

Zhigao Wang, Ph.D.

Center for Regenerative Medicine, Heart Institute, Department of Internal Medicine,
University of South Florida, Morsani College of Medicine, Tampa, Florida

Address

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Cellular: 469-348-1089
Email: zhigao@usf.edu
Google Scholar: Zhigao Wang

Citizenship

United States

Education

Univ. of Texas Southwestern Medical Center	PhD in Molecular Biology	1998-2004
Mentor: Eric Olson, PhD		
Wuhan University, China	B.S. in Biochemistry	1990-1994

Postgraduate Training

Postdoctoral Research Associate, HHMI /UT Southwestern Medical Center	2004-2012
Supervisor: Xiaodong Wang, Ph.D.	

Honors and Awards:

- CPRIT Scholar in Cancer Research, the Cancer Prevention & Research Institute of Texas. 2012
- Virginia Murchison Linthicum Scholar in Medical Research, UT Southwestern Medical Center 2012
- Grand prize, The 7th Annual Postdoctoral Research Symposium, UT Southwestern Medical Center 2010
- HHMI Postdoctoral Fellowship. 2008-2010
- Basic Science Research 1st Place, Molecular Cardiology Forum for Young Investigators, Pathway to Cardiac Development and Regeneration. UT Southwestern Medical Center 2003

Appointments:

Associate Professor	2021-present
Center for Regenerative Medicine, Heart Institute	
Department of Internal Medicine	
University of South Florida	
Assistant Professor	2012-2021
Department of Molecular Biology,	
UT Southwestern Medical Center	

Teaching, Lecture

- | | |
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| 1. Journal club, "Advances in cell death regulation". 5-30 lab members | 2012-present |
| 2. "Cell literature". 5-10 graduate students | 2017-2021 |
| 3. "Cell death in development and diseases". 4-12 graduate students | 2015-2021 |
| 4. "Student ethic discussion groups". 4-6 graduate students | 2012-2021 |

Teaching, Supervisory**I. Current PhD students**

- | | |
|-----------------|--------------|
| 1. Ken Chen | 2024-present |
| 2. Nhi Truong | 2024-present |
| 3. Javier Areas | 2023-present |

II. Current postdoctoral fellows:

- | | |
|-----------------------------------|--------------|
| 1. Katia Maria Gomes Andrade, PhD | 2023-present |
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2. Xueling Ma, MD, PhD 2022-present

III. Former PhD students

1. Xue Sun, visiting MD, PhD student from Soochow University, China. 2018-2020
Current position, ICU chief physician, the First Affiliated Hospital of Soochow University.
2. Sarah Hanna-Addams 2015-2020
Current position: Senior Program Manager, Curia Global.
3. Andrea Johnston 2013-2018
Current position: associate professor, School of Veterinary Medicine, Louisiana State University
4. Eduardo Reynoso 2012-2017
Current position: senior scientist, Leidos.

IV. Former postdoctoral fellows

1. Jingchun Du, PhD 2018-2021
Current position: Associate Professor, Guangzhou Medical University, China
2. Shuzhen Liu, PhD 2013-2021
Current position: Assistant Professor, UT Southwestern Medical Center
3. Hua Liu, PhD 2013-2015
Current position: Professor, Jiangxi University of Traditional Chinese Medicine, China
4. Yougui Xiang, PhD 2013-2018
Current position: Senior Bioinformatics Scientist, Caris Life Sciences

V. Other trainees

1. Emilio Lopez, undergraduate at USF, volunteer Aug 2024-Nov 2024
2. Frank Xu, high school student, volunteer Jun 2024-Aug 2024
3. Michael Youssef, undergraduate at USF, volunteer Mar 2023-Jun 2023
4. Nicole Capparell, undergraduate at USF, volunteer Feb 2023-Jul 2023
5. Hayley Manis, undergraduate at USF, volunteer Feb 2022-May 2022
6. Jamila Mammadova, medical student at USF, volunteer Feb 2022-May 2022
7. Thomas Wilkin, SURF (Summer Undergraduate Research Fellowship) student Jun 2016-Aug 2016
8. Lily Chen, college student at Emory University, volunteer Jul 2015-Aug 2015
9. Anthony Yuan, college student at Texas A&M, volunteer Jul 2015-Aug 2015
10. Yanjie Liu, high school student, volunteer Jun 2015-Aug 2015
11. Jiamin Zhou, high school student, volunteer Jun 2015-Aug 2015, and Jun 2014-Aug 2014
12. Seonghwan Hwahng, rotation PhD student Oct 2012-Nov 2012

Lectures by invitation

1. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Cancer Biology, University of Pennsylvania. 2012
2. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Chemistry, University of Texas at Dallas. 2012
3. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Pharmacology and Cancer Biology, Duke University. 2012
4. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Physiology, University of California, San Francisco. 2012
5. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Neuro-Oncology, MD Anderson Cancer Center. 2012
6. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Dept. of Cell & Molecular Biology, Tulane University. 2013
7. Title: Paving the Necrotic Cell Death Pathways with Chemical Compounds.
Molecular Biology Scientific Conference, Dallas, TX 2015
8. Title: Ancient Medicine, New Cure? Identification of Novel Necroptosis-blocking Compounds from Chinese Traditional Medicine Herbs

- Chinese Biological Investigator Society 11th Biennial Conference. Chengdu, Sichuan, China. 2016
9. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
Dept. of Biochemistry and Molecular Biology, Univ. of Oklahoma Health Sciences Center. 2018
10. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
Dept. of Biochemistry and Molecular Biology, Univ. of Oklahoma Health Sciences Center. 2018
11. Title: Novel membrane Protein MADMAN Recruits MLKL to Lipid Rafts and Drives MLKL Polymerization during Necroptosis.
Cold Spring Harbor Cell Death Meeting 2019
12. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
School of Life Sciences, Tsinghua University, Beijing, China. 2020
13. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
Dept. of Physiology, University of Tennessee. 2020
14. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
James Comprehensive Cancer Center, Ohio State University. 2020
15. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
Eppley Institute for Research in Cancer and Allied Diseases, Univ. of Nebraska Medical Center. 2020
16. Title: Paving the Necroptotic Cell Death Pathways with Chemical Compounds and Genetic Screens.
Dept. of Cell & Molecular Biology, Tulane University 2021
17. Title: Paving the Cell Death Pathways with Chemical Compounds and Genetic Screens.
Dept. of Chemistry, University of South Florida. 2022
19. Title: Novel membrane Protein MADMAN Mediates MLKL Polymerization in Necroptosis.
Cell Death and Disease Symposium, Suzhou, China. 2023
20. Title: Disrupting RIPK1 Dephosphorylation Protects against Myocardial Infarction.
19th TNF Superfamily Meeting: Inflammation & Diseases, Guangzhou, China. 2024

Grants:**Ongoing Research Support:**

Agency: NIH/NIGMS
 I.D.#: R01GM147474
 Title: Regulation of Cell Death and Disease by a Novel Membrane Protein MADMAN
 P.I.: Zhigao Wang, PhD
 Percent effort: 30%
 Direct costs per year: \$200,000
 Total costs for project period: \$699,167
 Project period: 9/1/2022-8/30/2025 (NCE)

Pending:

(1) Agency: NIH/NIGMS
 I.D.#: R01GM155585
 Title: Novel Mechanisms Regulating Cell Death and Disease
 P.I.: Zhigao Wang, PhD; Jianfeng Cai, PhD; Da-Zhi Wang, PhD
 Role on project: corresponding co-investigator
 Percent effort: 30%
 Project period: 7/1/2024-6/30/2029

(2) Agency: NIH/NIGMS
 I.D.#: R35GM158455
 Title: Molecular and Chemical Regulation of Cell Death in Disease
 P.I.: Zhigao Wang, PhD
 Percent effort: 45%
 Project period: 4/1/2025-3/30/2030

(3) Agency: NIH/NIDDK

I.D.#: R01DK143008
Title: PPP1R3G and Transplanted Renal Graft Function
P.I.: Lei Wang, PhD; Jianfeng Cai, PhD; Zhiago Wang, PhD
Role on project: co-investigator
Percent effort: 10%
Project period: 4/1/2025-3/30/2030

(4) Agency: NIH/NIDDK
I.D.#: R01DK143131
Title: PPP1R3G and Necroptosis in AKI
P.I.: Lei Wang, PhD; Jianfeng Cai, PhD; Zhiago Wang, PhD
Role on project: co-investigator
Percent effort: 10%
Project period: 4/1/2025-3/30/2030

(5) Agency: NIH/NHLBI
LD#: R01HL181123
Title: Regulating Cell Death to Treat Cardiac Diseases
P.I.: Zhigao Wang, PhD; Jianfeng Cai, PhD; Da-Zhi Wang, PhD.
Role on project: contact PI
Percent effort: 30%
Project period: 7/1/2025-6/30/2030

Completed Research Support:

(1) Agency: NIH/NIGMS
I.D.#: R01GM120502
Title: Molecular and Chemical Regulations of Necrotic Cell Death Pathways
P.I.: Zhigao Wang, PhD
Percent effort: 30%
Direct costs per year: \$200,000
Total costs for project period: \$1,701,000
Project period: 7/1/2017-6/30/2023 (NCE)

(2) Agency: Welch Foundation
I.D.#: I-1827
Title: Regulation of necroptosis by casein kinase 1
P.I.: Zhigao Wang, PhD
Percent effort: 10%
Direct costs per year: \$65,000
Total costs for project period: \$195,000
Project period: 6/1/2016-5/31/2019

(3) Agency: NIH/NIGMS
I.D.#: 5F31GM111049/Student Fellowship
Title: Biochemical Dissection of the Execution Step of Mammalian Necrotic Cell Death
Student: Eduardo Reynoso
Sponsor: Zhigao Wang, PhD
Direct costs per year: \$30,703
Total costs for project period: \$92,109
Project period: 7/1/2015-6/30/2017

(4) Agency: NIH/NIGMS
I.D.#: 2T32GM008203-26/Student Training Grant

Title: Novel Necroptosis-blocking Compound 1 Conjugates HSP70 to Inhibit Necroptosis
 Student: Andrea Johnston
 Sponsor: Zhigao Wang, PhD
 Direct costs per year: \$30,000
 Total costs for project period: \$60,000
 Project period: 6/1/2015-5/31/2017

(5) Agency: NIH/NCATS
 I.D.#: TL1TR001104/Student Training Grant
 Title: The Role of Casein Kinase 1 in TNF-induced Necroptosis
 Student: Sarah Hanna-Addams
 Sponsor: Zhigao Wang, PhD
 Total costs for project period: \$30,000
 Project period: 6/1/2015-5/31/2016

(6) Agency: Welch Foundation
 I.D.#: I-1827
 Title: Biochemical Identification of Proteases Involved in Necrotic Cell Death Execution.
 P.I.: Zhigao Wang, PhD
 Percent effort: 10%
 Direct costs per year: \$60,000
 Total costs for project period: \$180,000
 Project period: 6/1/2013-5/31/2016

(7) Agency: Cancer Prevention & Research Institute of Texas
 I.D.#: R1222
 Title: Recruitment of First-Time, Tenure-Track Faculty Members.
 P.I.: Zhigao Wang, PhD
 Total costs for project period: \$2,000,000
 Project period: 9/1/2012-8/31/2017

(8) Agency: UT Southwestern Medical Center
 Title: Virginia Murchison Linthicum Scholar in Medical Research.
 P.I.: Zhigao Wang, PhD
 Total costs for project period: \$1,250,000
 Project period: 9/1/2012-8/31/2017

Bibliography:

1. Wang DZ, Chang PS, **Wang Z**, Sutherland L, Richardson JA, Small E, Krieg PA, Olson EN. (2001). Activation of cardiac gene expression by myocardin, a transcriptional cofactor for serum response factor. *Cell* 105, 851-862.
2. Wang DZ, Passier R, Liu ZP, Chin CH, **Wang Z**, Li S, Sutherland L, Small E, Krieg PA, Olson EN. (2002). Regulation of cardiac growth and development by SRF and its cofactors. *Cold Spring Harbor symposia on quantitative biology*. 2002; 67: 97-105
3. Wang DZ, Li S, Hockemeyer D, Sutherland L, **Wang Z**, Schrott G, Richardson JA, Nordheim A, Olson EN. (2002). Potentiation of serum response factor activity by a family of myocardin-related transcription factors. *Proc Natl Acad Sci U S A* 99, 14855-14860.
4. **Wang Z**, Wang DZ, Pipes GC, Olson EN. (2003). Myocardin is a master regulator of smooth muscle gene expression. *Proc Natl Acad Sci U S A* 100, 7129-7134.
5. Li S, Wang DZ, **Wang Z**, Richardson JA, Olson EN. (2003). The serum response factor coactivator myocardin is required for vascular smooth muscle development. *Proc Natl Acad Sci U S A* 100, 9366-9370.
6. **Wang Z**, Wang, DZ, Hockemeyer D, McAnally J, Nordheim A, Olson EN. (2004). Myocardin and ternary complex factors compete for SRF to control smooth muscle gene expression. *Nature* 428, 185-189.

7. Oh J*, **Wang Z***, Wang DZ*, Lien CL, Xing W, Olson EN. (2004). Target gene-specific modulation of myocardin activity by GATA transcription factors. *Mol Cell Biol* 24, 8519-8528. (* **equal contribution**).
8. Cao D*, **Wang Z***, Zhang CL*, Oh J, Xing W, Li S, Richardson JA, Wang DZ, Olson EN. (2005). Modulation of smooth muscle gene expression by association of histone acetyltransferases and deacetylases with myocardin. *Mol Cell Biol* 25, 364-376. (* **equal contribution**).
9. Liu ZP, **Wang Z**, Yanagisawa H, Olson EN. (2005). Phenotypic modulation of smooth muscle cells through interaction of Foxo4 and myocardin. *Dev Cell* 9, 261-270.
10. Xing W, Zhang TC, Cao D, **Wang Z**, Antos CL, Li S, Wang Y, Olson EN, Wang DZ. (2006). Myocardin induces cardiomyocyte hypertrophy. *Circ Res* 98, 1089-1097.
11. Wang J, Li A, **Wang Z**, Feng X, Olson EN, Schwartz RJ. (2007). Myocardin sumoylation transactivates cardiogenic genes in pluripotent 10T1/2 fibroblasts. *Mol Cell Biol* 27, 622-632.
12. **Wang Z**, Jiang H, Chen S, Du F, Wang X. (2012). The mitochondrial phosphatase PGAM5 functions at the convergent point of multiple necrotic death pathways. *Cell*. 148(1-2):228-43. (Commented in *Cell*. 148(1-2):17-8 and evaluated in Faculty of 1000. F1000.com/13861956)
13. Sun L, Wang H, **Wang Z**, He S, Chen S, Liao D, Wang L, Yan J, Liu W, Lei X Wang X. (2012). Mixed Lineage kinase domain-like protein mediates necrosis signaling downstream of receptor-interacting serine-threonine kinase 3. *Cell*. 148(1-2):213-27. (Commented in *Cell*. 148(1-2):17-8 and evaluated in Faculty of 1000. F1000.com/14267354)
14. Hanus J, Zhang H, **Wang Z**, Liu Q, Zhou Q, Wang, S. (2013). Induction of necrotic cell death by oxidative stress in retinal pigment epithelial cells. *Cell Death Dis* 4: e965.
15. Liu S, Liu H, Johnston AN, Hanna-Addams S, Reynoso E, Xiang Y, **Wang Z**. (2017). MLKL forms disulfide bond-dependent amyloid-like polymers to induce necroptosis. *Proc Natl Acad Sci U S A* 114, E7450-7459.
16. Reynoso E, Liu H, Li L, Yuan A, Chen S, **Wang Z**. (2017). Thioredoxin 1 actively maintains the pseudokinase MLKL in a reduced state to suppress MLKL polymerization and necroptosis. *J Biol Chem* 292, 17514-17524
17. Hanna-Addams S, **Wang Z**. (2018). Use of two-dimensional semi-denaturing detergent agarose gel electrophoresis to confirm size heterogeneity of amyloid or amyloid-like fibers. *J Vis Exp* (134), e57498,
18. Johnston AN, **Wang Z**. (2018). Necroptosis: MLKL polymerization. *J Nat Sci*. 4 (7), e513.
19. Li Y, Zhang Z, Chen J, Liu W, Liu B, Li X, Liu L, Xu S, Dong Q, **Wang Z**, Wang H, Gao S, Zhu B. (2018). Stella safeguards the oocyte methylome by preventing de novo methylation mediated by DNMT1. *Nature* 564, 136-140
20. Hanna-Addams S, Liu S, Liu H, Chen S, **Wang Z**. (2020a). CK1 α , CK1 δ and CK1 ϵ are necrosome components which phosphorylate serine 227 of human RIPK3 to activate necroptosis. *Proc Natl Acad Sci U S A* 117 (4): 1962-1970
21. Johnston AN, Ma Y, Liu H, Liu S, Hanna-Addams S, Chen S, Chen C, **Wang Z**. (2020b). Necroptosis-blocking compound NBC1 targets heat shock protein 70 to inhibit MLKL polymerization and necroptosis. *Proc Natl Acad Sci U S A* 117 (12):6521-6530.
22. Yu B, Ma J, Li J, Wang DZ, **Wang Z**, Wang S. (2020). Mitochondrial phosphatase PGAM5 modulates cellular senescence by regulating mitochondrial dynamics. *Nat Commun* 11 (1), 2549
23. Johnston AN, **Wang Z**. (2020). HSP70 promotes MLKL polymerization and necroptosis. *Molecular & Cellular Oncology* 14: 7(5):1791561
24. Du J, Xiang Y, Liu H, Liu S, Kumar A, Xing C, **Wang Z**. (2021). RIPK1 dephosphorylation and kinase activation by PPP1R3G/PP1 γ promote apoptosis and necroptosis. *Nat Commun* 12 (1), 7067
25. Liu S, Perez P, Sun X, Chen K, Fatirkhorani R, Mammadova J, **Wang Z**. (2024). MLKL polymerization-induced lysosomal membrane permeabilization promotes necroptosis. *Cell Death Differ* 31 (1), 40-52
26. Du J, **Wang Z**. (2024). Regulation of RIPK1 Phosphorylation: Implications for Inflammation, Cell Death, and Therapeutic Interventions. *Biomedicines* 2024, 12 (7), 1525
27. Tan J, Li Y, Li X, Zhu X, Liu L, Huang H, Wei J, Wang H, Tian Y, **Wang Z**, Zhang Z, Zhu B (2024). Pramell15 facilitates zygotic nuclear DNMT1 degradation and DNA demethylation. *Nat Commun* 15 (1):7310

Pending Patents:

- (1) Patent application number: US 18/590,068
Date of filing: February 28, 2024
Applicants: Zhigao Wang, Shuzhen Liu, Preston Perez
Title: Method of Inhibiting Necroptosis.
- (2) Patent application number: US 18/589,619
Date of filing: February 28, 2024
Applicants: Jianfeng Cai, Zhigao Wang, Yizhan Zhai, Xue Zhao, Xueling Ma, Ken Chen
Title: Method of Inhibiting PPP1R3G/PP1Gamma Activity to Prevent Doxorubicin-induced Cardiomyopathy and Myocardial Infarction.

Professional service:

- | | |
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| 1. <i>ad-hoc</i> reviewer, Cell Signaling and Regulatory Systems (CSRS) study section, NIH | 2024 |
| 2. Associate Editor for the journal Frontier in Cell Death-Inflammation and Cytotoxicity | 2023-present |
| 3. Review Editor for the journal Frontier in Cell Death. | 2022-present |
| 4. Member, American Heart Association (AHA) | 2021-present, |
| 5. Member, American Society for Biochemistry and Molecular Biology (ASBMB) | 2015-present, |
| 6. <i>ad-hoc</i> reviewer for journals, | 2012-present |
| 1. Science, | |
| 2. Nature Chemical Biology, | |
| 3. Nature Communications, | |
| 4. PNAS, | |
| 5. ELife, | |
| 6. Journal of Biological Chemistry, | |
| 7. Cell Death & Disease, | |
| 8. Journal of Molecular Signaling, | |
| 9. BMC Biology, | |
| 10. Differentiation, | |
| 11. Toxicological Sciences, | |
| 12. Cells, | |
| 13. Frontiers in Cell and Developmental Biology, | |
| 14. Frontier in Cell Death, | |
| 15. Frontiers in Immunology, | |
| 16. Frontiers in Pharmacology | |
| 17. Frontiers in Cellular and Infection Microbiology | |
| 18. Frontiers in Oncology | |
| 19. BBA Molecular Cell Research, | |
| 20. Pharmaceuticals, | |
| 21. Differentiation, | |
| 22. International Journal of Cancer, | |
| 23. iScience, | |
| 24. Theranostics | |
| 25. Communications Biology | |
| 26. Biomedicines | |

Faculty Committee service:

- | | |
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| 1. Faculty Search Committee, Center for Regenerative Medicine, USF | 2021-present |
| 2. Appointment, Promotion, and Tenure Committee for the Dept. of Internal Medicine, USF. | 2021-2023 |

Student Committee service:

- | | |
|---|-----------|
| 1. UT Southwestern graduate student interviews. | 2012-2021 |
| 2. UT Southwestern medical student interviews. | 2012-2021 |
| 3. PhD dissertation committee of Chengzu Long. | 2012-2014 |

4. qualifying exam committee of Laura Yuan	2014
5. qualifying exam committee of Ebony Flowers.	2014
6. qualifying exam committee of Jin Suk Park	2015
7. qualifying exam committee of Bercin Cenik.	2015
8. PhD dissertation committee of Xiang Gui.	2016-2018
9. qualifying exam committee of Andres Ramirez-Martinez	2016
10. qualifying exam committee of Josiah Flaming	2018
11. qualifying exam committee of Anne Cooley	2018
12. chair of the qualifying exam committee of Tyron Chang	2019
13. qualifying exam committee of Michael Trinh	2020
14. USF graduate student interviews	2023-present
15. PhD dissertation committee of Minh Tran	2023-present