaswamy S**: *De Novo* Valve Tissue Morphology Following Bioscaffold Mitral Valve Replacement in a Juvenile Non-Human Primate Model, *Bioengineering (Basel)* 2021, 8(7)-100. <https://doi.org/10.3390/bioengineering8070100>. [IF: 2.690.](#)
- 7) \*Hsu CPD, \*Mirza A, Matheny R, **Ramaswamy S**: Tricuspid Versus Mitral Performance of Cylindrical Porcine Small Intestinal Submucosa Valves. *Structural Heart 5* (sup1), 74-74, 2021, [IF: Under Computation.](#)
- 8) \*Mirza AM, #Barreto A, #Boodooram T, **Ramaswamy S**: Importance of Non-Newtonian Modeling of Blood Flow for Calcified Aortic Valves: Relevance to Sub-Clinical Thrombosis. *Structural Heart 5* (sup1), 30-30, 2021. [IF: Under Computation.](#)
- 9) #Agarwal A, \*Gonzalez BA, #Gonzalez-Perez M, Scholl F, Bibevski S, Ladich E, Wagner KR, Bibevski J, Hernandez L, Morales P, Lopez J, **Ramaswamy S**: Fibrin Quantification on Bio-Scaffold Valve Explant as a Measure of Their Integration. *Structural Heart 5* (sup1), 65-65, 2021. [IF: Under Computation.](#)
- 10) \*Gonzalez BA, #Gonzalez-Perez M, Scholl F, Bibevski S, Ladich E, Wagner KR, Bibevski J, Hernandez L, Morales P, Lopez J, **Ramaswamy S**: Assessment of Regenerated Bioscaffold Mitral Valve Annulus Extracellular Matrix Components from a Juvenile Non-human Primate Model. *Structural Heart 5* (sup1), 68-68, 2021. [IF: Under Computation.](#)
- 11) #Barreto A, Paolino L, Orikasa-Lopez K, Mirza A\*, Agarwal A, Hutcheson J, **Ramaswamy S**: Constitutive Properties of Mitral Valve Tissues via Nanoindentation *Structural Heart 5* (sup1), 48-48, 2021. [IF: Under Computation.](#)
- 12) Gonzalez B\*, Perez MG#, Mirza A\*, Scholl F, Bibevski S, Rivas-Wagner K, Bibevski J, Hernandez LE, Ladich E, Brehier V, Casares M, Morales P, Lopez J, Wagner J, **Ramaswamy S**: Extracellular Matrix Quantification of Fully Regenerated Neochorade After Bio-scaffold Mitral Valve Implantation In A Juvenile Non-human Primate Model. *Circulation*, 142 Suppl\_3, 2020, A14888-A14888. [IF: 19.309.](#)
- 13) Sonawane A, Nasim S\*, **Ramaswamy S**, Shah P, Urizar G, Pandiaraj M, Mujawar M, Bhansali S: Communication—Detection of Salivary Cortisol Using Zinc Oxide and Copper Porphyrin Composite Using Electrodeposition and Plasma-Assisted Deposition, *ECS Journal of Solid State Science and Technology*. 2020. [IF: 2.142.](#)
- 14) Bibevski S, **Ramaswamy S**, Hutcheson J: Editorial: Extracellular Matrix for Cardiovascular Reconstruction, *Front. Cardiovasc. Med.* *Frontiers in Cardiovascular Medicine* 8, 249. [IF: 3.915](#)

- 15) Bustillos, J, Loganathan A, Agrawal, R, Gonzalez BA\*, Perez MG#, **Ramaswamy S**, Boesl B, Agarwal A: Uncovering the mechanical, thermal, and chemical characteristics of biodegradable mushroom leather with intrinsic antifungal and antibacterial properties, *ACS Applied Biomaterials*, 2020, 3 (5), 3145-3156. IF: Under Computation.
- 16) Gonzalez BA\*, Perez-Nevarez M\*, Mirza A\*, Perez MG#, Lin Y-M\*, Hsu C-PD\*, Caobi A, Raymond AD, Hernandez MG, Fernandez-Lima F, George F, **Ramaswamy S**: Physiologically-Relevant Fluid-Induced Oscillatory Shear Stress Stimulation of Mesenchymal Stem Cells Enhances the Engineered Valve Matrix Phenotype. *Front. Cardiovasc. Med.*, 2020, May 19;7:69. doi: 10.3389/fcvm.2020.00069. eCollection. IF: 3.915.
- 17) Hsu C-PD\*, Hutcheson JD, **Ramaswamy S**: Oscillatory fluid-induced mechanobiology in heart valves with parallels to the vasculature. *Vascular Biology*. 2020 2(1), R59-R71. Impact Factor (IF): Under Computation.
- 18) Hsu C-PD\*, Mirza A\*, Matheny R, **Ramaswamy S**: Hydrodynamic Assessment of a Small Intestinal Submucosa Tubular Aortic Valve. *Structural Heart*, 2020, 4 (sup1), 75-75. IF: Under Computation.
- 19) Mirza A\*, Hsu C-PD\*, Matheny R, **Ramaswamy S**: Hydrodynamic Assessment of a Small Intestinal Submucosa Tubular Mitral Valve. *Structural Heart*, 2020, 4 (sup1), 114-114. IF: Under Computation.
- 20) Gonzalez BA\*, Pour Issa E\*, Mankame OV\*, Bustillos J, Cuellar A#, Rodriguez AJ#, Scholl F, Bibevski S, Hernandez L, Brehier V, Casares M, Rivas K, Morales P, Lopez J, Wagner J, Bibevski J, Agarwal A, George F, **Ramaswamy S**: Porcine small intestinal submucosa mitral valve material responses support acute somatic growth. *Tissue Eng Part A*. 2020 May;26(9-10):475-489. doi: 10.1089/ten.TEA.2019.0220. Epub 2020 Jan 16. IF: 3.616.
- 21) Williams A\*, **Ramaswamy S**: A comparison of the oscillatory shear index on the aortic valve-fibrosa with and without the presence of calcified deposits. *ProClinS Cardiology*. 2019, August, Vol. 2, No. 1: 1-8 IF: Under Computation.
- 22) 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 May 7;6(2). pii: E39. doi: 10.3390/bioengineering6020039, 2019. IF: 2.690.
- 23) Gonzalez B\*, Hernandez L, Bibevski S, Scholl F, Brehier V, Bibevski J, Rivas K, Morales P, Wagner J, Lopez J, **Ramaswamy S**: Recapitulation of Human Bio-scaffold Mitral Valve Growth in the Baboon Model. *Circulation*, 2018, Vol 138, No. Suppl\_1, Abstract 11348. IF: 19.309.
- 24) Castellanos G\*, Nasim S\*, Medina DA#, Rath S, **Ramaswamy S**: Stem Cell cytoskeletal responses to pulsatile flow in heart valve tissue engineering studies. *Front. Cardiovasc. Med.*, June, 5:58. doi: 10.3389/fcvm.2018.00058, 2018. IF: 1.658.

- 25) Williams A<sup>\*</sup>, Nasim S<sup>\*</sup>, Salinas M, Moshkforoush A, Tsoukias N, **Ramaswamy S**: A "sweet-spot" for fluid-induced oscillations in the conditioning of stem cell-based engineered heart valve tissues. *J Biomech.* 2017 Dec 8; 65:40-48. doi: 10.1016/j.jbiomech.2017.09.035. Epub 2017 Oct 7. IF: 2.712.
- 26) Mankame O<sup>\*</sup>, Valdes-Cruz L, Bibevski S, Scholl F, Baez I, **Ramaswamy S**: Early Hydrodynamic Assessment of a Porcine Small Intestinal Sub-Mucosa Bioscaffold Valve for Mitral Valve Replacement. *The Journal of the American College of Cardiology (JACC)*, 2017, March 69(11), Supplement: 590. IF: 17.759.
- 27) **Ramaswamy S**, Lordeus M<sup>\*</sup>, Mankame OV<sup>\*</sup>, Valdes-Cruz L, Bibevski S, Bell SM, Baez I, Scholl F. Hydrodynamic Assessment of Aortic Valves Prepared from Porcine Small Intestinal Submucosa. *Cardiovasc Eng Technol.* 2017, March; 8(1): 30-40. IF: 1.42.
- 28) Gill P, Musaramthota V, Munroe N, Datye A, Dua R<sup>\*</sup>, Haider W, McGoron A, Rokicki R, **Ramaswamy S**: Surface Modification of Ni-Ti alloys For Stent Application After Magneto-electropolishing, *Mater. Sci. Eng. C* 2015, 50: 37-44. Erratum in: *Mater. Sci. Eng. C: Mater Biol Appl.* 2016 Jul 1; 64:454. IF: 3.088.
- 29) Dua R<sup>\*</sup>, Comella K<sup>\*</sup>, Butler R, Castellanos G<sup>\*</sup>, Brazille B, Claude A, Agarwal A, Liao J, **Ramaswamy S**: Integration of Stem Cell to Chondrocyte-Derived Cartilage Matrix in Healthy and Osteoarthritic States in the Presence of Hydroxyapatite Nanoparticles. *PLOS ONE*, 2016 Feb 12;11(2): e0149121. doi: 10.1371/journal.pone.0149121. IF: 3.234.
- 30) Salinas M<sup>\*</sup>, Rath S<sup>\*</sup>, Villegas A<sup>#</sup>, Unnikrishnan V, **Ramaswamy S**: Relative Effects of Fluid Oscillations and Nutrient Transport in the In Vitro Growth of Valvular Tissues, *Cardiovascular Engineering and Technology*, 2016 Jun;7(2):170-81. doi: 10.1007/s13239-016-0258-x. Epub 2016 Feb 8. IF: 1.41.
- 31) Chue-Sang J, Bai Y, Stoff S, Straton D<sup>#</sup>, **Ramaswamy S**, Ramella-Roman J: Use of combined polarization-sensitive optical coherence tomography and Mueller matrix imaging for the polarimetric characterization of excised biological tissue, *Journal of Biomedical Optics.* 2016 Jul;21(7):71109. doi: 10.1117/1.JBO.21.7.071109. IF: 2.859.
- 32) Rath S<sup>\*</sup>, Salinas M<sup>\*</sup>, Villegas A<sup>#</sup>, **Ramaswamy S**. Differentiation and Distribution of Marrow Stem Cells in Flex-Flow Environments Demonstrate Support of the Valvular Phenotype. *PLOS ONE*, 2015 Nov 4;10(11):e0141802. doi: 10.1371/journal.pone.0141802. IF: 3.234.
- 33) Nieto A, Dua R<sup>\*</sup>, Zhang C, Boesl B, **Ramaswamy S**, Agarwal A. Three dimensional Graphene foam/polymer hybrid as a high strength biocompatible scaffold. *Advanced Functional Materials.* 2015; Jul 25(25): 3916-3924. IF: 10.4.
- 34) Lordeus M<sup>\*</sup>, Estrada A<sup>#</sup>, Stewart D<sup>#</sup>, Dua R<sup>\*</sup>, Zhang, C, Agarwal A, **Ramaswamy S**: Graphene Nanoplatelet-Reinforced Silicone for the Valvular Prosthesis Application *Journal of Long Term Effects of Medical Implants* 2015 25(1-2): 95-103. IF: 0.696.

- 35) Salinas M\*, Schmidt DE, Libera M#, Lange RR, **Ramaswamy S**: Oscillatory Shear Stress Created by Fluid Pulsatility Versus Flexed Specimen Configurations, *Comput Methods Biomech Biomed Engin.* 2014 May;17(7):728-39. Erratum in: *Comput Methods Biomech Biomed Engin.* 2014, 17(8): 932. [IF: 1.169](#).
- 36) Pulletikurthi C, Munroe N, Stewart D#, Haider W, Amruthaluri S, Rokicki R, Dugrot M, **Ramaswamy S**: Utility of Magneto-electropolished Ternary Nitinol Alloys for Blood-Contacting Applications, *Journal of Biomedical Materials Research: Part B - Applied Biomaterials.* 2014; 2014 Jul;102(5):922-32. [IF: 2.328](#).
- 37) **Ramaswamy S**, Boronyak SM#, Le T, Holmes A, Sotiropoulos F, Sacks MS. A novel bioreactor for mechanobiological studies of engineered heart valve tissue formation under pulmonary arterial physiological flow conditions. *J Biomech Eng.* 2014 Dec;136(12):121009. [IF: 2.097](#).
- 38) Salinas, M\*, **Ramaswamy, S**: Computational simulations predict a key role for oscillatory fluid shear stress in de novo valvular tissue formation. *Journal of Biomechanics*, 2014 Nov 47(14): 3517–3523. [IF: 2.712](#).
- 39) Rath S\*, Salinas M\*, Bhattacharjee S, **Ramaswamy S**. Marrow Stem Cell differentiation for Valvulogenesis via Oscillatory Flow and Nicotine Agonists: Unusual Suspects? *Journal of Long Term Effects of Medical Implants* 2015 25(1-2): 147-160. [IF: 0.696](#).
- 40) **Ramaswamy S**: Preface: Heart Valves Journal of Long-Term Effects of Medical Implants, 25(1 2): 1–1 (2015). . [IF: 0.696](#).
- 41) Dua R\*, Centeno J#, **Ramaswamy S**: Augmentation of engineered cartilage to bone integration using hydroxyapatite. *J Biomed Mater Res B Appl Biomater.* 2014, Jul 102(5):922-32. [IF: 2.328](#).
- 42) Salinas M\*, **Ramaswamy S**: Applicability of the Taguchi Method to Mechanobiology-Based Experiments. *Journal of Validation Technology.* 2013, Sep 19(3). [IF: Under Computation](#).
- 43) Martinez C\*, Henao A#, Rodriguez JE, Padgett KR, Ramaswamy S: Monitoring Steady Flow Effects on Cell Distribution in Engineered Valve Tissues by Magnetic Resonance Imaging. *Mol Imaging.* 2013 Oct;12(7):1-13. [IF: 3.169](#).
- 44) Alfonso A\*, Rafiee P, Rath S\*, Hernandez-Espino#, Din M#, George F, **Ramaswamy S**: Glycosaminoglycan Entrapment by Fibrin in Engineered Heart Valve Tissues. *Acta Biomater.* 2013 Sep; 9(9): 8149-57. [IF: 5.093](#).
- 45) **Ramaswamy S**, Salinas M\*, Carrol R, Landaburo K#, Ryans X#, Crespo C#, Rivero A#, Al-Mousily F, DeGroff C, Bleiweis M, Yamaguchi H: Protocol for Relative Hydrodynamic Assessment of Tri-leaflet Polymer Valves. *J Vis Exp.* 2013 Oct 17;(80):e50335. doi: 10.3791/50335.. [IF: 1.19](#).
- 46) Dua R\*, **Ramaswamy S**: Relative survivability of human osteoblasts is enhanced by 39 °C and ascorbic acid after exposure to photopolymerization ingredients. *Cytotechnology.* 2013, Aug;65(4):587-96.. [IF: 1.207](#).

- 47) Martinez C<sup>\*</sup>, Rath S, Van Gulden S<sup>#</sup>, Pelaez D, Alfonso A<sup>\*</sup>, Fernandez N, Kos L, Cheung H, and **Ramaswamy S**: Periodontal Ligament Cells Cultured under Steady Flow Environments Demonstrate Potential for Use in Heart Valve Tissue Engineering. *Tissue Eng Part A*. 2013 Feb;19(3-4):458-66. doi: 10.1089/ten.TEA.2012.0149. IF: 4.022.
- 48) Lahiri D, Dua R<sup>\*</sup>, Zhang C, Novoa S, Bhat A, **Ramaswamy S**, Agarwal A: Graphene Nano Platelet Induced Strengthening of Ultra High Molecular Weight Polyethylene and Biocompatibility *In-Vitro*, *Applied Materials and Interfaces*, 2012 Apr;4(4):2234-41. IF: 4.525.
- 49) Gill P, Munroe N, Dua R<sup>\*</sup>, **Ramaswamy S**: Corrosion and Biocompatibility Assessment of Magnesium Alloys *Journal of Biomaterials and Nanobiotechnology*, (3):10-13, 2012. IF: 0.44.
- 50) **Ramaswamy S**, Schornack PA, Smelko AG<sup>#</sup>, Boronyak SM<sup>#</sup>, Ivanova J, Mayer JE, Sacks MS: SPIO Labeling Efficiency and Subsequent MRI Tracking of Native Cell Populations Pertinent to Heart Valve Tissue Engineering Studies. *NMR in Biomedicine*, Vol. 25, 410-417, 2012. IF: 3.214.
- 51) Zhang Z, Hancock B, Leen S, **Ramaswamy S**, Sollott SJ, Boheler KR, Juhaszova M, Lakatta EG, Spencer RG, Fishbein KW: Compatibility of superparamagnetic iron oxide nanoparticle labeling for <sup>1</sup>H MRI cell tracking with <sup>31</sup>P MRS for bioenergetic measurements. *NMR in Biomedicine*, Dec;23(10):1166-72. 2010. IF: 3.214.
- 52) Nugent AE, Reiter DA, Fishbein KW, McBurney DL, Murray T, Bartusik D, **Ramaswamy S**, Spencer RG, Horton WE: Characterization of ex vivo-generated bovine and human cartilage by immunohistochemical, biochemical, and MRI analyses. *Tissue eng Part A*, Jul;16(7):2183-96. 2010. IF: 4.022.
- 53) **Ramaswamy S**, Gottlieb D, Engelmayr GC, Aikawa E, Schmidt DE, Gaitan DL, Sales VL, Mayer JE and Sacks MS: The Role of Organ Level Conditioning on the Promotion of Engineered Heart Valve Tissue Development In-Vitro Using Mesenchymal Stem Cells. *Biomaterials*, Vol 31, No. 6, pp. 1114-25, 2010. IF: 7.404.
- 54) **Ramaswamy S**, Greco JB, Uluer MC, Zhang Z, Zhang Z, Fishbein KW, Spencer RG.: Magnetic Resonance Imaging of Chondrocytes labeled with Superparamagnetic Iron Oxide Nanoparticles in Tissue Engineered Cartilage. *Tissue Eng Part A*, Vol. 15, No.12, pp. 3899-3910, 2009. IF: 4.022.
- 55) **Ramaswamy S**, Uluer MC<sup>#</sup>, Leen S<sup>#</sup>, Bajaj P<sup>#</sup>, Fishbein KW, Spencer RG: Non-invasive Assessment of Glycosaminoglycan Production in Injectable Tissue- Engineered Cartilage Constructs using Magnetic Resonance Imaging. *Tissue Eng Part C Methods*, Vol.14, No. 3, pp. 243-9, 2008. IF: 4.022.
- 56) **Ramaswamy S**, Gurkan I, Sharma B, Cascio B, Fishbein KW, Spencer RG: Assessment of Tissue Repair in Full Thickness Chondral Defects in the Rabbit Using Magnetic Resonance Imaging Transverse Relaxation Measurements. *Journal of Biomedical Materials Research (JBMR) – Part b: Applied Biomaterials*, Vol. 86B, No. 2, pp. 375-380, 2008. IF: 2.147.

- 57) Baur JA, Pearson KJ, Price NL, Jamieson HA, Lerin C, Kalra A, Vinayakumar PV, Allard JS, Guillermo LL, Lewis K, Pistell PJ, Poosala S, Becker KG, Boss O, Gwinn D, Wang M, **Ramaswamy S**, Fishbein KW, Spencer RG, Lakatta EG, Le Couteur D, Shaw RJ, Navas P, Puigserver P, Ingram DK, de Cabo R, and Sinclair DA: Resveratrol Improves Health and Survival of Mice on a High-Calorie Diet. *Nature*, Vol. 444, No. 7117, pp. 337-342, 2006. [IF: 36.280](#).
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- 60) **Ramaswamy SD**, Vigmostad SC, Wahle A, Lai YG., Olzewski ME, Braddy KC, Brennen TMH, Rossen JD, Sonka M, Chandran KB: Comparison of Left Anterior Descending Coronary Artery Hemodynamics Before and After Angioplasty. *Journal of Biomechanical Engineering*, Vol. 128, No. 1, pp. 40-48, 2006. [IF: 2.097](#).
- 61) **Ramaswamy SD**, Vigmostad SC, Wahle A, Lai YG, Olzewski ME, Braddy KC, Brennen TMH, Rossen JD, Sonka M, Chandran KB: Fluid Dynamics in a Human Left Anterior Descending Coronary Artery with Arterial Motion. *Annals of Biomedical Engineering*, Vol. 32, No. 12, pp. 1628-1641, 2004. [IF: 2.368](#).

## PROCEEDINGS

- 62) Gonzalez M, Saytashev I, Luna C, Gonzalez B\*, Pinero A\*, Perez M\*, **Ramaswamy S**, Ramella-Roman J: Multiphoton Microscopy of ECM Proteins in Baboon Aortic Leaflet. *Proceedings of Diagnostic and Therapeutic Applications of Light in Cardiology, SPIE BiOS 2018*, Vol. 10471, 104710Y, (22 February 2018); doi: 10.1117/12.2291024, 2018.
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- 64) Wahle A, **Ramaswamy SD**, Olszewski ME, Rossen JD, Lopez JJ, Lai YG, Chandran KB, Sonka M: Temporal Analysis of 3D Coronary Plaque Morphology and Hemodynamics Shear-Stress Distribution In-Vivo. Jointly published in Advances in Medical Imaging, Niederalag W. and Lemke HU (eds), *Health Academy No.2*, pp25-31, 2002, Dresden Germany; and in *Computer Assisted Radiology and Surgery 2002 (CARS 2002)*, Lemke HU, Vannier MW, Inamura K, Farman AG, Doi K, Reiber JHC (eds), Paris, Springer/CARS, CVI 2002.



- 65) Wahle A, Mitchell SC, **Ramaswamy SD**, Chandran KB, Sonka M: Virtual Angioscopy in Human Coronary Arteries with Visualization of Computational Hemodynamics. *SPIE Proceedings, Medical Imaging 2001: Physiology and Function from Multidimensional Images*, San Diego CA.
- 66) Wahle A, Mitchell SC, **Ramaswamy SD**, Chandran KB, Sonka M: Four-Dimensional Coronary Morphology and Computational Hemodynamics, *SPIE Proceedings, Medical Imaging 2001: Image Processing*, San Diego CA.
- 67) Wahle A, Mitchell SC, **Ramaswamy SD**, Chandran KB, Sonka M: Visualization of Human Coronary Arteries with Quantification Results from 3-D and 4-D Computational Hemodynamics based upon Virtual Endoscopy. *Computer Assisted Radiology and Surgery*, Lemke HU, Vannier MW, Inamura K, Farman AG, Doi K (eds), Berlin, Excerpta Medica International Congress Series, Elsevier, CVI 2001.
- 68) Ramakrishna S, **Ramaswamy SD**, Teoh SH, Hastings GW and Tan CT: Applications of Textiles and Textile Composites for Biomaterials Development. *TEXCOMP-3*, December 1996, Germany.
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- 70) **Ramaswamy SD**, Ramakrishna S. and Teoh SH: Tensile Behavior of Knitted Fabric Reinforced Elastomeric Composites. *Society for the Advancement of Materials Processing and Engineering (SAMPE), September 1997, Japan*.

## CHAPTERS IN BOOKS

- 71) Comella K\* and **Ramaswamy S**: Novel Bioreactors for Mechanistic Studies of Engineered Heart Valves, In: *Advances in Heart Valve Biomechanics: Valvular Physiology, Mechanobiology, and Bioengineering*, Liao J and Sacks M Eds., Springer, New York, NY, pp. 319-335, 2019.
- 72) Pour Issa E\* and **Ramaswamy S**: SPIO-labeled Cellular MRI in Tissue Engineering: A Case Study in Growing Valvular Tissues – Chapter 4, In: *Magnetic Resonance Imaging in Tissue Engineering*, Kotecha M, Magin R and Mao J Eds., Wiley Publications, New York, NY, pp. 71-90, 2017.
- 73) Salinas M\* and **Ramaswamy S**: Computational Fluid Modeling of Heart Valves – Chapter 8. In: *Computational Bioengineering*, Guigen Zhang (Ed), CRC Press, Boca Raton, FL, pp. 191-210, 2015.
- 74) Dua R\*, **Ramaswamy S**: Strategies for Integration of tissue engineered constructs to native cartilage and bone. – Chapter 4. In: *Tissue Engineering: Fundamentals, Techniques and Applications*. Takeshi Ishikawa and Masayoshi Yamamoto (Eds). Nova Science Publishers, Inc. New York, pp.75-88, 2012.

75) Martinez C\*, **Ramaswamy S**: Magnetic Resonance Imaging of Cells Labeled with Iron Oxides - Utility in Cardiovascular Medicine. – Chapter 5. In: *Iron Oxides: Structure, Properties and Applications*. Arturo I. Martinez (Ed). Nova Science Publishers, Inc., pp. 133 – 150. 2012.

76) **Ramaswamy S**, D Schmidt and G.S. Kassab: Biomechanics of Heart Valves. – Chapter VII. In: *Percutaneous Valve Technology: Present and Future*. Jose L. Navia and Sharif Al-Ruzzeh (Eds). Nova Science Publishers, Inc., New York, pp. 175-194, 2012.

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## PRESENTED PAPERS AND LECTURES

Perez M, Gonzalez BA, Lin Y-M, **Ramaswamy S** (VIRTUAL ORAL): Pulsatile Flow Conditioning of Stem Cells Substantially Increases the Protein Concentration in their Secreted Exosomes. *9<sup>th</sup> World Congress of Biomechanics (WCB)*, July 10-14, Taipei, Taiwan, 2022.

Hsu C-P D, Hutcheson J, **Ramaswamy S** (VIRTUAL ORAL): Valve Endothelial Cell Secretions Augment Calcification by Valve Interstitial Cells. *9<sup>th</sup> World Congress of Biomechanics (WCB)*, July 10-14, Taipei, Taiwan, 2022.

Lin Y-M, Lou L, Herrera A, Agarwal A, **Ramaswamy S** (VIRTUAL POSTER): Enhanced 3D scaffold substrates facilitate the regeneration of myocardium. *9<sup>th</sup> World Congress of Biomechanics (WCB)*, July 10-14, Taipei, Taiwan, 2022.

Lin, Y.-M., & **Ramaswamy, S** (POSTER): hiPSC-Cardiomyocytes Derived Engineered Tissue Deposited Cardiac Patch as a Platform for Heart Tissue Repair. *48th Annual Northeast Bioengineering Conference (NEBEC 2022)*, April 23-24, 2022, Columbia University, New York City, NY.

Bibeovski S, Gonzalez BA, **Ramaswamy S**, Scholl F (ORAL): *In-vivo* Model of Bioscaffold Mitral Valve Replacement in the Juvenile Non-human Primate. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Herrera A, **Ramaswamy S** (E-POSTER COMPETITION): Mechanical Property Correction of Engineered Heart Valve Tissues Post-Culture. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Rodrigues A, Barreto A, **Ramaswamy S** (E-POSTER COMPETITION): Protocol for Inducing Severe Calcification in Valves. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Mirza A, **Ramaswamy S** (E-POSTER COMPETITION): Need for a More Representative Constitutive Model for Severely Calcified Aortic Valves. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Hsu C-P D, Gonzalez BA, **Ramaswamy S** (E-POSTER COMPETITION): Bio-scaffold Versus Synthetic Scaffold Interactions with Seeded Stem Cells in Dynamic Flow Culture Environments. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Aportela CLP, Mantovani OM, **Ramaswamy S** (ORAL): Preliminary Assessment of *De-novo* Collagen Secretion by Vic-macrophage Co-culture on 3D Engineered Valve Tissues Versus a Porcine Bio-scaffold Valve. *The Heart Valve Society (HVS) 2022 Meeting*, March 3 to 5, 2022, Miami Beach, FL.

Alvarez PA, Hsu CPD, Mirza A, Hutcheson DJ, **Ramaswamy S** (E-POSTER): Computational Assessment of Oscillatory Flows to Induce Valve Calcification. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 6<sup>th</sup> - 9<sup>th</sup>, 2021, Hybrid meeting, Orlando, FL.

Mirza A, Barreto A, Boodaram T, **Ramaswamy S** (E-POSTER): Enhanced Hemodynamic Predictions in a Calcified Aortic Valve Geometry Using the Quemada Model. *2021 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, June 14-18, 2021, Virtual Meeting.

Hsu CPD, Mirza A, Matheny R, **Ramaswamy S** (PRE-RECORDED VIDEO PRESENTATION): Tricuspid Versus Mitral Performance of Cylindrical Porcine Small Intestinal Submucosa Valves. *The Heart Valve Society (HVS) 2021 Highlights of Heart Valve Virtual Meeting*, April 9<sup>th</sup>, 2021.

Mirza AM, Barreto A, Boodoram T, **Ramaswamy S** (PRE-RECORDED VIDEO PRESENTATION): Importance of Non-Newtonian Modeling of Blood Flow for Calcified Aortic Valves: Relevance to Sub-Clinical Thrombosis. *The Heart Valve Society (HVS) 2021 Highlights of Heart Valve Virtual Meeting*, April 9<sup>th</sup>, 2021.

Agarwal A, Gonzalez BA, Gonzalez-Perez M, Scholl F, Bibevski S, Ladich E, Wagner KR, Bibevski J, Hernandez L, Morales P, Lopez J, **Ramaswamy S** (PRE-RECORDED VIDEO PRESENTATION): Fibrin Quantification on Bio-Scaffold Valve Explant as a Measure of Their Integration. *The Heart Valve Society (HVS) 2021 Highlights of Heart Valve Virtual Meeting*, April 9<sup>th</sup>, 2021.

Gonzalez BA, Gonzalez-Perez M, Scholl F, Bibevski S, Ladich E, Wagner KR, Bibevski J, Hernandez L, Morales P, Lopez J, **Ramaswamy S** (PRE-RECORDED VIDEO PRESENTATION): Assessment of Regenerated Bioscaffold Mitral Valve Annulus Extracellular Matrix Components from a Juvenile Non-human Primate Model. *The Heart Valve Society (HVS) 2021 Highlights of Heart Valve Virtual Meeting*, April 9<sup>th</sup>, 2021.

Barreto A, Paolino L, Orikasa-Lopez K, Mirza A, Agarwal A, Hutcheson J, **Ramaswamy S** (PRE-RECORDED VIDEO PRESENTATION): Constitutive Properties of Mitral Valve Tissues via Nanoindentation. *The Heart Valve Society (HVS) 2021 Highlights of Heart Valve Virtual Meeting*, April 9<sup>th</sup>, 2021.

Gonzalez BA, Perez MG, Mirza A, Scholl F, Bibevski S, Rivas-Wagner K, Bibevski J, Hernandez LE, Ladich E, Brehier V, Casares M, Morales P, Lopez J, Wagner J, **Ramaswamy S** (VIRTUAL PRESENTATION): Extracellular Matrix Quantification of Fully Regenerated Neochordae After Bioscaffold Mitral Valve Implantation in A Juvenile Non-Human Primate Model. *American Heart Association - Scientific Sessions*, November 13<sup>th</sup> - 17<sup>th</sup>, 2020, Virtual Meeting.

Hsu CP, Tchir A, Hutcheson J, **Ramaswamy S** (PRE-RECORDED ORAL): Calcific Media Combined with Media from Oscillatory Flow-Conditioned Valve Endothelial Cells Leads to Valve Interstitial Cell Calcification. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 14<sup>th</sup> -17<sup>th</sup>, 2020, Virtual Meeting.

Lin Y-M, Ekhruiwesh R, Gonzalez BA **Ramaswamy S** (E-POSTER): Identification of Stem Cells and Related Reagents in Exosomal Protein Production for Cardiac Regeneration. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 14<sup>th</sup> -17<sup>th</sup>, 2020, Virtual Meeting.

Perez MG, Mirza A, Lin Y-M, Perez M, Ribifiaro AS, He J, **Ramaswamy S** (E-POSTER): Evaluation of iPSC- Derived Cardiomyocyte Contractility in a Gel Substrate. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, Virtual meeting, October 14<sup>th</sup> -17<sup>th</sup>, 2020.

Barreto A, Mirza A, Bacca N, Gonzalez B, Nautiyal P, Hutcheson J, Agarwal A, **Ramaswamy S** (E-Poster): Increased Adhesion Forces in Severely Calcified Valve Leaflets During Indentation Testing. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 14<sup>th</sup> -17<sup>th</sup>, 2020, Virtual Meeting.

Gonzalez BA, Scholl F, Bibevski S, Wagner K-R, Bibevski J, Hernandez L, Ladich E, Brehier V, Casares M, Morales P, Lopez J, Wagner J, **Ramaswamy S** (Pre-recorded ORAL): Complete Regeneration of NeoChordae Component of Bioscaffold Mitral Valve Apparatus in a Non-Human Primate Model, *2020 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, June 17-20, 2020, Virtual Meeting.

Mirza AM, Barreto A, **Ramaswamy S** (Pre-recorded ORAL): The Effect of Pulsatility on Thrombus Risk in Trans-Aortic Stent Geometries, *2020 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, June 17-20, 2020, Virtual Meeting.

Perez-Nevarez M, Gonzalez B, Mirza A, Gonzalez M, Ramaswamy S (Pre-recorded ORAL): Torpedo-Shaped Bioreactor Design for Flow Conditioning of Cell-Seeded Tubular Heart-Valve Bioscaffolds, *2020 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, June 17-20, 2020, Virtual Meeting.

Hsu C-PD, Mirza A, Matheny R, **Ramaswamy S** (ORAL): Hydrodynamic Assessment of a Small Intestinal Submucosa Tubular Mitral Valve, *2nd International Conference of Tissue-Engineered Heart*

*Valves (ICTEHV), satellite meeting as part of the Heart Valve Society (HVS) Annual Meeting 2020* February 14-16, Abu Dhabi, UAE, 2020.

Mirza A, Barreto A, **Ramaswamy S** (POSTER): Aortic Valve Shape Assessment Following Elastin Degradation. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 16-19, Philadelphia, PA, 2019.

Hsu C-PD, Tchir AG, Hutcheson J, **Ramaswamy S** (POSTER): Vascular Smooth Muscle Cell Alpha-Smooth Muscle Actin Expression after Exposure to Conditioned Media from Endothelial Cells Cultured in Oscillatory Flow Environments. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 16-19, Philadelphia, PA, 2019.

Gonzalez BA, Scholl F, Bibevski S, Hernandez L, Brehier V, Casares M, Rivas K, Morales P, Lopez J, Wagner J, **Ramaswamy S** (ORAL): Longitudinal Tissue Engineered Mitral Heart Valve Growth Estimation in a Nonhuman Primate Model. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 16-19, Philadelphia, PA, 2019.

Tchir A, Hsu, C-PD, **Ramaswamy S** (ORAL): Oscillatory Flow Magnitude-Effects on Stem Cell Gene Expression for Heart Valve Regenerative Medicine. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 16-19, Philadelphia, PA, 2019.

Lin Y-M, Perez-Nevaraz M, Gonzalez, B, Caobi A, Raymond A, **Ramaswamy S** (POSTER): Stem cell-derived exosomes for isolation and use in injectable cardiac repair. *Biomedical Engineering Society Annual Fall Meeting (BMES)*, October 16-19, Philadelphia, PA, 2019.

Tchir AG, Hsu C-PD, **Ramaswamy S** (POSTER): Non-Linear CD31 expression in vascular endothelial cells in response to increasing oscillatory flow conditions. *SB3C2019, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Seven Springs, June 25-28, PA, 2019.*

Barreto AD, Mirza AM, **Ramaswamy S** (POSTER): A Spatial Mean Curvature Map of the Aortic Valve - Relevance to Calcification. *SB3C2019, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Seven Springs, June 25-28, PA, 2019.*

Hsu C-PD, Tchir AG, Hutcheson J, **Ramaswamy S** (POSTER): The Effects of Oscillatory Shear Regulation on Paracrine Signaling Between Vascular Endothelial Cells and Vascular Smooth Muscle Cells. *SB3C2019, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Seven Springs, June 25-28, PA, 2019.*

Gonzalez B, Hernandez L, Bibevski S, Scholl F, Brehier V, Bibevski J, Rivas K, Morales P, Wagner J, Lopez J, **Ramaswamy S** (POSTER): Recapitulation of Human Bio-scaffold Mitral Valve Growth in the Baboon Model. *American Heart Association - Scientific Sessions, November 10th - 12th, Chicago, IL 2018.*

Ali A, Tesfamariam M, Chaparro D, Hendon M, Hutcheson J, **Ramaswamy S** (POSTER): Aortic Valve Leaflet Curvature Alterations after Elastin Degradation, *Biomedical Engineering Society Annual*

*Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Hendon MH, Shaver M, Ali A, Gomez R, Gonzalez B, Bustillos J, Agarwal A, **Ramaswamy S** (POSTER): Towards 3D Printing of a Bio-mimetic Hydrogel Scaffold for Tissue Engineering Heart Valve Applications, *Biomedical Engineering Society Annual Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Gonzalez B, Bustillos J, Shaver M, Rodriguez A, Cuellar A, Agarwal A, **Ramaswamy S** (POSTER): Leaflet Extensions in Porcine Small Intestinal Submucosa Bio-Scaffolds for Heart Valve Regenerative Applications, *Biomedical Engineering Society Annual Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Hsu C-PD, Perez NM, Pour Issa E, Montesinos M, Gonzales B, Pinero A, **Ramaswamy S** (POSTER): Assembly of a Pulsatile Flow Bioreactor System to Facilitate Oscillatory-flow Conditions to Optimize In Vitro Engineered Valve Tissue Growth. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Nasim S, Medina D, Hutcheson J, **Ramaswamy S** (POSTER): Paracrine Effects of Oscillatory Shear Stress on Valvular Endothelial to Interstitial Cells in the Context of Aortic Valve Calcification. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Zatarain J, Karas M, Nasim S, **Ramaswamy S**, Tsoukias NM (POSTER): Ion Channel Expression Regulation by Sodium and Potassium in Vascular Endothelial Cells. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 17-20<sup>th</sup>, Atlanta, GA, 2018.*

Gonzalez B, Hernandez L, Bibevski S, Scholl F, Brehier V, Casares M, Bibevski J, Rivas K, Morales P, Wagner J, Lopez J, **Ramaswamy S** (ORAL): Assessment of Growth of Mitral Valves Fabricated from Porcine Small Intestinal Submucosa in a Nonhuman Primate Model. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Gonzalez B, Pinero A, Perez M, Saytashev I, Gonzalez M-C, Rivas K, Morales P, Wagner J, Ramella-Roman J, **Ramaswamy S** (POSTER): Elastin Fiber Network Alterations in Primate Aortic Valves After Flex-Flow Exposure. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Chaparro D, Tesfamariam M, **Ramaswamy S**, Hutcheson J (POSTER): A Rapid and Accurate Assessment of Aortic Valve Leaflet Curvature. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Perez-Nevarez M, Montesinos M, Pour Issa E, **Ramaswamy S** (POSTER): Assembly and Validation of a Pulsatile Flow Bioreactor for the Conditioning of Engineered Heart Valve Tissue. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Rodriguez A, Shaver M, Gonzalez B, Cuellar A, Bustillos J, Agarwal A, **Ramaswamy S** (POSTER): Fatigue Assessment of Porcine Small Intestinal Submucosa for Pediatric Heart Valve Replacement. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Williams A, Nasim S, Sukop M, **Ramaswamy S** (POSTER): Computation of Oscillatory Fluid-Induced Shear Stresses on Mesenchymal Stem Cells – for Heart Valve Phenotypic Development. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Nasim S, Medina D, Hutcheson J, **Ramaswamy S** (POSTER): Valvular Interstitial Cell Exposure to Media Derived from Oscillatory Flow Conditioned Valve Endothelial Cells: *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018.*

Hendon M, Shaver M, Gomez R, Ali A, Bustillos J, Agarwal A, **Ramaswamy S** (POSTER): Feasibility Assessment for Shape Replication of the Aortic Heart Valve using Syringe based 3D Printing. *8th World Congress of Biomechanics, July 8-12, Dublin, Ireland 2018* (Accepted as a finalist for Bachelor's level Student Poster Presentation Competition).

Nasim A, Williams A, Medina D, Valdes-Cruz L, Bibevski S, Scholl F, **Ramaswamy S** (POSTER): Valve Endothelial Cell Gene Expression in Response to a Clinically-Relevant Pediatric Pulsatile Flow Profile. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Gonzalez B, Pinero A, Perez, M, Saytashev I, Rivas K, Morales P, Ramella-Roman J, **Ramaswamy S** (POSTER): Two-Photon Fluorescence Microscopy Assessment of Elastin Fiber Network in Primate Aortic Valves Subjected to Flex-Flow Conditions. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Gonzalez B, Mankame OM, Hernandez L, Valdes-Cruz L, Bibevski S, Scholl F, Bell SM, Baez I, **Ramaswamy S** (POSTER): Preliminary Clinical Assessment of Growth Potential of Mitral Valves Fabricated from Porcine Small-Intestinal Submucosa. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Pour Issa E, Mankame OM, Hernandez L, Valdes-Cruz L, Bibevski S, Scholl F, Bell SM, Baez I, **Ramaswamy S** (POSTER): Bioscaffold Mitral Valve Hydrodynamic Evaluation in Child versus Adult Hemodynamic Settings, *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Suthar N, Gonzalez B, Pinero A, Perez M, Saytashev I, Rivas K, Morales P, Roman-Ramella J, **Ramaswamy S** (POSTER): Histological Assessment of Elastin Fiber Orientation in Non-Human Primate Aortic Valves After Flex- Flow Treatment, *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Medina D, Nasim S, Williams A, **Ramaswamy S** (POSTER): Computational Fluid Dynamic Analysis of Neonatal Aortic Valve Post Balloon Valvuloplasty, *Biomedical Engineering Society Annual Fall Meeting (BMES), October 11-14th, Phoenix, AZ, 2017.*

Cuellar A, Gonzalez B, Mankame B, **Ramaswamy S**, Valdez-Cruz L, Bibevski S, Scholl F, Hernandez L, Brehier S, Casares M, Rivas K, Morales P, Lopez J, Bell S, Baez I (POSTER): Preliminary and Acute Histological Assessment Of Elastin In A Porcine Small-Intestinal Submucosa Replacement Mitral Valve. *Biomedical Engineering Society Annual Fall Meeting (BMES), October*

11-14th, Phoenix, AZ, 2017.

Perez M, Mankame O, Pour Issa E, Williams A, Piñero A, **Ramaswamy S** (POSTER): Design Integration of a Physiologically Relevant Pulsatile Bioreactor System for Cardiovascular Valve Tissue Studies, *SB3C2017, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Tucson, AZ, 2017.*

Mankame O, **Ramaswamy S**, Valdes-Cruz L, Bibevski S, Scholl F, Baez I (ORAL): Porcine Small Intestinal Submucosa Mitral Valve Functionality Under Pediatric Conditions. *SB3C2017, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Tucson, AZ, 2017.*

Williams A, Perez M, Moshkforoush A, Mankame O, Salinas M, Tsoukias N, **Ramaswamy S** (POSTER): A Computational Analysis of Aortic Pulsatile Flow Conditions for Valve Tissue Formation. *SB3C2017, Summer Biomechanics, Bioengineering and Biotransport Conference, June 21 – 24, Tucson, AZ, 2017. (Selected as finalist for MS-level poster competition).*

Mankame O, Valdes-Cruz L, Bibevski S, Scholl F, Baez I, **Ramaswamy S** (POSTER): Early Hydrodynamic Assessment of a Porcine Small Intestinal Sub-Mucosa Bioscaffold Valve for Mitral Valve Replacement. American College of Cardiology (ACC), *66th Annual Scientific Session, March 17-19th, Washington DC, 2017.*

Nasim S, Castellanos G, Medina-Almora D, Rath S, **Ramaswamy S** (POSTER): Cytoskeletal Reorganization of Marrow Stem Cells in Response to Flow. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 5-8<sup>th</sup>, Minneapolis, MN, 2016.*

Pour Issa E, Williams AT, Nasim S, Moshkforoush A, Media-Almora D, Valdes-Cruz L, Bibevski S, Scholl F, Tsoukias N, **Ramaswamy S** (POSTER): Flow Field in Critical Aortic Valve Stenosis in Infants. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 5-8<sup>th</sup>, Minneapolis, MN, 2016.*

Williams A, Perez M, Moshkforoush A, Mankame O, Salinas M, Tsoukias N, **Ramaswamy S** (ORAL): Physiologically relevant Effects of Fluid Pulsatility on Engineered Valve Tissue Growth. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 5-8<sup>th</sup>, Minneapolis, MN, 2016.*

Hausz R, Mankame OV, Valdes-Cruz L, Bibevski S, Scholl F, Bell SM, Baez I, **Ramaswamy S** (POSTER): Porcine Small Intestinal Submucosal Mitral Valve Hydrodynamics: Preliminary Assessment. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 5-8<sup>th</sup>, Minneapolis, MN, 2016.*

Shaver M, Agarwal A, Rengifo S, **Ramaswamy S** (POSTER): Feasibility of 3-D Printing for the Replication of Tri-Leaflet Heart Valve Shape. *Biomedical Engineering Society Annual Fall Meeting (BMES), October 5-8<sup>th</sup>, Minneapolis, MN, 2016.*

Nasim S, Castellanos G, Medina D, Valdes-Cruz L, Bibevski S, Scholl F, **Ramaswamy S** (ORAL): Flow Patterns in critical congenital aortic valve stenosis Post-repair. *The 7th Biennial Heart Valve Biology & Tissue Engineering Meeting, 12th - 14th October 2016, Hilton Head Island, SC, (Accepted*



for presentation; meeting was cancelled due to inclement weather).

Mankame O, Hausz R, Valdes-Cruz L, Bibevski S, Scholl F, Bell S, Baez I, **Ramaswamy S** (ORAL): Porcine Small Intestinal Submucosal Valve Functionality In The Mitral Position. *The 7th Biennial Heart Valve Biology & Tissue Engineering Meeting*, 12th - 14th October 2016, Hilton Head Island, SC, (Accepted for presentation; meeting was cancelled due to inclement weather).

Nasim S, Castellanos G, Estrada A, Medina D, Lordeus M, Valdes-Cruz L, Bibevski S, Scholl F, Boesl B, Agarwal A and **Ramaswamy S** (POSTER): Flow Field Post-Repair in Critical Aortic Valve Stenosis: Implications to Recurring Disease States, *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB<sup>3</sup>C)*, National Harbor, MD, June 29 – July 2, 2016 (Accepted as a finalist for Master's level Student Paper Competition).

Comella K, Stewart D, Rath S, **Ramaswamy S** (POSTER): *In vitro* Studies on Native to Engineered Heart Valve Tissue Integration. *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB<sup>3</sup>C)*, National Harbor, MD, June 29 – July 2, 2016.

Mankame OV, Lordeus M, Valdes-Cruz L, Bibevski S, Scholl F, Bell SM, Baez I, **Ramaswamy S** (POSTER): Porcine Small Intestinal Submucosal Valve Dynamics in the Aortic Position. *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB<sup>3</sup>C)*, National Harbor, MD, June 29 – July 2, 2016.

Salinas M, Unnikrishnan V, **Ramaswamy S** (POSTER): Nutrient Transport in Dynamic Culture of Engineered Valves. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Castellanos G, Nassar L, Rath S, **Ramaswamy S** (POSTER): Bone Marrow Stem Cell Structural Reorganization after Flow Exposure: Relevance to the Valve Phenotype. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Dua R, Comella K, Butler R, Castellanos G, Brazille B, Claude A, Agarwal A, Liao J, **Ramaswamy S** (POSTER): The Role of Hydroxyapatite Nanoparticles in Enhancing Cartilage-Cartilage Integration in Osteoarthritic Environments. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Rath S, Salinas M, Villegas A, **Ramaswamy S** (POSTER): Fluid Oscillations: A Key Component to Valvulogenic Gene Expression. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Mankame O, Lordeus M, Valdes-Cruz L, Bibevski S, Scholl F, Bell SM, Baez I, **Ramaswamy S** (POSTER): Porcine Small Intestinal Submucosal ECM Valve Dynamics in the Aortic Position. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Estrada A, Castellanos G, Almora D, Moshkforoush A, Valdes-Cruz L, Bibevski S, Scholl F, **Ramaswamy S** (POSTER): Endothelial Cell Responses to Flow Profiles and Tensile Testing. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Stewart D, Comella K, Rath S, **Ramaswamy S** (POSTER): Native to Engineered Valvular Tissue Integration Under Flex-Flow States. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, Tampa, FL, October 7-10, 2015.

Dua R, Siyambalapitiya C, Agarwal A and **Ramaswamy S** (POSTER): Tissue Engineered Cartilage Interaction in Healthy and Diseased Environment Using Hydroxyapatite Nanoparticles. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, San Antonio, TX, October 22-25, 2014.

Rath S, Villegas A, Salinas M, **Ramaswamy S** (ORAL): Physiological Relevant Shear Stress and Flexure in Developing Valvular Tissues. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, San Antonio, TX, October 22-25, 2014.

Salinas M, Unnikrishnan V, **Ramaswamy S** (POSTER): Nutrient Transport During Engineered Heart Valve Tissue Exposure to Steady Flow. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, San Antonio, TX, October 22-25, 2014.

Lordeus M, Estrada A, Stewart D, Dua R, Zhang C, Agarwal A, **Ramaswamy S** (POSTER): Properties of Graphene-Silicone Prosthetic Heart Valves. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, San Antonio, TX, October 22-25, 2014.

Rath S, Van Gulden S, **Ramaswamy S** (POSTER): Mechanotransduction events in bone marrow mesenchymal stem cells after fluid flow exposure, *7th World Congress of Biomechanics*, July 6-11, 2014, Boston, Massachusetts.

Salinas M, **Ramaswamy S** (POSTER): Oscillatory Fluid-Induced Shear Stresses in Moving Engineered Valvular Tissues, *7th World Congress of Biomechanics*, July 6-11 2014, Boston, Massachusetts.

Lordeus M, Estrada A, Stewart D, Zhang C, Dua R, Agarwal A, **Ramaswamy S** (POSTER): Silicone Graphene Composite Material for the Heart Valve Prosthesis Application, *7th World Congress of Biomechanics*, July 6-11, 2014, Boston, Massachusetts.

Lordeus M, Dua R, **Ramaswamy S** (ORAL): Mechanical characterization in the valve prosthesis and engineered cartilage interface applications, Bose Symposium on Advances on Biomechanics Research, *7th World Congress of Biomechanics*, July 6-11, 2014, Boston, Massachusetts.

Dua R, **Ramaswamy S** (POSTER): Cartilage-Cartilage Integration Improvements using Hydroxyapatite: Healthy versus Osteoarthritic Conditions, *7th World Congress of Biomechanics*, July 6-11, 2014, Boston, Massachusetts.

Lordeus M, Estrada A, Stewart D, Zhang C, Dua R, Agarwal A, **Ramaswamy S** (POSTER): A Graphene Reinforced Silicone Composite Material for Artificial Heart Valves, Biomaterials Day 2014- Engineering the Future of Medicine, *Society of Biomaterials, University of Florida*, Gainesville, FL, March 28<sup>th</sup> 2014.

Salinas M, **Ramaswamy S** (POSTER): Implications of Oscillatory Shear Stress Environments for Engineered Heart Valves, Biomaterials Day 2014- Engineering the Future of Medicine, *Society of Biomaterials, University of Florida, Gainesville, FL, March 28<sup>th</sup> 2014.*

Castellanos G, Behdad S, Rath S, Boesl B, **Ramaswamy S** (POSTER): Bone Marrow Stem Cell Deformation During Valve-Relevant Loading, Biomaterials Day 2014- Engineering the Future of Medicine, *Society of Biomaterials, University of Florida, Gainesville, FL, March 28<sup>th</sup> 2014.*

Rath S, **Ramaswamy S** (POSTER): Mechanically-regulated Gene Expression in Heart Valve Targeted Tissue Engineering Studies, Biomaterials Day 2014- Engineering the Future of Medicine, *Society of Biomaterials, University of Florida, Gainesville, FL, March 28<sup>th</sup> 2014.*

Dua R, **Ramaswamy S** (POSTER): Interfacial Properties Between Stem Cell and Chondrocyte Derived Tissue Matrices Using Hydroxyapatite Nanoparticles, Biomaterials Day 2014- Engineering the Future of Medicine, *Society of Biomaterials, University of Florida, Gainesville, FL, March 28<sup>th</sup> 2014.*

Lahiri D, Zhang C, Dua R, Hec F, Thiesse M, Durygin A, **Ramaswamy S**, Agarwal A (ORAL): Graphene Reinforced Ultra High Molecular Weight Polyethylene for Orthopedic Application. *2014 TMS Annual Meeting & Exhibition, San Diego, CA, February 16 – 20, 2014.*

Dua R and **Ramaswamy S** (ORAL): Osteoinduction with hydroxyapatite nanoparticles for enhanced integration of tissue engineered cartilage constructs to diseased cartilage mimics. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Seattle, WA, September 25-28, 2013.*

Dua R. and **Ramaswamy S** (ORAL): A Hydroxyapatite-Based Technique for Increasing Integration of Engineered Cartilage with Surrounding Tissues. *Southern Biomedical Engineering Conference 2013, Miami, FL. May 3-5, 2013.*

Rafiee P, Alfonso A, and **Ramaswamy S** (ORAL): Effects of Valve-Relevant Mechanical Stresses on Periodontal Ligament Cell Differentiation. *Southern Biomedical Engineering Conference 2013, Miami, FL. May 3-5, 2013.*

Stewart D, Dugrot M, Munroe N and **Ramaswamy S** (ORAL): Platelet Adhesion Characteristics of Materials for Use in Blood-Contacting Applications. *Southern Biomedical Engineering Conference 2013, Miami, FL. May 3-5, 2013.*

Rath S and **Ramaswamy S** (ORAL): Distribution of Actin Filaments and Focal Adhesions in Marrow Stem Cells under Various Flow-Based Culture Condition. *Southern Biomedical Engineering Conference 2013, Miami, FL. May 3-5, 2013.*

Lordeus M, Tanne D, Bouchinet L, Bjornstad G, Goicoechea G, **Ramaswamy S** (POSTER): Computational prediction of aortic stent mechanical response to pulsatile flow fatigue loads. *Southern Biomedical Engineering Conference 2013, Miami, FL. May 3-5, 2013.*

Salinas M, Bouchinet L, Tanne D, Bjornstad G, Goicoechea G, and **Ramaswamy S** (ORAL): Finite

element Analysis of Stents for Use in Stent-Graft Aortic Implantation. *Southern Biomedical Engineering Conference 2013*, Miami, FL. May 3-5, 2013.

Brignola G, Lordeus M, **Ramaswamy S** (ORAL): Temporal Shear Stress Changes on Tri-leaflet Valve Structures: Implications for Emerging. Elastomeric Valves. *Southern Biomedical Engineering Conference 2013*, Miami, FL. May 3-5, 2013.

Martinez C, Dua R, **Ramaswamy S** (ORAL): Fluid Shear Stress Alters Native Cell Migration in Engineered Valve Tissues. *ASME 2013 2nd Global Congress on NanoEngineering for Medicine and Biology (NEMB2013)*, Boston, MA, Feb. 4–6, 2013.

Dua R. and **Ramaswamy S.** (POSTER): Enhancement Of Interfacial Mechanical Properties Of Tissue Engineered Cartilage To Bone Using Hydroxyapatite Nanoparticles. Paper Number NEMB2013-93205. *Proceedings of the 2013 ASME Global Congress on Nano Engineering for Medicine and Biology*, February 4-6, 2013, Boston, MA, USA.

Rath S, **Ramaswamy S** (POSTER): Scaffold design in mechanically-induced cardiomyogenic differentiation of periodontal ligament cells. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Alfonso AR, Martinez C, Hernandez M, **Ramaswamy S** (POSTER): Cyclic Flexure, Laminar Flow, and Fibrin Effects on the Production of Stem Cell Derived Engineered Valve Tissue. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Dua R, Gill P, Munroe N, **Ramaswamy S** (ORAL): A Hydrogel-Mineral Composite Scaffold to Improve the Shear Stress Between Engineered Cartilage and Bone. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Pierre KK, Salinas M, Carroll R, Landaburo K, Yamaguchi H, DeGross C, Al-Mousily F, Bleiweis M, **Ramaswamy S** (POSTER): Hydrodynamic Evaluation of a Novel Tri-Leaflet Silicone Heart Valve Prosthesis. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Van Gulden, S., Salinas, M., Martinez, C., **Ramaswamy, S** (POSTER): Fluid-Flow Patterns as Regulatory Mechanisms in Stem-Cell Based Heart Valve Tissue Engineering. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Salinas M, Schmidt DE, Libera M, Lange RR, **Ramaswamy S** (POSTER): Geometric Changes and Pulsatility Effects on Oscillatory Shear Stress Environments: Implications for Heart Valve Tissue Engineering. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Atlanta, GA, October 24-27, 2012.*

Salinas M, Schimdt D, Lange R, Libera M, **Ramaswamy S** (POSTER): Computational Prediction of Fluid Induced Stress States in Dynamically Conditioned Engineered Heart Valve Tissues. *American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference, Fajardo, Puerto Rico, June 20-23, 2012.*

Gill P, Munroe N, Dua R, **Ramaswamy S** (ORAL): Electrochemical Studies of Degradable Biomaterials in PBS and PBS with Amino Acids. 220th ECS Meeting & Electrochemical Energy Summit, Boston, MA, October 9 – 14, 2011.

Martinez C, Henao A, Padgett K, Pelaez D, **Ramaswamy S** (POSTER): Iron Oxide Labeling of Three Different Cell Populations: Relevant to Tissue Engineered Heart Valves. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Hartford, CT, October 12-15, 2011.*

Salinas M, Lange R, **Ramaswamy S** (POSTER): The Study of Time Varying Effects in the Dynamic Culture of Engineered Heart Valves. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Hartford, CT, October 12-15, 2011.*

Dua R, Centeno J, **Ramaswamy S** (POSTER): Hydroxyapatite nanoparticles improve retention of tissue engineered cartilage constructs. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Hartford, CT, October 12-15, 2011.*

Gill P, Munroe N, Dua R, **Ramaswamy S** (ORAL): Electrochemical Studies of Degradable Biomaterials in PBS and PBS with Amino Acids. 220th ECS Meeting & Electrochemical Energy Summit, Boston, MA, October 9-14, 2011.

**Ramaswamy S** (ORAL): Valve-like Movement Effects on the Computational Prediction of Fluid-Induced Specimen Surface Shear Stresses. *11<sup>th</sup> US National Congress on Computational Mechanics (USCCM -11), Minneapolis, MN, July 25<sup>th</sup> -28<sup>th</sup>, 2011.*

Salinas M, Lange R, **Ramaswamy S** (POSTER): Specimen Dynamics and Subsequent Implications in Heart Valve Tissue Engineering Studies. *American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference, Farmington, PA, June 21<sup>st</sup> – 25<sup>th</sup> 2011.*

**Ramaswamy S**, Salinas M, Lange R (POSTER): Insights on Specimen Movement Effects on Engineered Heart Valve Tissue. Inaugural Conference on Cellular and Molecular Engineering - 29<sup>th</sup> Scientific Meeting of the Society for the Physical Regulation in Biology and Medicine (SPRBM), Miami Beach, FL, January 4 – 8, 2011.

Martinez C, Padgett K, Henao A, Ramirez L, **Ramaswamy S** (POSTER): Migration of Vascular Scaffolds Exposed to Valve-Like Deformations: Implications for Heart Valve Tissue Engineering. *The TERMIS-NA 2010 Annual Conference & Exposition, Orlando, FL, December 5 - 8, 2010.*

Salinas M, Fernandez L, Lang R, **Ramaswamy S** (POSTER): The Importance of Dynamics on Heart Valve Tissue Engineering: A Modeling Approach. *The TERMIS-NA 2010 Annual Conference & Exposition, Orlando, FL, December 5 - 8, 2010.*

Dua R, Centeno J, Parrilla K, Agarwal A, **Ramaswamy S** (POSTER): Osteoinduction with Hydroxyapatite for Enhanced Anchorage of Tissue Engineered Cartilage Constructs. *The TERMIS-NA 2010 Annual Conference & Exposition, Orlando, FL, December 5 - 8, 2010.*

Salinas M, Lang R, **Ramaswamy S** (POSTER): The Importance of Dynamics on Heart Valve Tissue Engineering: A Modeling Approach. *The 10<sup>th</sup> NJ symposium on Biomaterials Science: From Materials Design to Scaffolds to Tissue Regeneration, New Brunswick, NJ, October 27<sup>th</sup>-28<sup>th</sup> 2010.*

Schornack PA, **Ramaswamy S** (ELECTRONIC POSTER): MRI of Vascular Cells Labeled with SPIO-PLL Complexes for Heart Valve Tissue Engineering Studies. *ISMRM-ESMRMB Joint Annual Meeting, Stockholm, Sweden, May 1<sup>st</sup> – 7<sup>th</sup> 2010.*

**Ramaswamy S**, Gottlieb D, Mayer JE, Sacks MS (POSTER): Effects of Physiological Hemodynamics on Engineered Heart Valve *In-Vitro* Tissue Development Using Bone Marrow-Derived Mesenchymal Stem Cells. *Symposium on Cardiovascular Regenerative Medicine NHLBI-NIH, Bethesda, MD, October 14-15, 2009.*

**Ramaswamy S**, Schornack P, Ivanova J, Smelko A Sacks MS (ORAL): MRI of Vascular Cells Labeled with SPIO-PLL Complexes for Heart Valve Tissue Engineering Studies. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Pittsburgh, PA, October 7-10, 2009.*

**Ramaswamy S**, Schmidt D, Boronyak S, Sacks MS (POSTER): Flow Patterns Under Combined Flexural States for Engineered Heart Valve Tissue Development. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Pittsburgh, PA, October 7-10, 2009.*

Boronyak S, Smelko A, Sacks MS **Ramaswamy S** (POSTER): Design of a Flow-Stretch-Flexure Bioreactor for Physiologic Conditioning of Engineered Tissue. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Pittsburgh, PA, October 7-10, 2009. Winner of the 2009 BMES undergraduate research award.*

**Ramaswamy S**, Smelko A, Boronyak S Schornack P, Sacks MS (POSTER): A MRI-Compatible Bioreactor for Monitoring Conditioned Marrow Derived Stem Cell Seeded Scaffolds. *Biomedical Engineering Society (BMES) Annual Fall Meeting, Pittsburgh, PA, October 7-10, 2009.*

**Ramaswamy S**, Schmidt D, Boronyak S, Sacks MS (ORAL): Flow Patterns in a Flow Stretch Flexure Bioreactor System: Implications for the Conditioning of Heart Valve Tissue. *American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference, Lake Tahoe, CA, June 17<sup>th</sup> – 21<sup>st</sup> 2009.*

**Ramaswamy S**, Schmidt DE, Boronyak SM, Sacks MS (POSTER): Flow patterns in flow-stretch-flexure bioreactors: Implications for heart valve tissue formation. *FDA/NHLBI/NSF Workshop on Computer Methods for Cardiovascular Devices, Rockville, MD, June 1-2, 2009.*

**Ramaswamy S**, Boronyak S, Schmidt D, Sacks MS (ORAL): Design of a Novel Curved Tube Flow-Stretch-Flexure Bioreactor for Mechanistic Studies in Heart Valve Tissue Engineering. *Society for Biomaterials, 2009 Annual meeting and exposition, San Antonio, TX, April 22 to 25 2009.*

**Ramaswamy S**, Boronyak S, Goldberg M, Schornack P, and Sacks MS (POSTER): Design of a Novel, MRI-compatible Bioreactor for Longitudinal Monitoring of Mechanically Conditioned

Engineered Cardiovascular Constructs. *ISMRR 17th Scientific Meeting & Exhibition, Honolulu, HI, 18-24th April 2009.*

**Ramaswamy S, Sacks M (POSTER):** Design of a Novel Curved Tube Flow-Stretch-Flexure Bioreactor for Mechanistic Studies of Heart Valve Tissue Engineering. *13th Annual Hilton Head Workshop, Hilton Head Island, SC, March 5- 8 2009.*

**Ramaswamy S, Boronyak S, Schmidt D, Sacks MS (POSTER):** Design and Evaluation of a New Flow-Stretch-Flexure Bioreactor for Mechanical Conditioning of Engineered Heart Valve Tissues in the Physiological Range. *The TERMIS-NA 2008 Annual Conference & Exposition, San Diego, CA, December 7 - 10, 2008. Selected as a top finalist in Young Investigator poster competition.*

**Ramaswamy S, Gottlieb D, El-Kurdi M, Mayer JE, Sacks MS (POSTER):** Properties of Tissue Engineered Heart Valves after Mechanical Pre-Conditioning at Pulmonary Artery Hemodynamic Conditions. *The TERMIS-NA 2008 Annual Conference & Exposition, San Diego, CA, December 7 - 10, 2008.*

**Ramaswamy S, Gottlieb D, Mayer JE, Sacks MS (ORAL):** Engineered Heart Valve Tissue Formation at the Organ Level – Effects of Flow Dynamics on Tissue Development. *American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference, Marco Island, FL, June 25<sup>th</sup> - 29<sup>th</sup> 2008. Selected for oral presentation at the special “Nerem Symposium”.*

**Ramaswamy S, Gottlieb D, Mayer JE, Sacks MS (ORAL):** Guiding *In-vitro* Engineered Heart Valve Tissue Formation in the Pulmonary Valve Physiologic Environment. *8<sup>th</sup> World Biomaterials Congress: Crossing Frontiers in Biomaterials and Regenerative Medicine, Amsterdam, The Netherlands, May 28<sup>th</sup> – June 1<sup>st</sup>, 2008.*

**Ramaswamy S, Sacks MS (ORAL):** Effects on Specimen Motion on Flow Induced Shear Stresses in Engineered Heart Valve Tissues. *8<sup>th</sup> World Biomaterials Congress: Crossing Frontiers in Biomaterials and Regenerative Medicine. Amsterdam, The Netherlands, May 28<sup>th</sup> – June 1<sup>st</sup> 2008.*

**Ramaswamy S, Gottlieb D, Mayer JE, Sacks MS (POSTER):** Effects of *In-vitro* Mechanical Pre-Conditioning in the Development of Tissue Engineered Heart Valves (TEHVs). *3<sup>rd</sup> Biennial Heart Valve Biology and Tissue Engineering Meeting, The Royal Society, London, UK, May 4<sup>th</sup>-7<sup>th</sup> 2008.*

**Ramaswamy S, Gottlieb D, Mayer JE, Sacks MS (ORAL):** Physiological Conditioning of TEPVs Seeded with Ovine Bone Marrow Mesenchymal Stem Cells. *Regenerative Medicine – Advancing to Next Generation Therapies, Hilton Head Island, SC, March 12-16, 2008.*

**Ramaswamy S, Sacks MS (POSTER):** Influence of Simulated Physiological Hemodynamics on Engineered Heart Valve Tissue Formation. *Biomedical Engineering Society (BMES), Annual Fall Meeting, Los Angeles, CA, September 26-29, 2007.*

**Ramaswamy S**, Uluer MC, Zhang Z, Spencer RG: SPIO-Labeled Chondrocytes for MRI Evaluation of Cell Distribution in Tissue Engineered Constructs. *Biomedical Engineering Society (BMES)*, Annual Fall Meeting, Chicago, IL, October 11-14, 2006.

**Ramaswamy S**, Gurkan I, Sharma B, Fishbein KW, Cascio B, Elisseeff JH, Spencer RG: Effectiveness of a Biomaterial Adhesive in Integrating a Hydrogel with Surrounding Tissue in Rabbit Cartilage Defects. *International Society of Magnetic Resonance in Medicine (ISMRM)*, 14<sup>th</sup> Scientific Meeting, Seattle, WA, May 6-12, 2006.

Kim M, Hidaka C, Cheng C, **Ramaswamy S**, Spencer RG, Camacho NP: Development and Analysis of Tissue-Engineered Mammalian Cartilage in a Hollow-Fiber Bioreactor: FTIR Spectroscopic and Gene Expression Studies. 6<sup>th</sup> *International Cartilage Repair Society (ICRS) Symposium*, San Diego, CA, January 8-11, 2006.

**Ramaswamy S**, Fishbein KW, Wang DA, Elisseeff J, Spencer RG: Study of Collagen Content Progression in Engineered Cartilage Using Magnetization Transfer Imaging. *Biomedical Engineering Society (BMES)*, Annual Fall Meeting, Baltimore, MD, September 28-October 1, 2005.

Jones B, Duffy K, **Ramaswamy S**, Anson R, Pistell P, Chachick M, Spangler R, Spencer R, Ingram D, De Cabo R: Is Limiting Calorie Intake Necessary for Reaping the Rewards of Dietary Restriction – or is it Just a Gut Feeling? *American Aging Association - 34<sup>th</sup> Annual Meeting, Aging: Mechanisms and Prevention*, Oakland, CA, June 3-6, 2005.

**Ramaswamy S**, Fishbein KW, Wang DA, Elisseeff J, Spencer RG: *Non-Invasive Monitoring of Tissue Engineered Cartilage Development Using MRI. Regenerate 2005, Atlanta, GA, June 1-3, 2005.*

**Ramaswamy S**, Fishbein KW, Wang DA, Elisseeff J, Spencer RG: Magnetization Transfer Imaging for the Study of Matrix Development in Tissue Engineered Cartilage Materials. *The 46<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC46)*, Providence, RI, April 10-15, 2005.

**Ramaswamy S**, Wang DA, Fishbein KW, Taboas A, Elisseeff JH, Spencer RGS: Evaluation of the Interactions at the Hydrogel-Cartilage Interface Using Magnetic Resonance Imaging. *2004 Gordon Research Conference on Musculoskeletal Biology & Bioengineering; Orthopaedic Tissue Engineering: Basic Science to Clinical Applications*, Andover, New Hampshire, July 25-30, 2004.

Wang. DA., Meyers JD, Taboas A, Williams CG, Wenz J, **Ramaswamy S**, Spencer RGS, Elisseef JH: Magnetic Resonance Imaging on *In Vitro* Engineered Cartilage – In Situ Transplantation of Mesenchymal Stem Cells in Hydrogels. *50<sup>th</sup> Annual Meeting of the Orthopaedic Research Society (ORS)*, March 7-10, 2004, San Francisco, CA).

**Ramaswamy S**, Wahle A, Lai Y, Olszewski M, Braddy K, Rossen JD, Sonka M, Chandran KB: Effect of Motion on the Fluid Dynamics in a Human Left Coronary Artery. *Biomedical Engineering Society (BMES)*, Annual Fall Meeting, October 1-4, Nashville, TN, 2003.



**Ramaswamy S**, Wahle A, Lai Y, Olszewski M, Braddy K, Rossen JD, Sonka M, Chandran KB: Alterations in Arterial Motion and Flow Dynamics in a Coronary Artery Before and After Intervention. *Biomedical Engineering Society (BMES), Annual Fall Meeting*, October 1-4, Nashville, TN, 2003.

Chandran KB, **Ramaswamy S**, Wahle A, Lai Y, Olszewski M, Braddy K, Brennen T, Rossen J, Sonka M: Steady and Unsteady Flow Dynamic Analysis in a Human Coronary Artery with Stenosis. *World Congress on Medical Physics and Biomedical Engineering*, Aug.24-29<sup>th</sup> Sydney, Australia, 2003.

Vigmostad S, **Ramaswamy SD**, Lai YG., Wahle A, Rossen J, Sonka M, Chandran KB: Localized Geometric Changes in Relation to Coronary Artery Hemodynamics and Wall Thickness. *Research Open House Poster Session at the College of Engineering, The University of Iowa, Selected as Best Poster* in the Department of Biomedical Engineering, April 2003.

Chandran KB, **Ramaswamy SD**, Lai YL, Wahle A, Sonka M: Effect of Constant and Time-varying Flow rate in the Right Coronary Artery. American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), *Vol.51, 2001, New York*.

Ramakrishna S, Teoh SH, **Ramaswamy SD**, Hastings GW and Tan CT: Development of a Knitted fabric Reinforced Elastomeric Composite Intervertebral Disc Prosthesis. *11<sup>th</sup> International Conference of Composite Materials (ICCM-11)*, July 1997, Australia.

Teoh SH, **Ramaswamy SD**, Hastings GW and Tan CT: Rotational Molding for the Manufacture of an Intervertebral Disc Prosthesis. 1<sup>st</sup> Scientific Meeting of the Biomedical Engineering Society (Singapore), January 1996.

Teoh SH, **Ramaswamy SD**, Ramakrishna S, Hastings GW and Tan CT: A Novel Method of Fabricating a Textile Preform Reinforced Polymeric Intervertebral Disc Prosthesis (IVDP) using Rotational Molding. *The Polymer Processing Society, Asia/Australia Regional Meeting*, November 1996, Singapore.

Ramakrishna S, **Ramaswamy SD** and Teoh SH: Development of Thin and Flexible Knitted Fabric Composites for Soft Tissue Replacements. *Japanese Society for Artificial Organs (JSAO)*, September 1997.

**Ramaswamy SD**, Diner H, Huang ZM, Ramakrishna S and Teoh SH: Development of Fibrous Structure Based Materials. *Poster Conference in Conjunction with the Institute of Materials and Engineering (IMRE) Official Launch, Selected as Best Poster*, September 1997, Singapore.

## **FUNDED RESEARCH/GRANTS**

Agency: National Science Foundation (NSF)

PFI-Partnerships for Innovation Program

Title: PFI-TT: Development of an enhanced molecular cargo via flow oscillations for heart regeneration

Status: Awarded, June 2020 (06/01/20 – 12/31/22)

Amount: \$250,000

Award #: 1941141

NSF Research Enhancement for Undergraduates (REU) supplement for this project was awarded in February 2021 and in May 2022, in the net amount of \$32,000

NSF Allowable Patent Expenses (APEX) supplement for this project was awarded in July 2022, in the amount of \$45,275

Total project award:  $\$250,000 + \$32,000 + \$45,275 = \$327,275$

Role: PI

Agency: CorMatrix

Title: Hydrodynamic testing of a seamless bioscaffold valve design in the mitral location

Status: Awarded, February 2020 (02/01/2020 - 07/01/2021)

Amount: \$15,000 (100% direct costs)

Role: Principal Investigator (PI)

Agency: National Science Foundation (NSF), Boston University

Title: NSF Engineering Research Center (ERC) in Cellular Metamaterials (CELL-MET)

Status: Awarded, October 2019

Amount: \$236,950 (10/01/2019 - 09/30/2022)

Award#: 1647837

Role: Local (Florida International University), Co-Principal Investigator (CO-PI)

Agency: US Department of State

Title: Fulbright award to Sweden (Karolinska Institutet) - Mechanobiology and Cardiovascular Regeneration

Status: Awarded, February 2019 (May 4<sup>th</sup> – May 18<sup>th</sup>, 2019)

Amount: \$3,100 + travel costs (100% direct costs)

Award #: FSP-P004466

Role: Fulbright Specialist

Agency: Miami Heart Research Institute (MHRI)/Florida Heart Research Foundation (FHRF)

Title: Stem Cell-seeded bioscaffolds supporting somatic growth, function and remodeling in the treatment of critical congenital valve disease in the young

Amount: \$300,000 (100% direct costs)

Status: Awarded (MHRI), October 2018 (\$150,000; 02/28/2019-02/28/2021)

Renewal: Awarded (FHRF), March 2021 (\$150,000; 03/09/2021-09/08/2022)

Role: PI

Agency: FIU College of Engineering and Computing Coulter Foundation Seed Grants Program

Title: A curvature-based biomarker for early detection of aortic valve calcification

Amount: \$100,475

Status: Awarded, July 2018 (07/01/2018 - 06/01/2020)

Role: PI

Agency: Vivex Biomedical Inc.

Title: Terminal sterilization

Amount: \$5,000 (100% direct costs)  
Status: Awarded, August 2018 (08/20/2018 – 12/31/2019)  
Role: PI

Agency: Office of Research and Economic Development (ORED), FIU  
Start-up-FIU seed Funding  
Title: A bioreactor mimicking the human circulation  
Amount: \$10,000  
Status: Awarded, December 2016 (12/31/2016 – 12/31/2017)  
Role: PI

Agency: American Heart Association (AHA)  
Grant in Aid, Southeastern Affiliate  
Title: Bioscaffold mitral valve replacement permitting somatic growth and remodeling  
Amount: \$154,000 (0.25% percentile, priority score: 1.24 – (1.0 – 1.4 considered excellent))  
Status: Awarded, May 2016 (07/01/2016 – 06/30/2018; no cost extension till 06/30/2019)  
Award #: 16GRNT31090009  
Role: PI

Agency: National Science Foundation (NSF)  
I-Corps National Teams Program  
Title: I-Corps: Mechanically Conditioned 3-Dimensional Cell Culture System  
Status: Awarded, May 2016 (08/01/16 – 01/31/17)  
Amount: \$50,000  
Award #: 1644603  
Role: PI

Agency: National Science Foundation (NSF)  
Mini-I-Corps Site program  
Title: 3D Flow-Stretch-Flex Bioreactor  
Status: Awarded, March 2016 (03/31/16 – 05/01/16)  
Amount: \$2,550  
Award #: 1347356  
Role: PI

Agency: BME Coulter Seed Grant  
Title: Permanent valvular replacement supporting growth using porcine bioscaffolds  
Status: Awarded, March 2016 – March 2017.  
Amount: \$16,667  
Role: PI

Agency: Saint George Medical, Inc.  
Title: Fatigue and constitutive properties of novel stent-graft  
Status: Awarded, June 2012 (06/12 – 06/14)  
Amount: \$38,500 (100% direct costs)  
Role: PI

Agency: Seventh Framework Program of the Directorate General Research of the European Commission

Title: Targeted delivery for liver cancer treatment (Heptag exchange)

Status: Awarded: January 2012 (1/2012 – 12/2015)

ID #: FP7-PEOPLE-2011-IRSES-295218.

Amount: €105,000 (\$118,514)

Role: Collaborator

The four institutional partners of this grant are: 1. Sichuan University, China, University of Navarra, Spain (Universidad de Navarra, España), Florida International University (FIU), USA, and University of Wolverhampton, UK. The project PI is Dr. James Z. Tang from the University of Wolverhampton

Agency: University of Florida, College of Medicine - Seed Grant

Title: Hydrodynamic testing of a novel tri-leaflet silicone valve at four anatomically-relevant locations

Status: Awarded, April 2012 (4/2012-4/2013),

Amount: \$10,000 (100% direct costs)

Role: PI

Agency: Florida International University, Department of Biomedical Engineering, Collaborative Technology Innovation Program (CTIP)

Title: Mechanical testing of soft tissue hydrogel substitutes in compression and shear.

Status: Awarded, April 2011 (4/2011-4/2012); Industrial Partner: Bose Corporation; Industry contribution: \$10,000

FIU-Match: \$10,000. Total: \$20,000; Role: PI

Agency: Florida International University, Department of Biomedical Engineering, Collaborative Technology Innovation Program (CTIP)

Title: Techniques for Prolonged Retention of Scaffold Environments in Osteochondral Defects – *In Vitro* Feasibility Assessment by Mechanical Testing and Characterization

Status: Awarded, March 2010 (3/2010 – 3/2011); Amount: Industrial Partner: Bose Corporation; Industry contribution: \$10,000; FIU-Match: \$10,000. Total: \$20,000; Role: PI.

Agency: Florida International University, College of Engineering and Computing (CEC), RESEED grant

Title: Enhanced Retention and Anchorage of Hydrogels Augments Cartilage Regeneration in Osteochondral Defects.

Status: Awarded, May 2010; 1 year (06/2010-06/2011); \$36328 (\$7500 research expenses and support of 1 graduate student for 1 year, ~ \$28828); Role: PI

Agency: American Heart Association (AHA), National Scientist Development Grant

Title: Noninvasive detection and tracking of cell populations in the development and remodeling of engineered heart valves.

ID #: 0830061N

Status: Awarded, January 2008; 4 years (01/2008-12/2011)

Amount: \$308,000. (Portion of funds transferred to FIU: \$177,060); Role: PI

*Total Extramural Funding as PI or CO-PI: \$1,450,375*

*Total Intramural Funding as PI or CO-PI: \$203,470.00*

*Total Funds secured as PI or CO-PI: \$1,653,845*

## **PATENT DISCLOSURES AND APPLICATIONS**

*Title of Invention:* Transcatheter Aortic Valve Decalcification System.

*Inventors:* **Sharan Ramaswamy**, Pulugurtha Markondeya Raj

*Current Status:* US Provisional patent filed with the United States Patent and Trademark Office (USPTO), Application number. US 63/228,952.

*Title of Invention:* Materials and Methods for Accelerating Cardiovascular Tissue Regeneration

*Inventors:* **Sharan Ramaswamy**, Brittany Gonzalez, Ariadna Herrera, Alexander Williams

*Current Status:* Issued, Non-Provisional US patent, patent number, 11376347.

*Title of Invention:* Systems and methods for producing injectable enhanced stem cell exosomes, improved exosomes, and methods of use

*Inventors:* **Sharan Ramaswamy**, Manuel Perez, Yih-Mei Lin

*Current Status:* US Non-Provisional patent pending, Application no. 17119170.

*Title of Invention:* Flow-Stretch-Flexure Bioreactor

*Inventors:* **Sharan Ramaswamy**, Steven M. Boronyak, George C. Engelmayr, David E. Schmidt, Mohammed El-Kurdi Michael S. Sacks

*Current Status:* Issued, Non-Provisional US patent, patent number, US 8852923 B2.

*Companies:* Registered company (10/2015 – 06/2020) in the state of Florida based on Flow-Stretch-Flexure bioreactor technologies

*Company Name:* *DeNovo* Biodevices LLC

*Company Principals:* Manuel Perez and **Sharan Ramaswamy**

## **PROFESSIONAL HONORS, PRIZES, FELLOWSHIPS, AWARDS AND APPOINTMENTS**

Graduate Program Director, Department of Biomedical Engineering, FIU, December 2021 – Present.

Equity Advisor, College of Engineering and Computing, FIU, Fall 2021 – Spring 2022.

ADVANCE Faculty Fellow, Office to Advance Women, Equity & Diversity (AWED), FIU, Fall 2020 – Spring 2022: Institutional-level service appointment with leadership and administrative duties, with an emphasis in promoting diversity across FIU. Co-Presented workshops on Strategies and Tactics for Recruitment to Increase Diversity and Excellence (STRIDE), with a focus on Hiring/Faculty Recruitment and/or Tenure and Promotion.

Fellow, - American Society of Mechanical Engineers (ASME), (Since June 2019).

Faculty Mentorship Award in the College of Engineering and Computing, College-level award,

Florida International University, 2019.

Fulbright Specialist, May 4-18, 2019, Karolinska Institute, Sweden. Activities (at Karolinska Institutet and Uppsala University): seminars and scientific discussions and education in the area of “Tissue Engineered Heart Valves and related mechanobiology” as well dialogue to help facilitate collaborations with between both these Swedish institutions and FIU in the area of cardiovascular regenerative medicine.

Secondary Faculty Appointment, School of Universal Computing, Construction and Engineering Education (SUCCEED). My over-arching objective in SUCCEED is to work pro-actively with in-unit SUCCEED Faculty and other partners at FIU and in Miami-Dade County Public Schools to work on educational initiatives focused on outreach and mentorship programming and development.

Faculty Fellow, Honors College, Florida International University, August 2017 – Spring 2022.

Faculty Award for Excellence in Research and Creative Activities, University-wide award, Florida International University, 2017.

William R. Jones Outstanding Mentor Award, McKnight Doctoral Fellows Program, Florida Education Fund, 2017.

Faculty Research Award in the College and Engineering and Computing, College-level award, Florida International University, 2017.

Hind Rattan Award 2017 – Presented to Sharan Ramaswamy for his “Outstanding services, contributions and achievements” in his professional field. As described on the referenced website ([https://en.wikipedia.org/wiki/Hind\\_Rattan](https://en.wikipedia.org/wiki/Hind_Rattan)), the “The Hind Rattan (Hindi phrase translated to English as “Jewel of India”) is one of the highest Indian diasporic awards granted annually to non-resident persons of Indian origin (NRIs) by the NRI Welfare Society of India.”

Faculty Award for Excellence in Advising and Mentorship, University-wide award, Florida International University, 2016.

Founding Faculty Fellow – STEM Transformation Institute, Florida International University (FIU). Spring 2015.

Honorary member – National Academy of Inventors, November 2013.

Top Scholar – Spring 2013, Florida International University – for recognition of research, service and activities in the cardiovascular arena and association as a fellow of the American Heart Association and its council on basic cardiovascular sciences.

Outstanding Paper Award, 2013 ASME Global Congress on Nano Engineering for Medicine and Biology, awarded for Dua R. and **Ramaswamy S.** Enhancement of Interfacial Mechanical Properties of Tissue Engineered Cartilage to Bone Using Hydroxyapatite Nanoparticles. Paper Number

NEMB2013-93205. Proceedings of the 2013 *ASME Global Congress on Nano Engineering for Medicine and Biology*, February 4-6, 2013, Boston, MA, USA.

Session Chair, (2 sessions) on Bioreactors and Biofabrication, 8<sup>th</sup> World Congress of Biomechanics (WCB), Dublin, Ireland, July 8<sup>th</sup> -12<sup>th</sup> 2018, Dublin, Ireland.

Session Chair/Co-Chair, Biomedical Engineering Society (BMES), Annual Fall Scientific Meeting.

Session Chair/Co-Chair, American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference.

Fellow - American Heart Association (AHA) and its council on Basic Cardiovascular Sciences (Since November 2011).

Travel award, TERMIS NA meeting 2008, San Diego, CA, December 7 - 10, 2008.

Top finalist for the TERMIS NA meeting, 2008 Young Investigator Poster Competition  
Selected to speak at the special “Nerem Symposium” at the American Society of Mechanical Engineers (ASME) Bioengineering Division (BED), Summer Bioengineering Conference, Marco Island, FL, June 25<sup>th</sup> - 29<sup>th</sup> 2008.

Nominated for leadership development event at the American Society of Mechanical Engineers (ASME), Bioengineering Division (BED), June 20-24<sup>th</sup> 2007, to improve activities and target initiatives of the BED for individuals over the short and long term and to partner with the society in developing the initiatives once identified.

Educational Stipend award, International Society of Magnetic Resonance in Medicine (ISMRM), 14<sup>th</sup> Scientific Meeting, Seattle, WA, May 6-12, 2006.

National Institutes of Health (NIH) visiting post-doctoral fellowship: May 2003 –January 2007.

Travel grant (awarded by NIH) for scientific talk presented at REGENERATE 2005 (June 2005).

Best scientific poster award, Research open house poster session, College of Engineering, The University of Iowa, April 2003, Iowa City, Iowa.

French Government scholarship: October 1997- August 1998

Best scientific poster award, Institute of Materials and Engineering (IMRE) opening launch, September 1997, Singapore

Invited talks (Since joining FIU, 12/2009):

University of Oklahoma, Virtual Seminar, March 2022.

Nova Southeastern University, Virtual Seminar, September 2021.

Florida Institute of Technology, Virtual Seminar, March 2021.

Indian Institute of Technology (IIT), Banaras-Hindu University (IIT-BHU), Varnasi, India, July 2019.

Uppsala University and the Karolinska Institute, Uppsala and Stockholm, Sweden, May 2019.

Indian Institute of Technology (IIT), New Delhi, India, July 2017.

Department of Bioengineering, University of Washington, May 2017.

Florida Memorial University, Miami Gardens, FL, April 12<sup>th</sup>, 2016.

Indian Institute of Science, Bangalore, August 7<sup>th</sup>, 2014.

Biomaterials Day 2014- Engineering the Future of Medicine, Society of Biomaterials, University of Florida, Gainesville, FL, March 28<sup>th</sup>, 2014.

Institute for Stem Cell Biology and Regenerative Medicine (InStem), Bangalore, Department of Biotechnology, Government of India, August 5<sup>th</sup>, 2013.

University of Florida, College of Medicine, Congenital Heart Center, Gainesville, FL, April 2012.

United States Congress on Computational Mechanics – USCCM 11, Minneapolis, MN, July 2011.

University of Florida, Dept. of Mechanical and Aerospace Engineering, Gainesville, FL, July 2011

GVP College of Engineering, Visakhapatnam, Andhra Pradesh, India, May 2011.

Indian Institute of Technology (IIT), Chennai, Tamil Nadu, India, May 2011.

Vellore Institute of Technology (VIT), Vellore, Tamil Nadu, India, May 2011

#### Offices held in professional societies

Member of the following ASME- Bioengineering Division committees (July 2010 – Present):

- i) Education
- ii) Cell and Tissue Engineering.

## **TEACHING ACTIVITIES**

Courses Taught at FIU (all 3 credits each except for Biomedical Engineering (BME) laboratory, BME special topic courses and SLS 1501 – First Year Experience, which are each, 1 credit)

BME 4332/5336: Cell and Tissue Engineering

BME6750: Artificial Organs

BME6266: Advanced Biofluid Mechanics

BME5410: BME Physiology I (co-taught among 3 faculty)



BME5036: Biotransport  
BME4100: Biomaterials Science  
BME3632: Biomedical Transport Phenomena  
BME 4050L: BME Laboratory I (1 credit)  
BME 4051L: BME Laboratory II (1 credit)  
BME 6933: BME Workshop: Scientific Writing (1 credit)  
IDH 1001: Ideas of Origins and Origins of Ideas (co-taught among 4 faculty; Honors College)  
IDH 2003: Principles of Experiential Innovation I  
IDH 2004: Principles of Experiential Innovation II  
SLS 1501: First Year Experience (1 credit)

### Course Development

*PRINCIPLES OF EXPERIENTIAL INNOVATION I/II/III*: I developed and taught a 2-sequence (over 2 semesters; taught continuously from Fall 2018 – Spring 2022) undergraduate courses centered on entrepreneurship, which was offered for the first time in academic year 2018-2019. The course follows the “lean-launchpad” methodologies of Mr. Steven Blank who helped to form the Innovation Corps (I-Corps) process that is currently being employed by the NSF and NIH for commercial landscape assessment of technologies arising from academia. However, these courses target talented undergraduate students who innovate in technology while at university and also introduces important precursors to customer discovery, such as articulating a value proposition, getting contacts and conducting an interview. At the same time, other components associated with new technologies, such as IP issues, are discussed. The first in the two-semester course (IDH 2003: “Principles of Experiential Innovation I”) sequence focuses on understanding the start-up culture and in -particular, the basic knowledge and processes needed to identify if a technology/product derived from the university classroom and/or lab can be translated to the commercial marketplace. Teams present a product/technology that they will use to explore its commercial prospects. Experiential learning assignments in teams facilitates recognitions of gaps in local businesses and the mindset of local start-ups. The course transitions to learning important steps needed to protect intellectual property and clearly defining the value proposition of the technology. Practice exercises in talking to individuals and the “elevator-pitch” are emphasized in the latter part of this course. The remainder of the course describes the key initiating elements of a business model that needs to be clearly understood as part of lean innovation methodologies.

This second (IDH 2004: “Principles of Experiential Innovation II”) in the two-semester course sequence focuses on customer discovery in teams. The first few weeks of the semester emphasizes the “art” of securing interviews and identifying techniques established by personnel in sales and marketing divisions. Mock interviews are carried out in class. The key initiating elements of a business model are re-introduced in the context of the start-up scenario arising from academia. An emphasis is made on establishing a first guess on whom the targeted individuals and markets could be. The second half of the semester focuses on experiential learning in the marketplace and conducting customer interviews. During customer discovery, key insights (pivots, challenges, refinements, etc.) from the teams are discussed. The ending of the course focuses on identifying the parameters that define the key initiating elements of a business model. The end-objective of this course is to provide a starting point for directed customer discovery and the knowhow of how to accomplish it. This 2-semester sequence course is currently restricted to those students in the FIU Honors College who are in a major in the

College of Engineering and Computing. I also went through the process of ensuring that both IDH 2003 and IDH 2004 courses that I now teach satisfy the global learning (GL) requirement at FIU and through this effort, both these courses do indeed have an approved GL-designation.

*SCIENTIFIC WRITING:* I developed a new 1-credit (graded) workshop course in "Scientific Writing" (offered under the auspices of BME 6933). The scientific writing course was offered for the first time in Summer 2016. The purpose of this course is to assist students who intend to take a PhD qualifying examination that includes a proposal writing component. The course is also intended for students who are or will be writing their first scientific journal manuscript. This course is anticipated to be a required co or prerequisite to taking the doctoral qualifying examination in the Biomedical Engineering Department.

*CELL AND TISSUE LAB SESSIONS:* I helped to design cell and tissue laboratory sessions (a total of 5 sessions) for the elective course "Cell and Tissue Engineering" (BME 4332/ BME 5336; 3 credits) that I also teach. The course adopted the labs since Spring 2016, thereby making the lab sessions a part of the course instruction.

*HYBRID CERTIFIED* – December 2021: Converted BME 4332/5336: Cell and Tissue Engineering to a Hybrid course. I taught BME4332/BME5336 as a hybrid course, starting in Fall 2021, with major in class activities being course lectures, class polls and debates while the major out of class activities were watching lab videos, completing the lab reports and the final exam proctored via Honorlock.

*MECHANICAL TEST PROTOCOLS FOR BME LABORATORY II (BME 4051L):* I developed two lab protocols focused on the mechanical testing and analysis of (i) polymer and (ii) composite materials, which were subsequently adopted as a permanent fixture of BME 4051L since Spring 2014.

Course Taught at U. of Pittsburgh:

BIOE 2072: Functional Tissue Engineering (3 credits)

Major Professor – MS Project, MS Thesis and PhD Dissertation:

Current Students:

Claudia Ponce Aportela, PhD in progress: Expected Graduation Spring 2025.

Ariadna Herrera PhD in Progress: Expected Graduation Fall 2024.

Manuel Perez, PhD in progress: Expected Graduation Fall 2023.

Yih-Mei Lin PhD in progress in progress: Expected Graduation, Fall 2023.

Asad Mirza PhD in progress: Expected Graduation, Summer 2023.

Denise Hsu, PhD in progress, (Co-advised with Dr. Joshua Hutcheson), Expected Graduation, Fall 2022.

Ana Pena Diaz MS (Project) in progress, Expected Graduation, Fall 2023.

Andres Rodriguez, MS (Thesis) in progress, Expected Graduation, Spring 2023.

Claudia Iannini, MS (Project) in progress, Expected Graduation, Fall 2022.

Graduated Students:

Brittany A. Gonzalez (NSF bridge-to-doctorate fellow; Dissertation Year Fellow): PhD, Graduated, Fall 2020.

Dissertation Title: Bioscaffold Valve with and without Mechanically Conditioned Stem Cells for the Treatment of Critical Mitral Valve Diseases in the Young.

First and Current Position after graduating: Post-Doctoral Associate in the CV-PEUTICS Lab at FIU. Currently Post-Doctoral Fellow, Cincinnati Children's Hospital, Cincinnati, OH.

Manuel Perez, MS (Project), Graduated, Spring 2019.

Project Title: Design Integration of a Physiologically Relevant Pulsatile Bioreactor System for Engineered Heart Valve Tissues

First Position after graduating: Project Engineer, PC construction West Palm Beach, FL.

Alexander Williams, MS (Thesis), Graduated, Summer 2018.

Project Title: The Oscillatory Shear Index: Quantifications for Valve Tissue Engineering and a Novel Interpretation for Calcification

First Position after graduating: Fully funded (Grove School of Engineering/GSOE Scholarship) PhD position in the Department of Biomedical Engineering at City College of New York (CCNY), New York, NY.

Melake Tesfamariam, MS (Project), Graduated, Summer 2018.

Project Title: Elastin-Dependent Leaflet Curvature Changes during Cyclic Flexure: Relevance to Aortic Valve Calcification.

First Position after graduating: Quality Assurance Specialist, Beckman Coulter, Miami, FL.

Elnaz Pour Issa, MS (Project), Graduated, Spring 2018.

Project Title: Evaluating the Acute *In Vitro* Hydrodynamic Functionality of the Porcine Small Intestinal Submucosa (PSIS) Mitral Valve Bioscaffolds in Adult and the Pediatric Cardiovascular Conditions.

First Position after graduating: MDR/Vigilance Specialist, Medtronic Inc, Miami Lakes, FL.

Alejandro Pinero, MS (Project), Graduated, Spring 2018.

Project Title: Histological insights into the aortic valve tri-layer structure and relevance to growth of engineered valvular tissues

First Position after graduating: Quality Engineer, Boston Medical Inc., Fort Lauderdale, FL.

Omkar Mankame, MS (Thesis), Graduated, Summer 2017.

Thesis Title: Hydrodynamic Assessment of a Small Intestinal Submucosa Bioscaffold Valve for Pediatric Mitral Valve Replacement.

First Position after graduating: Validation Engineer/Technical Write, Celgene Corporation, Summit, NJ.

Manuel Salinas (NIH-MBRS-RISE Fellow; Outstanding Doctoral Graduate, College of Engineering and Computing, FIU), PhD, Graduated Spring 2015.

Dissertation Title: Movement Effects on the Flow Physics and Nutrient Delivery in Engineered Valvular Tissues.

First Position after graduating: Post-Doctoral Research Fellow, Harvard Medical School.

Currently Assistant Professor, College of Engineering, Nova Southeastern University, FL.

Rupak Dua, (Dissertation Year Fellow; Provost Award for Outstanding Engagement): PhD, Graduated Summer 2014.

Dissertation Title: Enhanced Anchorage of Tissue-Engineered Cartilage Using an Osteoinductive Approach.

First Position after graduating: Post-Doctoral Research Fellow, Institute of Orthopedic Research and Education, Houston, TX.

Currently Associate Professor, Department of Chemical Engineering, Hampton University, VA.

Sasmita Rath (Dissertation Year Fellow), PhD, Graduated Spring 2015.

Dissertation Title: Regulation of bone marrow stem cells through oscillatory shear stresses - a heart valve tissue engineering perspective.

First Position after graduating: First Position after graduating: Scientist, Biomedical Device Start-Up, San Diego, CA.

Currently: Research Scientist, San Diego State University

Makensley Lordeus, MS (Thesis), Graduated, Fall 2015.

Thesis Title: Enhanced Flexible Materials for Valve Prostheses Applications.

First Position after graduating: Test Engineer, JenaValve Inc., Irvine, CA.

Glenda Castellanos, MS (Latin American and Caribbean/LAC Fellow) (Thesis), Graduated, Fall 2015.

Thesis Title: Cellular Events under Flow States Pertinent to Valve Development.

First Position after graduating: EPIC Analyst, Mount Sinai Hospital, Miami Beach, FL.

Abraham Alfonso, MS (Project), Graduated Summer 2012

Project Title: Fibrin Promotes Retention of Glycosaminoglycans in Extracellular matrix: Implications for Heart Valve Tissue Engineering.

First Position upon graduating: Medical Student, FIU College of Medicine.

Catalina Martinez, MS (Thesis), Graduated Fall 2011.

Thesis Title: The Effects of Dynamic Culturing Environments on Cell Populations Relevant to Heart Valve Tissue Engineering.

First Position after graduating: Research Associate, The Miami Project to Cure Paralysis, University of Miami College of Medicine.

Manuel Salinas, MS (Thesis), Graduated Fall 2011 (Outstanding Masters Graduate, College of Engineering and Computing, FIU).

Thesis Title: Heart Valve Tissue Engineering: A Study of Time Varying Effects and Sample Geometry.

First Position after graduating: Doctoral Candidate/NIH-MBRS-RISE Fellow, Department of Biomedical Engineering, FIU.

Committee Member – Dissertation committees:

Harold Martin (ECE) – Graduated  
Maedeh Moznib (BME) - Graduated  
Abhignyan Nagasetti (BME) - Graduated  
Pratikkumar Shah (BME) - Graduated  
Jaimit Parikh (BME) - Graduated  
Sushma Amruthaluri (MME) - Graduated  
Arash Moshkforoush (BME) – Graduated  
Adeyinka Idowu (MME) – Graduated  
Amirala Bakhshiannik (BME) - Graduated  
Chiamaka Okafor (MME) – Ongoing  
Mohammad Shaver (BME) – Ongoing  
Abeer Al Barghouthi (MME) – Ongoing  
Ana Valentin Cabrera (BME) – Ongoing  
Sophie Ashbrook (BME) – Ongoing

Committee Member – MS thesis and project committees:

Sadhana Bhusal (MME), Thesis, Graduated  
Chris Estrella, (BME) - Project, Graduated  
Pallavi Joshi, (BME) - Project, Graduated  
Aasma Dahal (BME) – Thesis, Ongoing

Other mentorship activities:

BME 4908 (3 credits): Senior Design Project: While at FIU I have served as faculty advisor for 15 teams of undergraduate students (3 to 5 students/team). Five of these teams carried out design work directly under my supervision in my laboratory. BME 4908 represents a project course in which I provided principal direction/guidance to senior undergraduate groups carrying out their senior design (capstone) projects, to design a product of relevance to Biomedical Engineering.

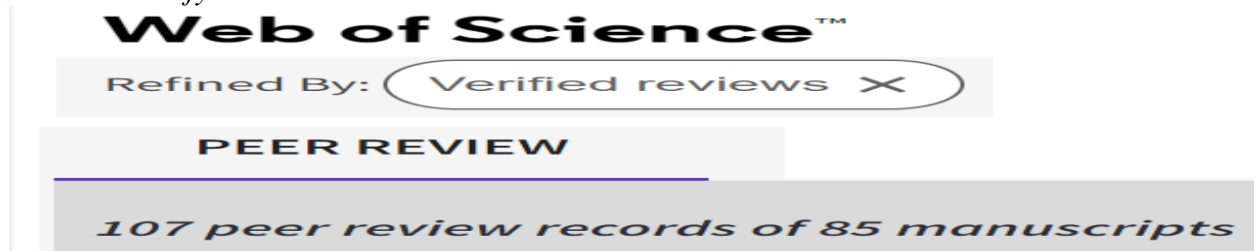
For undergraduate students at FIU, I am a research mentor for the MBRS-RISE program and serve as mentor in the advanced research and creativity in honors (ARCH) program. I also have had several undergraduate students conduct research in my laboratory either through part-time paid (e.g., Research Experiences for Undergraduates (REU)) or volunteer (unpaid) positions. Some of these undergraduates have managed to contribute significantly enough to earn co-authorship on some of our published papers. In the past 3 years I have had greater than 12 undergraduate students work in my laboratory with a minimum of at least 2 students at any given time.

Some noteworthy accomplishments of a selected few undergraduate students who worked under my mentorship are highlighted here: i) Amanda Barreto, NIH-Funded, MARC Ustar Fellow, FIU-BME CURE Undergraduate Trainee, admitted with to **Duke University’s Biomedical Engineering PhD program with a full Sloan Fellowship**, ii) Alexandria Tchir, NIH-Funded, MARC Ustar Fellow, FIU-BME CURE Undergraduate Trainee, admitted with an MIT University Center of Exemplary Mentoring (UCEM)-Alfred P. Sloan Foundation, Minority PhD program scholarship to pursue a PhD in Medical Engineering at the **Harvard-MIT Health Sciences and Technology (HST) program**. iii) Denise Medina Almora, **Sole nationwide winner of the 2017 Pressley and Mauise Vinson McPhail/NACME Award in Biomedical Engineering**, NIH-funded MBRS/RISE Research Assistant, co-author on a publication in *Frontiers in Medicine*, Admitted with full assistantship to pursue a PhD in Biomedical Engineering at University of Illinois, Urbana-Champaign, (iv) Stephanie Van Gulden, co-author on publication in *Tissue Engineering, Part (A)*, Admitted with full scholarship to **Driskill PhD program in Life Sciences at Northwestern University**, 1<sup>st</sup> place winner in Biomedical Engineering, undergraduate research day, 2012. v) Kamau Pier, **Most Outstanding student, College of Engineering and Computing, FIU, Spring 2012**, Full scholarship to Rutgers University, Biomedical Engineering PhD program. vi) Steven Boronyak, co-author on publications in Journal of Biomechanical Engineering and NMR in Biomedicine, **co-inventor on patent**, “Flow-Stretch-Flex Bioreactor”, **BMES 2009 undergraduate research award** (only 2 awards were awarded out of over 500 applicants), AHA pre-doctoral fellow at Vanderbilt University, Biomedical Engineering.

In addition to mentorship of graduate and undergraduate students, I also participated in outreach mentorship as a member of the Miami-Dade County Public School (MDCPS) –FIU leadership workgroup, with a focus on creating biomedical research awareness and internship opportunities to MDCPS high school students. Students from the MDCPS, especially from the high schools, TERRA and MAST had participated in summer research internships in my lab.

## **OTHER PROFESSIONAL ACTIVITIES AND PUBLIC SERVICE**

*Reviewer: Journals: 107 peer reviews of 85 journal manuscripts while at FIU (12/30/2009 – Present) as verified by Web of Science (<https://www.webofscience.com/>). Note: Reviews that Web of Science could not verify have not been included:*



*Other:*

Certification of recognition for the completion of the IDEA-SPARK entrepreneurial program by the Massachusetts Institute of Technology (MIT), January 26–28, 2022.

For the Journal, *Bioengineering*:

- Guest Editor (2020 – 2022)

*special issue: Applications of Cell and Tissue Mechanics in Cardiovascular Regenerative Medicine*

For the Journal, *Frontiers in Medicine*:

- Guest Associate Editor (2018 – 2022)  
*in Cardiovascular Biologics and Regenerative Medicine*  
*Research Topic: Extracellular Matrix for Cardiovascular Reconstruction*
- Review Editor (2018 – 2022)  
*in Nanobiotechnology*
- Review Editor  
in Cardiovascular Biologics and Regenerative Medicine

Reviewer of R01 grants, National Institutes of Health (NIH), Member Conflict (SEP) D2 panel, March 2021

Reviewer of SBIR/STTR grants, NIH, Study Section: ZRG1 SBIB-Y (12) - Cardiovascular and Surgical Devices, May 2019 – March 2021. Served as a primary reviewer for over 45 grant applications.

Reviewer, The Dutch Arthritis Foundation, August 2016.

Reviewer, The Wellcome Trust/Department of Biotechnology (DBT) India Alliance, August 2016, March 2019.

Reviewer, National Science Center, Poland, March 2016.

Guest Editor, Journal of Long-Term Effects of Medical Implants, Special Issue on Heart Valves (Volume 25, Issue 1-2, 2015).

Technical session chair/co-chair, American Society for Mechanical Engineers (ASME), Bioengineering Division (BED), Summer Biomechanics, Bioengineering and Biotransport Conference (SB<sup>3</sup>C).

Reviewer for ASME abstracts – ASME-BED, SB<sup>3</sup>C.

Member of Cell and Tissue Committee, SB<sup>3</sup>C.

Member of Education Committee, SB<sup>3</sup>C.

Reviewer and Panelist - Biomechanics and Mechanobiology (BMMB) program, National Science Foundation.

Proposal peer reviewer, Bioengineering Peer Review Study Group; American Heart Association.

Proposal peer reviewer, Health Research Board of Ireland

Proposal peer reviewer: The North Carolina Biotechnology Center.

Reviewer for NIH challenge grants 2009.

Reviewer for abstracts, Biomedical Engineering Society (BMES) annual Fall scientific meeting.

Reviewer for Lego proposals, Lego Competition, ASME-BED, 2010.

Reviewer of abstracts, submitted to the 17<sup>th</sup> Scientific Meeting & Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), 2009.

*Department/College/University Committees and Membership:*

Graduate Program Director, Department of Biomedical Engineering, Florida International University, December 2021 – Present.

Equity Advisor, College of Engineering and Computing (CEC), Florida International University, August 2021 – May 2022.

ADVANCE Faculty Fellow, Office to Advance Women, Equity & Diversity (AWED), Florida International University, August 2020 – May 2022.

Chair, PhD Qualifying Exam Committee, Department of Biomedical Engineering, Florida International University, August 2020 – May 2022.

Co-Director, Annual Heart Month and Heart Day, Department of Biomedical Engineering, Florida International University, Spring 2018 – Present.

Reviewer, Selection Committee - Presidential Leadership Program, Florida International University, Spring 2017 – Spring 2019.

Member of Search and Screen Committee, Mechanical and Materials Engineering Department, Florida International University, August 2018 – May 2020.

Member of Diversity Committee, Department of Biomedical Engineering, Florida International University, Fall semester 2018 – Spring semester 2021.

Member of University Academic Policies and Personnel Committee (APPC), Florida International University, August 2017 – May 2019.

Member of College of Engineering and Computing Curriculum Committee, Florida International University, August 2016 – May 2018.

Participant, Inaugural President's Leadership Program 2016-2017 Cohort.



Member of Undergraduate Program Committee, Department of Biomedical Engineering, Florida International University, May 2016 – December 2021.

Member of Library Committee, College of Engineering and Computing, Florida International University, August 2015 – May 2016.

Member of Graduate Program Committee, Department of Biomedical Engineering, Florida International University, August 2010 – May 2014; December 2021 – Present.

Member of Faculty Council, College of Engineering and Computing, Florida International University, Fall 2019 (October 2019) – Summer 2020 (August 2020): Interim Chair of the council.

August 2018 – Fall 2019 (October 2019): Vice-chair of the council.

August 2012 – May 2014, council member.

Member of Program Committee, Southern Biomedical Engineering Conference 2013, May 3-5, Miami, FL.

Team Captain, College of Engineering and Computing, for fundraising activities. Miami-Dade Heart Walk organized by the American Heart Association, October 29<sup>th</sup>, 2011.

Member of Undergraduate Program Committee, Department of Biomedical Engineering, Florida International University, December 2009 – August 2010.

Member of ACCESS MAST at Homestead Miami-Dade Public High School Workgroup

Faculty Mentor, National Institute of General Medical Sciences, NIGMS-RISE program, FIU.

Faculty Mentor and selection committee member, MARC-USTAR program, FIU.

Faculty Mentor and selection committee member, McNair program, FIU.

Advanced Research and Creativity program (ARCH) Mentor, FIU Honors College.

*Active Professional Memberships:*

Fellow - American Heart Association (AHA), (Fellow of the AHA and its council on Basic cardiovascular sciences)

Fellow - American Society of Mechanical Engineers (ASME)

Member - Biomedical Engineering Society (BMES)

*Current Collaborations:*

External:

- 1) Frank Scholl MD, Cardiac Surgery, Joe DiMaggio Children's Hospital, Hollywood, FL.

- 2) Steven Bibeovski MD, PhD, Cardiac Surgery, Joe DiMaggio Children's Hospital, Hollywood, FL.
- 3) Pablo Morales DVM, Mannheimer Foundation, Homestead FL.
- 4) Robert Matheny, MD, Chief Medical Officer at CorMatrix Cardiovascular, Inc, Roswell, GA.
- 5) Raul Herrera MD, Miami Cardiac & Vascular Institute, Baptist Health, South Florida Miami, FL

Internal (at FIU):

- 1) Arvind Agarwal, PhD, Mechanical and Materials Engineering
- 2) Andrea Raymond, PhD, Immunology and Nanomedicine
- 3) Joshua Hutcheson, PhD, Biomedical Engineering
- 4) Florence George, PhD, Mathematics and Statistics
- 5) Raj Pulugurtha, PhD, Biomedical Engineering