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## BIOGRAPHICAL SKETCH

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NAME Shusheng Wang, PhD	POSITION TITLE Assistant Professor		
eRA COMMONS USER NAME swang6			
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Huazhong University of Science and Technology, Wuhan, P.R. China	B.E.	1988-1992	Biomedical Engineering
Peking University, Beijing, P.R. China	M.S.	1996-1999	Cell Biology
Tulane University, New Orleans, LA	Ph.D.	1999-2004	Developmental Biology
UT Southwestern Medical Center, Dallas, TX	Postdoctoral	2005-2009	Molecular Biology

### A. Personal Statement

The long term goal of the research in my lab is to elucidate the mechanisms of retinal development and disease at transcriptional and posttranscriptional levels, focusing on microRNAs and transcription factors. I was trained as a developmental biologist with a broad background in vascular diseases. When I was a postdoctoral fellow in Dr. Eric Olson's lab at UT Southwestern Medical Center at Dallas, I initiated several projects studying the signaling pathways involved in angiogenesis, a process essential for vascular development and disease. Our work resulted in two important research papers in peer reviewed journals, and is among the first to demonstrate that class II HDACs and microRNAs are important for angiogenesis. Starting September 2009, as a new tenure track assistant professor in the Department of Ophthalmology, I am trying to use my expertise to attack degenerative retinal diseases, with a focus on age-related macular degeneration (AMD). Our recent studies have revealed important roles for microRNAs in regulating angiogenesis and choroidal neovascularization (CNV) in mice by targeting multiple angiogenic pathways. The objective for the proposed research is to decipher the mechanism of microRNAs in neovascular and dry AMD. The current application builds logically on my prior work and newly generated exciting preliminary results. I have arranged all necessary research resources to ensure the success of project. In this proposal, we hypothesize that microRNAs in the miR-23~27~24 families are key regulatory mechanisms in AMD. Specifically, miRNA-23 and miRNA-27 regulate multiple angiogenic and inflammatory pathways required for CNV; while miR-24 protects retinal pigment epithelium (RPE) atrophy by repressing oxidative stress-induced RPE cell death. We expect to develop new microRNA therapeutics for AMD upon finishing the project.

### B. Positions and Honors

#### Positions and employment:

1992-1996      Technical Manager, Northeast Pharmaceutical Group Corporation

- 1999-2001 Teaching Assistant, Department of Cell and Molecular Biology, Tulane University
- 2001-2004 Research Assistant, Department of Cell and Molecular Biology, Tulane University
- 2005-2009 Postdoctoral Fellow, Department of Molecular Biology, University of Texas Southwestern Medical Center at Dallas
- 2009- Assistant Professor, Department of Ophthalmology, University of Texas Southwestern Medical Center at Dallas

### **Other Experience and Professional Memberships:**

- 2009- Member, Association for Research in Vision and Ophthalmology
- 2009- Member, North American Vascular Biology Organization
- 2010- AHA Review Committee: Genetics and Epigenetics

### **Awards and Honors:**

- 2002 **First Place Poster award**, Society for Developmental Biology Southwestern Affiliate 2002 Annual meeting
- 2003 **Predoctoral Fellowship award** (Identification Number: 0315055B), American Heart Association (AHA) Southeast Affiliate (Declined)
- 2004 **Basic Research Award in Molecular Bioscience**, Sixteenth Annual Tulane Health Sciences Research days, Tulane University Health Science Center
- 2006 **Postdoctoral Fellowship Award**, American Heart Association (AHA) Texas Affiliate
- 2006 **Outstanding Postdoctoral Fellowship Applicant Award**, American Heart Association (AHA) Texas Affiliate
- 2008 **Award for Excellence in Postdoctoral Research**, UT Southwestern Medical Center
- 2008 **First Place Award for Basic Research**, 8<sup>th</sup> Annual Cardiovascular Research Symposium, UT Southwestern Medical Center
- 2011 **President's Research Council (PRC) Distinguished Researcher Award**, UT Southwestern Medical Center

## **C. Publications:**

### **a). Peer-reviewed Articles:**

1. Mi, Z., **Wang, S.**, Wu, NH. Isolation of osRACD gene encoding a small GTP-binding protein from rice. *Chinese Science Bulletin* (2000). 45 (19), 2047-2054.
  2. Yu, X., St Amand, TR., **Wang, S.**, Li, G., Zhang, Y., Hu, Y., Lan, N., Qiu, M., and Chen, YP. Differential expression and functional analysis of Pitx2
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- isoforms in regulation of heart looping in the chick. *Development* (2001). 128, 1005-1013.
3. Zhang, Y., **Wang, S.**, Song, Y., Han, J., Chai, Y., and Chen, YP. Timing of odontogenic neural crest cell migration and tooth-forming capability in mice. *Dev. Dyn* (2003). 226: 713-718.
  4. **Wang, S.**, Yu, X., Zhang, T., Zhang, X., Zhang, Z., and Chen, YP. Chick Pcl2 regulates the left-right asymmetry by repressing Shh expression in Hensen's node. *Development*. (2004). 131: 4381-4391.
  5. **Wang, S.**, He, F., Xiong, W., Gu, S., Liu, H., Zhang, T., Yu, X., Chen, YP. Polycomblike-2-deficient mice exhibit normal left-right asymmetry. *Dev Dyn*. (2007). 236(3):853-61.
  6. Chen, JF., **Wang, S.**, Wu, Q., Cao, D., Nguyen, T., Chen, YP., Wang, DZ. Myocardin marks the earliest cardiac gene expression and plays an important role in heart development. *Anat Rec* (Hoboken). (2008). 291(10):1200-11.
  7. **Wang, S.**, Li, X., Parra, M., Verdin, E., Bassel-Duby, R., and Olson EN. Control of endothelial cell proliferation and migration by VEGF signaling to histone deacetylase 7. *Proc. Natl. Acad. Sci. U S A*. (2008).105, 7738-7743.
  8. **Wang, S.**, Aurora, AB., Johnson, BA., Qi, X., McAnally, J., Hill, JA., Richardson, JA., Bassel-Duby, R., and Olson, EN. The endothelial-specific microRNA miR-126 governs vascular integrity and angiogenesis. *Dev. Cell*. (2008). 15, 261-271.
  9. Zernecke, A., Bidzhekov, K., Noels, H., Shagdarsuren, E., Gan, L., Denecke, B., Hristov, M., Köppel, T., Jahantigh, MN., Lutgens, E., **Wang, S.**, Olson, EN., Schober, A., Weber, C. Delivery of MicroRNA-126 by Apoptotic Bodies Induces CXCL12-Dependent Vascular Protection. *Sci Signal*. (2009). 2(100):ra81.
  10. Small, EM., Sutherland, L., Rajagopalan, K., **Wang, S.**, Olson, EN. MicroRNA-218 Regulates Vascular Patterning by Modulation of Slit-Robo Signaling. *Circ Res*. (2010). 107(11):1336-44.
  11. Zhou, Q., Gallagher, R., Ufret-Vincenty, R., Li, X., Olson, EN., **Wang, S.** Regulation of angiogenesis and choroidal neovascularization by members of microRNA-23~27~24 clusters. *Proc. Natl. Acad. Sci. U S A*. (2011). 108(20):8287-92.

#### **b). Non Peer-reviewed Articles:**

1. Yu, X., **Wang, S.**, Chen, YP. 2005. Expression and function of Pitx2 in chick heart looping. In "*The Molecular Mechanisms of Axenfeld-Rieger Syndrome*", Ed. B.A. Amendt. Landes Bioscience, Georgetown, TX. p65-73.
2. **Wang, S.** and Olson, EN. AngiomiRs: Key regulators of angiogenesis. *Curr Opin Genet Dev*. (2009). 19, 1-7.

#### **c). Abstracts Within the Last Two Years:**

1. **Wang, S.**, Gallagher, R., Arnold, MA., Phan, D., Kim, Y., Kim, M., Bassel-Duby, R., and Olson, EN. "Requirement of MEF2 Transcriptional Factors in Maintaining Vascular Integrity". Association for Research in Vision and Ophthalmology, May, 4, 2010.
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2. **Wang, S.**, Zhou, Q., Gallagher, R., Ufret-Vincenty, R., Li, X., and Olson, EN. "Role of microRNAs in retinal angiogenesis". Association for Research in Vision and Ophthalmology, May, 3, 2011.
3. Zhang, K., Aredo, B., Wang, H., **Wang, S.**, and Ufret-Vincenty, R. "Complement factor H in choroidal neovascularization and acute injury." Association for Research in Vision and Ophthalmology, May, 1, 2011.

#### **D. Research Support:**

##### **Ongoing Research Support:**

1. "Departmental Start-up Fund"

The Department of Ophthalmology, UT Southwestern Medical Center at Dallas.

PI: Shusheng Wang. Period: 09/02/2009-08/31/2012

The purpose of the fund is to set up the PI's laboratory and fund preliminary studies needed to be competitive for extramural research support.

2. "Regulation of Multiple Pathways in Neovascular AMD by microRNAs"

President's Research Council (PRC) New Investigator Award

PI: Shusheng Wang. Period: 05/01/2011-12/31/2012.

The purpose of the unrestricted grant is to studies the molecular pathways regulated by microRNA in neovascular AMD.

3. "Regulation of ocular angiogenesis by microRNAs"

R01. National Institute of Health.

PI: Shusheng Wang. Period: 09/01/2011-08/31/2015

The purpose of the grant is to study the function of microRNAs (mainly miR-126) in retinal vascular development and diseases.

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