

BIOGRAPHICAL SKETCH			
NAME Madhavi J. Rane	POSITION TITLE Assistant Professor		
eRA COMMONS USER NAME mjrane01			
University of Bombay, India	B.S.	1986	Chemistry
University of Bombay, India	M.S.	1988	Chemistry
University of Akron, Akron, Ohio	Ph.D.	1995	Chemistry

A. Positions and Honors: Professional Positions:

- 1989-1992 Teaching Assistant, University of Akron, Dept. of Chemistry, Akron, OH.
1993-1994 Research Assistant, University of Akron, Dept. of Chemistry, Akron, OH.
1995-1998 Post-doctoral Fellow, Univ. of Louisville, Dept. of Medicine, Louisville, KY.
1998- 2002 Research associate/Instructor of Medicine, Univ. of Louisville, Dept. of Medicine, Louisville, KY.
2002- 2003 Assistant Professor, Research Track University of Louisville, Dept. of Medicine, Louisville, KY.
2004-present Assistant Professor, Tenure Track University of Louisville, Dept. of Medicine, Louisville, KY.
2005-2009 Assistant Professor, University of Louisville, Dept. of Biochemistry and Molecular Biology, Louisville, KY.
2010 Associate Professor, University of Louisville, Dept. of Biochemistry and Molecular Biology, Louisville, KY.

Other Experiences and Professional Memberships

Membership: American Society of Nephrology, Society for Leukocyte Biology, Sigma Xi, American Society of Biochemistry and Molecular Biology.

Grant Review: Member of the Region I Basic Cell 2 Study Group at the American Heart Association (2008, 2009).

Reviewer for Journals:

- Journal of Biological Chemistry (2005)
Frontiers in Bioscience (2008)
Immunology and Cell Biology (2005)
American Journal of Pathology (2007)
Journal of Leukocyte Biology (2008)
Experimental Cell Research (2007)
Biomedical central Cancer (2008)
Biochemistry (2008)

Honors:

- Outstanding Investigator Award, Department of Medicine, University of Louisville (2009).
Research! Louisville winner: Most promising basic science research (2008).
NIAID/NIH Bridge Award (2008) 1R56 AI075212-01A1 (*Surrendered after receiving RO1*)
NIAID/NIH Bridge Award (2006-2008) 1R56AI059165-01A2
American Heart Association Scientist Development Grant (2003) Reference # 0335278N
American Heart Association Beginning Grant-in-aid (2002) Refer # 0265487B (*Surrendered in 2003*)
American Heart Association Beginning Grant-in-aid (1998) Reference # 9960365V
American Heart Association fellowship (1996) application # KY-96-F-7
Servicing as a secretary of Sigma XI Louisville Chapter (2003-2007)
Serving as vice president of Sigma Xi-Louisville chapter (2007-2009)
(http://www.sigmaxi.org/chapters/web/index.php?chapter_id=77).

Member of the Professional Development Taskforce at the Society for Leukocyte Biology (2010)
Outstanding Teaching Assistantship from University of Akron (1992)
Teaching and Research Assistantship from University of Akron (1989-1994)

B. Peer-reviewed Publications

Selected Peer-Reviewed Publications)

1. **Rane, MJ**, Arthur, JM, Prossnitz, ER, and McLeish, KR. Activation of mitogen-activated protein kinases by formyl peptide receptors is regulated by the cytoplasmic tail. *J. Biol. Chem.* 273: 20916-20923, 1998.
2. Klein, JB, **Rane, MJ**, Coxon, PY, Scherzer, JA, Mathiesen, JM, Buridi, A, Kettritz, R, McLeish, KR. GM-CSF delays neutrophil constitutive apoptosis through phosphoinositide 3-kinase and extracellular signal-regulated kinase pathways. *J. Immunol.* 164: 4286-4291, 2000.
3. **Rane, MJ**, Prossnitz, ER, Arthur, JM, Ward, RA, and McLeish, KR. Impaired homologous desensitization of formyl peptide receptors expressed in undifferentiated HL-60 cells. *Biochem. Pharmacol.* 60: 179-187, 2000.
4. Coxon, PY, **Rane, MJ**, Powell, DW, Klein, JB, and McLeish, KR. Differential mitogen-activated protein kinase stimulation by Fc γ receptor IIa and Fc γ receptor IIIb determines the activation phenotype of human neutrophils. *J. Immunol.* 164: 6530-6537, 2000.
5. Arthur, JM, Lawrence, MS, Payne CR, **Rane, MJ**, and McLeish, KR. The calcium-sensing receptor stimulates JNK in MDCK cells. *Biochem. Biophys. Res. Comm.* 275: 538-541, 2000.
6. **Rane, MJ**, Coxon, PY, Powell, DW, and McLeish, KR. Regulation of neutrophil functions by mitogen-activated protein kinase modules. *Current Topics in Biochemical Research* 2: 199-205, 2000.
7. **Rane, MJ**, Coxon, PY, Powell, DW, Webster, R, Klein JB, Pierce, W, Ping, P, and McLeish, KR. p38 kinase-dependent MAPKAPK-2 activation functions as PDK2 for Akt in human neutrophils. *J. Biol. Chem.* 276: 3517-3523, 2001.
8. Klein JB, Buridi A, Coxon PY, **Rane MJ**, Manning T, Kettritz R, McLeish KR. Role of extracellular signal-regulated kinase and phosphatidylinositol-3 kinase in chemoattractant and LPS delay of constitutive neutrophil apoptosis. *Cell. Signal.* 13: 335, 2001
9. Powell DW, **Rane MJ**, Chen Q, Singh S, McLeish KR. Identification of 14-3-3zeta as a protein kinase B/Akt substrate. *J. Biol. Chem.* 277(24):21639-42, 2002 Jun 14
10. Kettritz R, Choi M, Butt W, **Rane MJ**, Rolle S, Luft F and Klein JB. Phosphatidylinositol 3-Kinase/Akt Controls ANCA-induced Respiratory Burst in Human Neutrophils *J. Am. Soc. Nephrol.* 13, 1740-1749, 2002.
11. Khundmiri SJ, **Rane MJ**, Lederer, ED. Parathyroid Hormone Regulation of Type II Sodium-phosphate Cotransporters Is Dependent on an A Kinase Anchoring Protein. *J Biol Chem.* 2003 Mar 21;278(12):10134-41.
12. Choi M, Rolle S, **Rane M**, Haller H, Luft FC and Kettritz R. Extracellular signal-regulated kinase inhibition by statins inhibits neutrophil activation by ANCA. *Kidney Int.* 63(1): 96-106, 2003.
13. Chen QC, Powell DW, **Rane MJ**, Singh S, Klein JB, and McLeish KR. Akt Phosphorylates p47^{phox} and Mediates Respiratory Burst Activity in Human Neutrophils. *J. Immunol.* 170: 5302-5308, 2003.
14. Coxon, PY, **Rane, MJ**, Uriarte, S, Powell, DW, Singh, S, Chen, Q, and McLeish, KR. MAPK-activated protein kinase-2 participates in p38-dependent- and ERK-dependent functions in human neutrophils. *Cell. Signal.* 15: 993-1001, 2003.
15. Singh, S, Powell, DW, **Rane, MJ**, Millard, TH, Trent, JO, Pierce, WM, Klein, JB, Machesky, LM, and McLeish, KR. Identification of the p16-Arc subunit of the Arp2/3 complex as a substrate of MAPK-activated protein kinase-2 by proteomic analysis. *J. Biol. Chem.* 278 (38) 36410- 36417- 2003
16. Powell DW, **Rane MJ**, Joughin BA, Kalmukova R, Hong J-H, Todor B, Dean WL, Pierce WM, Klein JB, Yaffe MB and McLeish KR. Proteomic Identification of 14-3-3 ζ as a MAPK-activated protein kinase-2 substrate. *Mol Cell Biol.* 2003 Aug;23(15):5376-87.
17. Zhang S, Gozal D, Sachleben LR, **Rane MJ**, Klein JB, Gozal E. Hypoxia induces an autocrine- paracrine survival pathway via PDGF-B/PDGFR- α Receptor/PI3K/Akt signaling in RN46A neuronal cells. *FASEB J.*;17; 1709-11, 2003.
18. **Rane MJ**, Pan Y, Singh S, Powell DW, Wu R, Cummins T, Chen Q, McLeish KR, Klein JB. Heat shock protein 27 controls apoptosis by regulating Akt activation. *J. Biol Chem.* 2003 Jul 25;278(30):27828-35.

19. Villafuerte BC, Lawrence P, **Rane MJ**, Weidong Z. Insulin-Response Element Binding Protein 1: A Novel Akt Substrate involved in Transcriptional Action of Insulin. *J. Biol. Chem.* 2004 Aug 27;279(35):36650-9.
20. Gozal E, Sachleben Jr LR, **Rane MJ**, Vega C, Gozal D. Mild Sustained and Intermittent Hypoxia Induce Apoptosis in PC-12 Cells via Different Mechanisms. *Am J Physiol Cell Physiol.* 2005 Mar;288(3):C535-42.
21. **Madhavi J. Rane**, David Gozal, Waseem Butt, Evelyne Gozal, William M. Pierce, Jr Shang Z. Guo, Rui Wu, Aviv D. Goldbart, Visith Thongboonkerd, Kenneth R. McLeish & Jon B. Klein. GABA_B Receptors Stimulate Neutrophil Chemotaxis During Ischemia-Reperfusion. *J Immunol.* 2005 Jun 1;174(11):7242-9.
22. George Lominadze, **Madhavi J. Rane**, Michael Merchant Jian Cai, and Kenneth R. McLeish. Myeloid Related Protein-14 is a p38 Mitogen-Activated Protein Kinase Substrate in Human Neutrophils. *J Immunol.* 2005 Jun 1;174(11):7257-67.
23. Khundmiri SJ, Weinman EJ, Steplock D, Cole J, Ahmad A, Baumann PD, Barati M, **Rane MJ**, Lederer E. Parathyroid hormone regulation of NA⁺,K⁺-ATPase requires the PDZ 1 domain of sodium hydrogen exchanger regulatory factor-1 in opossum kidney cells. *J Am Soc Nephrol.* 2005 Sep;16(9):2598-607.
24. Jon B. Klein, Michelle T. Barati, Rui Wu, David Gozal, Leroy R. Sachleben Jr, Hina Kausar, John O. Trent, Evelyne Gozal, **Madhavi J. Rane**. Akt mediated VCP phosphorylation regulates its association with ubiquitinated proteins. *J Biol Chem.* 2005 Sep 9;280(36):31870-81.
25. Barati MT, **Rane MJ**, Klein JB, McLeish KR. A proteomic screen identified stress-induced chaperone proteins as targets of Akt phosphorylation in mesangial cells. *J Proteome Res.* 2006 Jul;5(7):1636-46.
26. Khundmiri SJ, Metzler MA, Ameen M, Amin V, **Rane MJ**^{*}, Delamere NA^{*}. (* equal contributing last author) Ouabain induces Cell Proliferation through Calcium Dependent Phosphorylation of Akt (Protein Kinase B) in Opossum Kidney Proximal Tubule Cells. *Am J Physiol Cell Physiol.* 2006 Dec;291(6):C1247-57.
27. Jog NR, **Rane MJ**, Lominadze G, Luerman G, Ward R, McLeish KR. The actin cytoskeleton regulates exocytosis of all neutrophil granule subsets. (2006) *Am. J. Physiol. Cell Physiol.* 292(5):C1690-700.
28. Jog, N, Vala, VR, Ward, RA, **Rane, MJ**, Bodulluri, H, and McLeish, KR. Heat shock protein 27 (Hsp27) regulates neutrophil chemotaxis and exocytosis through two different mechanisms. *J Immunol.* 2007 Feb 15;178(4):2421-8.
29. Wu R, Kausar H, Johnson P, Montoya-Durango DE, Merchant M, **Rane MJ**. Hsp27 regulates Akt activation and PMN apoptosis by scaffolding MK2 to Akt signal complex. *J Biol Chem.* (2007) Jul 27;282(30):21598-608.
30. Khundmiri SJ, Amin V, Henson JT, Lewis J, Ameen M, **Rane MJ**, Delamere NA. Ouabain stimulates Protein Kinase B (Akt) phosphorylation in opossum kidney proximal tubule cells through an ERK-dependent pathway. *Am J Physiol Cell Physiol.* (2007) 293(3):C1171-C1180.
31. **Rane MJ**. and Klein JB. Regulation of Neutrophil Apoptosis by Modulation of PKB/Akt Activation. *Frontiers of Bioscience* 14, 2400-2411 January 2009.
32. Chahal J., Chen C., **Rane MJ**, Moore, JP, Barati MT, Song Y, and Villafuerte BC. Mechanisms for Impaired Function of IRE-BP1 in Obesity and Diabetes. *Endocrinology*, 2008 (In Press).
33. Tang Y., Yang Q., Lu J., Zhang X., Suen D., Tan Y., Jin L., Xiao J., Xie R., **Rane M.J.**, Li X., and Cai L. Zinc supplementation partially prevents renal pathological changes in diabetic rats. *Journal of Nutritional Biochemistry* 2008 (in Press).
34. Luerman GC, Uriarte SM, **Rane MJ**, McLeish KR. Application of proteomics to neutrophil biology. *J Proteomics.* 2010 Jan 3;73(3):552-61. Epub 2009 Jul 4. Review.
35. Clark CB, **Rane MJ**, El Mehdi D, Miller CJ, Sachleben LR Jr, Gozal E. Role of oxidative stress in geldanamycin-induced cytotoxicity and disruption of Hsp90 signaling complex. *Free Radic Biol Med.* 2009 Nov 15;47(10):1440-9. Epub 2009 Aug 21.
36. **Rane MJ**, Song Y, Jin S, Barati MT, Wu R, Kausar H, Tan Y, Wang Y, Zhou G, Klein JB, Li X, Cai L. Interplay between Akt and p38 MAPK pathways in the regulation of renal tubular cell apoptosis associated with diabetic nephropathy. *Am J Physiol Renal Physiol.* 2010 Jan;298(1):F49-61. Epub 2009 Sep 2.

C. Research Support

Ongoing Research Support

Rane, M.

Active

R01AI075212-01A1 (Rane M. PI) *08/08/2008-07/30/2012* 6.6 calendar
NIAID-NIH \$1,397,000

“Modulation of Neutrophil Apoptosis by Akt-Hsp27 signalosome”

The major goals of this project are to identify Akt binding proteins in the presence and absence of TAT-Akt-Hsp27 peptides and to determine contributions of these interactions to neutrophil apoptosis and resolution of inflammatory response in an animal model of acute lung inflammation.

Klein, J.

Active

VA-Merit *07/01/2007-06/30/2012* 2.4 calendar
Veterans Administration \$494,400

“Control of Immune Cells: Role of a Novel Chemotactic Receptor”

The major goals of this project are to elucidate mechanisms underlying GABA_BR2 activation in the neutrophils and their role in neutrophil chemotaxis.

Villafuerte, B.

Active

R01 DK067413-01A2-(Villafuerte, B. PI) *7/01/2005-6/30/2010* 0.6 calendar
NIH/NIDDK \$1,125,000

Insulin Control of Gene Transcription through Sensitin

This research project will study the effects of a novel insulin responsive protein, sensitin and its role in gene transcription and diabetes Mellitus.

Gozal, E.

Active

RR015576-06--(Gozal, E. PI) *07/01/2005-6/30/2010* 0.6 calendar
NCI/NIH \$1,250,000

"Heat shock proteins in spinal cord neural survival"

The major goals of this project are to examine the role of heat shock protein induction in cell survival after spinal cord injury.

Kakar, S.

Active

RO1 CA124630-01-(Kakar, S. PI) *03/26/2007-11/30/2011* 0.6 calendar
NIH/NCI \$1,250,000

PTTG Role in Ovarian Tumorigenesis and Metastasis

The aims of this project are to delineate PTTG-mechanisms regulating ovarian tumorigenesis and metastasis.

McLeish, K. R.

Active

VA-Merit *10/01/2008-09/30/2012* 0.6 calendar
Veterans Administration \$624,000

“Mechanisms of Neutrophil Activation”

The current proposal will examine the role of exocytosis in neutrophil-mediated cellular injury and determine the mechanism by which exocytosis contributes to this process.

Pending Research Support:

“Age associated effects on liver inflammation”

NIA: PI: Lentsch, Alex, University of Cincinnati. **PI of Subcontract: Rane M**, University of Louisville.

6% Score.

Completed Research Support: **Madhavi J. Rane, Ph.D.**

9960365V **Rane, M. (PI)**

1999-2002

American Heart Association (Beginning Grant-in-Aid)

\$90,000

Deletion mutagenesis of formyl peptide receptor

0265487B **Rane, M. (PI)** (Surrendered)

07/2002-06/2003

American Heart Association (Beginning Grant-in-Aid)

\$45,000

Mechanisms of Akt Regulation of Neutrophil apoptosis

0335278N **Rane, M. (PI)**

07/01/2003-06/30/2007

American Heart Association (Scientist development Grant)

\$260,000

Mechanisms of Akt Regulation of Neutrophil apoptosis

1R56AI059165-01A2 **Rane, M. (PI)**

7/01/06-04/30/2008

NIH/NIAID

\$331,000

Role of Hsp27 in regulation of Neutrophil apoptosis

R01 HL074296-01 Gozal (PI) **Rane (Co-PI)**

07/2003-06/2008

NIH/NHLBI

\$1,250,000

Hypoxia-induced Akt Signaling module in Neuronal Cells.