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**Professor & Department Chair**  
Department of Mechanical Engineering  
The University of Texas at San Antonio  
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## EDUCATION

<b>Ph.D.</b> in Solid Mechanics /Biomechanics, Xi'an Jiaotong University, China	1991
Jointly trained at University of California at San Diego, CA, USA	1988-1991
<b>M.S.</b> in Solid Mechanics, Xi'an Jiaotong University, China	1987
<b>B.S.</b> in Applied Mechanics, Xi'an Jiaotong University, China	1984

## EXPERIENCE

<b>Professor and Department Chair, Zachry Endowed Chair</b>	2015- present
Department of Mechanical Engineering, University of Texas at San Antonio	
<b>Professor (with tenure)</b>	2011- present
Department of Mechanical Engineering, University of Texas at San Antonio Biomedical Engineering Program, UTSA-UTHSCSA	
<b>Associate Professor (with tenure)</b>	2008-2011
Department of Mechanical Engineering, University of Texas at San Antonio Biomedical Engineering Program, UTSA-UTHSCSA	
<b>Assistant Professor (tenure-track)</b>	2003-2008
Department of Mechanical Engineering, University of Texas at San Antonio Biomedical Engineering Program, UTSA-UTHSCSA	
<b>Research Engineer II</b>	1999-2002
GT/Emory Center for the Engineering of Living Tissues School of Mechanical Engineering, Georgia Institute of Technology	
<b>Postdoctoral Fellow, Bioengineering</b>	1997-1999
School of Mechanical Engineering, Georgia Institute of Technology	
<b>Visiting Research Scientist, Bioengineering</b>	1996-1996
School of Mechanical Engineering, Georgia Institute of Technology	
<b>Associate Professor, Biomechanics</b>	1993-1995
School of Civil Engineering & Mechanics, Xi'an Jiaotong University, China	
<b>Lecturer, Biomechanics</b>	1991-1992
Department of Engineering Mechanics, Xi'an Jiaotong University, China	
<b>Research Associate, Bioengineering</b>	1988-1991
Department of AMES/Bioengineering, University of California at San Diego, USA	

## HONORS & RECOGNITIONS

CAREER Award (2007), National Science Foundation  
Adjunct Professor (2009-2015), Shanghai JiaoTong University, China  
Honorary Adjunct Professorship (2008-), Xi'an JiaoTong University, China  
Visiting Professorship (2004), Forth Military Medicine University, China  
Annual Review Poster Award (2004), Biomedical Engineering Society (co-author)

Who's Who in America.

Best Paper Award (1995), Chinese J Reparative & Reconstructive Surgery

Outstanding Contribution Award (1995), Shaanxi Province, China

Young Investigator Award (1995), National Nature Science Foundation of China

Takeshi Kunio Young Investigator Award (1994), Xi'an Jiaotong University

Advance in Science and Technology Contribution Award (1994), Army, China

Young Teacher Award (1993), State Educational Commission of China

Uchida International Grant (1993), Japan Foundation of Cardiovascular Research

Tang Zhaotian Fellowship (1991), Xi'an Jiaotong University

## PROFESSIONAL MEMBERSHIP AND SERVICES

Fellow, American Society of Mechanical Engineers (ASME), 2014-

Fellow, American Institute for Medical and Biological Engineering (AIMBE), 2013-

Fellow, American Heart Association (AHA), 2011-

Faculty Advisor, ASME student section of UTSA, 2012-2015

Executive Committee member, ASME San Antonio Section, 2012-2014

Member, American Physiological Society (APS), 2011-

Member, Biomedical Engineering Society (BMES), 1997-

Member, American Society of Biomechanics (ASB), 2002-

Member, American Society of Engineering Education (ASEE), 2003-

Member, American Society of Mechanical Engineers (ASME), 1996-2014

Member, American Heart Association (AHA), 2001-2011

Executive Board Member, Chinese Society of Biomechanics (1995-1999)

Proposal Review panelist: NSF, AHA, NIH (*ad hoc*)

Paper reviewer for over 30 journals

Editorial Board Member, *Journal of Medical Biomechanics (Chinese)* 2011-2013

Editorial Board Member, *Scientific World Journal: Mechanical Engineering* 2012-

Editorial Board member, *J Geriatric Cardiol*, 2014-

Editorial Advisory Board Member, *Cogent Engineering* 2014-

Associate Editor, *Frontier of Biomechanics* 2013-

Associate Editor, *ASME Journal of Biomechanical Engineering* 2011-2017

Theme Leader, Solid Biomechanics Subcommittee, ASME Bioengineering Division 2015-2017

## RESEARCH INTERESTS

### *Cardiovascular Biomechanics*

Atherosclerosis, plaque rupture, aneurysm rupture, artery buckling and mechanical stability, artery tortuosity, collateral vessel development, growth and remodeling, intimal hyperplasia, endothelial and smooth muscle cells, vascular grafts, stent fracture and restenosis, tissue engineering, tissue regeneration, mechanical modeling, cardiac mechanics, left ventricular remodeling, myocardial bridging, cardiac function, heart failure.

## PUBLICATIONS

### Peer Reviewed Journal Articles:

1. **Han HC** (1989). The linear increase law of optimum age of scientific creativity. *Scientometrics*. 15(3/4): 309-312.

2. **Han HC**, Fung YC (1991). Residual strain in porcine and canine trachea. *J Biomech.* 24(5): 307-315.
3. **Han HC**, Fung YC (1991). Species dependence of the zero-stress state of aorta: pig versus rat. *ASME J Biomech Eng.* 113: 446-451.
4. **Han HC**, Fung YC (1995). Longitudinal strain in canine and porcine aortas. *J Biomech.* 28(5): 637-642.
5. **Han HC**, Fung YC (1996). Direct measurement of transverse residual strains in aorta. *Am J Physiol. -Heart Circ Physiol* 270: H750-H759.
6. Huang M, **Han HC**, Zhao L (1996). The residual strain in canine arteries. *Chin J Biomed Eng.* (English edition). 5(1): 1-10.
7. **Han HC**, Zhao L, Huang M, Hou LS, Huang YT, Kuang ZB (1998). Postsurgical change of the opening angle of canine autogenous vein graft. *ASME J Biomech Eng* 120(2): 211-216.
8. Chesler NC, Conklin BS, **Han HC**, Ku DN (1998). Simplified *ex vivo* artery culture techniques for porcine arteries. *J Vasc Invest.* 4 (3): 123-127.
9. **Han HC**, Ku DN (2001). Contractile responses in arteries subjected to hypertensive pressure in seven-day organ culture. *Ann Biomed Eng.* 29(6): 467-475.
10. Oshinski JN, **Han HC**, Ku DN, Pettigrew RI (2001). Quantitative prediction of improvement in cardiac function after revascularization using magnetic resonance imaging and modeling—initial results. *Radiology.* 221(2): 515-522.
11. **Han HC**, Oshinski JN, Ku DN, Pettigrew RI (2002). A left ventricle model to predict post-revascularization ejection fraction based on cine magnetic resonance images. *ASME J Biomech Eng.* 124(1): 52-55.

### **2003-2007**

12. **Han HC**, Ku DN, Vito RP (2003). Arterial wall adaptation under elevated longitudinal stretch in organ culture. *Ann Biomed Eng.* 31(4): 403-411.
13. **Han HC** (2004). An echocardiogram-based 16-segment model for predicting left ventricular ejection fraction improvement. *J Theor Biol* 228(1): 7-15 .
14. **Han HC**, Lerakis S (2004). The relation between viable segments and the left ventricular ejection fraction improvement. *J Med Eng Technol* 28(6): 242-253.
15. Davis NP, **Han HC**, Wayman B, Vito RP (2005). Sustained axial loading lengthens arteries in organ culture. *Ann Biomed Eng.* 33(7): 869-879.
16. **Han HC**, Martin RP, Lerakis G, Lerakis S, (2005). Prediction of the left ventricular ejection fraction improvement using echocardiography and mechanical modeling. *J Am Society of Echocardiography* 18(7): 718-721.
17. **Han HC**, Marita S, Ku DN (2006). Changes of opening angle in hypertensive and hypotensive arteries in three-day organ culture. *J Biomech* 39 (13): 2410-2418.
18. Challa V, **Han HC** (2007). Spatial variations in wall thickness, material stiffness, and initial shape affect wall stress and shape of intracranial aneurysms. *Neurol Res.* 29(6): 569-577.
19. **Han HC** (2007). A biomechanical model of artery buckling. *J Biomech.* 40(16): 3672-3678.
20. Jin Y, **Han HC**, and Lindsey ML (2007). Editorial: ACE Inhibitors to Block MMP-9 Activity: New Functions for Old Inhibitors. *J Mol Cell Cardiol.* 40 (6): 664-666.

### **2008**

21. Lin J, Lopez E, Jin Y, Van Remmen H, Bauch T, **Han HC**, Lindsey ML (2008). Age-related cardiac muscle sarcopenia: combining experimental and mathematical modeling to identify mechanisms. *Exp Gerontol.* 43(4): 296-306.

22. **Han HC** (2008). Nonlinear buckling of blood vessels: A theoretical study. *J Biomech.* 41(12): 2708-2713.
23. Lee YU, Drury-Stewart D, Vito RP, **Han HC** (2008). Morphologic adaptation of arterial endothelial cells under axial stretch in organ culture. *J Biomech.* 41(15): 3274-77.

### 2009

24. **Han HC** (2009). The mechanical buckling of curved arteries. *Molecular & Cell Biomech.* 6(2): 93-100.
25. Kim YS, Galis ZS, Rachev A, **Han HC**, Vito RP (2009). Matrix metalloproteinase-2 and -9 are associated with high stresses predicted using a nonlinear heterogeneous model of arteries. *ASME J Biomech Eng* 131(1): 011009.
26. Yao Q, Hayman DM, Dai Q, Lindsey ML, **Han HC** (2009). Alterations in pulse pressure stimulate arterial wall matrix remodeling. *J Biomech Eng.* 131(10) 101011.
27. **Han HC** (2009). Blood vessel buckling within surrounding tissue generates tortuosity. *J Biomech.* 42(16): 2797-2801.
28. **Han HC** (2009). The theoretical foundation for artery buckling under internal pressure. *J Biomech Eng.* 131(12): 124501.

\*\*\* Top 10 most downloaded paper (Nov, 2009).

### 2010

29. **Han HC** (2010) Letter to the Editor: Response to comment on "A biomechanical model of artery buckling." *J Biomech* 43(4):802-803.
30. Lee YU, Luo J, Sprague EA, **Han HC** (2010). Comparison of artery organ culture and co-culture models for studying endothelial cell migration and its effect on smooth muscle cell proliferation and migration. *Ann Biomed Eng* 38(3):801-12.
31. Martinez R, Fierro CA, Shireman PK, **Han HC** (2010). Mechanical buckling of veins under internal pressure. *Ann Biomed Eng* 38(4):1345-53.
32. Wang Y, Yang J, **Han HC**, Lindsey ML, Jin Y (2010). A conceptual cellular interaction model of left ventricular remodeling post-MI: dynamic network with exit-entry competition strategy. *BMC System Biol* 4(suppl 1):S5 (1-10).
33. Lee YU, Hayman D, Sprague EA, **Han HC** (2010). Effects of axial stretch on intimal thickness and cell proliferation in arteries in organ culture. *Cell & Mol Bioeng.* 3(3): 286-295.
34. **Han HC**, Liu Q, Cui F (2010). Response to Comment on "A biomechanical model of artery buckling" and subsequent comments. *J Biomech.* 43(14): 2864.
35. Lee AY, **Han HC** (2010). A nonlinear thin-walled model for vein buckling. *Cardiovasc Eng & Tech.* 1(4):282-289.

### 2011

36. **Han HC** (2011). Determination of the critical pressure of artery buckling using the potential energy approach. *Ann Biomed Eng* 39(3):1032-40.
37. Jin Y, **Han HC**, Berger J, Dai Q, Lindsey ML (2011) Combining experimental and mathematical modeling to reveal mechanisms of macrophage-dependent left ventricular remodeling. *BMC System Biology*, 5:60(1-14).
38. Datir P, Lee AY, Lamm SD, **Han HC** (2011). Effect of geometric variations on the buckling of arteries. *Int J Appl Mech* 3(2): 385-406.
39. Chesnutt JKW, **Han HC** (2011) Tortuosity triggers platelet activation and thrombus formation in microvessels. *ASME J Biomech Eng.* 133(12), 121004 (2011).

\*\*\*Top 10 most downloaded paper (Jan, Feb, 2012)

## 2012

40. Lee AY, Han B, Lamm SD, Fierro CA, **Han HC** (2012). Effects of elastin degradation and surrounding matrix support on artery stability. *Am J Physiol -Heart Circ Physiol* 302(4): H873–H884.
41. Martinez R, **Han HC** (2012). Effect of collagenase on the critical buckling pressure of arteries. *Mol Cell Biomech* 9 (1):55-76.
42. **Han HC** (2012). Twisted blood vessels: symptoms, etiology and biomechanical mechanisms. *J Vasc Res.* 49(3):185-197.

**JVR top 5 cited article: 2015; JVR most read article: 9/2018, 7/2019-10/2020**

43. Liu Q, **Han HC** (2012). Mechanical buckling of arteries under pulsatile pressure. *J Biomech.* 45(7):1192-1198.
44. Hayman DM, Xiao Y, Yao Q, Jiang ZL, Lindsey ML, **Han HC** (2012). Alterations in pulse pressure affect artery function. *Cell & Mol Bioeng* 5(4):474-487.
45. Yang T, Chiao YA, Wang Y, Voorhees A, **Han HC**, Lindsey ML, Jin YF (2012). Mathematical modeling of left ventricular geometry changes in aging mice, *BMC Systems Biol* 6 (Suppl 3): S10.

## 2013

46. Liu Q, **Han HC** (2013). Mechanical buckling of arterioles in collateral development. *J Theor Biol*, 316: 42-48.
47. Hayman DM, Zhang J, Liu Q, Xiao Y, **Han HC** (2013). Smooth muscle contraction increases the critical buckling pressure of arteries. *J Biomech* 46(4):841-4; 2013.
48. Ma Y, Halade GV, Zhang J, Ramirez TA, Levin D, Voorhees A, Jin YF, **Han HC**, Manicone AM, and Lindsey ML (2013). Matrix metalloproteinase-28 deletion exacerbates cardiac dysfunction and rupture following myocardial infarction in mice by inhibiting M2 macrophage activation. *Circ Res* 112(4): 675-688.
49. **Han HC**, Chesnutt JKW, Garcia JR, Liu Q, Wen Q (2013). Artery buckling: new phenotypes, models, and applications. (Invited review) *Ann Biomed Eng* 41(7):1399-1410.
50. Garcia JR, Lamm SD, **Han HC** (2013). Twist buckling behavior of arteries. *Biomech Model Mechanobiol* 12(5): 915-927, Oct 2013.
51. Chesnutt JKW, **Han HC** (2013). Platelet size and density affect shear-induced thrombosis formation in tortuous arterioles. *Phys Biol* 10(5):056003, Oct 2013.
52. Chesnutt JKW, **Han HC** (2013). Effect of red blood cells on platelet activation and thrombus formation in tortuous arterioles. *Frontiers Bioeng Biotech.* 1:18 (1-12), Dec 3, 2013.

## 2014

53. Grimes KM, Voorhees A, Chiao YA, **Han HC**, Lindsey ML, Buffenstein R (2014). Cardiac function of the naked mole-rat: ecophysiological responses to working underground. *Am J Physiol. - Heart Circ Physiol.* 306(5): H730-H737.
54. Voorhees A. **Han HC** (2014). A model to determine the effect of collagen fiber alignment on heart function post myocardial infarction. *J Theoretical Biol Model* 11:6 (1-19).
55. Qiao A, **Han HC**, Ohta M, Qian Y (2014). Editorial: Computational simulations in the cardiovascular system. *Scientific World J.* 2014: 421061

56. Yabluchanskiy A, Ma Y, Chiao YA, Lopez EF, Voorhees AP, Toba H, Hall ME, **Han HC**, Lindsey ML, Jin YF (2014). Cardiac aging is initiated by matrix metalloproteinase-9 mediated endothelial dysfunction. *Am J Physiol. -Heart Circ Physiol.* 306(10): H1398-H1407.
57. Zhang J\*, Liu Q\*, **Han HC** (2014). An *in vivo* animal model of artery buckling for studying wall remodeling. *Ann Biomed Eng* 42(8): 1658-1667.
58. Liu Q, Wen Q, Mottahedi M, **Han HC** (2014). Artery buckling analysis using four-fiber wall model. *J Biomech.* 47(11): 2790-2796.
59. Xiao Y, Hayman D, Khalafvand SS, Lindsey ML, **Han HC** (2014). Artery buckling stimulates cell proliferation and NF- $\kappa$ B signaling. *Am J Physiol. -Heart Circ Physiol.* 307(4): H542-H551.  
 \*\*\*Highlighted by the Editor in a video podcast [https://www.youtube.com/watch?v=KbU-FFb\\_E0&list=UU5Y0t0nplkcJthLKOTskFgA&index=1](https://www.youtube.com/watch?v=KbU-FFb_E0&list=UU5Y0t0nplkcJthLKOTskFgA&index=1)
60. Lee AY\*, Sanyal A\*, Shadfan R, Xiao Y, **Han HC** (2014). Mechanical instability of normal and aneurismal arteries. *J Biomech* 47(16): 3868-3875.  
 \*\*\*Selected by editor-in-chief as a highlight on the cover of the issue.

## 2015

61. Chesnutt JKW, **Han HC** (2015). Simulation of the microscopic process during initiation of stent thrombosis. *Comput Biol Med* 56:182-191. Jan 1, 2015.
62. Sanyal A, **Han HC** (2015). Artery buckling affects the mechanical stress in atherosclerotic plaques. *Biomed Eng Online* 14(Suppl 1): S4.
63. Khalafvand SS, **Han HC** (2015), Stability of carotid artery under steady state and pulsatile blood flow: A fluid-structure interaction study. *ASME J Biomech Eng.* 137(6): 061007 (8 pages).
64. Luetkemeyer CM, James RH, Devarakonda ST, Le VP, Liu Q, **Han HC**, Wagenseil J (2015). Critical buckling pressures in mouse arteries with altered elastic fibers. *J Mech Behav Biomed Mater* 46: 69-82.
65. Voorhees AP, DeLeon-Pennell KY, Ma Y, Halade GV, Yabluchanskiy A, Iyer RP, Flynn E, Cates VA, Lindsey, ML, and **Han, HC** (2015). Building a Better Infarct: Modulation of Collagen Cross-linking to Increase Infarct Stiffness and Reduce Left Ventricular Dilation post-Myocardial Infarction. *J Mol Cell Cardiol* 85:229-239.
66. Wang G, Xiao Y, Voorhees AP, Qi YX, Jiang Z, **Han HC** (2015). Artery remodeling under axial twist in three days organ culture. *Ann Biomed Eng* 43(8): 1738-47.
67. Voorhees AP. **Han HC** (2015). Biomechanics of Cardiac Function. (Invited review). *Comprehensive Physiol.* 5:1623–1644. Oct. 2015.
68. Huang K, Yan ZQ, Zhao D, Chen SG, Gao LZ, Zhang P, Shen BR, **Han HC**, Qi YX, Jiang ZL (2015). SIRT1 and FOXO mediate contractile differentiation of vascular smooth muscle cells under cyclic stretch. *Cell Physiol Biochem.* 37(5): 1817-1829. Nov. 2015.
69. Qi N, Gao H, Ogden RW, Holzapfel GA, **Han HC**, Luo XY (2015). Investigation of the optimal collagen fibre orientation in human iliac arteries. *J Mech Behavior Biomed Mat* 52: 108-119. Dec 2015.

## 2016

70. Chesnutt JKW, **Han HC** (2016). Computational simulation of platelet interactions in the initiation of stent thrombosis due to stent malapposition. *Phys Biol* 13(1):016001. Jan 2016.
71. Yabluchanskiy A, Ma Y, DeLeon-Pennell KY, Altara R, Halade GV, Voorhees AP, Nguyen NT, Jin YF, Winniford MD, Hall ME, **Han HC**, Lindsey ML (2016). Myocardial Infarction Superimposed on Aging: MMP-9 Deletion Promotes M2 Macrophage Polarization. *J Gerontol A Biol Sci Med Sci.* 71(4):475-83. Apr 2016.

72. Mottahedi M, **Han HC** (2016). Artery buckling analysis using two layered model with collagen dispersion. *J Mech Behavior Biomed Mat* 60: 515–524. (July 2016).
73. Xiao Y, Liu Q, **Han HC** (2016). Buckling reduces eNOS production and stimulates extracellular matrix remodeling in arteries in ex vivo organ culture. *Ann Biomed Eng.* 44(9):2840-50. Sept. 2016.
74. **Han HC**, Liu Q, Jiang ZL (2016). Mechanical Behavior and Wall Remodeling of Blood Vessels under Axial Twist (Invited review). *J Med Biomech*, 31(4):319-326. Sept 2016
75. Alagarsamy K, Fortier A, Kumar N, Mohammad A, Banerjee S, **Han HC**, Mishra RS (2016). Computational modeling of stent implant procedure and comparison of different stent materials. *J Biomed Eng Res.* 1: 101. (Sept. 2016).
76. FatemiFar F, **Han HC** (2016). Effect of axial stretch on lumen collapse of arteries. *J Biomech Eng.* 138(12), 124503 (6 pages) (Nov 03, 2016).
77. Alagarsamy K, Fortier A, Komarasamy M, Mishra R, Mohammad A, Banerjee S, Han HC (2017). Mechanical properties of High Entropy Alloy Al0.1CoCrFeNi for Peripheral Vascular Stent Application. *Cardiovasc Eng & Tech.* 7(4): 448-454. Dec 2016.

## 2017

78. Halaney DL, Sanyal A, Nafissi NA, Escobedo D, Goros M, Michalek J, Acevedo PJ, Pérez W, Escobar GP, Feldman MD, **Han HC** (2017). The importance of trabeculae carneae for left ventricular diastolic compliance: improvement in compliance with trabecular cutting. *J Biomech Eng.* 139(3), 031012 (8 pages) (Jan 24, 2017).
79. Yang H, Fortier A, Home K, Mohammad A, Banerjee S, **Han HC** (2017), Investigation of Stent Implant Mechanics Using Linear Analytical and Computational Approach. *Cardiovascular Eng Tech.* 8(1):81-90. (March 2017).
80. Garcia JR, Sanyal A, Fatemifar F, Mottahedi M, **Han HC** (2017). Twist buckling of veins under torsional loading. *J Biomech* 58: 123-130. (June 2017).
81. Wang GL, Wang LY, Yang SX, Zhang P, Chen XH, Yao QP, Gong XB, Qi YX, Jiang ZL, Han HC (2017). Arterial wall remodeling under sustained axial twisting in rat. *J Biomech* 60:124-133. (July 2017).
82. Feng ZG, Cortina M, Chesnutt JKW, **Han HC** (2017). Numerical simulation of thrombotic occlusion in tortuous arterioles. *J Cardiol Cardiovasc Med.* 2017; 2: 095-111.

## 2018

83. Sharzehee M, Khalafvand SS, **Han HC** (2018). Fluid-structure interaction modeling of aneurysmal arteries under steady-state and pulsatile blood flow: a stability analysis. *Computer Methods in Biomechanics and Biomedical Engineering* 21(3): 219-231.
84. Thirugnanasambandam M, Simionescu DT, Escobar PG, Sprague EA, Goins B, Clarke GD, Han HC, Amezcua KL, Adeyinka OR, Goergen CJ, Finol E (2018). The effect of pentagalloyl glucose on the wall mechanics and inflammatory activity of rat abdominal aortic aneurysms. *J Biomech Eng.* 140(8):084502 (8 pages).
85. Han, H. C. (2018). Understanding the mechanisms of left ventricle mechanical unloading to achieve myocardial recovery. *Am J Physiol Heart Circ Physiol.* 315(6): H1519-H1520.

## 2019

86. Fatemifar F, Feldman MD, Oglesby M, Han HC (2019). Comparison of Biomechanical Properties and Microstructure of Trabeculae Carneae, Papillary muscles, and Myocardium in Human Heart. *J Biomech Eng.* 141(2): 021007 (10 pages).

87. Han HC, Liu SQ, Guo EX (2019). Preface - A tribute to Dr. YC Fung on his 100<sup>th</sup> birthday. Guest Editorial. *J Biomech Eng* 141 (9): 090301.
88. Fatemifar F, Clarke G, Finol EA, Feldman MD, Han HC (2019). Computational modeling of human left ventricle to assess the effects of trabeculae carneae on the diastolic and systolic functions. *J Biomech Eng* 141(9): 091014 (10 pages).
89. Oglesby M, Escobedo D, Escobar GP, Fatemifar F, Sako EY, Bailey SR, Han HC, Feldman MD (2019). Trabecular Cutting: A Novel Surgical Therapy to Increase Diastolic Compliance. *J Appl Physiol*. 127: 457–463.
90. Sharzehee M, Change Y, Song J, Han HC (2019). Hemodynamic effects of myocardial bridging in patients with hypertrophic cardiomyopathy. *Am J Physiol*. 317(6): H1282-1291. Dec 2019.
91. Sharzehee M, Fatemifar F, Han HC (2019). Computational simulations of the helical buckling behavior of blood vessels. *Int J Numer Meth Biomed Eng*. 35(12): e3277 (1-14).

## **2020**

92. Han HC, Wan, H, Wang X (2020). Quantifying Engineering Faculty Performance Based On Expectations On Key Activities and Integration Using Flexible Weighting Factors. *J Biomech Eng*. 142 (11): 114701 (9 pages).
93. Andrew DL, Han HC, Ocampo J, Alaeddini A, and Thomsen M (2020). Characterization of residual stresses from cold expansion using spatial statistics. *Fatigue & Fracture of Engineering Materials & Structures* (FFEMS). 46: Online 8/16. <https://doi.org/10.1111/ffe.13334>
94. Moreno J, Escobedo D, Calhoun C, Jourdan-La Saux C, Han HC (2020). Arterial wall stiffening in Caveolin-1 deficiency induced pulmonary artery hypertension in mice. *Experimental Mechanics*. 60: online 10/14.
95. Sharzehee M, Seddighia Y, Sprague EA, Finol EA, Han HC (2020). A hemodynamic comparison of myocardial bridging and coronary atherosclerotic stenosis: A computational model with experimental evaluation. *J Biomech Eng*. 142 online 11/2020.

## **Book Chapters**

96. Ku DN, **Han HC** (2003), Assessment of function in tissue engineered vascular grafts. In *Functional Tissue Engineering*, Ed: Farshid Guilak, David L. Butler, Steven A. Goldstein, and David Mooney Springer-Verlag. New York, NY, Chapter 19, 258-267. (Book Chapter)
97. Northcutt A, Datir P, **Han HC** (2009). Computational simulations of buckling of oval and tapered arteries. In *Tributes to Yuan-Cheng Fung on His 90th Birthday. Biomechanics: From Molecules to Man*. Ed: Shu Chien, Peter C Y. Chen, Geert W. Schmid-Schönbein, Pin Tong, and Savio L-Y Woo, World Scientific Publishing Co. New Jersey, Chapter 6, 53-64. (Book Chapter)

## **Additional Peer-Reviewed Journal Articles in Chinese**

98. Chen ST, **Han H** (1987). The Fourier Eigen Transform. *Chin J Appl Mech*. 4(1): 33-37.
99. Zhao L, Huang YT, **Han H**, Huang M, Han LP, Zhang LF, Zhang R, Li J (1993). Mechanical and hemodynamical changes of autogenous vein grafts. *Chin J Reparative Reconstructive Surg*. 7(2): 91-94.
100. **Han H** (1994). An analysis of stress and strain representations. *J Xi'an Jiaotong Univ*. 28(1): 45-50. (English Abstract in Ei '9409).
101. Huang M, **Han H**, Zhao L (1994). The zero-stress state of canine aorta. *J Med Biomech [Chinese]*. 9(1): 52-55.
102. **Han H** (1994). A review of the residual strain in living organs. *Adv Mech*. 24(1): 124-131.



103. **Han H**, Li G, Kuang ZB, Zhao L, Huang YT (1994). Tensile test of autogenous vein grafts. *Chin J Appl. Mech.* 11(3): 122-123.
104. **Han H**, Huang M, and Yang Z (1994). The zero-stress state of human extremital arteries and veins. *Chin J Biomed Eng.* 13(3): 244-250. (English Abstract in EI '9505).
105. Shen Q, Zong W, Jiang D, **Han H** (1994). An isometric muscle contraction test device using capacitive transducer. *Chin J Biomed Instrument.* 18(6): 329-332.
106. Liao DH, **Han H**, Li LS (1995). An in vitro fatigue test of human tibia. *J Med Biomech [Chinese]*. 10(4): 238-244.
107. Xu H, Zhu M, Pei J, Zang Y, **Han H** (1997). [The establishment and evaluation of abdominal aorta thrombosis model in rat]. *Chin J Appl Physiol.* 13(1): 89-90. (English Abstract in Medline).
108. Xu H, Zhu M, Pei J, Zang Y, **Han H** (1997). [Changes in the contraction and relaxation of abdominal aorta after thrombosis in rats]. *Chin J Appl Physiol.* 13(3): 260,267.
109. Xu H, Zhu M, **Han H**, Pei J, Wang Y, Zang Y, Hu S (1997). Effect of calcitonin gene-related peptide on the relaxation of isolated abdominal aorta of rat following thrombosis. *J FMMU* 18(6): 532-535.
110. Liao DH, **Han HC**, Huang M, Kuang Z, Zhao L (1997). A study of stress-strain relation of autogenous vein grafts: circumferential versus longitudinal. *J Med Biomech [Chinese]* 12(3):134-137.
111. Liao D, **Han H**, Kuang Z (1998). Finite element analysis of human tibia in vitro. *J Biomed Eng [Chin]*. 15(1): 53-57.
112. Liao D, Kuang Z, **Han H** (1999). Simulation of endothelial cell behavior by 2-D steady flow on a wavy surface. *J Xi'an Jiaotong Univ.* 33(2): 59-63.
113. Hou L, Huang Y, **Han H** (1999). Establishment of axial tension in anastomosis for arterial defect repair using vein grafting. *J Naval General Hospital*, 12(2):65-68.
114. **Han HC**, Xu H, Zhu M, Zang YM (1999). The zero-stress state of rat abdominal aorta following thrombosis. *Chin J Biomed Eng.* 18(2): 184-186. (English Abstract in Ei)
115. Liao DH, **Han HC**, Zhao L, Huang M, Huang YT, Kuang ZB (2000). The stress-strain relations of autogenous vein grafts and its histologic correlation. *Chin J Biomed Eng.* 19(3): 261-266.
116. Hou L, Huang Y, **Han H** (2000), Bridging artery defect with autogenous vein under required anastomosing tension – a theoretical analysis based on related biomechanical evidence. *J Biomed Eng [Chin]*. 17 (3): 277-280. (English Abstract in Medline)
117. Liao DH, Kuang ZB, Li J, **Han HC** (2001). Simulation of endothelial cell behavior under 2-D pulsatile flow on a wavy surface. *Chin J Biomed Eng.* 20(6): 545-551.
118. Liao DH, Li J, Kuang ZB, **Han HC** (2002). Numerical simulation of the shear stress on the surfaces of endothelial cells under static and 24h flow conditions. *Chin J Biomed Eng.* 21(1): 21-27.
119. Hou L, Huang Y, **Han H** (2002). Compliance variation following the change of longitudinal stretch ratio. A study on femoral artery and vein in a rabbit model. *J Biomed Eng [Chin]* 19(2):207-211.
120. Gao F, Cheng JH, Xue JH, Bai YG, Chen MS, Huang WQ, Huang J, Wu SX, **Han HC**, Zhang LF (2012). In-vivo and ex-vivo studies on region-specific remodeling of large elastic arteries due to simulated weightlessness and its prevention by gravity-based countermeasure. *Acta Physiologica Sinica*, 64(1): 14–26.
121. **Han HC**, Jiang ZL (2012). Vascular remodeling under axial tension. *J Med Biomech [Chinese]* (Invited review) 27(1):7-12.

122. Gu X, Jiang J, Wu L, Yang Y, Zhang P, **Han HC**, Jiang Z, Qi Y (2014). The role of FOXO1 on cyclic stretch induced proliferation of vascular smooth muscle cells during hypertension. *J Med Biomech* [Chinese] 29(5): 440-446.
123. **Han HC** (2018). Great Mentor and role model: celebrating the 100th birthday of Dr. YC Fung. *J Med Biomech* [Chinese] 2018; 33: S31-S32.

**Over 160 conference presentation and invited talks.**

**RESEARCH FUNDS:**

**Current:**

1. T32 HL07446, PI: McManus 07/1990- 08/2022  
NIH /NHLBI  
Pathobiology of Occlusive Vascular Disease  
Role: Faculty Mentor  
This grant supports one postdoctoral fellow in Dr. Han's lab
2. T34GM007717 MARC-U\*STAR Program, PI: Barea-Rodriguez 6/1/2009-5/31/2021  
NIGMS/NIH  
"UTSA MBRS MARC-U\*STAR program"  
The program provides opportunities for disadvantaged and underrepresented students to gain the skills and motivation required to pursue graduate education and a career in research.  
Role: Faculty Mentor
3. MBRS-RISE R25GM060655, PI: Barea-Rodriguez 8/1/2008-7/31/2023  
NIH/NIGMS  
"UTSA MBRS RISE Program"  
The RISE program support students with disadvantaged background to pursue advanced degrees.  
Role: Faculty Mentor

**Recently Completed as PI:**

4. R01HL095852, PI: Han 3/1/2010-12/31/2016  
NIH/NHLBI  
"Biomechanical mechanisms of artery tortuosity"  
The main goal of this project is to determine the biomechanical mechanisms of artery tortuosity by investigating the interactions between vascular hemodynamics, buckling, and wall remodeling.  
Role: PI
5. Innovative Research Grant, PI: Feldman 1/1/2015 – 12/31/2017  
AHA National  
"A new treatment for diastolic heart failure: trabecular cutting"  
Role: Co-I
6. CAREER Award (CBET-0644646), PI: Han 3/1/2007-2/28/2013 (no-cost ext)  
NSF  
"CAREER: Biomechanics of artery buckling"  
The main goals of this project are to establish the biomechanical models of three forms of artery buckling (bending, kinking, and twisting) and to predict the buckling load.  
Role: PI
7. F31 Predoctoral Fellowship F31HL096448, PI: Hayman 5/1/2009-4/30/2011  
NIH/NHLBI

“Determining the effect of altered pulse pressure on artery structure and function”

This fellowship supports PhD student Danika Hayman to study the effect of altered pulse pressure on artery structure and function.

Role: Sponsor (Mentor)

8. BME (CBET-0602834), Han (PI)

6/1/2006- 5/31/2010

NSF

“The effect of pulse pressure on vascular remodeling”

The main goal of this project is to elucidate the role of pulse pressure on arterial wall function and remodeling.

Role: PI

## TEACHING INTERESTS

*Mechanics and Biomechanics:*

Solid mechanics, advanced solid mechanics, mechanical vibration, elasticity, statics and dynamics, mechanical stability

Biomechanics, introduction to bioengineering, cardiovascular biomechanics, medical imaging and tissue engineering

## TEACHING EXPERIENCE

New Courses Developed

Fall 2003	<i>ME 4963 Introduction to Bioengineering (New)</i>	U
Fall 2006	<i>BME 6893: Cardiovascular Biomechanics (new)</i>	G

Courses Taught:

Spring 2003,	ME 3813 Solid Mechanics	(24 students)
Fall 2003,	ME 4963 Introduction to Bioengineering (new course)	(20)
Spring 2004	EGR 3323 Applied Engineering Analysis II,	(90)
Spring 2004,	ME 3813 Solid Mechanics	(33)
Fall 2004,	ME 4963 Introduction to Bioengineering	(14)
Fall 2004	ME 5183: Mechanical Vibration,	(8)
Spring 2005,	ME 3813 Solid Mechanics,	(46)
Fall 2005,	ME 3813 Mechanics of Solids	(41)
Spring 2006,	ME 4963: Introduction to Bioengineering	(20)
Fall 2006,	BME6893: Cardiovascular Biomechanics (new course)	(7)
Spring 2007	ME3323: Mechanical Vibration	(9)
Fall 2007	ME 4963: Introduction to Bioengineering	(11)
Spring 2008	ME 3813 Solid Mechanics	(76)
Fall 2008,	BME6893: Cardiovascular Biomechanics	(5)
Spring 2009	ME 3813 Solid Mechanics	(47)
Fall 2009	ME 4963: Introduction to Bioengineering	(9)
Fall 2009	ME 5963: Introduction to Bioengineering	(2)
Spring 2010	ME5453: Advanced Strength of Materials	(11)
Fall 2010	ME 3813 Solid Mechanics	(61)
Spring 2011	BME/ME6893 Cardiovascular Biomechanics	(5)
Fall 2011	ME 3813 Solid Mechanics	(85)
Spring 2012	ME 3813 Solid Mechanics, (section 1)	(49)
Spring 2012	ME 3813 Solid Mechanics, (section 2)	(35)
Fall 2012	ME 3813 Solid Mechanics, (section 1)	(36)
Fall 2012	ME 3813 Solid Mechanics, (section 2)	(54)

Fall 2013	ME 3813 Solid Mechanics	(86)
Spring 2014	ME 3813 Solid Mechanics	(102)
Fall 2014	ME 3813 Solid Mechanics	(96)
Spring 2015	ME 3813 Solid Mechanics (2 sections)	(160)
Fall 2016	ME 3813 Solid Mechanics	(40)
Spring 2017	ME 4963: ME application to Bioengineering	(27)
Spring 2018	ME 3813 Solid Mechanics	(39)
Fall 2019	ME 3813 Solid Mechanics	(30)
Spring 2020	ME 6043: Continuum Mechanics	(8)

### **Graduate students supervised**

#### Postdoctoral Fellows

Yong-Ung Lee, PhD, 8/2008-7/2009  
 Qin Liu, PhD, 6/2010-8/2014  
 Jennifer Chesnutt, 8/2010-6/2015  
 Liping Wu, 11/2010-2/2012  
 Danika Hayman, 8/2011-11/2011  
 Qingping Yao, Research Scientist Associate, 7/2007-12/2009  
 Jinzhou Zhang, PhD, 2/2012-4/2013  
 Seyed Saeid Khalafvand. PhD, 5/2013-8/2014  
 Yangming Xiao, MD, PhD (Research Scientist III) 9/2010-2015  
 Arnav Sanyal, PhD, 2/2014-10/2015  
 Andrew Voorhees, PhD, 1/2015-4/2015  
 Qin Liu, PhD, 8/2014-5/2016, Research Assistant Professor

#### Graduate Students

Yong-Ung Lee, PhD student, BME Sept 2003- August 2008  
 Danika Hayman, PhD student (Hispanic), BME, Sept 2006- August 2011  
 Avione Northcutt, PhD student (Africa American), BME, Sept 2007- August 2011  
 Justin Garcia, PhD student (Hispanic), BME, Fall 2009-Spring 2015 (medical Leave)  
 Andrew Voorhees, PhD student, BME, Jan 2011-Dec 2014  
 Guoliang Wang, PhD Student, Exchange student from Shanghai Jiaotong Univ. 2012-2014  
 Graduated SJTU 5/2016  
 Fatemeh Fatemifar, PhD Student, ME, 9/2014-5/2018  
 Mohammad Ali Sharezhee, Fall 2017-Spring 2020  
 Dallen Andrew, PhD Student, ME, Fall 2015-Summer 2020

Vinay Challa, MS student, ME, Sept. 2003 – Aug. 2005  
 Armando Silva, MS student ME, (Hispanic), Sept 2006 - May 2007  
 Marcello Pilia, MS student, BME Sept 2007- Dec 2008  
 Parag Datir, MS student, ME, Sept 2008- Aug. 2010  
 Yang Zhao, MS student, BME, Fall 2009- August 2011  
 Ricky Martinez, MS student (Hispanic), ME, Nov. 2009- Aug. 2011  
 Justin Moreno, MS student (Hispanic), BME, Fall 2010-Summer 2012  
 Shawn Lamm, Graduate Research Assistant (Hispanic), ME, Jan 2010- Dec 2011  
 Aida Nasirian, MS BME, Spring 2014-2015  
 Mohammad Mottahedi, MS ME, Spring 2014-Dec 2015 (Fall 2016)  
 Paul Garza, MS ME Special project, 9/2014-5/2016  
 Ramsey Shadfan, BME MS student 9/2015-8/2018

Beili Zhu, Graduate Research Assistant, 2004-2005  
Jenny Wehmeyer, Graduate Research Assistant, Jan.-March, 2007  
Binya Liu, Graduate Research Assistant, summer 2011  
Sean Dion, ME MS student, Jan. 2017-2018

*Current:*

Yasamin Seddighi, Fall2019-

**Awards received by supervised students**

Ricky Martinez, Finalist, Student Paper Competition, ASME Summer Bioeng Conf, FL (June 2008)  
Shawn Lamm, Best Poster Award. SACNAS National Conference, Utah, 2008  
Danika Hayman, NIH MBRS-RISE predoctoral scholarship (Sept 2008--April 2009)  
Avione Northcutt, NIH MBRS-RISE predoctoral scholarship (Sept. 2008--July 2011)  
Danika Hayman, NIH F31 Predoctoral Fellowship (May 2009--April 2011)  
Danika Hayman, Graduate Research Award, BMES Sept. 2009  
Shawn Lamm, Travel Scholarship, SACNAS, Sept 2009  
Danika Hayman featured in **UTSA Today** (Aug 24, 2009) regarding receiving NIH F31 Fellowship  
and BMES Graduate Research Award  
Justin Garcia, Travel Scholarship, SACNAS, Sept. 2010.  
Justin Garcia, NIH MBRS-RISE predoctoral scholarship (Sept 2011--)  
Justin Moreno, Valero Graduate Scholarship (Sept 2010—May 2012)  
Rita Thornton, Poster Award, ABRCMS, Nov. 2011.  
Justin Garcia and Justin Moreno are featured on the UTSA Graduate School (3/2012).  
Justin Moreno, Nominee for MS Thesis Award, CONFERENCE OF SOUTHERN GRADUATE  
SCHOOLS (CSGS), 2013 MASTER'S THESIS AWARDS  
Frank Wang, COE Valero Foreign Visiting PhD Student Award, Fall 2012  
Andrew Voorhees, COE PhD Student Excellence Award, Fall 2012  
Andrew Voorhees, COE Valero student travel Award, Fall 2013  
Justin Garcia, Best Presentation Award, SACNAS National Conference, San Antonio, TX, 2013