Yap, Choon Hwai

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EDUCATION

Jan 2006 – July 2011 **Doctor of Philosophy, Biomedical Engineering**
Georgia Institute of Technology, Atlanta, GA, USA
Advisor: Dr. Ajit Yoganathan. Thesis: Biofluid Mechanics of Heart Valves

Aug 2000 - May 2001 **Master of Science, Civil Engineering**
California Institute of Technology, Pasadena, CA, USA, GPA: 3.4/4.0

Aug 1997 - May 2000 **Bachelor of Science, Civil Engineering**
Cornell University, Ithaca, NY, USA, GPA: 3.93/4.3

EMPLOYMENT

Imperial College London, UK
Jul 2020 – Current *Senior Lecturer, Dept of Bioengineering*

National University of Singapore, Singapore
Jul 2013 – Jun 2020 *Assistant Professor, Dept of Biomedical Engineering*

University of Pittsburgh Medical School, Pittsburgh, PA, USA
Aug 2011 – Jul 2013 *Post-Doctoral Research Associate (advisor: Kang Kim)*

Georgia Institute of Technology, Atlanta, GA, USA
Jan 2006 – Jul 2011 *Graduate Research Assistant*

JTC Corporation, Singapore
Jul 2001 – Dec 2005 *Assistant Manager* (Marketing, Infrastructure Development)

EDITORIAL POSITIONS

1. Associate Editor, Medical and Biological Engineering and Computing
2. Editorial Board Member, Scientific Reports

RESEARCH INTERESTS

1. Cardiac Biofluid Mechanics (Emphasis on Fetal and Embryonic Hearts)
2. Materials Surfaces to Modulate Thrombosis and Blood Damage in Medical Devices

PATENT PUBLICATIONS

1. Li Z, **Yap CH**, Millionis A, Poulikakos D. "Haemostatic Device of Material." Singapore PCT Patent Application No. PCT/SG2020/050336, filed 15 June 2019
2. Li Z, Nguyen BL, **Yap CH**. "Hydrophobic Composite Materials, Methods And Uses Thereof." Singapore Patent Application No. 10201806940R, filed 16 Aug 2018.
3. **Yap CH**, Subramanian Shanmugasundaram P, Lee SY. "A Tri-Functional Portable Surface, With Passive-Warming, Pressure-Relieving And Fluid Adsorption Properties, To Provide Prolonged Physiological Warming In The Healthcare Setting." Singapore Patent Application #10201706185S, filed 28 July 2017.
4. **Yap CH**, Kim K. "Methods and Apparatus to Measure Constitutive Relations and Fiber Orientation of Soft Tissue." *PCT Patent Application #WO 2014/138423*
5. Wei Q, Thiele K, Yoganathan AP, **Yap CH,** "Analysis of Mitral Regurgitation by Ultrasonic Imaging." June 28th 2012, *WO Patent 2012085797*
6. Wei Q, Thiele K, Yoganathan AP, **Yap CH**, "Analysis of Mitral Regurgitation from Slit Orifices By Ultrasonic Imaging." June 28th 2012, *WO Patent 2012085778*
7. Wei Q, Thiele K, Yoganathan AP, **Yap CH**, "Automatic Identification of Location of Regurgitant Orifice of a Mitral Valve in an Ultrasound Image." June 28th 2012, *WO Patent 2012085789*

HONORS AND AWARDS

Research Awards

1. The Yamaguchi Medal (2015), "In recognition of excellent academic achievements in the field of Cardiovascular Biofluid Mechanics", AP Biomech Conference, Sept 2015, Sapporo, Japan
2. The National University of Singapore Young Investigator Award (2015).
3. The *CHIH Foundation award*, Georgia Tech Dept of Biomedical Engineering (2011), for "[having] made significant contributions to and [having] a strong passion for research and publication in the fields of Engineering and Health Sciences."
4. Cornell University "*the Moles" Student Award* (2000), for "having shown outstanding efforts in working towards a career in construction engineering and management".
5. 3rd Prize, Ph.D. Student Paper Competition, 2009 ASME Summer Bioengineering Conference, July 17-21 2009, Lake Tahoe, CA, USA.

Teaching Award

1. The National University of Singapore Annual Teaching Excellence Honours List 2017/2018. Nominated for the Annual Teaching Excellence Award 2017/2018.

Advisee's Research Awards

2. PhD Student, Shier Nee Saw, won the 2018 BMES Career Development Award, awarded by the Biomedical Engineering Society (USA)
3. PhD Student, Shier Nee Saw, won the Student Bursary Award, 2018 World Congress for Biomechanics.

PHD STUDENT SUPERVISED

1. Saw, Shier Nee. NUS President's Graduate Fellow – Graduated
2. Hadi Wiputra. NGS Scholarship – Graduated
3. Sheldon Ho. NGS Scholarship – Graduated
4. Foo, Yoke Yin. NUS Research Scholarship – PhD studies ongoing
5. Zheng, Yu. MOE Industry-Linked Research Scholarship – PhD studies ongoing
6. Ren, Mei Feng. MOE Research Scholarship – PhD studies ongoing

POSTDOCTORAL SCHOLARS SUPPORTED

1. Muhammad Jamil. PhD. Nanyang Technological University
2. Lai Chang Quan. PhD. Singapore MIT Alliance, National University of Singapore
3. Vivek Vasudevan. PhD. National University of Singapore
4. Li Zhe. PhD. National University of Singapore
5. Chan Wei Xuan. PhD. Nanyang Technological University
6. Ong Chi Wei. PhD. National University of Singapore

RESEARCH GRANTS AWARDED

A total of $4,052,800 SGD in direct cost as a PI in the National University of Singapore

1. NUS Startup Grant: $180,000. "The Role of Mechanical Forces in Congenital Cardiovascular Development and Disease." Jul 2013 - Jul 2016. **Role: PI**
2. Singapore Ministry of Education (MOE) Tier 1: $180,000. " A more accurate method to quantify mitral regurgitation using 3D color Doppler." Feb 2014 – Feb 2017. **Role: PI**
3. Engineering-Medicine Seed Grant: $50,000. "Robotic Catheter for Minimally Invasive Cardiovascular Surgery Based on Intravascular Ultrasonic Sensing." Mar 2014 – Mar 2016. **Role: PI**
4. Singapore Ministry of Health, NMRC-CBRG-NIG: $170,000. "Human Foetal Cardiovascular Fluid Mechanics in Relation to Congenital Malformations – Preparations for Foetal Surgery".18 Jul 2014 – 31 Jul 2016. **Role: PI**
5. Singapore Millenium Foundation: $500,000. "Minimally-Invasive, Laparoscopic-ally Implantable Cardiac Assist Device for Palliative Care of the Elderly with Failing Hearts. 1 Jan 2015 – 31 Dec 2017. **Role: PI**
6. NRF POC grant: $232,800. "CoSYcloud™, a nanostructured phase-change technology in a portable infant warming system for the surgical/critical care setting". 23 Nov 2015 – 22 May 2017. **Role: Co-Investigator.** $180,000 of the funds are channeled from PI in KKH to my account in NUS.
7. NUS Young Investigator Award: $498,000. "Fluid Mechanics and Mechanobiology of Congenital Cardiac Outflow Tract Malformations." 1 Feb 2016 – 31 Jan 2019. **Role: PI**
8. MOE Tier 1: $160,000. "Placenta Blood Oxygen Monitor for Intrauterine Growth Restriction Pregnancies." Awarded Dec 2016. **Role: PI**
9. Singapore Ministry of Health, NMRC-OF-IRG: $1,150,000. "A Centrifugal Blood Pump with Low Blood Damage." 1 Feb 2018 – 31 Jan 2023 (Awarded). **Role: PI**
10. Intra-CREATE Seed Grant. "Novel Superhemophobic Coatings to Reduce Thrombosis in Cardiovascular Devices." 1 Feb 2018 – 31 Jun 2019 (Awarded). **Role: PI**
11. Singapore Ministry of Education (MOE) Tier 2: $661,000. "Growth and Remodelling of the Human Fetal Heart in Health and Disease." Selected for funding in Sept 2018. **Role: PI**

JOURNAL PUBLICATIONS

As Independent Investigator at the National University of Singapore

In 2020

1. Wiputra H, Chan WX, Foo YY, Ho S, **Yap CH**. "Cardiac Motion Estimation from Medical Images: A Regularisation Framework Applied on Pairwise Image Registration Displacement Fields." *Scientific Reports*. [accepted Oct 2020]
2. Zebhi B, Wiputra H, Howley L, Cuneo B, Park D, Hoffman H, Gilbert L, **Yap CH**, Bark D. "Right Ventricle in Hypoplastic Left Heart Syndrome Exhibits Altered Hemodynamics in the Human Fetus." *J Biomech*. 2020 Sep 6; 112:110035.
3. Foo YY, Pant S, Tay S, Imangali N, Chen NG, Winkler C, **Yap CH**. "4D modelling of fluid mechanics in the zebrafish embryonic heart." *Biomech Model Mechanobiol.* 2020 Feb;19(1):221-32. (Impact Factor: 2.829)

In 2019

4. Li Z, Milionis A, Zheng Y, Yee MX, Codispoti L, Tan FYH, Poulikakos D, **Yap CH**. "Superhydrophobic Hemostatic Nanofiber Composites for Fast Clotting and Minimal Adhesion." *Nature Communications*. 2019 Dec 5;10(1):1-1. *(Impact Factor: 11.880)*
5. Ho S, Chan WX, Nhan PT, **Yap CH**. "Organ Dynamics and Hemodynamics of the Whole HH25 Avian Embryonic Heart, Revealed by Ultrsound Biomicroscopy, Bounday Tracking, and Flow Simulations." *Scientific Reports*. 2019 Dec 2;9(1):1-4. *(Impact Factor: 4.122)*
6. Vasudevan V, Wiputra H, **Yap CH**. "Torsional Motion of the Left Ventricle Does not Affect Ventricular Fluid Dynamics of both Foetal and Adult Hearts." *J Biomech*. 2019 Nov 11;96:109357 (*Impact factor: 2.576*)
7. Tun W, **Yap CH**, SN Saw, James J, and Clark A. "Differences in placental capillary shear stress in fetal growth restriction may affect endothelial cell function and vascular network formation." Scientific Reports. 2019 Jul 8;9(1):1-0. *(Impact Factor: 4.122)*
8. Li Z, Marlena J, Pranantyo D, Nguyen BL, **Yap CH**. "Porous Superhydrophobic Surface with Active Air Plastron Control for Drag Reduction and Fluid Impalement Resistance." *J Mater Chem A*. [Epub June 2019] (*Impact factor: 10.733*)
9. Vasudevan V, Low AJJ, Annamalai SP, Sampath S, Chin CL, Ali AAB, **Yap CH**. "Role of Diastolic Vortices in Flow and Energy Dynamics during Systolic Ejection." J Biomech. 2019 Jun 11;90:50-7. (*Impact factor: 2.576*)
10. Ho S, Chan WX, Rajesh S, Phan-Thien N, **Yap CH**. "Fluid Dynamics and Forces in the HH25 Avian Embryonic Outflow Tract." *Biomech Model Mechanobiol*. [Epub Feb 2019] (*Impact Factor: 2.829*)

In 2018

11. Saw SN, Tay JJH, Poh YW, Yang L, Tan WC, Tan LK, Clark A, Biswas A, Mattar CNZ, Yap CH. "Altered Placental Chorionic Arterial Biomechanical Properties During Intrauterine Growth Restriction." *Scientific Reports.* [epub Nov 2018] *(Impact Factor: 4.122)*
12. Ang BT, Yap CH, Lee WS, Xue JM. "Bioinspired Dual-Tier Coalescence for Water Collection Efficiency Enhancement." *Langmuir.* [epub Oct 2018]. *(Impact Factor: 3.683)*
13. Wiputra H, Chen CK, Talbi E, Lim GL, Soomar SM, Biswas A, Mattar CNZ, Bark D, Leo HL, **Yap CH**. "Human Fetal Hearts with Tetralogy of Fallot have Altered Fluid Dynamics and Forces." *Am J Physiol Heart and Circ Physiol.* [accepted Aug 2018] *(Impact Factor: 4.048)*
14. Li Z, Nguyen BL, Cheng YC, Xue JM, MacLaren G, **Yap CH**. "Durable, Flexible, Superhydrophobic and Blood-Repelling Surface for Use in Medical Blood Pumps." *J. Mater. Chem. B.* 2018;6(39):6225-33. *(Impact Factor: 5.047)*
15. Wang YX, Li Z, Qin L, Caddy G, **Yap CH** and Zhu J. "Dielectric Elastomer Fluid Pump of High Pressure and Large Volume Via Synergistic Snap-Through" *J. Appl. Mech.* 2018 Oct 1; 85(10):101003 *(Impact Factor: 2.772)*
16. Saw SN, Poh YW, Chia DAK, Biswas A, Mattar CNZ, **Yap CH**. "Characterization of the Hemodynamic Wall Shear Stresses in Human Umbilical Vessels from Normal and Intrauterine Growth Restricted Pregnancies." *Biomech Model Mechanobiol.* 2018 Aug;17(4):1107-1117 *(Impact Factor: 2.829)*

17. Ong CW, **Yap CH**, Kabinejadian F, Nguyen YN, Cui FS, Chua KJ, Ho P, Leo HL. "Association of hemodynamic behaviour to the intraluminal thrombus prediction: a two-way fluid structure coupling investigation." *Int. J. Appl. Mechanics.* 2018;10(4):1850035 *(Impact Factor: 1.939)*
18. Saw SN, Low JYR, Ong MHH, Poh YW, Mattar CNZ, Biswas A, **Yap CH**. "Hyperelastic Mechanical Properties of Ex Vivo Normal and Intrauterine Growth Restricted Placenta." *Ann Biomed Engr.* 2018 Jul 1;46(7):1066-77 *(Impact Factor: 3.474)*
19. Saw SN, Low JYR, Mattar CNZ, Biswas A, Chen L, **Yap CH**. "Motorizing and Optimizing Ultrasound Strain Elastography for Detecting Intrauterine Growth Restriction Pregnancies." *Ultrasound Med. Biol.* 2018 Mar 1;44(3):532-43 *(Impact Factor: 2.205)*

In 2017

20. Li Z, Zhu J, Foo KCC, **Yap CH**. "A Novel and Robust Dual-Membrane Dielectric Elastomer Actuator for Large Volume Fluid Pumping via Snap-through". *Appl. Phys. Lett.* 2017 Nov 20;111(21):212901. *(Impact Factor: 3.495)*
21. Li Z, Wang Y, Foo KCC, Godaba H, Zhu J, **Yap CH**. "The Mechanism for Large-Volume Fluid Pumping via Reversible Snap-Through of Dielectric Elastomer." *J Appl Phys.* 2017 Aug 28;122(8):084503. *(Impact Factor: 2.328)*
22. Wiputra H, Lim GL, Chu KC, R Nivetha, Soomar SM, Biswas A, Mattar CNZ, Leo HL, **Yap CH**. "Peristaltic-Like Motion of the Human Fetal Right Ventricle and its Effects on Fluid Dynamics and Energy Dynamics." *Ann Biomed Engr.* 2017 Oct 1;45(10):2335-47. *(Impact Factor: 3.474)*
23. Sheldon H, Tan GXY, Foo TJ, Phan-Thien N, **Yap CH**. "Organ Dynamics and Fluid Dynamics of the HH25 Chick Embryonic Cardiac Ventricle as Revealed by a Novel 4D High-Frequency Ultrasound Imaging Technique and Computational Flow Simulations." *Ann Biomed Engr.* 2017 Oct 1;45(10):2309-23 *(Impact Factor: 3.474)*
24. Vasudevan V, Low AJJ, Annamalai SP, Sampath S, Poh KK, Totman T, Mazlan M, Croft G, Richards AM, de Kleihn DPV, Chin CL, **Yap CH**. "Flow Dynamics and Energy Efficiency of Flow in the Left Ventricle during Myocardial Infarction." *Biomech Model Mechanobiol*. 2017 Oct 1;16(5):1503-17. *(Impact Factor: 2.892)*
25. Ho S, Banerjee H, Foo YY, Godaba H, Aye WMM, Zhu J, **Yap CH**. "Experimental Characterization of a Dielectric Elastomer Fluid pump and Optimizing Performance via Composite Materials." *Journal of Intelligent Material Systems and Structures*. 2017 Dec;28(20):3054-65. *(Impact Factor: 2.582)*
26. Jamil M, Ahmad O, Poh KK, **Yap CH**. "Feasibility of Ultrasound-Based Computational Fluid Dynamics as a Mitral Valve Regurgitation Quantification Technique, Comparison with 2D PISA and 3D PISA." *Ultrasound in Medicine & Biology*. 2017 Jul 31; 43(7):1314-30 *(Impact Factor: 2.205)*
27. **Yap CH**, Lai CQ, Loh IGH, Ong TZR. "Non-Linear Flow Rate Response to Pumping Frequency and Reduced Hemolysis in the Drastically Under-Occluded Pulsatile Roller Pump." *Artif Organs*. 2017; 41 (2), 178-185. *(Impact Factor: 2.379)*
28. Ko GZY, Mehta K, Jamil M, **Yap CH**, Chen NG. "A method to study the hemodynamics of chicken embryo's aortic arches using optical coherence tomography." *J Biophotonics*. 2017 Mar 1;10(3):353-9. *(Impact Factor: 3.768)*
29. Saw SN, Chia DAK, Biswas A, Mattar CNZ, **Yap CH**. "Characterization of the In Vivo Shear Stress Environment of Human Fetus Umbilical Arteries and Veins." *Biomech Model Mechanobiol*. 2017 Feb;16(1):197-211 *(Impact Factor: 2.892)*

In 2016

30. Park DW, Sebastiani A, **Yap CH**, Simon MA, Kim K. "Quantification of Coupled Stiffness and Fiber Orientation Remodeling in Hypertensive Rat Right-ventricular Myocardium Using 3D Ultrasound Speckle Tracking with Biaxial Testing." *Plos One*. 2016 Oct 25;11(10):e0165320. *(Impact Factor: 2.776)*
31. Wiputra H, Lai CQ, Lim GL, Heng JJW, Guo L, Soomar SM, Leo HL, Biswas A, Mattar CNZ, **Yap CH**. "Fluid Mechanics of Human Fetal Right Ventricles from Image-Based Computational Fluid dynamics Using 3D Clinical Ultrasound Scans." *Am J Physiol Heart and Circ Physiol*. 2016 Dec 1;311(6):H1498-508. *(Impact Factor: 4.048)*
32. Lai CQ, Chia JWS, Chua WWC, **Yap CH**. "Near-Superhydrophobic Surface Reduces Hemolysis of Blood Flow in Tubes." *RSC Advances*. 2016; 6(67):62451-9. *(Impact Factor: 3.049)*

33. Jamil M, Tan GXY, Huq M, Kang H, Lee ZR, Tang PH, Hu XH, **Yap CH**. "Changes to the Geometry and Fluid Mechanics of the Carotid Sihpon in the Pediatric Moyamoya Disease." *Comput Methods Biomech Biomed Engin*. 2016; 19(16):1760-71. *(Impact Factor: 1.610)*
34. Wiputra H, Lim GL, Chia DAK, Mattar CNZ, Biswas A, **Yap CH**. "Methods for Fluid Dynamics Simulations of Human Fetal Cardiac Chambers Based on Patient-Specific 4D Ultrasound Scans." *JBSE*. 2016; 11(2): 15-00608. *(Impact Factor: 1.024)*
35. Lau JSF, Saw SN, Buist ML, Biswas A, Mattar CNZ, **Yap CH**. "Mechanical Testing and Non-Linear Viscoelastic Modelling of Human Placenta in Normal and Growth Restriction Pregnancies." *J Biomech*. 2016; 49 (2): 173-184. *(Impact Factor: 2.5761)*
36. Lai CQ, Lim GL, Jamil M, Mattar CNZ, Biswas A, **Yap CH**. "Fluid Mechanics of Blood Flow in Human Fetal Left Ventricles based on Patient-Specific 4D Ultrasound Scans." *Biomech Model Mechanobiol*. 2016; 15(5):1159-72. *(Impact Factor: 2.892)*

In 2015

37. Tan GXY, Jamil M, Tee NGZ, Zhong L, **Yap CH**. "3D Reconstruction of Chick Embryo Vascular Geometry Using Non-Invasive High-Frequency Ultrasound for Computational Fluid Dynamics." *Ann Biomed Engr*. 2015; 43(11): 2780-2793. *(Impact Factor: 3.474)*
38. **Yap CH**, Park D, Dutta D, Simon M, Kim K. "Methods for Using 3D Ultrasound Speckle Tracking in Biaxial Mechanical Testing of Biological Tissue Samples." *Ultrasound in Medicine & Biology*, 2015, 41 (4), 1029-1042. *(Impact Factor: 2.205)*

In 2014

39. **Yap CH**, Liu X, Pekkan K. "Characterization of the Vessel Geometry, Flow Mechanics and Wall Shear Stresses in the Great Arteries of Wildtype Prenatal Mouse." *Plos One*, 2014, 27;9(1):e86878. *(Impact Factor: 2.776)*

Before Joining the National University of Singapore (2010-2013)

40. **Yap CH**, Thiele K, Wei Q, Santhanakrishnan A, Khiabani R, Cardinale M, Salgo I, Yoganathan AP. "Novel Method of Measuring Valvular Regurgitation Using Three-Dimensional Non-Linear Curve Fitting of Doppler Signals Within the Flow Convergence Zone." *IEEE Trans Ultrason Ferroelectr Freq Control*. 2013 Jul;60(7):1295-1311.
41. **Yap CH,** Saikrishnan N, Tamilselvan G, Vasilyev N, Yoganathan AP. "The Congenital Bicuspid Aortic Valve Can Experience High Frequency Unsteady Shear Stresses on Its Leaflet Surface", *Am J Physiol Heart Circ Physiol. Am J Physiol Heart circ Physiol*. 2013 Sept;303(6):H721-H731.
42. **Yap CH**, Tamiselvan G, Saikrishnan N, Yoganathan AP. "Experimental Measurement of Dynamic Fluid Shear Stress on the Aortic Surface of the Aortic Valve Leaflet." *Biomech Model Mechanobiol*. 2012 Jan;11(1-2)171-82.
43. **Yap CH**, Tamiselvan G, Saikrishnan N, Yoganathan AP. "Experimental Technique of Measuring Dynamic Fluid Shear Stress on the Aortic Surface of the Aortic Valve Leaflet." *J Biomech Eng*. 2011 Jun; 133(6):061007
44. **Yap CH**, Saikrishnan N, Yoganathan AP. "Experimental Measurement of Dynamic Fluid Shear Stress on the Ventricular Surface of the Aortic Valve Leaflet." *Biomech Model Mechanobiol*. 2012 Jan;11(1-2):231-44.
45. **Yap CH**, Kim HS, Balachandran K, Weiler M, Haj-Ali R, Yoganathan A.P. "Dynamic Deformation Characteristics of Porcine Aortic Valve Leaflets under Normal and Hypertensive Conditions", *Am J Physiol Heart Circ Physiol.* 2010 Feb;298(2):H395-405.
46. **Yap CH**, Dasi LP, Yoganathan AP. "Dynamic Hemodynamic Energy Loss in Normal and Stenosed Aortic Valves", *J Biomech Eng.* 2010 Feb;132(2):021005
47. Saikrishnan N, **Yap CH**, Stamatios L, Kimar G, Yoganathan AP. "Revisiting the Gorlin equation for aortic stenosis – is it correctly used in clinical practice?" *Int J Cardiol*. [accepted April 2013]
48. Saikrishnan N, **Yap CH**, Milligan NC, Vasilyev NV, Yoganathan AP. "In Vitro Characterization of Bicuspid Aortic Valve Hemodynamics Using Particle Image Velocimetry." *Ann Biomed Eng*. 2012 Aug;40(8):1760-75
49. Weiler M, **Yap CH**, Balachandran K, Padala M, Yoganathan AP. "Regional Variation of Dynamic Deformation Characteristics of Native Aortic Valve Leaflets." *J Biomech*. 2011 May 17; 44(8):1459-65.

50. Spinner EM, Buice D, **Yap CH**, Yoganathan AP. "The Effects of a Three-Dimensional, Saddle-Shaped Annulus on Anterior and Posterior Leaflet Stretch and Regurgitation of the Tricuspid Valve. *Ann Biomed Eng*. 2012 May;40(5):996-1005.
51. Balachandran K, Hussain S, **Yap CH**, Padala M, Chester AH, Yoganathan AP. "Elevated Cyclic Stretch and Serotonin Result in Altered Aortic Valve Remodeling via a Mechanosensitive 5-HT(2A) Receptor-Dependent Pathway." *Cardiovasc Pathol*. 2012 May-Jun;21(3):206-13
52. Thayer P, Balachandran K, Rathan S, Arjunon S, **Yap CH**, Jo H, Yoganathan AP. The Effect of Combined Cyclic Stretch and Pressure on the Aortic Valve Interstitial Cell Phenotype. *Ann Biomed Eng*. 2011 June; 39(6):1654-67.

BOOK CHAPTERS

1. Yoganathan AP, **Yap CH**. "Fluid Dynamics of Prosthetic Valves", in Practice of Clinical Echocardiography, 4th edition, 2012, Otto C.M. (Ed), Saunders Elsevier.
2. **Yap CH**, Spinner EM, Padala SM, Yoganathan AP. "Heart Valve Dynamics", in Biomedical Engineering Handbook, 4th Edition, 2013, Bronzino J.D. and Peterson D.R. (Eds.)., CRC Press.

INVITED TALKS

At International Conferences

1. "Studies of Embryonic and Fetal Cardiovascular Fluid Mechanics using Ultrasound-Based Computational Fluid Dynamics." The 8th Asian-Pacific Conference on Biomechanics, 16-19 Sept 2015, Sapporo, Japan.
2. "Ultrasound Strain Elastography to Detect Placenta Diseases." International Congress on Ultrasonics, 18-20 Dec 2017, Honolulu, USA.
3. "Ultrasound-based Computational Fluid Dynamics to Investigate Human Fetal and Small Animal Embryonic Hearts in Health and During Congenital Malformations." Advanced Techniques and Therapies in Cardiovascular Care (ATTICC 2018), 11-12 Sept 2018, Venice, Italy. (https://www.atticc2018.deib.polimi.it/)
4. "Biomechanics of Valvulogenesis Using 4D High Frequency Ultrasound and Computational Modelling." Heart Valve Society Annual Scientific Meeting. 11-13 April 2019, Barcelona, Spain.
5. "Fluid Mechanics of the Developing Heart – Studies in Chick Embryos and Human Fetuses." Newton Advanced Fellowship (NAF) Workshop on Integrative Modelling of Biological Systems. 14-16 May 2019, Kuala Lumpur, Malaysia.
6. **Keynote Talk:** "Using CAD in Biofluid Mechanics Research on Cardiovascular Physiology and Disease." CAD'19 Conference, 24-26 June 2019, Singapore.
7. "Image Tracking and Flow Modelling of Human Fetal and Animal Embryonic Hearts." 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 4th Conference on Imaging and Visualization. 14-16 Aug 2019, New York City, USA.
8. "Investigation of Mechanical Properties of Whole Placenta Tissues and Using Ultrasound Placenta Strain Elastography to Detect Intrauterine Growth Restriction." 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 4th Conference on Imaging and Visualization. 14-16 Aug 2019, New York City, USA.
9. "Using Superhydrophobic Material for Potential Reduction of Blood Damage in Blood Pumps." 2nd Mechanical Circulatory Support Symposium, 12-13 Oct 2019, Tianjin, China.

At Local Conferences

10. "Fluid Mechanics of Blood Flow in Human Fetal Left ventricles based on Patient-Specific 4D Ultrasound Scans." Cardio-Bioengineering Workshop 2015, 20 Nov 2015, Singapore
11. "Engineering Dielectric Elastomers for Fluid Pumping – a Composite Material to Resolve Viscoelasticity Problems." 6th International Symposium on InfoComm & Mechatronics Technology for Bio-Medical & Healthcare Applications (IS-3T-in-3A). 23-26 Oct 2016, Singapore
12. "Fluid Dynamics of Human Fetal Right Ventricles, Existence and Effects of Peristaltic-Like Contractile Motions." Cardio-Bioengineering Symposium 2016, 18 Nov 2016, Singapore.
13. "Patient-Specific Computational Simulations of Fetal and Embryonic Hearts in Health and congenital Malformations." 5th Singhealth Duke-NUS Congress Scientific Congress, 21-22 Sept 2018, Singapore.
14. "Image-Based Computational Tools for Understanding Fluid Dynamics in the Zebrafish Embryonic Heart." The Singapore Fish Meeting 2018, 2 Oct 2018, Singapore.

During Campus Visits

15. “The Fluid Mechanics of the Human Fetal Heart, and the Development of Blood Pumps with Low Hemolysis Potential.” 11 Jul 2017, Soochow University, China
16. “Fluid Mechanics of the Human Fetal Heart in Health and Congenital Malformations.” 22 Jan 2018, Koc University, Turkey
17. “Biomechanics of the Intrauterine Growth Restriction Placenta Disease, and Using Artificial Muscles to Make Artificial Hearts.” 23 Jan 2018, Bogazici University, Turkey
18. “Fluid Mechanics of the Human Fetal Heart in Health and Congenital Malformations.” 9 Oct 2017, Colorado State University, CO, USA.
19. “Strategies for Anti-Thrombotic Blood Pumping: Innovations on Materials and Pumping Mechanisms.” 29 May 2018, University of Waterloo, Canada.
20. “Strategies for Anti-Thrombotic Blood Pumping: Innovations on Materials and Pumping Mechanisms.” 1 June 2018, ETH Zurich, Switzerland.
21. “Biofluid Mechanics of Human Fetal Hearts, and of Anti-Thrombotic Blood Pumps.” 27 Dec 2018, National Chiao Tung University, Taiwan.