**Curriculum Vitae**

**Name:** Wanling Xuan

**Title:** Assistant Professor

**Email Address: wxuan@usf.edu**

**Education**

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| Shantou University Medical College, China  | M.D. | Clinical Medicine |
| Shantou University Medical College, China  | M.S. | Internal Medicine, Cardiology |
| Southern Medical University, China | Ph.D. | Internal Medicine, Cardiology |

**Positions/Training**

2014.5-2017 Postdoc, University of Illinois at Chicago, Chicago, IL, United states

2018-2020.1 Senior Research Associate, Vascular Biology Center, Augusta University, Augusta, GA

2020.2-2021.12 Assistant Research Scientist, Vascular Biology Center, Augusta University, Augusta, GA

2022.1- Dept of Pharmaceutical Science, USF Health Taneja College of Pharmacy, Tampa, FL

**Research experience**

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| 2022.1- | **Assistant Professor**Dept of Pharmaceutical Science, USF Health Taneja College of Pharmacy, University of South Florida**Research area:** muscle regeneration, extracellular vesicles, sarcopenia, heart failure, Alzheimer's disease, aging |
| 2020.2-2021.12 | **Assistant Research Scientist**Vascular Biology Center, Medical College of Georgia, Augusta University**Research area:** muscle regeneration, vascular dysfunction and cardiomyopathy in muscle dystrophy and aging. Recently I made an exciting discovery that switching of vascular smooth muscle cells (VSMCs) phenotype is an important factor in the pathogenesis of Duchenne muscular dystrophy. Thus I am developing bioengineered vascular cells and extracellular vesicles for the repair of dysfunctional vessel and improvement of muscle function in dystrophic muscle tissue. I am also using aging mice, iPSC platform (dCas9-KRAB iPS cell line/ progeria iPS cell line), iPSC derived cardiomyocyte, cardiac fibroblast and CRISPR-Cas9 screening library to identify and test the potential targets for reversing aging heart.  |
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| 2014.5-2020.1 | **Postdoctoral Research Associate/Senior Research Associate**University of Illinois at Chicago; Vascular Biology Center, Augusta University**Research area:** Therapeutic Cell based Approaches for heart repair and regeneration.I established non-viral reprogramming technique for hiPSC into cardiac progenitor cells(CPCs) using a cardiogenic small molecule with muscle differentiating and antioxidant properties. These induced CPCs were extremely resistant to ischemia and developed into cardiac lineage cells upon transplantation into infarcted heart. The second significant contribution was that I discovered that the extracellular vesicles (EV) released from these CPCs were several folds potent than those obtained from ordinary hiPSC. These EV had novel miRNA cargo particularly miR-373 which was responsible for effectively reducing fibrosis and promoting angiogenesis in a mouse myocardial infarction model. In addition, I identified Notch1 signaling was strong stimulus for cardiac regeneration by cardiac mesenchymal stem cells (C-MSC). EV secreted by Notch1 overexpressing C-MSC were highly effective in preventing cell death, promoting angiogenesis, CM proliferation and in restoring cardiac function after myocardial infarction. Mentor: Muhammad Ashraf Ph.D. |
| 2008-2012 | Graduate Research Assistant/ Research associateSouthern Medical University, China **Research area: Therapeutic strategies for cardiac hypertrophy, myocardial infarction, heart failure.**I discovered a novel cardiac chemokine (fractalkine) and determined its detrimental effects on myocardial ischemia and heart failure. Inhibition of fractalkine improved cardiac function in mice post-myocardial infarction. Subsequently, I identified a new mechanism of resveratrol effect on myocardial ischemia and ischemic heart failure. These findings provided the novel potential targets for treatment of ischemic heart disease. In addition, I have identified IL-32 as a predictor of adverse cardiac event in patients with heart failure after myocardial infarction. I demonstrated that the endogenous activation of CB1 has cardiac protection in acute heart failure, which is attributable to the inhibition of excessive sympathetic activation in collaboration with other colleagues. I discovered that expression of adiponectin in hypertrophied hearts was significantly downregulated and adiponectin knockout mice exhibited higher levels of transverse aortic constriction (TAC) induced cardiac hypertrophy and EGF receptor activation, demonstrating the protective effects of adiponectin on cardiac hypertrophy. Further I demonstrated that inhibition of HB-EGF mediated EGFR activation as a mechanism of antihypertrophic action of adiponectin. In collaboration with other colleagues, we found that Ankrd1 was increased during pathological cardiac hypertrophy by enhancement of CARP and calcineurin. Short hairpin RNA targeting Andkrd1 can inhibit TAC-induced hypertrophy. In addition, together with other colleagues, we first reported the existence of the phenomenon for hypertrophic preconditioning. We first demonstrated that preconditioning by pro-hypertrophic factors increased resistance of the heart to subsequent hypertrophic stress. These findings provide important insight for preconditioning as an effective strategy for delaying the progression of hypertrophy leading to heart failure.Mentor: Yili Liu M.D; Yulin Liao M.D, Ph.D. |

**Teaching experience**

**2008-2012** **Laboratory mentorship**

Directly supervised and mentored MS and medical students for their laboratory projects.

Southern Medical University, China

**2006-2012 Clinical teaching**

Southern Medical University, China; Shantou University Medical College, China

Directly mentored medical students and clinical interns using clinical case studies and simple medical procedures.

**2018.3-2021.12**: **Contributions to the Development of Vascular Biology Center**, Augusta University, USA

**Laboratory** mentoring high school student, graduate student, postdocs in the lab for their research projects.

**2020.11 lecture** VBIO 9010 Seminar in Vascular Bio- Vascular Biology PhD. program

Vascular Biology Center, Augusta University, USA

**Grant support**

**Grant #** [**1R01AG070145-01**](https://public.era.nih.gov/grantfolder/viewCommonsStatus.era?applId=10098452&urlsignature=v1$26687025$eracert168_ks$NEKf5QE4pFBiDYt-yfk4iqp6dMVZybfW-Dk3EC0n-E4jSNekxHLPyAPXUMA9Og7fFr3aiXIGYiygtXB0P4d6MHOeZBmAYyAq4JX4jkfkwvDur-NcK5yFh71J86TZblBHj2-uDuVhqHIAqkFPuRaKzIRULPf0uybFqfHoB-SDLD3pgU5yZnk8GbWi-x31PbeYnJb_UO_TragnYXlAwYBwjJSMIIBhwxKUjnlKnTkzuRNrgg9N0syoTgwdzlfi3CgFptMWyQul1xN1cBjUsTVNbkLPrUyccl3wV6EXxmWbCM9IPxkLiWkFJ-zueU4cWg6o3o7HVkRNWa3DuM3VsOHK3Q..) **Wanling Xuan** (PI) 1/1/2021-12/31/2025

**Title**: hiPS cells derived skeletal muscle progenitors and their extracellular vesicles for treatment of sarcopenia

**Major Goal**: This project will develop novel strategies using induced pluripotent stem cell derived muscle progenitors and their extracellular vesicles to reverse the senescence process of muscle stem cells and to enhance the therapeutic efficacy of stem cells for the treatment of sarcopenia.

Role: PI

**Grant # 3R01AG070145-04S1  Wanling Xuan** (PI) 6/15/2024-12/31/2024

**Title**: hiPS cells derived skeletal muscle progenitors and their extracellular vesicles for treatment of sarcopenia

(Therapeutic potential of muscle progenitor cells derived extracellular vesicles in Alzheimer's disease)

**Major Goal**: This project will develop a novel and potentially effective extracellular vesicles-based treatment for Alzheimer's disease.

Role: PI

**Grant #** [**1R01AG070145-01**](https://public.era.nih.gov/grantfolder/viewCommonsStatus.era?applId=10098452&urlsignature=v1$26687025$eracert168_ks$NEKf5QE4pFBiDYt-yfk4iqp6dMVZybfW-Dk3EC0n-E4jSNekxHLPyAPXUMA9Og7fFr3aiXIGYiygtXB0P4d6MHOeZBmAYyAq4JX4jkfkwvDur-NcK5yFh71J86TZblBHj2-uDuVhqHIAqkFPuRaKzIRULPf0uybFqfHoB-SDLD3pgU5yZnk8GbWi-x31PbeYnJb_UO_TragnYXlAwYBwjJSMIIBhwxKUjnlKnTkzuRNrgg9N0syoTgwdzlfi3CgFptMWyQul1xN1cBjUsTVNbkLPrUyccl3wV6EXxmWbCM9IPxkLiWkFJ-zueU4cWg6o3o7HVkRNWa3DuM3VsOHK3Q..) **Wanling Xuan** (PI)

**Florida High Tech Corridor Grant Tipparaju PI, Co-PI: Xuan and Ashraf** 06/01/2023- 05/30/2024

Title: IPS cells for cardiovascular and skeletal muscle diseases

Aim: The goal of the project is development of iPS cells for treatment of skeletal muscle and heart disease.

Industry sponsor: IPS Heart

Role: Co-PI

**Peer-Reviewed Journal Articles**

1. Joung W Kim, Ravikumar Manickam, Puja Sinha, **Wanling Xuan**, Jian Huang, Kamal Awad, Marco Brotto, Srinivas M Tipparaju. P7C3 ameliorates barium chloride-induced skeletal muscle injury activating transcriptomic and epigenetic modulation of myogenic regulatory factors. J Cell Physiol. 2024 Sep;239(9):e31346. PMID: 38946152.
2. Xiaowei Han, Muhammad Ashraf, Hong Shi, Augustine T. Nkembo, Srinivas M. Tipparaju, **Wanling Xuan**. Combined Endurance and Resistance Exercise Mitigates Age-Associated Cardiac Dysfunction. Advanced Biology, May 21, 2024. PMID: 38773896.
3. Ganesh V Halade, Gunjan Upadhyay, MathanKumar Marimuthu, **Xuan Wanling**, Vasundhara Kain. Exercise reduces pro-inflammatory lipids and preserves resolution mediators that calibrate macrophage-centric immune metabolism in spleen and heart following obesogenic diet in aging mice. J Mol Cell Cardiol. 2024 Mar:188:79-89. PMID: 38364731.
4. Joung W Kim, Ravikumar Manickam, Puja Sinha, **Wanling Xuan**, Jian Huang, Kamal Awad, Marco Brotto, Srinivas M Tipparaju. P7C3 ameliorates barium chloride-induced skeletal muscle injury activating transcriptomic and epigenetic modulation of myogenic regulatory factors. J Cell Physiol. 2024 Jun 30. PMID: 38946152.
5. Ashraf M, Tipparaju SM, Kim JW, **Xuan W**. Chemokine/ITGA4 Interaction Directs iPSC-Derived Myogenic Progenitor Migration to Injury Sites in Aging Muscle for Regeneration. *Cells* 2023, *12*(14), 1837. PMID: 37508502.
6. **W Xuan**, F Cheng, X Han, S Tipparaju, M Ashraf. Phenotypic Switching of Vascular Smooth Muscle Cells in Duchenne Muscular Dystrophy. bioRxiv, 2023.06. 23.546309.
7. **Xuan W**, Khan M, Ashraf M. Pluripotent Stem Cells induced Skeletal Muscle Progenitor Cells with Givinostat Promote Myoangiogenesis and Restore Dystrophin in injured Duchenne Dystrophic Muscle. Stem Cell Res Ther. 2021 Feb 12;12(1):131.
8. **Xuan W**, Khan M, Ashraf M. Extracellular Vesicles from Notch activated Cardiac Mesenchymal Stem Cells Promote Myocyte Proliferation and Neo-vasculogenesis. Front Cell Dev Biol. 2020 Feb 21; 8:11.
9. **Xuan W**, Wang L, Xu M, Weintraub NL, Ashraf M. miRNAs in extracellular vesicles from iPS derived cardiac progenitor cells effectively reduce fibrosis and promote angiogenesis in infarcted heart. Stem cell international. Stem Cells Int. 2019 Nov 11; 2019:3726392.
10. **Xuan W**, Wang Y, Tang Y, Ali A, Hu H, Maienschein-Cline M, Ashraf M. Cardiac Progenitors Induced from Human Induced Pluripotent Stem Cells with Cardiogenic Small Molecule Effectively Regenerate Infarcted Hearts and Attenuate Fibrosis. Shock. 2018 Dec;50(6):627-639.
11. **Xuan W**, Huang W, Wang R, Chen C, Chen Y, Wang Y, Tan X. Elevated circulating IL-32 presents a poor prognostic outcome in patients with heart failure after myocardial infarction. Int J Cardiol. 2017 Sep 15; 243:367-373.
12. **Xuan W**, Wu B, Chen C, Chen B, Zhang W, Xu D, Bin J, Liao Y. Resveratrol improves myocardial ischemia and ischemic heart failure in mice by antagonizing the detrimental effects of fractalkine. Crit Care Med. 2012 Nov; 40(11):3026-33. **Highlighted by Iervasi G, Forini F, Sabatino L. A glass of wine: how good is good? The resveratrol lesson. Crit Care Med. 2012 Nov;40(11):3098-3099.**
13. **Xuan W**, Liao Y, Chen B, Huang Q, Xu D, Liu Y, Bin J, Kitakaze M. Detrimental effect of fractalkine on myocardial ischemia and heart failure. Cardiovasc Res. 2011 Dec 1; 92(3):385-393. **Highlighted by Altin SE, Schulze PC. Fractalkine: a novel cardiac chemokine? Cardiovasc Res. 2011 Dec 1;92(3):361-362.**
14. Liao Y\*, **Xuan W**\*, Zhao J, Bin J, Zhao H, sakura M, Funahashi T, Takashima S, Kitakaze M. Antihypertrophic effects of adiponectin on cardiomyocytes are associated with the inhibition of heparin- binding epidermal growth factor signaling. Biochem Biophys Res Commun. 2010 Mar 12; 393(3):519-525. (co-first).
15. Yan Wang, Yue Zhang, Zhaoying Wen, Bing Tian, Evan Kao, Xinke Liu, **Wanling Xuan**, Karen Ordovas, David Saloner, Jing Liu. Deep Learning based Fully Automatic Segmentation of the Left Ventricular Endocardium and Epicardium from Cardiac Cine MRI. Quantitative Imaging in Medicine and Surgery 2021;11(4):1600-161.
16. Shen J, Ji Y, Xie M, Zhao H, **Xuan W**, Yin L, Yu X, Xu F, Su S, Nie J, Xie Y, Gao Q, Ma H, Ke X, Shi Z, Fu J, Liu Z, He Y, Xiang M. Cell-modified Bioprinted Microspheres for Vascular Regeneration. Mater Sci Eng C Mater Biol Appl, 2020 Jul; 112:110896. doi: 10.1016/j.msec.2020.110896.
17. Hao H, Li X, Li Q, Lin H, Chen Z, Xie J, **Xuan W**, Liao W, Bin J, Huang X, Kitakaze M, Liao Y. FGF23 promotes myocardial fibrosis in mice through activation of β-catenin. Oncotarget. Oncotarget. 2016 Oct 4;7(40):64649-64664.
18. Wei X, Wu B, Zhao J, Zeng Z, **Xuan W**, Cao S, Huang X, Asakura M, Xu D, Bin J, Kitakaze M, Liao Y. Myocardial hypertrophic preconditioning attenuates cardiomyocyte hypertrophy and slows progression to heart failure through upregulation of S100A8/A9. Circulation. 2015 Apr 28;131(17):1506-17.
19. Liao Y, Bin J, Asakura M, **Xuan W**, Chen B, Huang Q, Xu D, Ledent C, Takashima S, Kitakaze M. Deficiency of type 1 cannabinoid receptors worsens acute heart failure induced by pressure overload in mice. Eur Heart J. 2012 Dec; 33(24):3124-33.
20. Chen C, Shen L, Cao S, Li X, **Xuan W**, Zhang J, Huang X, Bin J, Xu D, Li G, Kitakaze M, Liao Y. Cytosolic CARP promotes angiotensin II- or pressure overload-induced cardiomyocyte hypertrophy through calcineurin accumulation. PLoS One. 2014 Aug 4;9(8): e104040.
21. Xie J, Liao Y, Yang L, Wu J, Liu C, **Xuan W**, Li M, Zhang L, Liu Y, Wu P, Bin J. Ultrasound molecular imaging of angiogenesis induced by mutant forms of hypoxia inducible factor-1α. Cardiovasc Res. 2011 Nov 1; 92(2):256-66.
22. Yan Y, Liao Y, Yang L, Wu J, Du J, **Xuan W**, Ji L, Huang Q, Liu Y, Bin J. Late-phase detection of recent myocardial ischemia using ultrasound molecular imaging targeted to intercellular adhesion molecule-1. Cardiovasc Res. 2011 Jan 1; 89(1):175-83.

**Reviews**

**1. W Xuan**, SM Tipparaju, M Ashraf. Transformational Applications of Human Cardiac Organoids in Cardiovascular Diseases. Front Cell Dev Biol. 2022 Jun 9:10:936084. PMID: 35813193.

**2.** X Han, M Ashraf, S Tipparaju, **W Xuan**. Muscle-brain Crosstalk in Cognitive Impairment. Front Aging Neurosci

. 2023 Jul 27:15:1221653. PMID: 37577356.

3. SR Ali, AT Nkembo, SM Tipparaju, M Ashraf, **W Xuan**. Sarcopenia: recent advances for detection, progression, and metabolic alterations along with therapeutic targets. Can J Physiol Pharmacol. 2024 Aug 26. PMID: 39186818.

**Conference abstracts /Poster Presentations**

1. Extracellular Vesicles from iPSC derived Muscle Progenitor Cells Rejuvenate the Dysfunctional Muscle Stem Cells during Aging. Wanling Xuan, Srinivas M. Tipparaju, Muhammad Ashraf. Experimental Biology 2022.
2. Restoration of Dystrophin in Duchenne Muscular Dystrophy by Human iPS Cells Derived Skeletal Muscle Progenitor Cells. **W Xuan**, Y Tang, M Ashraf. The FASEB Journal. Experimental Biology 2020. <https://doi.org/10.1096/fasebj.2020.34.s1.02223>.
3. Notch1 Overexpression in Cardiac Mesenchymal Stem Cells Renders their Exosomes Highly Effective in Promoting Angiogenesis and Cardiac Regeneration. **W Xuan**, Y Tang, M Ashraf. The FASEB Journal 33 (1\_supplement), lb63-lb63. Experimental Biology 2019 (Orlando, USA).
4. Exosomal miRNAs derived from specific cardiac progenitor cells exert strong therapeutic effect on myocardial infarction. **Wanling Xuan**, Lei Wang, Yaoliang Tang, Muhammad Ashraf. The FASEB Journal, Experimental Biology 2018 (San Diego, USA).
5. Triggering Mechanism of Isoxazole in Cardiac Differentiation of Human Induced Pluripotent Stem Cells. **W Xuan**, Muhammad Ashraf. Circulation 136 (Issue Suppl 1) AHA 2017 (Orange county, LA, USA).
6. Conversion of Human Induced Pluripotent Stem Cells into Cardiac Progenitor Cells for Heart Repair. **W Xuan**, A Ali, M Ashraf. The FASEB Journal 31 (1\_supplement), 978.3-978.3. Experimental Biology 2017 (Chicago, USA).
7. Abstract 13004: Fractalkine Promotes the Progression of Diabetes-Induced Cardiorenal Syndrome through Induction of Mitochondrial Dysfunction and Cell Apoptosis. Liao Y, **Xuan W**, Wu B, Guo S, Su L, Zeng Z, Chen B, Chen C, Bin J, and Masafumi K, Circulation. 2012;126: A13004. AHA 2012 (LA, USA).
8. Abstract 11457: Deficiency in Fractalkine Receptor Reduces Post-Infarction Cardiac Rupture by Preventing Down-Regulation of aE-catenin. Su L, **Xuan W**, Shen L, Li X, Xu D, and Liao Y, Circulation. 2013; 128: A11457.
9. [Evaluation of ICAM-1 expression for a recent myocardial ischemia in late time window with ultrasound molecular imaging](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=PboHR7kAAAAJ&citation_for_view=PboHR7kAAAAJ:zYLM7Y9cAGgC). J Bin, Y Yan, L Yang, J Wu, M Li, **W Xuan**, J Liu, L Ji, Y Liao. Circulation 120 (Suppl 18), S326-S326.

**Invited talk**

1. Human Pluripotent Stem Cells Derived Muscle Progenitors and Their Extracellular Vesicles for Treatment of Muscle Atrophy. Augusta University, 11/2020.
2. The Therapeutic Application of Extracellular Vesicles in Cardiovascular Diseases. University of South Florida, 6/2021.
3. Muscle Progenitor Cells Derived Extracellular Vesicles for the Treatment of Sarcopenia. 13th World Congress of International Society for Adaptive Medicine, Orlando, USA, 11/2022.
4. Therapeutic Application of Extracellular Vesicles in Cardiovascular Diseases. 10th Annual North American Section meeting of the International Academy of the Cardiovascular Sciences, IACS-NAS 2023. Tampa, USA, 9/2023.
5. Role of Paracardial Adipose Tissue in Age Associated Cardiac Diastolic Dysfunction (Award of Institute of Cardiovascular Sciences (Winnipeg) Symposium on Women’s Heart Health). 11th Annual North American Section meeting of the International Academy of the Cardiovascular Sciences. IACS-NAS 2024. Houston, USA, 9/2024.

**Scientific Appointments**

02/2023 NIH Peer-review member (ad hoc) Special Emphasis Panel (SEP)

11/2021-present Guest Associate Editor, Frontiers in cell and developmental biology (Stem cell Research)

02/2023-present Review Editor, Frontiers in Bioengineering and Biotechnology (Biomaterials)

**Journal reviewer**

* AJP-Heart and Circulatory Physiology
* Journal of American Heart Association
* Medical Science Monitor
* Cardiology
* Stem Cell International
* Stem Cell Research& Therapy
* Frontiers in Bioengineering and Biotechnology, section Biomaterials
* Frontiers in Cardiovascular Medicine
* Biochemical Genetics
* BMC Neuroscience