

**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)** -Tissue Engineered Mechanics, Imaging and Materials Laboratory (TEMIM Lab; 12/2009 – Present). The TEMIM LAB's primary research focus lies in the area of cell and engineered tissue mechanics with application in cardiovascular regenerative medicine. The TEMIM lab, conducts both experimental and computational investigations in this area. A major goal of the lab is to develop functional tissue engineered heart valves (TEHVs) using 1) porcine small intestinal submucosa (PSIS) substrates and 2) mechanically regulate stem cells for the TEHV application as well as for (3) broader application in cardiovascular regenerative medicine. Concurrently the TEMIM 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 TEMIM lab has been supported by the AHA, NSF, the Miami Heart Research Institute, industry and academic funding sources.

## PUBLICATIONS IN DISCIPLINE (*H-Index: 16; Citations: 4953; as of 01/2019*)

*For journal papers, proceedings, book chapters and publication works in progress:*

# *undergraduate student under my supervision*

\* *graduate student under my supervision*

1) Gonzalez B<sup>\*</sup>, 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. Impact Factor (IF): 19.309.

2) Castellanos G<sup>\*</sup>, Nasim S<sup>\*</sup>, Medina DA<sup>#</sup>, Rath S, **Ramaswamy S**: Stem Cell cytoskeletal responses to pulsatile flow in heart valve tissue engineering studies. *Front. Cardiovasc. Med.* 5:58. doi: 10.3389/fcvm.2018.00058, 2018. IF: 1.658.

3) 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: 2.664.

4) 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.

5) **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.

- 6) Gill P, Musaramthota V, Munroe N, Datye A, Dua R\*, 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.
- 7) Dua R\*, Comella K\*, Butler R, Castellanos G\*, 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.
- 8) Salinas M\*, Rath S\*, Villegas A#, 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.
- 9) Chue-Sang J, Bai Y, Stoff S, Straton D#, **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.
- 10) Rath S\*, Salinas M\*, Villegas A#, **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.
- 11) Nieto A, Dua R\*, 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.
- 12) 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.
- 13) **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: 1.748.
- 14) 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: 2.496.
- 15) Lordeus M\*, Estrada A#, Stewart D#, Dua R\*, 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.
- 16) 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](#).

17) 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](#).

18) Salinas M\*, **Ramaswamy S**: Applicability of the Taguchi Method to Mechanobiology-Based Experiments. *Journal of Validation Technology*. 2013, Sep 19(3). [IF: Under Computation](#).

19) 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](#).

20) 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](#).

21) **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](#).

22) 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](#).

23) Martinez C\*, Rath S, Van Gulden S#, Pelaez D, Alfonso A\*, 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](#).

24) 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](#).

25) Lahiri D, Dua R\*, 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](#).

26) Gill P, Munroe N, Dua R\*, **Ramaswamy S**: Corrosion and Biocompatibility Assessment of Magnesium Alloys *Journal of Biomaterials and Nanobiotechnology*, (3):10-13, 2012. [IF: 0.44](#).

27) **Ramaswamy S**, Schornack PA, Smelko AG#, Boronyak SM#, 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](#).

- 28) 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  $^1\text{H}$  MRI cell tracking with  $^{31}\text{P}$  MRS for bioenergetic measurements. *NMR in Biomedicine*, Dec;23(10):1166-72. 2010. IF: 3.214.
- 29) 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.
- 30) **Ramaswamy S**, Gottlieb D, Engelmayer 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.
- 31) **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.
- 32) **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.
- 33) **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.
- 34) 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.
- 35) Bi X, Yang X, Bostrom MPG, Bartusik D, **Ramaswamy S**, Fishbein KW, Spencer RG, Camacho NP: Fourier Transform Infrared Imaging and MR Microscopy Studies Detect Compositional and Structural Changes in Cartilage in a Rabbit Model of Osteoarthritis. *Analytical and Bioanalytical Chemistry*, Vol. 387, No.5, pp.1601-1612, 2007. IF: 3.778.
- 36) **Ramaswamy S**, Wang DA, Fishbein KW, Elisseff JH, Spencer RG: An Analysis of the Integration Between Articular Cartilage and Non-degradable Hydrogel Using Magnetic Resonance Imaging. *Journal of Biomedical Materials Research (JBMR) – Part b: Applied Biomaterials*, Vol. 77B, No. 1, pp. 144-148, 2006. IF: 2.147.

37) **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: 1.9.

38) **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

39) 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.

40) Dua R\*, Centeno J, **Ramaswamy S**: Novel Design to Integrate Tissue Engineered Cartilage to Native Bone Using Hydroxyapatite. IEEE conference on Nanoscience, Engineering and Technology (ICONSET), Chennai, India, November 28 – 30, 2011.

41) 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.

42) 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.

43) 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.

44) 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.

45) 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.

46) Ramakrishna S, **Ramaswamy SD** and Teoh SH: Analytical Modeling of Elastic Properties of Knitted Fabric Composites. *International Conference of Advanced Composites (ADCOMP '96)*, December 1996, India.

47) **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

48) 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, (*In Press*).

49) 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.

50) 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.

51) 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.

52) 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.

53) **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.

54) Wiid M, Underwood M, **Ramaswamy S**, Ramachandran K: Primer on Stress Echocardiography. - Chapter 9, In: *Beside Ultrasonography in Clinical Medicine*, Alexander Levitov, Apostolos Dallas and Anthony Slonim (Eds). McGraw-Hill Publications, New York, pp. 101-110, 2011.

55) **Ramaswamy SD**: Bioengineering of a Closed Loop Insulin Delivery System: The Hybrid Artificial Pancreas. In: *International Conference in Biomedical Engineering, The Institution of Engineers, India (IEI)*, Tata McGraw-Hill Publications, 1995, New Delhi, India.

## PRESENTED PAPERS AND LECTURES

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-P D, 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.*

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, 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**: 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**: 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: 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 (POSTER): 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, DeGroff 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, Elisseeff 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.

Vigmstad 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

Agency: Miami Heart Research Institute

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

Amount: \$150,000 (100% direct costs)

Status: Awarded, October 2018. (February 2019 – January 31<sup>st</sup> 2020)

Role: Principal Investigator (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: \$85,475

Status: Awarded, July 2018 (07/01/2018 - 06/01/2019)

Role: PI

Agency: Vivex Biomedical Inc.

Title: Terminal sterilization

Amount: \$5,000

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)

Award #: 16GRNT31090009

Role: PI

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

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

#### BME Coulter Seed Grant

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

#### Saint George Medical, Inc.

Title: Fatigue and constitutive properties of novel stent-graft  
Status: Awarded, June 2012 (06/12 – 06/14)  
Amount: \$38,500  
Role: PI

#### 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

#### 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; Role: PI

#### 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

#### 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.

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

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: \$718,050*

*Total Intramural Funding as PI: \$180,970*

*Total Funds secured as PI: \$899,020*

## **PATENT DISCLOSURES, APPLICATIONS, AND AWARDS**

*Title of Invention:* Novel nitinol alloys and uses thereof in surgical implants

Inventors: Norman Munroe, Ryszard Rokicki, Chandan Pulletikurthi, **Sharan Ramaswamy**, Waseem Haider, Puneet Gill.

*Current Status:* non-provisional US patent pending, patent number, US 20150315681 A1.

*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:* Formed company (10/2015) based on Flow-Stretch-Flexure bioreactor technologies

Company Name: *DeNovo* Biodevices LLC

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

## **PROFESSIONAL HONORS, PRIZES, FELLOWSHIPS**

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

Faculty Award for 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, 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 and the council on Basic Cardiovascular Sciences

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):*

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 and BME special topic courses)

BME 4332/6330: 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  
BME3632/3032: 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

### Course Development

*PRINCIPLES OF EXPERIENTIAL INNOVATION I/II*: I developed a 2-sequence (over 2 semesters) undergraduate course centered on entrepreneurship which is being 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; however, the goal is to expand this offering to all FIU students with a STEM major by Fall 2020. The course is currently being co-taught by myself and a senior instructor at FIU.

*SCIENTIFIC WRITING:* I developed proposals for two 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 designed cell and tissue sessions (a total of 5 laboratory sessions) for the elective course "Cell and Tissue Engineering" (BME 4332/ BME 6330; 3 credits) that I also teach. The course adopted the labs since Spring 2016 and officially linked a lab fee to the course starting in Fall 2018, thereby making the lab sessions a formal part of course instruction.

*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:*

Brittany Gonzalez PhD in progress, Expected Graduation, Fall 2020.

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

Asad Mirza PhD in progress: Expected Graduation, Spring 2022

*Graduated Students:*

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: To be decided.

Manuel Perez, MS (Project), Graduated, Summer 2018

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.

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 Assistant 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 Castanillos, 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:*

Maedeh Moznib (BME) - Ongoing

Abhignyan Nagasetti (BME) - Graduated

Pratikkumar Shah (BME) - Graduated

Jaimit Parikh (BME) - Graduated

Sushma Amruthaluri (MME) - Graduated

Arash Moshkforoush (BME) – Ongoing

Adeyinka Idowu (MME) – Ongoing

Amirala Bakhshiannik (BME) - Ongoing

Sadhana Bhusal (MME) - Ongoing

### Other teaching activities:

Pallavi Joshi, MS (Project/Non thesis), Graduated Summer 2012, My Role: Project Committee member.

BME 4908 (3 credits): Senior Design Project: While at FIU I have served as faculty advisor for 11 teams of undergraduate students (3 to 5 students/team). Four 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 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) 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, (ii) 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. iii) Kamau Pier, Most Outstanding student, College of Engineering and Computing, FIU, Spring 2012, Full scholarship to Rutgers University, Biomedical Engineering PhD program. iv) Steven Boronyak, co-author on publication in 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 participate 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. Several students from the MDCPS, especially from the high schools, TERRA and MAST participate in research internships in my lab each summer.

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

### Reviewer:

*Journals: > 60 journal manuscript reviews while at FIU (January 2010 – Present) as verified by Publons ([www.publons.com](http://www.publons.com)). Note: Reviews that Publons could not verify have not been included in the following list:*

Ramaswamy Sharan  
<https://publons.com/a/599893>

#### Peer Review Summary

Performed 63 reviews for journals including *Journal of Biomechanics* and *Acta Biomaterialia*, placing in the 97th percentile for verified review contributions on Publons up until July 2018.

	6	Journal of Biomechanics
	4	Acta Biomaterialia
	4	Molecular Imaging
	4	Cytotechnology
	4	Tissue Engineering Part A
	3	Plos One
	3	Journal of Biomechanical Engineering
	3	NMR in Biomedicine
	2	Biomaterials
	2	Biotechnology Progress
	2	Journal of Biomedical Materials Research Part A
	2	Medical & Biological Engineering & Computing
	2	Journal of Tissue Engineering
	1	Scientific Reports
	1	Langmuir
	1	Integrative Biology
	1	Cytotherapy
	1	International Journal of Nanomedicine
	1	Molecular and Cellular Biochemistry
	1	IEEE Transactions on Biomedical Engineering
	1	Cellular and Molecular Bioengineering
	1	BMC Musculoskeletal Disorders
	1	Applied Biochemistry and Biotechnology
	1	Journal of Biomaterials Applications
	1	Cells Tissues Organs
	1	Expert Review of Medical Devices
	1	Cardiovascular Engineering and Technology
	1	Recent Patents on Cardiovascular Drug Discovery
	1	Journal of Long-Term Effects of Medical Implants
	1	BioMed Research International
	1	ISRN Tissue Engineering
	1	AIMS Materials Science
	1	Journal of Visualized Experiments
	1	3D Printing and Additive Manufacturing
	1	Recent Patents on Regenerative Medicine

#### Other:

Reviewer, The Dutch Arthritis Foundation, August 2016.

Reviewer, Selection Committee - Presidential Leadership Program, Florida International University, (since Spring 2017).

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

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.

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.

*Committees and Membership:*

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

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 - Present.

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.

Member of Faculty Council, College of Engineering and Computing, Florida International University,  
-August 2018 – Present, serving as 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, MARC-USTAR program, FIU.

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

Active Memberships:

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

Member - American Society of Mechanical Engineers (ASME) – Bioengineering Division

Member - Biomedical Engineering Society (BMES)

Active Collaborations:

External:

- 1) Frank Scholl MD and Steven Bibeovski MD, Cardiac Surgery, Joe DiMaggio Children's Hospital, Hollywood, FL.
- 2) Pablo Morales DVM and Krishna Rivas-Wagner DVM, Mannheimer Foundation, Homestead FL

Internal:

- 1) Arvind Agarwal PhD, Mechanical and Materials Engineering
- 2) Lidia Kos PhD, Biological Sciences
- 3) Jessica Ramella-Roman, PhD, Biomedical Engineering
- 4) Joshua Hutcheson, PhD, Biomedical Engineering