# Bowen Wang, Ph.D.

*CURRICULUM VITAE* (Updated 10/2/2022)


**PERSONAL DATA**

Address: University of Virginia School of Medicine
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Citizenship: China (US Permanent Resident)


**EDUCATION**

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|---|---|---|---|
| **Ph.D.** | Cell&Mol Pathology | University of Wisconsin-Madison, WI US | 2017 |
| **B.S.** | Basic Medicine | Peking University Health Science Center, China | 2012 |

**POST-DOCTORAL TRAINING**

2017 Postdoctoral Research Associate, Department of Surgery, The Ohio State University

**ACADEMIC APPOINTMENTS**

8/2020 – Present **Assistant Professor** (*tenure-track*). Department of Surgery, University of Virginia
5/2018 – 7/2020 **Research Assistant Professor.** Department of Surgery, Ohio State University
11/2017-5/2018 **Research Scientist.** Department of Surgery, Ohio State University

**HONORS & AWARDS**

2020 Commercialization Award, NIH Center for Accelerated Innovation
2017 Distinguished Post-Doctoral Award, Davis Heart and Lung Research Institute, Ohio State University
2016 Pre-doctoral Fellowship, American Heart Association
2012 Cross-disciplinary Scholars in Science and Technology (CSST), Peking University-University of California, Los Angeles
2010 National Scholarship, Ministry of Education, China
2010 Merit Student Honor, Peking University, China
2009 Outstanding Medical Student, Peking University, China

**PROFESSIONAL SOCIETY MEMBERSHIPS**

2015 – Present American Heart Association (AHA)

**RESEARCH INTERESTS**

My research focuses on discovering mechanisms of and therapies for peripheral vascular diseases, including restenosis, aortic aneurysm, and thrombosis. Our laboratory utilizes both cellular/*in vitro* (smooth muscle and endothelial cells) and animal/*in vivo* models (rodent and large animals) to help address innovative intervention targets and therapeutic approaches. Currently we have 4 major directions:

(1) The protective role of Amino Acid Starvation Response (AASR) kinase GCN2 against smooth muscle cell (SMC) degeneration and aortic aneurysm (supported by R01HL162895).
(2) PADI3-mediated citrullination of glycolytic kinases underlies the bioenergenetic shift and phenotypic switching of SMC: mechanistic and therapeutic implications in restenosis (R01 A0 planned in 2023 Oct/2024).
(3) A methionine-restricted, vegan-like diet mitigates deep vein thrombosis (DVT) via modulating gut microbiome (R01 A0 planned in 2023 Feb/June).
(4) Developing innovative nanoplatforms for targeted drug delivery to treat restenosis and aortic aneurysm ((R01 A0 planned in 2023 Feb/June)

The long-term goal is to discover new therapeutic targets and translate our discoveries to novel methods to prevent and treat peripheral vascular diseases.

**TEACHING ACTIVITIES**

**Research Mentoring of Postdoctoral Trainees:**

| Dates | Name | Current/Last Known Position |
|---|---|---|
| 11/2021 – Present | Li Yin, MD | Vascular Surgery Fellow, Zhejiang University, China |

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|---|---|---|
| 8/2019 – 7/2022 | Takuro Shirasu, MD, PhD | Vascular Surgery Attending, Asahi General Hospital, Japan |
| 9/2019 –4/2022 | Mengxue Zhang, MD, PhD | Pathology Resident, University of Chicago, US |
| 5/2018 – 7/2019 | Go Urabe, MD | Vascular Surgery Attending, Tokyo Medical University, Japan |

**Research Mentoring of Medical Students:**

| Dates | Name | Position during training |
|---|---|---|
| 8/2022 – Present | Quang Le | Medical student, UVA |
| 8/2022 – Present | Paranjay Patel | Medical student, UVA |
| 5/2022 – Present | Nicholas Hoyt | Medical student, George Washington University |
| 1/2022 – Present | Greg Ahn | Medical student, UVA |
| 1/2021 – 5/2022 | Alexander Gregg | Medical student, UVA |
| 7/2021 – 5/2022 | Alessandra Riccio | Medical student, UVA |

**Research Mentoring of Undergraduate Students:**

| Dates | Name | Position during training |
|---|---|---|
| 9/2022 – Present | Jerry Zhang | Undergraduate student, UVA |
| 8/2018 – 3/2020 | Corey Williams | Undergraduate student, Ohio State University |

**Didactic Teaching (Graduate & Postdoctoral):**

9/2022 *Research Ethics and Compliance*, Dept. of Surgery NIH T32 Trainee seminar series
5/2021 *Intellectual Property and Commercialization*, Dept. of Surgery NIH T32 Trainee seminar series

**COMMITTEES & COUNCILS**

**School Level:**

8/2021 – Present **Communications Council**, UVA

**Department Level:**

8/2018 – 7/2020 **Education Committee**, Davis Heart and Lung Research Institute, Ohio State University

**PEER REVIEW**

**Federal Grants:**

5/2022 NEPH Review Panel: 2022/05 VA BL/CS, VA Merit (I01) & Career Development Awards (IK2)

**International:**

8/2022 Nanjing University Tenure-Track/Tenured Faculty External Reviewer, China.

**RESEARCH FUNDING**

**Current Funding:**

R01 HL162895, NIH/NHLBI (PI: Wang)
4/2022 – 3/2027, *The Role of Amino Acid Starvation Response Kinase GCN2 in Abdominal Aortic Aneurysm.*

R01 HL143469, NIH/NHLBI (MPI: Kent, Guo, Gong)
8/2018 – 7/2023 (NCE), *Targeting PERK: An Endothelium-Protective Stent-Free Strategy for Mitigation of Intimal Hyperplasia After Vascular Surgery.*
Role: Co-Investigator

R01 HL141752, NIH/NHLBI (PI: Hossack)
4/2019 – 3/2024, *Accelerated Low Dose Thrombolytic Catheter Directed Sonothrombolysis.*
Role: Co-Investigator

**Previous Funding:**

R01 HL132395, NIH/NHLBI (PI: Hossack)
7/2016 – 4/2022 (NCE), *Ultrasound Targeted Molecular Imaging in Large Arteries to Predict AAA Risk.*
Role: Co-Investigator

R01 HL129785, NIH/NHLBI (MPI: Kent, Guo, Gong)
8/2017 – 6/2022 (NCE), *Development of unimolecular nanoparticle-mediated periadventitial drug delivery system for sustained and targeted inhibition of intimal hyperplasia following open vascular reconstruction*

Role: Co-Investigator

NIH Centers for Accelerated Innovation Award, NCAI (PI: Wang)
8/2019 – 7/2020, *NanoPlatyx-1, A Biomimetic Nanocluster Product for Stent-Free Management of Restenosis*

**INVITED LECTURES & SYMPOSIA**

11/2021 FASEB Catalyst Conference: Mechanisms of Aortic Aneurysm Formation, Growth, and Rupture.
Title: Amino Acid Starvation Response in Abdominal Aortic Aneurysm
11/2019 The 12th Annual Vascular Noninvasive Testing Symposium; All About the Aorta and Arterial Disease – A Primer for Primary Care Doctors, Specialists and Affiliated Healthcare Professionals.
Title: Harnessing Epigenetic Reader BRD4 for Abdominal Aortic Aneurysm (AAA) Treatment.

**PATENTS**

1. Kent KC, Guo L-W, **Wang B**, Urabe G, Gong SQ, Chen GJ. BIOMIMETIC VESICLES AND USES THEREOF. Application No.62/675,744. Filing date: May 23, 2018. PCT/US2019/033861. PCT nationalized in USA, Australia, Canada, and Europe in 2020.
2. Kent KC, Guo L-W, **Wang B**, Shirasu, T., Gong SQ, Yodsanit, N. PAINTING THE ADVENTITIA TO GENERATE A DRUG RESERVOIR FOR LOCAL DELIVERY. P210321. Provisional Filing Submitted.
3. Kent KC, Guo L-W, **Wang B**, Shirasu, T., Gong SQ, Zhao, Y. A MULTIMODAL "CLUSTER-BOMB" DESIGN FOR ENHANCED TARGETED DRUG DELIVERY. P210367. Provisional Filing Submitted.
4. Kent KC, Guo L-W, **Wang B**, Shirasu, T., Xie X. BIOMIMETIC TORPEDO FOR TARGETED GENE THERAPY TO PREVENT RESTENOSIS. 222117-8100. Disclosed. Provisional Filing in Preparation.

**PEER-REVIEWED PUBLICATIONS** (821 citations, h-index = 16)

1. Yin, L., Gregg, A.C., Riccio, A.M., Hoyt, N., Ahn, J., Le, Q., Zhang, M., He, X., Kent, E., **Wang, B.*** (senior corresponding authors), Dietary Therapy in Abdominal Aortic Aneurysm — Insights from Clinical and Experimental Studies. Frontiers in Cardiovascular Medicine. In Press.
2. Yin, L., Kent, E., Wang, B.* (senior corresponding authors), Progress in Murine Models of Ruptured Abdominal Aortic Aneurysm. Frontiers in Cardiovascular Medicine. In Press.
3. Zhang, M., Wang, Q., Urabe, G., Huang, Y., Mosquera, J.V., Kent, K.C., **Wang, B.**, Miller, C.L., Guo, L.W. Gene-repression epigenetic reader EED unexpectedly enhances cyclinD1 gene activation. In Revision.
4. Yodsanit, N., Shirasu, T., Huang, Y., Gregg, A.C., Riccio, A.M., Yin, L., Wang, Y., Xie, R., Zhao, Y., Ye, M., Huang, Y., Hoyt, N., Zhang, M., Hossack, J.A., Salmon, M., Kent, K.C., Guo, L.W., Gong, S., **Wang, B.*** (senior corresponding authors), Targeted PERK Inhibition with Biomimetic Nanoclusters Confers Preventative and Interventional Benefits to Elastase-induced Abdominal Aortic Aneurysms. Bioactive Materials. In Revision.
5. Zhang, M., Urabe, G., Ozer, H.G., Xie, X., Webb, A., Shirasu, T., Li, J., Han, R., Kent, K.C., **Wang, B.*** (co-corresponding authors), Guo, L.W. Angioplasty-induced epigenomic remodeling entails BRD4 and EZH2 hierarchical regulations. Life Science Alliance. 2022 Feb 15;5(5):e202101114.
6. Zhao, Y., Shirasu, T., Yodsanit, N., Huang, Y., Ye, M., Wang, Y., Xie, R., Kent, K.C., Guo, L.-W.*, Gong, S.*, **Wang, B.*** (senior corresponding authors). Biomimetic, ROS-Detonable Nanoclusters — A Multimodal Nanoplatform for Anti-Restenotic Therapy. Journal of Controlled Release. 2021 Oct 10;338:295-306.
7. Shirasu, T., Yodsanit, N., Xie, X., Zhao, Y., Wang, Y., Xie, R., Huang, Y., **Wang, B.**, Urabe, G., Gong, S., Guo, L.W., Kent, K.C. (2021). An Adventitial Painting Modality of Local Drug Delivery to Abate Intimal Hyperplasia. Biomaterials, p.120968.
8. Wang, Q., Ozer, H.G., **Wang, B.**, Zhang, M., Urabe, G., Huang, Y., Kent, K.C. and Guo, L.W., (2021). A hierarchical and collaborative BRD4/CEBPD partnership governs vascular smooth muscle cell inflammation. Molecular Therapy-Methods & Clinical Development, 21, pp.54-66.
9. Shen, H., Li, J., Xie, X., Yang, H., Zhang, M., **Wang, B.**, Kent, K.C., Plutzky, J. and Guo, L.W., (2021). BRD2 regulation of sigma-2 receptor upon cholesterol deprivation. Life science alliance, 4(1).
10. Li, J., Urabe, G., Zhang, M., Huang, Y., **Wang, B.**, Marcho, L., Shen, H., Kent, K.C., Guo, L.-W. (2021) A role for polo-like kinase-4 in adventitial fibroblast cell type transition. JACC Basic to Translation Science, 2021 6 (3), 257-283.

11. Yodsanit, N., **Wang, B.*** (equal first author), Zhao, Y., Guo, L., Kent. K.C., Gong, S. (2020) Recent progress on nanoparticles for targeted aneurysm treatment and imaging. Biomaterials. 2020 Sep 21;265:120406.
12. **Wang, B.***, Zhang, M., Urabe, G., Guo, L.W., Kent. K.C. (2020) Re-Endothelialization is Paracrine-regulated by ER-stress PERK Signaling in Smooth Muscle Cells. Journal of Surgical Research. 2020 Aug 29;257:294-305.
13. Huang, Y., Urabe, G., Zhang, M., Li, J., Ozer H.G., **Wang, B.**, Kent, K.C., Guo, L.W. (2020) Nullifying epigenetic writer DOT1L attenuates neointimal hyperplasia. Atherosclerosis . 2020 Sep;308:22-31.
14. **Wang, B.***, Zhang, M., Urabe, G., Chen, G., Wheeler, D., Dornbos, D., Nimjee, S., Gong, S., Guo, L., Kent. K.C. (2020) Evaluating the Therapeutic Potential of PERK Pathway for Anti-Restenotic Anti-Thrombogenic Treatment After Vascular Interventions. JACC Basic to Translation Science, 2020 Feb 19;5(3):245-263.
15. Shi, Y., **Wang, B.*** (equal first author), Chen B., Urabe G., Shi X., Guo, L.W., Kent, K.C., Li, L. (2019). Mass Spectrometric Imaging Reveals Temporal and Spatial Dynamics of Bioactive Lipids in Arteries Undergoing Restenosis. Journal of Proteome Research. Apr 5;18(4):1669-1678.
16. Zhang, M., **Wang, B.*** (equal first author), Urabe, G., Huang, Y., Plutzky, J., Kent, K.C., Guo, L.W. (2019) The BD2 domain of BRD4 is a determinant in EndoMT and vein graft neointima formation. Cell Signal, May 7;61:20-29.
17. Zhang, J., McIntosh, BE., **Wang, B.**, Brown, ME., Probasco, MD., Webster, S., Duffin, B., Zhou, Y., Guo, L.W., Burlingham, WJ., Kent, K.C., Ferris, M., Thomson, JA. (2019). A Human Pluripotent Stem Cell-Based Screen for Smooth Muscle Cell Differentiation and Maturation Identifies Inhibitors of Intimal Hyperplasia. Cell Reports, 19(9), pp.1902-1916.
18. **Wang, B.***, Chen, G., Urabe, G., Zhang, M., Shi, X., Guo, L.W., Gong, S. and Kent, K.C. (2018). Platelet membrane coated biomimetic nanocluster for endovascular delivery of endothelium-protective anti-restenotic therapies. Biomaterials, Jun 18.
19. Zhang, M., Urabe, G., Little, C., **Wang, B.**, Kent, AM., Huang, Y., Kent, K.C., Guo, L.W. (2018). HDAC6 Regulates the MRTF-A/SRF Axis and Vascular Smooth Muscle Cell Plasticity. JACC Basic to Translation Science, Dec 31;3(6):782-795.
20. Pan, X., **Wang, B.*** (equal first author), Zhang, M., Kent, K.C. and Guo, L.W., (2017). Analysis of Combined Transcriptomes Identifies Gene Modules that Differentially Respond to Pathogenic Stimulation of Vascular Smooth Muscle and Endothelial Cells. Scientific Reports, Jan 10;8(1):395.
21. Zhu, Y., Tayakama, T., **Wang, B.*** (equal first author), Kent, A., Zhang, M., Binder, BY., Urabe, G., Shi, Y., DiRenzo, D., Goel, SA., Zhou, Y., Little, C., Roenneburg, DA., Shi, X., Li, L., Murphy, WL., Kent, KC., K, J., Guo, L.W. (2017). Restenosis Inhibition and Re-differentiation of TGF $\beta$ /Smad3-activated Smooth Muscle Cells by Resveratrol. Scientific Reports. 2017;7.
22. Yu, Q., **Wang, B.**, Chen, Z., Urabe, G., Glover, M.S., Shi, X., Guo, L.W., Kent, K.C. and Li, L., (2017). Electron-Transfer/Higher-Energy Collision Dissociation (EThcD)-Enabled Intact Glycopeptide/Glycoproteome Characterization. Journal of The American Society for Mass Spectrometry, pp.1-14.
23. Chen, G., Shi, X., **Wang, B.**, Xie, R., Guo, L.W., Gong, S. and Kent, K.C. (2017). Unimolecular Micelle-Based Hybrid System for Perivascular Drug Delivery Produces Long-Term Efficacy for Neointima Attenuation in Rats. Biomacromolecules. Jun 14.
24. Zhao, L., Li, J., Fu, Y., Zhang, M., **Wang, B.**, Ouellette, … and Guo, L.W. (2017). Photoreceptor protection via blockade of BET epigenetic readers in a murine model of inherited retinal degeneration. Journal of neuroinflammation, 14(1), p.14.
25. Kumar, A., D'Souza, S.S., Moskvin, O.V., Toh, H., **Wang, B.**, Zhang, J., Swanson, S., Guo, L.W., Thom-son, J.A. and Slukvin, I.I., (2017). Specification and Diversification of Pericytes and Smooth Muscle Cells from Mesenchymoangioblasts. Cell Reports, 19(9), pp.1902-1916. PMCID: PMC6428685
26. Shi, X., Guo, L.W., Seedial, S., Takayama, T., **Wang, B.**, Zhang, M., Franco, S.R., Si, Y., Chaudhary, M.A., Liu, B. and Kent, K.C., (2016). Local CXCR4 Upregulation in the Injured Arterial Wall Contributes to Intimal Hyperplasia. STEM CELLS, 34(11), pp.2744-2757. PMCID: PMC5113668
27. Tsai, T.L., **Wang, B.**, Squire, M.W., Guo, L.W. and Li, W.J., (2015). Endothelial cells direct human mesenchymal stem cells for osteo-and chondro-lineage differentiation through endothelin-1 and AKT signaling. Stem cell research & therapy, 6(1), p.88.
28. **Wang, B.***, Zhang, M., Takayama, T., Shi, X., Roenneburg, D. A., Kent, K. C., & Guo, L. W. (2015). BET Bromodomain Blockade Mitigates Intimal Hyperplasia in Rat Carotid Arteries. EBioMedicine, 2(11), 1650-1661.

29. Takayama, T., Shi, X., **Wang, B.**, Franco, S., Zhou, Y., DiRenzo, D., Kent, A., Hartig, P., Zent, J. and Guo, L.W., 2015. A murine model of arterial restenosis: technical aspects of femoral wire injury. JoVE (Journal of Visualized Experiments), (97), p.e52561.
30. Guo, L. W., **Wang, B.*** (equal first author), Goel, S. A... & Kent, K. C. (2014). Halofuginone stimulates adaptive remodeling and preserves re-endothelialization in balloon-injured rat carotid arteries. Circulation: Cardiovascular Interventions, 7(4), 594-601. PMCID: PMC4140988
31. Goel, S. A., Guo, L. W., **Wang, B.**.. & Kent, K. C. (2014). High-throughput screening identifies Idarubicin as a preferential inhibitor of smooth muscle versus endothelial cell proliferation. PloS one, 9(2), e89349.
32. Shi, X., Guo, L.W., Seedial, S., Si, Y., **Wang, B.**, Takayama, T., Suwanabol, P.A., DiRenzo, D., Liu, B. and Kent, K.C., (2014). Local CXCR4 Upregulation in the Injured Arterial Wall Contributes to Intimal Hyperplasia.TGF-β /Smad3 inhibit vascular smooth muscle cell apoptosis through an autocrine signaling mechanism involving VEGF-A. Cell Death & Disease, 5(7), e1317.
33. Shi, X., DiRenzo, D., Guo, L.W., Franco, SR., **Wang, B.**, Seedial, S., and Kent, K.C., (2014). TGF-β /Smad3 stimulates stem cell/developmental gene expression and vascular smooth muscle cell de-differentiation. Plos One, 9(4), e93995.

**BOOK CHAPTERS**

1. Zhang, M., **Wang, B.**, Kent, K.C., Guo, L.W. (2019) Fibrosis in Disease. Vascular Fibrosis and Disease. Pp369-386. Publisher: Humana Press, Cham.

**ABSTRACTS**

1. **Wang, B.** (presenter), Zhang, M., Urabe, G., Shirasu, T., Guo, L.W., Kent. K.C. PERK Inhibition Promotes Post-angioplasty Re-endothelialization via Modulating SMC Phenotype Changes. 15th Annual Academic Surgical Congress. Orlando, FL, USA. February 2020
2. **Wang, B.** (presenter), Zhang, M., Shi, X., Guo, L.W., Kent. K.C. Parthenolide Inhibits Inflammatory Dysfunction of Human Aortic Endothelial Cells and Proliferation of Smooth Muscle Cells in vitro and Restenosis in a Rat Model. The Vascular Research Initiatives Conference (VRIC) and Arteriosclerosis, Thrombosis and Vascular Biology (ATVB) 2018 Scientific Sessions. San Franscisco, CA, USA. May, 2018
3. **Wang, B.** (presenter), Shi, X., Zhang, M., Guo, L.W., Kent. K.C. Targeting the PERK Pathway of ER Stress Response for Endothelium Protection and Restenosis Prevention: A Paradigm for Developing Anti-thrombogenic stents. Atherosclerosis Thrombosis and Vascular Biology (ATVB) Scientific Sessions. May 5th, 2016. Nashville, TN, USA
4. Shi, X., **Wang, B.** (presenter), Guo, L.W., Zhang, M., Chaudhary, M.A., Franco, SR., Zhu, Y., Kent. K.C. TGFβ/Smad3 stimulates CD34 expression, MAPK activation and vascular smooth muscle cell proliferation. American College of Surgeons Clinical Congress. Oct. 2015. Chicago, IL,

**MENTEE AWARDS and RECOGNITIONS**

| Name | Year | Award | Agency |
|---|---|---|---|
| Yitao Huang | 2022 | Pre-doctoral Fellowship | American Heart Association |
| Quang Le | 2022 | Invited talk at annual meeting | Eastern Vascular Society |
| Takuro Shirasu | 2021 | Invited talk at annual meeting | Society of Vascular Surgery |
| Mengxue Zhang | 2020 | Post-doctoral Fellowship | American Heart Association |
| Mengxue Zhang | 2017 | Pre-doctoral Fellowship | American Heart Association |