

BO WANG

Assistant Professor

Department of Biomedical Engineering

The Marquette University and Medical College of Wisconsin

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EDUCATION

- 2012 Ph.D., Biomedical Engineering
Tissue Engineering Research Center/Department of Biological Engineering
Mississippi State University, Mississippi State
Dissertation: "The Tissue Engineered Cardiac Patches: Multifaceted Stimulation of Stem Cells in Decellularized Myocardium"
- 2007 M.S., Maxillofacial Surgery
Dalian Medical University, Liaoning, China
Thesis: "Spatial and temporal changes of palatal cell proliferation and apoptosis in retinoic acid induced mouse cleft palate varies with the embryonic stages"
- 2004 D.D.S., Stomatology
Dalian Medical University, Liaoning, China

PROFESSIONAL EXPERIENCE

- 2019- Assistant Professor
Department of Biomedical Engineering, The Marquette University and Medical College of Wisconsin
- 2016-2018 Assistant Professor
Biomedical Engineering Program, Alabama State University
- 2012-2016 Postdoc Fellow, Department of Surgery
Feinberg School of Medicine, Northwestern University
- 2008-2012 Research Assistant of Biomedical Engineering
Department of Agricultural and Biological Engineering
Mississippi State University
- 2010-2012 Teacher Assistant of Tissue Engineering
Department of Agricultural and Biological Engineering
Mississippi State University
- 2005-2007 Resident Intern of Oral and Maxillofacial Surgery
Department of Dentistry
First Affiliated Hospital of Dalian Medical University (Liaoning, China)
- 2003-2005 Dental Intern
Department of Dentistry
First Affiliated Hospital of Dalian Medical University (Liaoning, China)

AWARDS

- 2011: TERMIS pediatric workshop scholarship

2008-2012: Graduate Research Assistantships, Mississippi State University
2014: 2014 TERMIS-AM Annual Conference travel award
2015: 2015 Postdoctoral Professional Development Travel Award, Northwestern University

OTHER EXPERIENCE AND PROFESSIONAL MEMBERSHIPS

- Member, Biomedical Engineering Society (BMES) (2008 to present)
- Member, Tissue Engineering and Regenerative Medicine Society (TERMIS) (2011 to present)
- Member, American Heart Association (AHA) (2012 to present)
- Member, Society for Biomaterials (SFB) (2017 to present)
- Reviewer, Biomed Research International (2013 to present)
- Reviewer, Biochemical engineering journal (2014 to present)
- Reviewer, Journal of Stem cells and Regenerative Medicine (2014 to present)
- Reviewer, Theranostics journal (2019 to present)

CURRENT PROJECTS

1. Optimization and Enhancement of Hepatic Differentiation for Stem Cells via Biofunctional Modification.
2. Development of an Amnion-based Construct via Biofunctional Modification as an Interface for Cleft Palate Repair.
3. Develop an Individualized Multiplex Composite via 3D Bioprinting for Complex Bone Defect Restoring.
4. Cardiovascular tissue engineering, imaging, modeling, and simulation.

PREVIOUS PROJECTS

1. Designing and fabricating tissue engineered myocardium using acellular myocardium scaffolds and mesenchymal stem cells.
2. Study of the ultra-structural and biomechanical properties of native and decellularized mitral valves.
3. Investigate the structural and mechanical alterations in cardiac muscles after hydrogel injection with an in vitro model
4. Fabricating a tissue engineered graft for cleft palate repairing and guided bone regeneration

RESEARCH FUNDINGS

- 2019-2022: "Tissue-Engineered Vascular Graft of Small Diameter Using Porcine Artery", Advancing a healthier Wisconsin (AHW) Research and Education Program, Role: Principle investigator, \$590,528
- 2018-2021: "Development of an Individualized Multiplex Composite as an Interface for Severe Cleft Palate Repair", NIH R15, Role: Principle investigator, \$354,805
- 2017-2020: "Optimization and Enhancement of Hepatic Differentiation for Mesenchymal Stem Cells via Biofunctional Modification", NSF Research Initiation Award, Role: Principle investigator, \$300,000

- 2016-2017: “Acquisition of a Multimaterial 3-D Bioplotter for Interdisciplinary Research and Education”, NSF MRI, Role: Co-Principle investigator, \$271,535, (Principle investigator: Derrick Dean)

COLLABORATORS

- Dr. Jason Wertheim, Northwestern University
- Dr. Guillermo Ameer, Northwestern University
- Dr. Ramille Shah, Northwestern University
- Dr. Jun Liao, The University of Texas at Arlington
- Dr. Derrick Dean, Alabama State University

TEACHING AND MENTORING

1. BIO 340 Biostatistics, Department of Biology, Alabama State University.
2. BIO 350: Biotechnology and Instruments, Department of Biology, Alabama State University.
3. BME 200: Static, Biomedical Engineering Program, Alabama State University.
4. BME 220 Biomechanics, Biomedical Engineering Program, Alabama State University.
5. Student Mentoring

I have supervised one graduate student and more than 20 graduate and undergraduate students since 2012. My role is to help the students to make a feasible research plan, provide subject-specific guidance, and give practical suggestions and solutions for the un- predictable problems in their endeavors.

PUBLICATIONS

1. Wuwei Li, Yuqian Fu, Bin Jiang, Aaron Lo, Guillermo Ameer, Cleon Barnett, and **Bo Wang**. “Polymer Integrated Amnion Scaffold Significantly Improves Cleft Palate Repair” *Acta Biomaterialia*,92:104-114, 2019.
2. **Wang B**, Li W, Dean D, Mishra MK, Wekesa KS. “Enhanced Hepatogenic Differentiation of Bone Marrow Derived Mesenchymal Stem Cells on Liver ECM Hydrogel” . *J Biomed Mater Res A*. 106(3): p. 829-838, 2018.
3. **Bo Wang**, Adam Jakus, Ramille Shah, Jason Wertheim. “Development of Micro Bioscaffold to Evaluate Functional and Proliferative Capabilities of Induced Pluripotent Stem Cell–Derived Hepatocytes.” *Stem Cells Translational Medicine*, 5:1–11, 2016.
4. **Bo Wang**, Sourav Patnaik, Bryn Brazile, J Ryan Butler, Andrew Claude, Ge Zhang, Jianjun Guan, Yi Hong, Jun Liao. “Establishing Early Functional Perfusion and Structure in Tissue Engineered Cardiac Constructs.” *Critical Reviews™ in Biomedical Engineering*, 43 (5-6); 455-471, 2015.
5. Uzarski JS, Bijonowski BM, **Wang B**, Ward HH, Wandinger-Ness A, Miller WM, Wertheim JA. “Dual-purpose bioreactors to monitor non-invasive physical and biochemical markers of kidney and liver scaffold recellularization.” *Tissue engineering. Part C, Methods*, 2015.
6. Wuwei Li, Jun Liao, Nan Li, Bryn Brazile, Wei Dai, Guowu Ma, **Bo Wang**. “An Amnion-based Barrier Membrane for Guided Bone Regeneration in Dental Implant Applications.” *Langmuir*, 31 (31), pp 8642–8653, 2015.

7. Bryn Brazile, **Bo Wang**, Guangjun Wang, Robbin Bertucci, Raj Prabhu, Sourav Patnaik, J. Ryan Butler, Andrew Claude, Erin Brinkman-Ferguson, Lakiesha N. Williams, and Jun Liao. "On the Bending Properties of Porcine Mitral, Tricuspid, Aortic, and Pulmonary Valve Leaflets. *Journal of Long-Term Effects of Medical Implants.*" 25(1–2): 41–53, 2015.
8. **Bo Wang**, Lakiesha Williams, Amy L. de Jongh Curry, Jun Liao. "Preparation of Acellular Myocardial Scaffolds with Well-preserved Cardiomyocyte Lacunae and Method for Applying Mechanical and Electrical Simulation to Tissue Construct." *Methods in Molecular Biology*, Vol1181, p 189-202, 2014.
9. Wuwei Li, Ryo Tamamura, **Bo Wang**, Qigui Liu, Tingjiao Liu, Naoki Katase, Jing Xiao, Hitoshi Nagatsuka. "Expressions of ABCG2, CD133 and podoplanin in salivary adenoid cystic carcinoma." *Biomed Research International*, vol. 2014, Article ID 132349.
10. **Bo Wang**, Guangjun Wang, Filip To, J. Ryan Butler, Andrew Claude, Ronald McLaughlin, Amy L. de Jongh Curry, and Jun Liao. "Myocardial Scaffold-based Cardiac Tissue Engineering: Application of Coordinated Mechanical and Electrical Stimulations" *Langmuir*, 29(35): p. 11109-17, 2013.
11. James P. Chow, Dan T. Simionescu, Harleigh Warner, **Bo Wang**, Sourav S. Patnaik, Jun Liao, Agneta Simionescu, "Mitigation of diabetes-related complications in implanted collagen and elastin scaffolds using matrix-binding polyphenol." *Biomaterials*, Jan; 34(3):685-95, 2013.
12. **Bo Wang**, Mary E. Tedder, Clara E. Perez, Guangjun Wang, Amy L. de Jongh Curry, Filip To, Steve H. Elder, Lakiesha N. Williams, Dan T. Simionescu, and Jun Liao. "Advanced Structural and Biomechanical Characterizations of Porcine Myocardial Extracellular Matrix." *Journal of Materials Science: Materials in Medicine*, Aug;23(8):1835-47, 2012.
13. Dan T. Simionescu, Joseph Chen, Michael Jaeggli, **Bo Wang**, and Jun Liao. "Form Follows Function: Advances in Trilayered Structure Replication for Aortic Heart Valve Tissue Engineering." *Journal of Healthcare Engineering*, 3(2): 179–202, 2012.
14. **Bo Wang**, Ali Borazjani, Mina Tahai, Amy L. de Jongh Curry, Dan T. Simionescu, Jianjun Guan, Filip To, Steve H. Elder, and Jun Liao. "Fabrication of Cardiac Patch with Decellularized Porcine Myocardial Scaffold and Bone Marrow Mononuclear Cells." *Journal of Biomedical Materials Research Part A*. 94(4), 1100-10, 2010.
15. Jun Liao, Lauren B. Priddy, **Bo Wang**, Joseph Chen, and Ivan Vesely. "Ultrastructure of Porcine Mitral Valve Chordae Tendineae." *Journal of Heart Valve Disease*, 18(3), 292-299, 2009.
16. Corin Williams, Jun Liao, Erinn M. Joyce, **Bo Wang**, Jennie B. Leach, Michael S. Sacks, and Joyce Y. Wong. "Structural and Mechanical Properties of Decellularized Rabbit Carotid Arteries." *Acta Biomaterialia*, 5(4):993-1005, 2009.
17. Ru Wang, Bin Liu, **Bo Wang**, Wei Cong, and Jing Xiao. "Spatial and temporal changes of palatal cell proliferation and cell apoptosis of retinoic acid induced mouse cleft palate in different embryonic stages." *Hua Xi Kou Qiang Yi Xue Za Zhi*, 26(5): p.546-9, 2008. (in Chinese).
18. Xiao J, Cong W, Wang R, **Wang B**, Wnag F, Zhu E-X, Hu H, Katase K and Nagatsuka

H. "The study of palatal cell proliferation and apoptosis in retinoic acid induced mouse cleft palate varied with different developmental stage." *Journal of Hard Tissue Biology* 16(3):125-130, 2007

BOOK CHAPTERS

1. Katherine Copel, **Bo Wang**, Xiaodan Shi, Dan T. Simionescu, Yi Hong, Pietro Bajona, Michael S. Sacks, Jun Liao, Decellularization in Heart Valve Tissue Engineering. Book Title: *Advances in Heart Valve Biomechanics*. Springer, Cham, Page: 289-317, 2018.
2. **Bo Wang** and Jason Wertheim, Experimental Cell Therapy for Liver Dysfunction, Book Title: *Translating Regenerative Medicine to the Clinic*, Page: 309-313, 2016.
3. **Bo Wang**, Lakiesha Williams, Amy L. de Jongh Curry, Jun Liao. Chapter Title: Preparation of Acellular Myocardial Scaffolds with Well-preserved Cardiomyocyte Lacunae, and Method for Applying Mechanical and Electrical Simulation to Tissue Construct. Book Title: *Cardiac Tissue Engineering Methods and Protocols*. Editors: Milica Radisic and Lauren Black; Springer Science, Page: 189-202, 2014.
4. Sourav S. Patnaik, **Bo Wang**, Benjamin Weed, Jason A. Wertheim, Jun Liao, Chapter 3 Decellularized Scaffolds: Concepts, Methodologies, and Applications in Cardiac Tissue Engineering and Whole-Organ Regeneration, Book Title: *Tissue Regeneration: Where Nanostructure Meets Biology*, Editor: Qing Liu; World Scientific Company, page: 77-124, 2013.
5. Dan T. Simionescu, Joseph Chen, Michael Jaeggli, **Bo Wang**, Jun Liao. Chapter Title: Form Follows Function: Advances in Trilayered Structure Replication for Aortic Heart Valve Tissue Engineering. Book Title: *Advances in Engineering for Surgery-from information-guided surgery to cell-based medicine*. Editor: Ming Chyu; Multi-Science Publishing Company, Page: 225-248, 2013.

PEER REVIEWED CONFERENCE PRESENTATIONS

1. **Bo Wang**, "Development of an Extracellular Matrix-Enriched Gelatin Sponge for Liver Wound Dressing." Society for Biomaterials 2019 Annual Meeting & Exposition, Seattle, WA, April 3–6, 2019
2. **Bo Wang**, Adam Jakus, Pedro M. Baptista, Shay Soker, Alejandro Soto-Gutierrez, Michael M. Abecassis, Ramille Shah, Jason A. Wertheim, "Three-dimensional Micro-Bioscaffolds Enhance Protein Expression in Induced Pluripotent Stem Cell-Derived Hepatocytes." TERMIS-AM 2014 Annual Conference and Exposition, Washington DC, Dec. 13-16, 2014
3. **Bo Wang**, Benjamin Weed, Sourav Patnaik, Wuwei Li, Jing Xiao, J. Ryan Butler, Jun Liao, "A Novel Composite Graft for Cleft Palate Repairing." BMES Annual Fall Meeting, Seattle, WA, Oct., 2013
4. **Bo Wang**, Adam Jakus, Alison Wu, Daniel Benjamin Eiden, Yang Wu, Jenny Zhang, Ramille Shah, Jason Wertheim. "Development of Micro Bioscaffold as a Multiplex System To Evaluate Bioactive Molecules That Enhance Cell Function." American Transplant Congress (ATC), Seattle, WA, May, 2013

5. S. Patnaik, B. Weed, A. Borazjani, **B. Wang**, B. Brazile, L. Williams, M. Damaser, and J. Liao. "Characterization of Nonlinear Anisotropic Mechanical Properties of Sheep Vaginal Wall Tissue." BMES Annual Fall Meeting, Atlanta, Oct., 2012
6. **Bo Wang**, Adam Jakus, Daniel Eiden, Alison Wu, Yang Wu, Jenny Zhang, Ramille Shah, Jason Wertheim, "Derived Bioscaffold as a Multiplex System to Evaluate Bioactive Molecules that Enhance Cell Function". 10TH ANNUAL CBC SYMPOSIUM, Oct., 2012, Evanston, IL.
7. **Bo Wang**, Adam Jakus, Daniel Eiden, Alison Wu, Yang Wu, Jenny Zhang, Ramille Shah, Jason Wertheim, "Use of IPS Derived Hepatocytes to Create Liver Bioscaffolds and a Whole Organ, Tissue Engineered Liver". CDI User Group Meeting, Oct., 2012, Madison, WI
8. **Bo Wang**, Clara Esteban Perez, Alayne Stewart White, Filip To, Amy Curry, and Jun Liao. "Myocardial Scaffold-based Cardiac Tissue Engineering: Application of Coordinated Mechanical and Electrical Stimulations." The 9th World Biomaterials Congress (WBC), Chengdu, China, June 1-5, 2012.
9. **Bo Wang**, Clara Esteban Perez, Alayne Stewart White, Filip To, Amy Curry, and Jun Liao. "Myocardial Scaffold-based Cardiac Tissue Engineering: Application of Coordinated Mechanical and Electrical Stimulations." TERMIS North America 2011 Annual Conference and Exposition, Houston, TX, Dec.11-14, 2011
10. **Bo Wang**, Dustin McCallum, Lakiesha Williams, and Jun Liao. "Evaluation of Valuation of Acellular Mitral Valve Scalloids: Anterior Leaflet, Posterior Leaflet, and Chordae Tendineae." ASME 2011 Summer Bioengineering Conference, Farnington, PA, June 22-25, 2011
11. **Bo Wang**, Dustin McCallum, Lakiesha Williams, and Jun Liao. "Evaluation of Acellular Mitral Valve Scaffolds: Anterior Leaflet, Posterior Leaflet, and Chordae Tendineae" BMES Annual Fall Meeting, Hartford, Conn., Oct., 2011
12. Dan Koback, Ali Borazjani, Sourav Patnaik, Katherine King, **Bo Wang**, Lakiesha Williams, Jun Liao. "Biomechanical Properties of the Decellularized Human Amnion." BMES Annual Fall Meeting, Hartford, Conn., Oct. 12-15,2011
13. **Bo Wang**, Clara Esteban Perez, Alayne Stewart White, Filip To, Amy Curry, and Jun Liao. "Design a Bioreactor with Coordinated Mechanical and Electrical Stimulations for Cardiac Patch Tissue Engineering" BMES Annual Fall Meeting, Hartford, Conn., Oct.12-15,2011
14. **Bo Wang**, Robbin Bertucci, Zhenqing Li, Lakiesha Williams, Jianjun Guan and Jun Liao. "Effect of Thermosensitive Hydrogel Injection on Mechanical and Ultra structural Properties of Porcine Myocardium" BMES Annual Fall Meeting, Hartford, Conn., Oct. 12-15,2011
15. **Bo Wang**, Dustin McCollum, Mary E. Tedder, Dan T. Simionescu, Filip To, Amy L. de Jongh Curry, Lakiesha Williams, and Jun Liao. "The Structural and Biomechanical Properties of Porcine Myocardial Extracellular Matrix." BMES Annual Fall Meeting, Austin, TX, Oct. 7-10, 2010
16. **Bo Wang**, Ali Borazjani, Jianjun Guan, Amy Curry, Dan T. Simionescu, Filip To, Steve Elder, and Jun Liao, "Decellularized Porcine Myocardium as a Scaffold for

Cardiac Regeneration” S 6th Symposium on Biologic Scaffolds for Regenerative Medicine, Napa Valley, CA, Apr. 25 - 27, 2010.

17. **Bo Wang**, Ali Borazjani, Jianjun Guan, Steve Elder, Amy Curry, Dan T. Simionescu, and Jun Liao, “Fabrication of Tissue-engineered Cardiac Patch with Decellularized Porcine Myocardial Scaffold.” Society for Biomaterials Annual Meeting and Exhibition, San Antonio, San Antonio, TX, Apr. 22-25, 2009
18. **Bo Wang**, Ali Borazjani, Jianjun Guan, Steve Elder, and Jun Liao, “Fabrication of Cardiac Patch with Decellularized Myocardial Scaffold and Mesenchymal Stem Cells.” ASME International Mechanical Engineering Congress & Exposition, Boston, MA, Nov. 2-6, 2008
19. **Bo Wang**, Ali Borazjani, Anna Hood, Jianjun Guan, Steve Elder, and Jun Liao, “Tissue Engineered Cardiac Patch using Decellularized Myocardial Scaffold and Mesenchymal Stem Cells.” BMES Annual Fall Meeting, St. Louis, MO, Oct. 2-4, 2008
20. **Bo Wang**, Ali Borazjani, Jianjun Guan, Steve Elder, and Jun Liao. “Fabrication of Cardiac Patch with Decellularized Myocardial Scaffold and Mesenchymal Stem Cells.” Bio-Inspired Design Conference 2008, Starkville, MS, Aug.19-22, 2008