Kaiyan Qiu, *Ph.D.* | *Curriculum Vitae*

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ACADEMIC APPOINTMENTS & EDUCATIONS

- Washington State University, Pullman, WA (08/2020-Present)
  Berry Family Assistant Professor, School of Mechanical and Materials Engineering.
- Princeton University, Princeton, NJ (09/2014-06/2015)
  & University of Minnesota, Minneapolis, MN (07/2015-06/2020)
  Postdoctoral Associate, Mechanical Engineering. Advisor: Michael C. McAlpine
- Dartmouth College, Hanover, NH (06/2013-08/2014)
  Research Associate, Thayer School of Engineering. Advisor: Ulrike U. G. Wegst
- Cornell University, Ithaca, NY (08/2007-08/2012)
  Ph.D., Fiber Science with Polymers & Biological Engineering. Advisor: Anil N. Netravali
- Donghua University, Shanghai, China (09/2000-03/2007)
  B.S. & M.S., Chemical Engineering

RESEARCH AREAS

- 3D Printing (AI-Assisted 3D-Printing, Conformal and Multimodal 3D-Printing, and Bioprinting)
- Functional Materials for Biomedical Devices
- 3D-Printed Wearable Biosensors for Health Monitoring
- 3D-Printed Haptic Electronics and Prosthetic Systems for Rehabilitation
- 3D-Printed Artificial Organs for Surgical and Medical Applications

SELECTED RESEARCH HONORS AND MEDIA COVERAGE

- Invited by 3D HEALS, as one of five experts to deliver a talk and participate in a panel discussion during the webinar "Next-Gen 3D Printed Orthotics and Prosthetics".
- Invited by University of Washington, as one of 10 experts to participate in a roundtable discussion on "Bio-Integrated Sensing: Materials and Devices in and on the Body" in KEMi Inaugural Symposium at UW Seattle Campus, October 2026
- Featured paper "A geometry-aware and customizable multimodal sensing system for texture and material identification in prosthetics", in Live Interview Fox 13 TV News, 2026
- Featured two research projects on "3D-printed dynamic heart model" and "3D-printed microneedle-based electrochemical biosensor", both in VCEA e-News, Summer 2026
- MRS Best Poster Award Nominations (2 times), Spring 2025 & Spring 2026
- Featured paper "3D-printed dynamic heart model with left-side anatomy and integrated sensor for edge-to-edge repair and regurgitation reduction", in Live Interview Fox 13 TV News, 2026
- Recognized Top-Viewed Articles (Wiley) "Machine learning enabled design and optimization for 3D-printing of high-fidelity presurgical organ models", in *Adv. Mater. Technol.*, 2026
- Recognized Top-Viewed Articles (Wiley) "3D-printed biomimetic and bioinspired soft actuators", in *IET Cyber-Systems and Robotics*, 2026
- Elected Secretary of the Electronic Materials Technical Committee (ASME), with a six-year leadership progression as Secretary, Vice Chair, and Chair, 2025
- Selected Favorite Paper "3D-printed flexible microfluidic health monitor for *in-situ* sweat analysis and biomarker detection", by Editor-in-Chief, *ACS Sensors* for the First 10 Years, 2025
- Featured paper "Machine learning enabled design and optimization for 3D-printing of high-fidelity presurgical organ models", in Nvidia Blog News, 2024

- Top 10 most read paper "3D-printed flexible microfluidic health monitor for *in-situ* sweat analysis and biomarker detection", in *ACS Sensors*, July 2024
- Endowed as Berry Family Assistant Professor of Mechanical Engineering, 2021
- Best Manuscript Award (as co-author) "*In situ* expansion, differentiation and electromechanical coupling of human cardiac muscle in a 3D bioprinted, chambered organoid", selected by Editors in *Circulation Research*, 2020
- Best article in 2018 (as lead author) "3D printed organ models with physical properties of tissue and integrated sensors", selected by Editors in *Adv. Mater. Technol.,* 2019
- Featured in Fox News (as lead author) "3D printed organ models with physical properties of tissue and integrated sensors", 2017
- The 3rd Place in National Textile Center Forum Student Competition, Charleston, SC, 2011
- The 1st Place in FSAD student paper competition, Cornell University, 2011
- Liu Memorial Award Scholarship, Cornell University, 2010

PEER-REVIEWD PUBLICATIONS (CITATIONS 2856, H-INDEX 19)

(Underlined: students advised by K. Qiu & *: K. Qiu as the lead corresponding author)
Total 13 Publications at WSU. As the lead corresponding author at WSU: 9 (my students at WSU as the first authors); With my advised students: 10; Publications as collaborative coauthor: 4.

[32] S. Li, S. Chen, S. Zborovsky, Z. Du, Y. Li, P. Dong, **K. Qiu**, S. Yao. 'Skin-Conformal Thermo-Haptic Interface with Advanced Thermal Management for Multimodal Haptic Feedback.' 2026, *Small*, e75512, DOI: 10.1002/smll.75512 (**IF: 11.8**)

[31] H. Shen, N. Bogdv, Y. Zhang, S. Yao, P. Dutta, **K. Qiu***. 'A Geometry-Aware and Customizable Multimodal Sensing System for Texture and Material Identification in Prosthetics.' 2026, *Cell Reports Physical Science*, 7 (8), 103458, DOI: 10.1016/j.xcrp.2026.103458 (**3** students advised by Qiu, **IF: 6.9**)

- Featured in WSU Insider, and 15 news outlets and 6 blogs (Altmetric: 147)
- Live Interviewed and Featured in Fox 13 TV News

[30] Y. Fu, X., S. Rahmani, C. Chen, D. Du, H. P. A. Van Dongen, **K. Qiu**, Y. Lin. 'Flexible Electrochemical Sensors: Emerging Biomedical Applications and Future Perspectives.' 2026, *ECS Sensors Plus*, 2026, 5, 031601, DOI: 10.1149/2754-2726/ae8de6 (**2** students advised by Qiu, **IF: 6.3**)

[29] Y. Fu, C. Chen, X. Li, Y. Song, C. D. Simpson, L. P. Naeher, **K. Qiu***, D. Du. 'Fabrication and Optimization of a Hybrid 3D-Printed Flexible Electrochemical Biosensor for Sensitive Detection of 1-Hydroxypyrene Glucuronide, an Associated Wildfire Exposure Biomarker' *Talanta*, 2026, 307, 129778, DOI: 10.1016/j.talanta.2026.129778 (**2** students advised by Qiu, **IF: 6.7**)

[28] A. Guillen Obando, H. Shen, M. McGoven, Y. Zhang, V. Lin, D. Fu, R. Baumwart, **K. Qiu***. '3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction.' *Advanced Materials Technologies*, 2026, e70885, DOI: 10.1002/admt.70885 (**6** students advised by Qiu, **IF: 6.0**)

- Featured in WSU Insider, VCEA e-News & 6 news outlets and 3 blogs (Altmetric: 60)
- Live Interviewed and Featured in Fox 13 TV News

[27] C. Chen+, Y. Fu+, Y. Lin, Y. Liu, D. Du, **K. Qiu***. '3D-printed hollow microneedle-based electrochemical sensor for real-time and wireless glucose monitoring.' *Analyst*, 2026, 151, 1182-1194, DOI: 10.1039/d5an01058f (**2** students advised by Qiu, **IF: 3.6**)

- Featured in WSU Insider, VCEA e-News & 4 news outlets and 1 blog (Altmetric: 34)

[26] C. Chen[+], Y. Fu[+], Y. Liu, P. Dutta, Y. Lin, D. Du, **K. Qiu***. 'Next-Generation Health Monitoring: The Role of Nanomaterials in 3D-Printed Wearable Devices.' *Materials Today***,** 2025, 86, 317-339, DOI: 10.1016/j.mattod.2025.03.005 (**2** students advised by Qiu, **IF: 24.1**)

[25] E. S. Chen[+], A. Ahmadian[+], S. S. Sparks, C. Chen, A. Deshwal, J. R. Doppa, **K. Qiu***. 'Machine learning enabled design and optimization for 3D-printing of high-fidelity presurgical organ models.' *Advanced Materials Technologies*, 2025, 10(1), 202400037, DOI: 10.1002/admt.202400037 (**3** students advised by Qiu, **IF: 6.0**)

- Featured in WSU Insider & 17 news outlets and 1 blog (Altmetric: 134)
- Reported and Featured in Nvidia Blog News
- Wiley Top Viewed Article in *Advanced Materials Technologies* (2026)

[24] C. Chen, **K. Qiu***. '3D printed artificial organ models for surgical applications.' Biomedical Nanotechnology: Methods in Molecular Biology, vol 2902, *Springer Nature*, 2025, pp 183-195, DOI: 10.1007/978-1-0716-4402-7_12 (**1** student advised by Qiu)

[23] C. Chen, Y. Fu, S. S. Sparks**,** Z. Lyu, A. Pradhan, S. Ding, N. Boddeti, Y. Liu, Y. Lin, D. Du, **K. Qiu***. '3D-printed flexible microfluidic health monitor for *in-situ* sweat analysis and biomarker detection.' *ACS Sensors*, 2024, 9, 3212-3223, DOI: 10.1021/acssensors.4c00528 (**3** students advised by Qiu, **IF: 10.9**)

- Featured in WSU Insider & 25 news outlets and 2 blogs (Altmetric: 211)
- Top 10 most read paper in *ACS Sensors* in July 2024
- Selected by Editor-In-Chief as One of Favorite Papers in the First 10 Years of ACS Sensors

[22] S. S. Sparks[+], A. Guillen Obando[+], Y. Li, S. Chen, S. Yao, **K. Qiu***. '3D-printed biomimetic and bioinspired soft actuators.' *IET Cyber-Systems and Robotics*, 2024, 6(4), e70001, DOI: 10.1049/csy2.70001 (**2** students advised by Qiu, **IF: 2.8**)

- Wiley Top Viewed Article in *IET Cyber-Systems and Robotics* (2026)

[21] Y. Sun, J. Heacock, C. Chen, **K. Qiu**, L. Zou, J. Liu, Y. V. Li. 'Incorporation of gentamicin-encapsulated PLGA nanoparticles into PU/PEO nanofiber scaffolds for biomedical applications.' *ACS Applied Nano Materials*, 2023, 6(17), 16096-16105, DOI: 10.1021/acsanm.3c03549 (**1** student advised by Qiu, **IF: 5.8**)

[20] Z. Lyu, S. Ding, D. Du, **K. Qiu**, J. Liu, X. Zhang, Y. Lin. 'Recent advances in biomedical applications of 2D nanomaterials with peroxidase-like properties.' *Advanced Drug Delivery Review*, 2022, 185, 114269, DOI: 10.1016/j.addr.2022.114269 (**IF: 21.0**)

[19] **K. Qiu**, U. G. K. Wegst. 'Excellent mechanical and electrical properties of anisotropic freeze-cast native and carbonized bacterial cellulose-alginate foams.' *Advanced Functional Materials*, 2022, 32(1), 2105635, DOI: 10.1002/adfm.202105635 (WSU affiliation, **IF: 19.9**)

- Featured in WSU Insider & High Impact Factor

[18] G. Haghiashtiani[+](Co-First), **K. Qiu[+](Co-First)**, J. D. Zhingre Sanchez, Z. J. Fuenning, P. Nair, S. E. Ahlberg, P. A. Iaizzo, M. C. McAlpine. '3D printed patient-specific aortic root models with internal sensors for minimally invasive applications.' *Science Advances*, 2020, 6(35), eabb4641, DOI: 10.1126/sciadv.abb4641 (Published when in WSU, **IF: 12.5**)

- Featured in WSU Insider, Medical News, MedicalXpress, Science Daily, and numerous other news outlets

[17] M. E. Kupfer[+], W.-H. Lin[+], V. Ravikumar, **K. Qiu**, L. Wang, L. Gao, D. B. Bhuiyan, M. Lenz, J. Ai, R. R. Mahutga, D. Townsend, J. Zhang, M. C. McAlpine, E.. G. Tolkacheva, B. M. Ogle. '*In situ* expansion, differentiation and electromechanical coupling of human cardiac muscle in a 3D

bioprinted, chambered organoid.' *Circulation Research*, 2020, 127(2), 207-224, DOI: 10.1161/CIRCRESAHA.119.316155 **(IF: 18.0)**

- Selected as the Cover and the Best Manuscript Award in *Circulation Research*

[16] S. H. Park[+], R. Su[+], J. Jeong, S.-Z. Guo, **K. Qiu**, D. Joung, F. Meng, M. C. McAlpine. '3D printed polymer photodetectors.' *Advanced Materials*, 2018, 30(40), 1803980, DOI: 10.1002/adma.201803980 **(IF: 29.1)**

- Featured in Nature News, Newsweek, National Geographic, and numerous other news outlets

[15] **K. Qiu**, Z. Zhao, G. Haghiashtiani, S.-Z. Guo, M. He, R. Su, Z. Zhu, D. B. Bhuiyan, P. Murugan, F. Meng, S. H. Park, C.-C. Chu, B. M. Ogle, D. A. Saltzman, B. R. Konety, R. M. Sweet, M. C. McAlpine. '3D printed organ models with physical properties of tissue and integrated sensors.' *Advanced Materials Technologies*, 2018, 3(3), 1700235, DOI: 10.1002/admt.201700235 **(IF: 6.0)**

- Selected as a Best of 2018 article and the Inside Cover in *Advanced Materials Technologies*
- Featured in NIH News, Science Daily, Materials Today, Fox News, and numerous other news outlets

[14] **K. Qiu**, G. Haghiashtiani, M. C. McAlpine. '3D printed organ models for surgical applications.' *Annual Review of Analytical Chemistry*, 2018, 11, 287-306, DOI: 10.1146/annurev-anchem-061417-125935 **(IF: 7.5)**

- Featured in Annual Reviews News, Knowable Magazine, and a few other news outlets

[13] S.-Z. Guo, **K. Qiu**, F. Meng, S. H. Park, M. C. McAlpine. '3D printed stretchable tactile sensors.' *Advanced Materials*, 2017, 29(27), 1701218, DOI: 10.1002/adma.201701218 **(IF: 29.1)**

- Featured in NIH News, Advanced Science News, Materials Today, and numerous other news outlets

[12] **K. Qiu**, A. N. Netravali. 'In situ produced bacterial cellulose nanofiber-based hybrids for nanocomposites.' *Fibers*, 2017, 5(3), 31, DOI: 10.3390/fib5030031 **(IF 4.2)**

- Selected as Cover in *Fibers* 5(3)

[11] **K. Qiu**, A. N. Netravali. 'Polyvinyl alcohol based biodegradable polymer nanocomposites.' Chapter 13 In: Biodegradable Polymers, Vol. 1: Advancement in Biodegradation Study and Applications, *Nova Science Publishers, Inc.*, New York, 2015, pp. 325-379, ISBN: 978-1-63483-632-6

[10] **K. Qiu**, A. N. Netravali. 'A review of fabrication and applications of bacterial cellulose based nanocomposites.' *Polymer Reviews*, 2014, 54(4), 598-626, DOI: 10.1080/15583724.2014.896018 **(IF: 11.9)**

[9] **K. Qiu**, A. N. Netravali. ""Green" composites based on bacterial cellulose produced using novel low cost carbon source and soy protein resin.' Chapter 11 In: Recent Advances in Adhesion Science and Technology in Honor of Dr. Kash Mittal, *CRC Press*, Boca Raton, FL, 2014, pp. 193-208, DOI: 10.1201/b16347-15

[8] **K. Qiu,** A. N. Netravali. 'A composting study of membrane-like polyvinyl alcohol based resins and nanocomposites.' *Journal of Polymers and the Environment*, 2013, 21(3), 658-674, DOI: 10.1007/s10924-013-0584-0 **(IF: 5.0)**

[7] **K. Qiu,** A. N. Netravali. 'Halloysite nanotubes reinforced biodegradable nanocomposites using noncrosslinked and malonic acid crosslinked polyvinyl alcohol.' *Polymer Composites*, 2013, 34(5), 799-809, DOI: 10.1002/pc.22482 **(IF: 4.9)**

[6] **K. Qiu**, A. N. Netravali. 'Fabrication and characterization of biodegradable composites based on microfibrillated cellulose and polyvinyl alcohol.' *Composites Science and Technology*, 2012, 72(13), 1588-1594, DOI: 10.1016/j.compscitech.2012.06.010 **(IF: 9.9)**

[5] **K. Qiu**, A. N. Netravali. 'Bacterial cellulose-based membrane-like biodegradable composites using cross-linked and noncross-linked polyvinyl alcohol.' *Journal of Materials Science,* 2012, 47(16), 6066-6075, DOI: 10.1007/s10853-012-6517-9 **(IF: 3.9)**

[4] F. Hong, **K. Qiu**. 'An alternative carbon source from konjac powder for enhancing production of bacterial cellulose in static cultures by a model strain *Acetobacter aceti subsp. xylinus* ATCC 23770.' *Carbohydrate Polymers*, 2008, 72(3), 545-549, DOI: 10.1016/j.carbpol.2007.09.015 **(IF: 13.2)**

[3] **K. Qiu**, F. Hong. 'Mutation of *Acetobacter xylinum* for high-yield production of bacterial cellulose.' *Journal of Donghua University*, 2008, 34(2), 181-185

[2] F. Hong, **K. Qiu**, Y. Tan, Q. Chen. 'Production and characterization of bacterial cellulose membranes in static cultivations.' *Proceedings of the 2007 International Conference on Advanced Fiber and Polymer Materials*, Shanghai, China, Oct. 15-17, 2007, Vol. 2: 709-711

[1] **K. Qiu**, F. Hong. 'Development of an alternate carbon source from konjac powder for high-yield production of bacterial cellulose.' *Proceedings of 2007 International Forum on Biomedical Textile Materials*, Shanghai, China, May 30 -June 2, 2007, pp 235-240

PATENTS AND INVESTION DISCLOSURES

[9] **K. Qiu**, P. Dutta (Washington State University) 'A Geometry-Aware and Customizable Multimodal Sensing System for Texture and Material Identification in Prosthetics.' ID: *Disclosure-27-00003*, 2026 (A provisional patent, filed in July 2026)

[8] **K. Qiu**, D. Du (Washington State University) '3D-printed wearable flexible biosensors with microfluidic channels and single-atom catalyst.' ID: *Disclosure-23-00003*, 2022 (A non-provisional US Patent, filed in May 2026, US Patent Application *19/690,483*; A provisional patent, filed in 2024/2025)

[7] **K. Qiu** (Washington State University) "3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction". ID: *Disclosure-26-00061*, 2026 (A provisional patent, filed in February 2026)

[6] **K. Qiu**, D. Du. (Washington State University) '3D-printed hollow microneedle-based electrochemical sensor for real-time and wireless glucose monitoring.' ID: *Disclosure-26-00001*, 2025 (A provisional patent, filed in 2025)

[5] **K. Qiu**, J. R. Doppa (Washington State University) 'Machine Learning Enabled Design and Optimization for 3D-Printing of High-Fidelity Presurgical Organ Models.' ID: *Disclourse-24-00063* (A provisional patent, filed in 2024)

[4] M. C. McAlpine, **K. Qiu**, G. Haghiashtiani, R. M. Sweet (University of Minnesota). '3D printed organ model with integrated electronic device.' *US 11741854 B2*, 2023

[3] A. N. Netravali, **K. Qiu** (Cornell University). 'Bacterial cellulose based 'green' composites.' *US 9499686 B2*, 2016

[2] U. G. K. Wegst, D. Herron, M. Kretschmar, S. Bauer, **K. Qiu** (Dartmouth College). 'Material and method of manufacture of electrodes and porous filters formed of ice-templated graphene-oxide and carbon nanotube composite, and applications thereof.' *WO 2015109272 A1*, 2015

[1] F. Hong, **K. Qiu** (Donghua University). 'Preparation of a carbon source from konjac flour for producing bacterial cellulose.' *CN 100595271* C, 2010

GRANTS & PROPOSALS

Awarded Grants at WSU (Total 10)

[10] WSU Veterinary Medicine Collaborative Project Funds (**PI K. Qiu**) *Funded in July 2026*
- Title: 3D-printed pulmonary heart model for dogs.
- Awarded amount: **$3,600**
- Duration: July 2026-June 2027

[9] WSU Commercialization Special Project Fund (**PI K. Qiu**) *Funded in Dec. 2024*
- Title: 3D-printed wearable biosensors and electronics.
- Awarded amount: **$25,000**
- Duration: January 2025-December 2025

[8] NSF NRT-LEAD (PI: P. Dutta, **Core Participant: K. Qiu)** *Funded in Aug. 2023*
- Title: Convergent next-generation robotics training: leadership, entrepreneurship, and adaptive design (NRT- LEAD) amid a Changing World of Work
- Awarded amount: **$34,000** for each student, 3 PhD students in my group received this support
- Duration**:** 2024-2026

[7] WSU Commercialization Special Fund (**PI K. Qiu**) *Funded in Nov. 2022*
- Title: 3D-printed wearable biosensors.
- Awarded amount: **$15,000**
- Duration: January 2023-June 2024

[6] WSU New Faculty Seed Grant 2022 (**PI K. Qiu**) *Funded in May 2022*
- Title: 3D-Printed biomimetic sharkskin for underwater applications & Featured in WSU Insider
- Awarded amount: **$25,000**
- Duration: May 2022-August 2025

[5] WSU Industrial Engagement (**PI K. Qiu**) *Funded in May 2022*
- Title: 3D-printed wearable flexible biosensors
- Awarded amount: **$3,000**
- Duration: May 2022-August 2024

[4] Working with Industry 101 (**PI K. Qiu**) *Funded in May 2022*
- Awarded amount: **$3,000**
- Duration: May 2022-August 2024

[3] NIH NIAID R21AI69225 (PI: W. Dong; **Co-I: K. Qiu**; Co-I: C. Ivory) *Funded in Feb. 2022*
- Title: Paper-based nucleic acid amplification test for rapid diagnosis of hepatitis C viral (HCV) infection
- Awarded amount: **$406,490**
- Duration: 2022-2025

[2] Cougar Cage (**PI K. Qiu**) *Funded in July 2021*
- Title: 3D-printed cardiac models & Featured in WSU Insider
- Awarded amount: **$50,000**
- Duration: 2021-2028

[1] JCATI (PI: W. Dong; **Co-PI: K. Qiu**; Industry Partner: Altek) *Funded in Fall 2020*
- Title: Mask-based sensor for real time monitoring SARS-CoV-2 infection
- Award amount: **$58,086**
- Duration: 2020-2021

Pending Proposals (Total 7)

[7] Craig H. Neilsen Foundation Pre-proposal (**PI: K. Qiu**, Collaborators: Drs. S. Samejima and D. Du)
- Title: Non-Invasive Monitoring and Modulation of Body Temperature Control After Spinal Cord Injury
- Duration: July 2027-July 2029
- Outcome: **Invited for full proposal** (very high chance to get funded after invitation)

[6] Washington Research Foundation (**PI: K. Qiu**, Co-Is: Drs. S. Samejima & D. Du)
- Title: 3D-Printed Microneedle-Based Electrochemical Biosensor for Real-Time Monitoring and Modulation of Body Temperature.
- Requested amount: ~**$107,535**
- Duration: January 2027-December 2027
- Outcome: **Invited for full proposal** (**full proposal has been submitted**)

[5] NIH STTR (**PI: K. Qiu**, Co-I S. Samejima (UW) & DL ADV-Tech LLC)
- Title: 3D-Printed Microneedle-Based Electrochemical Biosensor for Cardiovascular Dysfunctions After Spinal Cord Injury.
- Requested amount: ~**$310,000**
- Duration: May 2027-May 2028

[4] NIH Parent R21 (**PI: K. Qiu**, Co-I: N. Boddeti)
- Title: 3D-Printed Dynamic Heart Phantom Using Liquid Crystal Elastomers with Dynamic Covalent Bonds.
- Requested amount: **$403,286** (My Part is $304,859)
- Duration: May 2027-May 2029
- Submitted as a backup proposal following Director guidance while awaiting the Trailblazer outcome (Trailblazer program was later terminated)

[3] NIH NIBIB R21 Trailblazer (**PI: K. Qiu**, Co-I: N. Boddeti)
- Title: Enhancing Contractility in Cardiac Tissue via Anisotropic Liquid Crystal Elastomer Substrates
- Requested amount: **$585,276** (My Part is about $381,217)
- Outcome: **Competitive**

[2] NIH NIBIB R21 Trailblazer (**PI: K. Qiu**, Co-I: N. Boddeti)
- Title: 3D-Printed Dynamic Heart Phantom Using Liquid Crystal Elastomers with Dynamic Covalent Bonds.
- Requested amount: **$558,552** (My Part: $306,704)
- Outcome: **Impact Score 37** for New Investigators with Positive Comments

[1] NIH NIBIB SBIR (**WSU PI: K. Qiu,** with DL ADV-Tech)
- Title: Monitoring of Alzheimer's Disease Associated Biomarkers Using Single-Atom Catalyst-Enhanced 3D-Printed Electrochemical Biosensors.
- Requested amount: **$305,779** (My part is $90,000)
- Outcome: **Competitive, submitted JIT Response** per Director's Request

INVITED TALKS AND GUEST LECTURES

[43] **K. Qiu**. Two oral talks "3D-printed dynamic heart model with left-side anatomy and integrated sensor for edge-to-edge repair and regurgitation reduction" & "3D-printed multimodal sensing devices for texture and materials identification". In *IMECE 2026*, Vancouver, BC, Canada, November 2026

[42] **K. Qiu**. Two oral talks "3D-printed dynamic heart model with left-side anatomy and integrated sensor for edge-to-edge repair and regurgitation reduction" & "3D-printed flexible microfluidic health monitor for in-situ sweat analysis and biomarker detection". In *FEDSM 2026*, Bellevue, WA, July 2026

[41] **K. Qiu**. One oral talk in haptic device and two poster presentations in 3D-printed biosensors and 3D-printed dynamic heart model. In *MRS Spring 26*, Honolulu, HI, April 2026

- Our group's poster was nominated for MRS Best Poster Award.

[40] **K. Qiu**. 3D-printed biomedical devices for health monitoring, multimodal sensing and surgical applications. Invited Talk, in *School of Chemical and Bioengineering at Washington State University*, Seattle, WA, February 2026

[39] **K. Qiu**. 3D-printed biomedical devices for health monitoring, multimodal haptics and surgical applications. Invited Talk, in *Department of Rehabilitation Medicine at University of Washington*, Seattle, WA, January 2026

[38] **K. Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in Biomechanics Seminar at *Department of Mechanical Engineering at University of Washington*, Seattle, WA, January 2026

[37] **K. Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in the *Veterans Affairs (VA) Center for Limb Loss and Mobility*, Seattle, WA, January 2026

[36] **K. Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in Mechanical Engineering, *University of British Columbia*, Vancouver, BC, Canada, November 2025

[35] **K. Qiu**. 3D-printed wearable biosensors for health monitoring. Oral Presentation in *SES 2025*, Atlanta, GA, October 2025

[34] **K. Qiu**. '3D-printed wearable biosensors and electronics.' Oral Presentations for *two Symposiums SB02 and SB03 in MRS Spring 2025*, Seattle, WA, April 2025 (Served as a Session Chair in Symposium SB02)

- Our group's poster was nominated for MRS Best Poster Award.

[33] **K. Qiu**. '3D-printed wearable sensors and artificial organs.' Poster Presentation for *GRC 2024 3D Printing Soft Materials*, Bryant University, Rohde Island, August 2024

[32] **K. Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for *ACS NORM 2024*, Pullman, WA, June 24, 2024

[31] **K. Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for Mechanical Engineering, Oregon State University, May 2024

[30] **K. Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for *ASME International Mechanical Engineering Congress and Exposition (IMECE)*, New Orleans, LA, October 29-November 2, 2023

[29] **K. Qiu**. '3D-printed biomedical and biomimetic devices.' Invited Distinguished Research Seminar for *Hong Kong Polytechnic University*, September 28, 2023

[28] **K. Qiu**. '3D printed functional devices for health monitoring.' Guest Lecture for *Biomedical Engineering, Washington State University*, Nov. 28, 2022

[27] **K. Qiu**. '3D printed functional devices for healthcare and engineering applications.' Poster Presentation, for *Gordon Research Conference: Additive Manufacturing of Soft Materials*, Ventura, CA, August 7-12, 2022

[26] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical applications.' Invited Talk for *NextFlex*, June 2022

[25] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *ACS Spring 2022*, San Diego, CA, March 22, 2022

[24] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Bioengineering, Washington State University*, February 18, 2022

[23] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Mechanical Engineering Program, Washington State University Tri-Cities*, January 28, 2022

[22] **K. Qiu**. '3D printed presurgical organ models for surgical applications.' Guest Lecture for *University of Nebraska Lincoln*, March 25, 2021

[21] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Bioengineering, Washington State University*, March 5, 2021

[20] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Chemical Engineering and Bioengineering, Washington State University*, November 9, 2020

[19] **K. Qiu**. '3D printed artificial organs.' Guest Lecture for *MSE 110, Washington State University*, October 8, 2020

[18] **K. Qiu**. '3D printed smart electronics.' Guest Lecture for *MSE 110, Washington State University*, October 1, 2020

[17] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *MME, Washington State University*, September 10, 2020

[16] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Washington State University*, April 23, 2020

[15] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *University of Tennessee*, March 31 & April 1, 2020

[14] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Florida Institute of Technology*, March 27, 2020

[13] **K. Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk in *University of Georgia*, Athens, GA, January 23, 2020

[12] **K. Qiu**. '3D printed organ models and flexible electronics for biomedical applications.' Oral Invited Talk in *Mississippi State University*, Starkville, MS, January 8, 2020

[11] **K. Qiu**. '3D printed models of the aortic valve.' Oral Invited Talk in *2019 Earl E. Bakken Surgical Device Symposium: Update on Surgical Aortic Disease*, Minneapolis, MN, November 8, 2019

[10] **K. Qiu**. '3D printed organ models with physical properties of tissue and integrated sensors.' Oral Invited Talk in *Micro- and Nanotechnology Sensors, Systems, and Applications XI* in *SPIE Defense + Commercial Sensing*, Baltimore, MD, April 14, 2019
- Proceedings Volumes 10982, https://doi.org/10.1117/12.2518370

[9] **K. Qiu**. **'**3D printed organ models with integrated electronics.' Oral Invited Talk in *University of Georgia*, Athens, GA, February 21, 2019

[8] **K. Qiu**, Michael C. McAlpine. '3D printed organ models with physical properties of tissue and integrated sensors.' Oral Presentation & Poster Presentation (03/20/18 & 03/19/18) in *255th ACS National Meeting & Exposition*, New Orleans, LA, 2018 (Selected as ACS Sci-Mix Poster)

[7] **K. Qiu**, M. C. McAlpine. '3D printed tissue-simulated organ model using designed synthesized polymeric inks and human organ data.' Oral Presentation (08/23/16) in *252th ACS National Meeting & Exposition*, Philadelphia, PA, 2016

[6] **K. Qiu**, M. C. McAlpine. '3D printed bionic prostate.' Oral Presentation (04/01/16) in *2016 Spring MRS Meeting & Exhibit*, Phoenix, AZ, 2016

[5] **K. Qiu**, M. C. McAlpine, R. M. Sweet. 'Patient specific 3D printed prostate with tissue and anatomic fidelity.' Poster Presentation in *Engineering & Urology Society 31th Annual Meeting*, San Diego, CA, 2016

[4] **K. Qiu**, U. G. K. Wegst. 'The structure and performance of freeze-cast bacterial cellulose aerogels.' Poster Presentation in *2013 MRS Fall Meeting & Exhibit*, Boston, MA, 2013

[3] **K. Qiu**, A. N. Netravali. 'Biodegradable polymer nanocomposites using polyvinyl alcohol and nanomaterials.' Poster Presentation in *2012 Fiber Society Fall Meeting*, Boston, MA, 2012

[2] **K. Qiu**, A. N. Netravali. ''Green' composites using soy protein resin and novel low cost carbon source based bacterial cellulose.' Poster Presentation in for *2011 Fiber Society Fall Meeting*, Charleston, SC, 2011

[1] F. Hong, **K. Qiu**. 'Mutation of Acetobacter xylinum for high-yield production of bacterial cellulose.' Presentation in *234th ACS National Meeting & Exposition*, Boston, MA, August 19-23, 2007

STUDENTS MENTOR AT WSU

(1) PhD Students

- Chuchu Chen, MSE PhD student — *Fall 2021-May 2025*
- Alejandro Guillen Obando, MSE PhD student — *Fall 2023-Present*
- Sonja Sargent Sparks, ME PhD student, **NSF GRFP recipient** — *Fall 2023-Present*
- Yonghao Fu, MSE PhD student, co-advised with Yuehe Lin — *Summer 2023-Present*
- Hongyi Shen, ME PhD student, co-advised with Pranshanta Dutta — *Fall 2024-Present*
- Jin Miao, ME PhD student (mentally health challenges in 2021-2023) — *Fall 2021-Spring 2023*
- Shihab Ahmed, ME PhD student, co-advised with Nestor Preze — *Fall 2022*

(2) Undergraduates

- Gabriel Policarpio, ME Undergraduate — *Fall 2026-Present*
- Yongtong He, BioE Undergraduate — *Fall 2026-Present*
- Samar Patil, BioE Undergraduate — *Fall 2025-Present*
- Grace Allen, ME Undergraduate — *Spring 2026-Present*
- Herry Kirkwood, ME Undergraduate — *Spring 2026-Present*
- Martin Lyndell, ME Undergraduate — *Summer 2024-Present*
- Nikolai K. Bogdev, ME Undergraduate (**Coauthor in one paper**) — *Fall 2024-Present*
- Jose L. Policarpio, ME Undergraduate — *Spring 2024-Present*

- Myles M. McGovern, ME Undergraduate (**Coauthor in one paper**) *Spring 2024-Fall 2025*
- Yushen Zhang, ME Undergraduate (**Coauthor in two papers**) *Fall 2024-Fall 2025*
- Matthew M. Demorse, ME Undergraduate *Spring 2023*
- Xinlan Wen, ChemE Undergraduate *Summer 2022*
- Jasper Allan Ellingson, ME Undergraduate *Spring 2022*
- Petra A. Jonson, co-advised with Dr. Nara Boddeti, MSE 425 undergraduates *Spring 2022*
- George Sam Eralil, ME undergraduate *Spring 2021*
- Hilal Al Harmali; Zhuocheng Huang; Badar Al Hosni, MSE 425 undergraduates *Fall 2020*

(3) High School Students

- Jolene Clark, Pullman High School *Summer 2026*
- Katherine Bai, Pullman High *School* *Summer 2026*
- Vivien Lin, Pullman High School (**Coauthor in one pa**per) *Summer 2025*
- Ryan Shi, Pullman High School *Summer 2025*
- Darryl Fu, Pullman High School (**Coauthor in one paper**) *Summer 2024*
- Eric S. Chen, Garnet Valley High School (**Coauthor in one paper**) *Summer 2023*
- Ambrose Wang, Pullman High School *Summer 2022*
- Rhea Kuppa, Tesla STEM High School *Fall 2021*

(4) Other Graduate Students (as Committee Member)

- Nathaniel W. Zuckschwerdt, MSE PHD *October 2024-Present*
- Bryson N. White, MSE MS and PhD *January 2024-Present*
- Ying Guo, MSE PhD *October 2023-Present*
- Connor Toulou, MSE PhD *October 2024-Present*
- Cassandra L. Orozco, MSE MS *October 2023-July 2024*
- Kimberlee Hughes, ME PhD *December 2022-2025*
- Zihui Zhao, IIDP PhD *December 2020-2025*
- Luiz Longo, ME MS *September 2021-April 2022*
- Zhaoyuan Lyu, ME PhD *October 2021-April 2022*
- Shichao Ding, MSE PhD *October 2021-April 2022*
- Shahriar Safaee, MSE PhD *October 2020-August 2021*

TEACHING

Instructor for *Courses at WSU*

- ME/MSE 483 3D-Printing of Biomedical Devices (New Undergraduate Course) *Fall 2026*
- ME 312 Manufacturing Engineering *Spring 2026*
- ME 216 Integrated CAD Design *Spring 2026*
- ME 312 Manufacturing Engineering *Fall 2025*
- ME 216 Integrated CAD Design *Spring 2025*
- ME 312 Manufacturing Engineering and ME 216 Integrated CAD Design *Fall 2024*
- ME 312 Manufacturing Engineering *Spring 2024*
- ME 216 Integrated CAD Design *Fall 2023*
- ME 579/MSE 503 3D Printing Biomedical Devices (New Graduate Course) *Spring 2023*
- ME 216 Integrated CAD Design *Fall 2022*
- ME 216 Integrated CAD Design *Spring 2022*
- ME 216 Integrated CAD Design *Fall 2021*
- ME 312 Manufacturing Engineering/ME 310 Manufacturing Processes/ME 311 Manufacturing Processes Laboratories & ME 598 Seminar *Spring 2021*
- ME 312/ME 311 Manufacturing Engineering/Processes Laboratories *Fall 2020*

Term	Course Number	Responses/ Enrollment	Instructor Rating	Course Rating	Overall Rating
Fall 20	ME 312	24/56	3.8	3.8	3.8
Spring 21	ME 312	20/64	4.2	3.8	4.0
Spring 21	ME 598	8/30	4.7	4.9	4.8
Fall 21	ME 216, Session 2	15/29	3.4	3.7	3.6
Spring 22	ME 216, Session 1	8/21	4.6	4.9	4.8
Fall 22	ME 216, Session 3	7/26	3.3	3.7	3.5
Spring 23	ME 579/MSE 503 (New Course)	9/18	4.8	4.8	4.8
Fall 23	ME 216, Section 1	9/9	4.7	4.7	4.7
Fall 23	ME 216, Section 2	19/22	4.6	4.4	4.5
Spring 24	ME 312	35/76	2.4	3.5	2.9
Fall 24	ME 216	12/29	4.2	4.0	4.1
Fall 24	ME 312	20/55	3.5	3.7	3.6
Spring 25	ME 216	10/27	4.4	4.4	4.4
Fall 25	ME 312	32/75	3.7	3.8	3.8
Spring 26	ME 216	10/30	4.0	3.6	3.8
Spring 26	ME 312	18/91	4.4	4.6	4.5

SERVICE: SYMPOSIA ORGANIZER IN CONFERENCES

Five Symposia in Conferences: AAAI 2024, SES 2025, FEDSM 2026, IMECE 2026, and MRS 2026

[5] **K. Qiu**, S. Yao, D. Joung, S. Wu. *Materials Research Society (MRS Spring 2027),* Seattle, WA, April 2027, Served as one of organizers for a symposium "SB01: Soft Electronics: Materials, Mechanics, Manufacturing, and Applications" in MRS Spring 27, Control ID: 4479059

[4] **K. Qiu**, J. Carney, M. Toma, Z. Wei, *International Mechanical Engineering Congress & Exposition (IMECE 2026)*, Vancouver, BC, Canada, November 2026, Served as one of organizers for a symposium for "Fluid Mechanics and Translation in Medical Devices".

[3] **K. Qiu,** H. Chen, Z. Wei. *Fluids Engineering Division Summer Meeting (FEDSM 2026)*, Bellevue, WA, July 2026, Served as one of organizers for a symposium for "Track 4-10: Experimental (In Vitro & Ex Vivo) Methods for Biomedical Flow Analysis".

[2] **K. Qiu**, S. Yao. *Society of Engineering Science (SES 2025)*, Atlanta, GA, October 2025, Served as one of organizers for a mini symposium of "Track 4.3: Materials, Mechanics, Manufacturing, and Applications of Soft Electronics".

[1] **K. Qiu,** A. Deshwal, S. Belakaria, J. R. Doppa. *The 3rd Annual Association for the Advancement of Artificial Intelligence (AAAI 2024)* Workshop on AI to Accelerate Science and Engineering, Vancouver, BC, Canada, February 2024, Served as one of organizers in a workshop for "AI for Materials and Manufacturing" in AAAI.

SERVICE: PROFESSIONAL AFFILIATIONS

- Secretary of Electronic Materials Technical Committee in ASME
- Member of American Chemical Society
- Member of American Society of Mechanical Engineering
- Member of Material Research Society
- Member of Fiber Society

SERVICE: GRANT & JOURNAL REVIEWER

- ***Grants***
  - Panelist Reviewer for NSF ECCS/CCSS Engineering Research Initiative (ERI)
  - External Reviewer for Research Grant Council of Hong Kong
  - Reviewer for UK Research and Innovation Funding Services
  - External Reviewer for CATALYST Funding Program, Rowan University
  - Reviewer for grants from ACS Petroleum Research Fund

- ***Journals***
  - *Advanced Materials;*
  - *Advanced Functional Materials;*
  - *Advanced Materials Technologies;*
  - *Proceedings of National Academy of Sciences of the United States of America (PNAS);*
  - *Scientific Reports;*
  - *Cardiovascular Engineering and Technology;*
  - *Mechatronics;*
  - *Materials & Design;*
  - *Sensors;*
  - *MRS Communications;*
  - *Trends in Pharmacological Sciences;*
  - *ACS Macro Letters;*
  - *ACS Applied Materials & Interfaces;*
  - *ACS Sustainable Chemistry & Engineering;*
  - *ACS Books;*
  - *Journal of Materials Chemistry A;*
  - *Journal of Materials Chemistry B;*
  - *Composites Science and Technology;*
  - *Carbohydrate Polymers;*
  - *Cellulose;*
  - *The Journal of Physical Chemistry;*
  - *Composite Part A;*
  - *Composite Part B;*
  - *Composite Interfaces;*
  - *Polymer Chemistry;*
  - *RSC Advances;*
  - *Analyst;*
  - *Scanning;*
  - *Journal of the Brazilian Chemical Society;*
  - *ASME Journal of Engineering and Science in Medical Diagnostics and Therapy;*
  - *International Journal of Engineering, Science and Technology;*
  - *Journal of Renewable Materials；*
  - *International Journal of Biological Macromolecules;*
  - *Food Biophysics;*
  - *Food & Function;*
  - *Food Hydrocolloids;*
  - *Advanced Fiber Materials.*

SERVICE: SEMINAR ORGANIZER AT WSU

Serve as a Seminar Organizer for ME598 at WSU to invite speakers and host seminars *Spring 2021*

- The speakers include John Rogers (Northwestern U), Michael McAlpine (U of Minnesota), Zhenan Bao (Stanford), Robert Shepherd (Cornell), Anil Netravali (Cornell), and Girish Krishnan (UIUC), and Tamas Havar (Blue Origin).

SERVICE: MME COMMITTEE SERVICE AT WSU

- Graduate Studies Committee *Fall 2024-Present*
- Development Committee *Fall 2022-Present*
- Research Committee *Fall 2022-Present*
- Student Success Committee *Fall 2022-Present*
- Undergraduate Studies Committee *Fall 2021-Spring 2022*

OTHER EDUCATION

- Shanghai Jiaotong University, Shanghai, China (01/2002-07/2004)
  Undergraduate Secondary Major (Diploma), Business Administration