Zhen Wang

U.S. Permanent Resident

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OBJECTIVE: To contribute to academic biomedical research.

PROFILE

Biomedical Research Scientist with 4 years of surgical clinical experience and 17 years of experience in biomedical research.

PROFESSIONAL EXPERIENCE

Life Science Research Associate Stanford University, CA 2005-current

- Investigate function of a novel protein Del1(EDIL3) on endothelial cells, chondrocytes, and stem cells and its impact on bone fracture and osteoarthritis. Discovered Del1 can protect chondrocytes from apoptosis thus reduce the risk for osteoarthritis
- Study unfolded protein response in wound healing, and demonstrated first time that XBP1 plays an essential role in normal skin wound healing
- Utilize transgenic mouse with a rib fracture model demonstrated that different gene expression regulatory elements control BMP5 expression in fracture healing and development
- Manage biomedical research laboratory and supervise Research Assistants, Surgical Residents, Postdoctoral fellow, medical students and college students
- Collaborate with cross-functional research teams, including laboratories in Department of Orthopedic surgery, Bioengineer, Radiation oncology, Developmental biology, Biochemistry, and Mechanical engineer, to integrate diverse expertise and make progress in research projects

Postdoctoral Research Fellow Stanford University, CA 2001-2005

- Explored the role of mechanical stress and serum stimulation in extracellular matrix producing of keloid fibroblasts, and discovered important signal transduction pathways in keloid formation
- Analyzed hypoxia stress on the gene expression of diverse types of cells with cDNA microarrray technique, and discovered a hypoxia gene signature which can predict cancer survival clinically

Plastic Surgery Resident Xijing Hospital, Xi'an, China 1997-2001

- Trained and performed plastic and reconstructive surgery, hand surgery, microsurgery, trauma surgery, and cosmetic surgery,
- collaborated with different medical teams and communication with patients with medical procedures
- Studied effect of calcium antagonist and angiogenesis inhibitor on hypertrophic scar formation, and developed new strategy for pathological scars treatment

EDUCATION

- **M.Sc. and M.D.** The Fourth Military Medical University, Xi'an, China 1992-1999

EXPERTISE

- **Cell Biology**: Cell adhesion molecules in skin and skeleton biology; mechanical signal transduction; apoptosis signaling transduction network; unfolded protein response in skin wound healing and scar formation; hypoxia stress responses in endothelial cell, smooth muscle cells, chondrocytes and renal proximal tubule epithelial cells. Intensive hands on experience for tissue culture, establish primary cell culture for skin fibroblast, keratinocytes, chondrocytes, microvascular endothelial cells, bone marrow mesenchymal stem cells, adipose-derived stromal cells; cell proliferation, migration, apoptosis assays.
- **Molecular Biology**: Nucleic acid and protein extraction and purification, cDNA Microarray and gene expression profiling, RNA interference, recombinant protein production and purification, real-time PCR, Northern blot, Western blot
- **Histology/Pathology**: Skeleton and soft tissue histology and pathology, including tissue preparation, processing, embedding, section, and staining. Expert in skin wound evaluation, osteoarthritis pathological scoring, and new bone formation histomorphometry. Immunohistochemistry.
- **Animal surgery**: Excellent research animal handing skills; establish skin wounding, bone fracture, and osteoarthritis surgical animal models
- **Laboratory management**: Laboratory establishing, biological laboratory safety, supervising and training Research Assistants, Surgical Residents, postdoctoral fellows, and graduate students for experimental technology; excellent communication skills and skillful troubleshooting.

AWARDS & FELLOWSHIPS

- ***Excellence in Research Award,*** American College of Surgeons, New Orleans, LA 2007
- ***Smile Train Fellowship,*** Smile Train Foundation 2001-2005
- ***Outstanding Medical Student Award,*** FMMU, Xi'an, China 1994

PROFESSIONAL SOCIETIES

- Member of Plastic Surgery Research Council 2005-current

REVIEWERSHIP

- Serve as a reviewer for *Medical Science Monitor* 2010-current

PEER-REVIEWED SCIENTIFIC RESEARCH PUBLICATIONS

(783 total citations by Feb 2015)

1. ***Wang Z***, Tran MC, Barbhaiya NJ, Chen C, Hsing A, La Russa M, Fattakhov E, Rashidi V, Jang KY, Choo KJ, Nie X, Mathy J, Dauskardt R, Longaker MT, Helms JA, and George P Yang. DEL1-knockout mice developed more severe osteoarthritis associated with increased susceptibility of chondrocytes to apoptosis. Submitted to Arthritis and Rheumatology in Jan 2015
2. Guenther C*, ***Wang Z****, (**** co-first author, contributed equally to this paper***), Li E,Tran MC, Logan CY, Nusse R, Pantalena-Filho L, Yang GP, and Kingsley DM.A distinct regulatory region of the BMP5 locus activates gene expression following adult bone fracture and soft tissue injury. Submitted to Bone in Dec 2014
3. ***Wang Z***, Kundu R, Longaker MT, Quertermous T, and Yang GP. The angiogenic factor Del1 prevents apoptosis of endothelial cells through integrin binding. Surgery. 2012; 151(2):296-305

4. Bulter PD, ***Wang Z***, Ly DP, Longaker MT, Koong AC, and Yang GP. Unfolded protein response regulation in keloid cells. J Surg Res. 2011; 167(1):151-7
5. Hsu GP, Mathy JA, ***Wang Z***, Wei X, Sakamoto G, Kundu R, Longaker MT, Quertermous T, and Yang GP. Increased rate of hair regrowth in mice with constitutive overexpression of Del1. J Surg Res, 2008.146:73-80.
6. Kwan MD, Wan DC, ***Wang Z***, Gupta DM, Slater BJ, Longaker MT. Microarray analysis of the role of regional dura mater in cranial suture fate. Plast Reconstr Surg. 2008 122:389-99.
7. Wan DC, Kwan MD, Gupta DM, ***Wang Z***, Slater BJ, Panetta NJ, Morrell NT, Longaker MT. Global age-dependent differences in gene expression in response to calvarial injury. J Craniofac Surg. 2008 Sep;19(5):1292-301.
8. Chi JT, Rodriguez EH, ***Wang Z***, Nuyten DS, van de Vijver MJ, Hastie T, and Brown PO. Gene expression programs of human smooth muscle cells: tissue-specific differentiation and prognostic significance in human cancers. PLoS Genetics. 2007. 3(9):1770-84.
9. Xia W, Kong W, ***Wang Z***, Lim IJ, Phan TT, Longaker MT, Yang GP. Increased CCN2 transcription in keloid fibroblasts requires cooperativity between AP-1 and Smad binding sites. Ann Surg. 2007. 246(5):886-95.
10. Chi JT*, ***Wang Z****, (**** co-first author, contributed equally to this paper***) Nuyten DS, Rodriguez EH, Schaner ME, Salim A, Wang Y, Kristensen GB, Helland A, Børresen-Dale AL, Giaccia A, Longaker MT, Hastie T, Yang GP, van de Vijver MJ, Brown PO. Gene Expression Programs in Response to Hypoxia: Cell Type Specificity and Prognostic Significance in Human Cancers. PLoS Medicine, 2006; 3(3): 395-408
11. ***Wang Z***, Fang, KD, Pham TT, Lim IJ, Longaker MT, and Yang GP. Increased transcriptional response to mechanical strain in keloid fibroblasts due to increased focal adhesion complex formation. Journal of Cellular Physiology, 2006; 206(2): 510-517
12. Wan DC, Aalami OO, ***Wang Z***, Nacamuli RP, Lorget F, Derynck R, Longaker MT. Differential Gene Expression between Juvenile and Adult Dura Mater: A Window into What Genes Play a Role in the Regeneration of Membranous Bone. Plast Reconstr Surg. 2006; 118(4):851-861
13. Fong KD, Trindade MC, ***Wang Z***, Nacamuli RP, Pham H, Fang TD, Song HM, Smith RL, Longaker MT, Change J . Microarray analysis of mechanical shear effects on flexor tendon cells. Plast Reconstr Surg. 2005; 116(5):1393-404; discussion 1405-6.
14. Chi JT, Chang HY, Haraldsen G, Jahnsen FL, Troyanskaya OG, Chang DS, ***Wang Z***, Rockson SG, van de Rijn M, Botstein D, Brown PO. Endothelial cell diversity revealed by global expression profiling. Proc Natl Acad Sci U S A. 2003; 100(19):10623-8.
15. Zhang Y, Lu KH, Guo SZ, Song G, Yang GR, ***Wang Z***, Lei YH. Cloning of human angiogenesis inhibitor METH1 and its expression in mammalian cells. Chinese Journal of Plastic Surgery. 2004; 20(3):225-227
16. ***Wang Z***, Lu KH, Guo SZ, Zhang LX, Huang XF. Effect of calcium antagonist on the ultrastructure of hypertrophic scar fibroblast. Chinese Journal of Experimental Surgery. 2003; 20(7): 635-636
17. ***Wang Z***, Zhang LX, Guo SZ, Lu KH. Thalidomide inhibits formation of hypertrophic scar. Journal of Fourth Military Medical University. 2002; 23(9):810-812
18. Zhang LX, Guo SZ, ***Wang Z***. Cultivate and observe the human melanocytes in vitro. Chinese Journal of Aesthetic Medicine. 2002; 11(5):409-411
19. Guo SZ, Zhang LX, ***Wang Z***. Effects of conditioned medium derived from different keratinocytes on proliferation and collagen synthesis of hypertrophic scar fibroblast. Chinese J of Plastic Surgery. 2002; 18(2):83-85
20. Zhang LX, Guo SZ, ***Wang Z***. Contrast study on the ultrastructure of melanocytes derived form normal tissue and hypertrophic scar. Journal of Fourth Military Medical University. 2002; 23(18):1713-1715
21. Zhang LX, Guo SZ, Xia WS, Yang L, ***Wang Z***. Influence of endothelial cells on the proliferation of scar-derived fibroblast in hypertrophic scar tissue. Chinese Journal of Plastic Surgery. 2002; 18(6): 338-340
22. ***Wang Z***, Guo SZ, Lu KH, Zhang LX. The biological effect of Verapamil on hypertrophic scar fibroblast.

Chinese Journal of Plastic Surgery, 2001; 17(6):328-331.

23. ***Wang Z***, Zhang LX, Guo SZ, Lu KH. Angiogenesis in hypertrophic scars: a pathology study. Journal of the Fourth Military Medical University. 2001; 22 (17):1612-1613.
24. Zhang LX, ***Wang Z***, Guo SZ, Xia W, Li W. Effect of ultraviolet B radiation on the normal human melanocyte in vitro. Chinese Journal of Aesthetic Medicine, 2001; 10 (3): 180-182.
25. Zhang LX, Guo SZ, ***Wang Z***. Biological effects of supernatant from melanocytes culture on proliferation of hypertrophic scar fibroblasts. Journal of the Fourth Military Medical University. 2000; 21(5):s93-94.
26. ***Wang Z***, Lu KH, Guo SZ, Zhang LX, and Liu J.P. Inhibition of hypertrophic scar derived fibroblast-populated collagen lattice contraction by calcium antagonist. Journal of the Fourth Military Medical University. 1999; 20 (7):559-562.

BOOK CHAPTERS

1. Chi JT, ***Wang Z***, Potti A. Genomic analysis of the endothelial cell specialization, "BioArrays: From Basics to Diagnostics" Humana Press, Totowa, NJ, 2007; June, 121-132
2. ***Wang Z***, Lu KH, Li HY. Verapamil Inhibits Hypertrophic Scaring: A Rabbit Ear Scar Model study, "Animal Model for Wound Healing: Establish and Application of Rabbit Scar Formation Model". FMMU Press, Xi'an, China. 2005; 91-94. ISBN 7-81086-041-0 (In Chinese)
3. Li HY, ***Wang Z***. Effect of Calcium Antagonist on the Formation of Hypertrophic Scars, "Scarology: A new edition" FMMU Press, Xi'an, China. 2003; 272-274. ISBN 7-81086-142-5 (In Chinese)

REVIEWS

1. ***Wang Z***, Guo SZ. Applications of endoscopic techniques in microsurgery and craniofacial plastic and reconstructive surgery. Chinese Journal of Aesthetic Medicine. 2001; 10(4): 322-324 (In Chinese)
2. ***Wang Z***, Lu KH. The research advance of visualization of prefabricated skin flap and transvascular territories skin flap. Chinese Journal of Microsurgery. 1997; 20(3):172-175 (In Chinese)

TRANSLATIONS (From English to Chinese)

1. Mulliken JB. Vascular Anomalies. "Grabb and Smith's Plastic Surgery" 5th Ed. Lippincott-Raven, Philadelphia, PA 1997, 17: 191-205. (Chinese Version: 191-204, translator: ***Wang Z***)
2. Bartlett SP and Mackay GJ. Craniosynostosis Syndromes. "Grabb and Smith's Plastic Surgery" 5th Ed. Lippincott-Raven, Philadelphia, PA 1997, 26: 295-305. (Chinese Version: 293-303, translator: ***Wang Z***)
3. Eaves FF III, Nahai F, and Bostwick J III. Endoscopic Plastic Surgery. "Grabb and Smith's Plastic Surgery" 5th Ed. Lippincott-Raven, Philadelphia, PA 1997,55: 693-699. (Chinese Version: 676-681, translator: ***Wang Z***)
4. Rosen HM. Osseous Genioplasty. "Grabb and Smith's Plastic Surgery" 5th Ed. Lippincott-Raven, Philadelphia, PA 1997, 57: 705-713. (Chinese Version: 688-693, translator: ***Wang Z***)

NATIONAL/INTERNATIONAL ACADEMIC CONFERENCE PRESENTATIONS

1. ***Wang Z***, Guenther C, Tran MC, Yang GP, Kingsley DM. Transcriptional regulation of BMP5 in fracture healing and development. Seventh Annual Academic Surgical Congress. Feb 14-16, 2012, Las Vegas, NV
2. ***Wang Z***, Tran MC, Barbhaiya NJ, Jang KY, Rashidi V, La Russa M, Choo JK, Longaker MT, Helms J, Yang GP. Del1 protects against osteoarthritis by preventing chondrocytes apoptosis. Seventh Annual Academic Surgical Congress. Feb 14-16, 2012, Las Vegas, NV

3. ***Wang Z***, Fattakhov E, Choo JK, Tran MC, Longaker MT, Yang GP. Identification of a cartilage phenotype in the DEL1 Knockout mouse. Sixth Annual Academic Surgical Congress. Feb 1-3, 2011, Huntington Beach, CA
4. Tran MC, ***Wang Z***, Butler PD, Spiotto MT, Chen Y, Fattakhov E, Longaker MT, Koong AC, Yang GP. Inhibition of unfolded protein response delays wound healing. Sixth Annual Academic Surgical Congress. Feb 1-3, 2011, Huntington Beach, CA
5. ***Wang Z***, Butler PD, Ly DP, Spiotto MT, Koong AC, Yang GP. Activation of unfolded protein response in wound healing. Fifth Annual Surgical Congress. Feb 2-5, 2010, San Antonio, TX
6. ***Wang Z***, Choo JK, Tran MC, Nie X, Longaker MT, Yang GP. Histomorphometric analysis of fracture healing in Del1 knockout mice. American College of Surgeons 95th Clinical Congress. October 7-11, 2009, Chicago, IL. Journal of American college of Surgeons, 2009, 209(3): S63
7. ***Wang Z***, Longaker MT, Yang GP. Integrin alphaV beta3 mediates the anti-apoptotic effect of DEL1 on endothelial cells. Fourth Annual Academic Surgical Congress. February 3-6, 2009, Fort Myers, FL
8. ***Wang Z***, Nie X, Longaker MT, Yang GP. DEL1 knockout mice heal fractures with decreased bony callus. Fourth Annual Academic Surgical Congress. February 3-6, 2009, Fort Myers, FL.
9. ***Wang Z***, Rodriguez EH, Longaker MT, Brown PO, Chi AJ, and Yang GP. Genomic analysis of the heterogeneity hypoxia response in renal proximal tubule epithelial cells after knock-down of HIF-1a and HIF-2a. Third Annual Academic Surgical Congress. February 12-15, 2008, Huntington Beach, CA.
10. ***Wang Z***, Nie X, Longaker MT, Yang GP. Del1 protects chondrocytes from apoptosis. American College of Surgeons 93nd Clinical Congress, October 8-12, 2007, New Orleans, LA. Journal of American college of Surgeons, 2007, 205(3): S45
11. Butler PD, ***Wang Z***, Koong AC, Longaker MT, and Yang GP. Regulation of the unfolded pretein response in keloid fibroblast. American College of Surgeons 93rd Clinical Congress. October 7-11, 2007, New Orleans, LA. Journal of American college of Surgeons, 2007, 205(3): S56-57
12. ***Wang Z***, Longaker MT, Yang GP. The effect of Del1 on apoptosis. The Plastic Surgery Research Council, June 19-23, 2007, Stanford, California. Plastic and Reconstructive Surgery, 2007, 120(1):44
13. Nie X, ***Wang Z***, Rodriguez E, Chi A, Longaker MT, Yang GP. Hypoxia induced pre-reperfusion response is critical for ischemic acute tubular necrosis. American College of Surgeons 92nd Clinical Congress, October 16-20, 2006, Chicago, Illinois. Journal of American College of Surgeons, 2006, 203(3): S25-S26
14. ***Wang Z***, Phan TT, Lim I, Longaker MT, Yang GP. Cellular response of keloid-derived keratinocytes to physical stress. American College of Surgeons 92nd Clinical Congress, October 16-20, 2006, Chicago, Illinois. Journal of American College of Surgeons, 2006, 203(3): S54-S55
15. ***Wang Z***, Longaker MT, Yang GP. Anti-apoptotic effects of the angiogenic factor Del1 on endothelial cells. Thirty-Ninth Annual Meeting of the Association for Academic Surgery & Sixty-seventh Annual Meeting of the Society of University Surgeons, February 7-11, 2006, San Diego, California. Journal of Surgical Research, 2006, 130(2):237
16. ***Wang Z***, Longaker MT, Yang GP. Effect of the angiogenic factor Del1 on endothelial cell apoptosis. American College of Surgeons 91st Clinical Congress, October 16-20, 2005, San Francisco, California. Journal of American College of Surgeons, 2005, 201(3): S104
17. Nie X, ***Wang Z***, Longaker MT, Chi AJT, Yang GP. Role of the hypoxia response in kidney injury. American College of Surgeons 91st Clinical Congress, October 16-20, 2005, San Francisco, California. Journal of American College of Surgeons, 2005, 201(3): S39
18. Philip JC, ***Wang Z***, Longaker MT, Yang GP. The effect of PKC epsilon antagonist inhibitor on hypoxia response of endothelial cells. The Plastic Surgery Research Council 50th Annual Meeting, May 17-21, 2005, Toronto, Ontario, Canada
19. Philip JC, ***Wang Z***, Chi A, Brown P, Longaker MT, Yang GP. Mediators of endothelial cell injury in low perfusion conditions. American College of Surgeons 90st Clinical Congress, October 10-14, 2004, New

Orleans, Louisiana. Journal of American college of Surgeons, 2004, 199(3): S62

20. Malladi P, Xu Y, ***Wang Z***, Sakamoto G, Longaker MT, Quertermous T, Yang GP. The role of the developmental endothelial locus 1 (Del1) in skeletal development. American College of Surgeons 90st Clinical Congress, October 10-14, 2004, New Orleans, Louisiana. Journal of American college of Surgeons, 2004, 199(3): S49-S50
21. ***Wang Z***, Phan TT, Lim IJ, Longaker MT, Yang GP. Growth factors expression by keloid keratinocytes after physical stress. The Plastic Surgery Research Council 49th Annual Meeting, June 9-12, 2004, Ann Arbor, Michigan.
22. Zhang LX, Chi AJ, ***Wang Z***, Longaker MT, Brown PO, Yang GP. Gene expression profile of endothelial cell following nutrient deprivation. The Plastic Surgery Research Council 49th Annual Meeting, June 9-12, 2004, Ann Arbor, Michigan.
23. Zhang LX, ***Wang Z***, Yang GP, Longaker MT, Guo SZ. The effect of the angiogenesis Inhibitor, angiostatin, on hypertrophic scarring. The Association for Academic Surgery 37th Annual Meeting, November 13-15, 2003, Sacramento, California.
24. ***Wang Z***, Phan TT, Lim IJ, Yang GP, Longaker MT. Mechanical signal transduction in normal versus keloid fibroblasts. American College of Surgeons 89th Clinical Congress, October 19-23, 2003, Chicago, Illinois. Journal of the American College Surgeons, 2003. 197(3): S52
25. ***Wang Z***, Trindade MCD, Fong KD, Peled Z, Yang GP, Smith, RL, Longaker MT. Growth factor production by keloid and normal fibroblasts after physical stress. American College of Surgeons 88th Clinical Congress, Oct 6-11, 2002, San Francisco, California. Journal of the American College Surgeons, 2002. 195(3): S49
26. Trindade MCD, ***Wang Z***, Fong KD, Yang GP, Longaker MT, Goodman SB, Smith RL. Fluid-induced shear stress increases fibroblast VEGF release in vitro. American College of Surgeons 88th Clinical Congress, Oct 6-11, 2002, San Francisco, California. Journal of the American College Surgeons, 2002, 195(3): S37-38
27. ***Wang Z***, Trindade MCD, Fong KD, Peled Z, Thang P, Lim IJ, Yang GP, Smith, RL, Longaker MT. Growth factor production by keloid and normal fibroblasts after physical stress. The Plastic Surgery Research Council 47th Annual Meeting, April 17-20, 2002, Boston, Massachusetts.