

BIOGRAPHICAL SKETCH

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NAME Li Yang	POSITION TITLE Postdocal Fellow		
eRA COMMONS USER NAME			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Beijing Medical University	MD	1988-1993	Medicine
University of Southern California	PhD	1997-2002	Physiology

Professional Positions

- 9/1993-7/1997 Research Associate, Dept. of Biophysics, Beijing Medical University, Beijing, China, Supervisor, Kechun Lin, M.D.
- 8/2002-present Postdoctoral Fellow, Dept. of Physiology and Biophysics, Univ. of Southern Calif., Supervisor, Alicia A. McDonough, Ph.D.

Research Support

- 7/1/2000-6/30/2002 American Heart Association Predoctoral Fellowship Award
Title: Cellular mechanisms controlling Na transporter trafficking during hypertension
- 7/1/2003-6/30/2006 American Heart Association Postdoctoral Fellowship Award
Title: Sympathetic nervous system regulation of proximal tubule sodium transport

Honors, Experience

- 2002 Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award from American Physiological Society
- 2000 The Aventis Pharma Excellence in Renal Research Award from Renal section, American Physiological Society

Peer Reviewed Publications

1. Yang LE, Sandberg MB, Can AD, Pihakaski-Maunsbach K, McDonough AA. Effects of dietary salt on renal Na⁺ transporters' subcellular distribution, abundance, and phosphorylation status. *Am J Physiol Renal Physiol.* 2008 Oct;295(4):F1003-16. PMID: 18653479
2. Zheng D, Perianayagam A, Lee DH, Brannan MD, Yang LE, Tellalian D, Chen P, Lemieux K, Marette A, Youn JH, McDonough AA. AMPK Activation with AICAR Provokes an Acute Fall in Plasma [K⁺]. *Am J Physiol Cell Physiol.* 2008 Jan;294(1):C126-35. PMID: 18003746
3. Yang LE, Leong PK, McDonough AA. Reducing blood pressure in SHR with enalapril provokes redistribution of NHE3, NaPi2 and NCC and decreases NaPi2 and ACE abundance. *Am J Physiol Renal Physiol.* 2007 Oct;293(4):F1197-208. PMID: 17652375
4. Sandberg MB, Riquier AD, Pihakaski-Maunsbach K, McDonough AA, Maunsbach AB. Angiotensin II provokes acute trafficking of distal tubule NaCl cotransporter (NCC) to apical membrane. *Am J Physiol Renal Physiol.* 2007 Sep;293(3):F662-9. PMID: 17507603
5. Leong PK, Devillez A, Sandberg MB, Yang LE, Yip KP, Klein JB, McDonough AA. Effects of ACE inhibition on proximal tubule sodium transport. *Am J Physiol Renal.* 2006 Apr;290(4):F854-63. PMID: 16263808
6. Chen P, Guzman JP, Leong PK, Yang LE, Perianayagam A, Babilonia E, Ho JS, Youn, JH, Wang WH, and McDonough, AA. Modest dietary K⁺ restriction provokes insulin resistance of cellular K⁺ uptake

and phosphorylation of ROMK without fall in plasma [K⁺]. *Am J Physiol Cell.* 2006;290(5):C1355-63. PMID: 16354756

7. Sandberg MB, Maunsbach AB, McDonough AA. Redistribution of distal tubule Na⁺-Cl⁻ cotransporter (NCC) in response to a high-salt diet. *Am J Physiol Renal Physiol.* 2006 Aug;291(2):F503-8. PMID: 16554416
8. Yang, LE, Maunsbach, AB, Leong, PK, McDonough, AA. Redistribution of Myosin VI from Top to Base of Proximal Tubule Microvilli during Acute Hypertension. *J Am Soc Nephrol.* 16(10):2890-6, 2005.
9. Yang, LE, Maunsbach, AB, Leong, PK, and McDonough, AA. Differential traffic of proximal tubule Na⁺ transporters during hypertension or PTH: NHE3 to base of microvilli vs. NaPi2 to endosomes. *Am J Physiol Renal Physiol.* 287(5):F896-906, 2004.
10. Leong, PK, Yang, LE, Lin, HW, Holstein-Rathlou, NH, and McDonough AA. Acute hypotension induced by aortic clamp vs. PTH provokes distinct proximal tubule Na⁺ transporter redistribution patterns. *Am J Physiol Regul Integr Comp Physiol.* 287(4):R878-85, 2004.
11. Yang, LE, Leong, PKK, Ye, SH, Campese, V, and McDonough AA. Responses of proximal tubule sodium transporters to acute injury induced hypertension. *Am. J. Physiol. Renal Physiol.* 284: F313-F321, 2003.
12. Yang, LE, Zhong, HQ, Leong, PKK, Perianayagam, A, Campese, V, and McDonough AA. Chronic renal injury induced hypertension alters renal NHE3 distribution and abundance. *Am. J. Physiol. Renal Physiol.* 284: F1056-F1065, 2003.
13. McDonough, AA, Leong, PK, and Yang, LE. Mechanisms of pressure natriuresis: how blood pressure regulates renal sodium transport. *Ann N Y Acad Sci.* 986:669-77, 2003.
14. Yang, LE, Leong, PK, Guzman, JP, Rhee, MS, and McDonough AA. Modest K⁺ restriction provokes insulin resistance of cellular K⁺ uptake without decrease in plasma K. *Ann N Y Acad Sci.* 986:625-7, 2003.
15. Yang, L, Leong, PKK, Chen, JO, Patel, N, Hamm-Alvarez, SF, and McDonough, AA. Acute hypertension provokes internalization of proximal tubule NHE3 without inhibition of transport activity. *Am. J. Physiol. Renal Physiol.* 282:F730-F740, 2002.
16. Leong, PKK, Yang, LE, Holstein-Rathlou, NH, and McDonough, AA. Angiotensin II clamp prevents the second step in renal apical NHE3 internalization during acute hypertension. *Am. J. Physiol. Renal Physiol.* 283 (5): F1142-F1150, 2002.
17. Leong, PKK, Zhang, YB, Yang, LE, Holstein-Rathlou, NH, and McDonough, AA. Diuretic response to acute hypertension is blunted during angiotensin II clamp. *Am. J. Physiol. Regul. Integr. Comp. Physiol.* 283: R837-R842, 2002.
18. Luo, XC, Zhang, RQ, Zhao NM, Yang, L and Nie SQ. Study on effect of IS4 on liposome structure by ³¹P-NMR. *J of Tsinghua University.* 10: 113-115, 1998.
19. Yang, L, Nie, SQ, Lin, KC, Zhou, Y and Sui, SF. The studies of insertion of BPP into membrane. *ACTA BIOPHYSICA SINICA.* Vol.13 No.2. June 1997.
20. Yang, L, Nie, SQ, Chen, HY and Lin, KC. Inhibition of membrane fusion of CL/PC liposomes by BPP. *ACTA BIOPHYSICA SINICA.* Vol.11. No.1. March 1995.
21. Nie, SQ, Yang, L, Lin, KC, Jiang, HL and Song, ZJ. The secondary structure of BPP after interaction with CL/PC vesicles by FT-IR spectroscopy. *ACTA BIOPHYSICA SINICA.* Vol.11. No.3. Sept 1995.
22. Song, ZJ, Jiang, HL, Yang, L, Nie, SQ and Gong, YD. The FT-IR & CD analysis of the secondary structure of BPP. *Chinese Biochemical Journal.* Vol.11 No.6. Dec 1995.

Li Yang, M.D., Ph.D. Past accomplishments

After coming to USC with an MD from Beijing Medical University, Li Yang joined Dr. Alicia McDonough's lab and chose to work on one of the most common yet daunting problems in clinical medicine – blood pressure regulation, specifically how the kidneys adjust sodium transport: 1) when blood pressure is elevated, 1) when the kidneys are injured, 3) in response to anti-hypertensive medication.

In her first project, Dr. Yang aimed to determine the molecular explanation for the natriuresis/diuresis that accompanies a rapid change in blood pressure. This response is critical to the setting and maintaining of baseline blood pressure and is altered in hypertension. Dr. Yang discovered that certain salt transporters were rapidly retracted out of the renal proximal tubule microvilli to a domain where they were unavailable for sodium transport during hypertension. Li Yang's work has contributed significantly to understanding of how the kidney senses and responds to hypertension and may identify candidate genes that contribute to the generation or maintenance of hypertension. This is prerequisite to understanding the genesis of this disease. To accomplish these findings, Li also became an expert at confocal microscopy techniques as applied to the kidney. She studied and learned this method at the University of Indiana Division of Nephrology O'Brien Center and further explored applying techniques to whole animals with Dr. Janos Peti-Peterdi here at USC. Li Yang was invited to present her work at "Experimental Biology 2000," and her presentation was awarded the very competitive and prestigious *Aventis Pharma Excellence in Renal Research Award* from the American Physiologic Society. Another measure of Dr. Yang's outstanding level of accomplishment in the field of hypertension research is the fact that she independently applied for and was awarded a very competitive American Heart Association (AHA) Predoctoral and Postdoctoral Fellowships over the years.

Dr. Yang's next project was in collaboration with Dr. Vito Campese, Chief of Renal and Hypertension Division here at USC and concerned how an acute renal injury provokes chronic hypertension. Dr. Yang applied the cellular and biochemical analysis techniques she developed in her previous work to this question and conducted a proteomic analysis of how all the sodium transporters along the nephron were affected by renal injury. Her work established that acute injury activates sympathetic nervous system inputs to the kidney which provoke rapid redistribution of proximal tubule transporters to the apical cell surface along with increased salt and volume reabsorption and the generation of hypertension. Li Yang's research is the first study of this kind to prove that activation of sympathetic nervous system moves sodium transporters to a location where they are more active in the kidney. She has presented her research findings at the ASN World Congress of Nephrology and EB 2002 where she received the Caroline tum Suden Career Development Award. Clearly, Li Yang has contributed significantly to renal physiology and to our understanding of the pathogenesis of hypertension and has demonstrated that she is an accomplished speaker.

Recently, Dr. Yang has become interested in understanding how dietary salts, specifically sodium and potassium, can be adjusted to prevent hypertension and minimize renal injury by determining their actions at the molecular level. This line of investigation (described in the next section) can have an enormous impact on preventing the development of renal disease and slowing the progression of existing disease. Dr. Yang recently published a comprehensive systems analysis of how a high salt diet affects all the renal sodium transporters as well as renal function. She is currently engaged in determining the molecular mechanisms for the protective effects of a high potassium diet using similar systems and proteomic approaches.