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Area of Expertise

Population of diabetes mellitus continues to rise in the U.S. Diabetic kidney disease is a major complication of diabetes mellitus and is the most common cause of chronic kidney disease.

The research in our laboratory is directed at understanding the molecular mechanisms of the development of diabetic kidney disease. Specifically, we are interested in the role of different calcium signaling pathways in the diabetes-induced kidney injury. Toward this goal, we use both animal models of diabetes mellitus and cultured kidney cells to study how altering calcium signaling changes the function and structure of the kidney/kidney cells under a diabetic environment. We utilize quantitative immunological methods, immunohistochemistry, and RT-PCR to reliably measure both protein and message for various molecules in specific calcium signaling pathways in kidney tissues/kidney cells. We also employ multiple tools to evaluate kidney function under different conditions. It is our goal to better understand the molecular events involved in the kidney response to diabetes, so that we can target rational development of effective therapeutics to prevent/treat the disease.

Qualifications

PhD in Physiology, University of Nebraska Medical Center

MS in Physiology, Anhui Medical University

BS in Medicine, Anhui Medical University

Recent Publications

Comparison of diabetic nephropathy between male and female eNOS^{-/-} db/db mice

Ma, Y., Li, W., Shotorbani, P. Y., Dubansky, B. H., Huang, L., Chaudhari, S., Wu, P., Wang, L. A., Ryou, M. G., Zhou, Z. & Ma, R., 1 May 2019, In : American Journal of Physiology - Renal Physiology. 316, 5, p. F889-F897

Short-term high-glucose treatment decreased abundance of Orai1 protein through posttranslational mechanisms in rat Mesangial cells

Jiang, H., Zou, S., Chaudhari, S. & Ma, R., 1 Jan 2018, In : American Journal of Physiology - Renal Physiology. 314, 5, p. F855-F863

Increased glomerular filtration rate and impaired contractile function of mesangial cells in TRPC6 knockout mice

Li, W., Ding, Y., Smedley, C., Wang, Y., Chaudhari, S., Birnbaumer, L. & Ma, R., 1 Dec 2017, In : Scientific Reports. 7, 1, 4145.

Effects of Shu Gan Jian Pi formula on rats with carbon tetrachloride-induced Liver fibrosis using serum metabonomics based on gas chromatography-time of flight mass spectrometry

Jiang, H., Qin, X. J., Li, W. P., Ma, R., Wang, T. & Li, Z. Q., 1 Oct 2017, In : Molecular Medicine Reports. 16, 4, p. 3901-3909 9 p.

Store-operated calcium entry suppressed the TGF- β 1/Smad3 signaling pathway in glomerular mesangial cells

Chaudhari, S., Li, W., Wang, Y., Jiang, H., Ma, Y., Davis, M. E., Zuckerman, J. E. & Ma, R., 11 Sep 2017, In : American Journal of Physiology - Renal Physiology. 313, 3, p. F729-F739

Negative regulation of smad1 pathway and collagen IV expression by store-operated Ca²⁺ entry in glomerular mesangial cells

Wu, P., Ren, Y., Ma, Y., Wang, Y., Jiang, H., Chaudhari, S., Davis, M. E., Zuckerman, J. E. & Ma, R., 4 Jun 2017, In : American Journal of Physiology - Renal Physiology. 312, 6, p. F1090-F1100

Reconstruction and analysis of the lncRNA-miRNA-mRNA network based on competitive endogenous RNA reveal functional lncRNAs in rheumatoid arthritis

Jiang, H., Ma, R., Zou, S., Wang, Y., Li, Z. & Li, W., 1 Jan 2017, In : Molecular BioSystems. 13, 6, p. 1182-1192 11 p.

lncRNAs expression in adjuvant-induced arthritis rats reveals the potential role of lncRNAs contributing to rheumatoid arthritis pathogenesis

Jiang, H., Qin, X. J., Li, W. P., Ma, R., Wang, T. & Li, Z. Q., 15 Nov 2016, In : Gene. 593, 1, p. 131-142 12 p.

Canonical Transient Receptor Potential 6 Channel: A New Target of Reactive Oxygen Species in Renal Physiology and Pathology

Ma, R., Chaudhari, S. & Li, W., 1 Nov 2016, In : Antioxidants and Redox Signaling. 25, 13, p. 732-748 17 p.

Store-operated calcium entry and diabetic complications

Chaudhari, S. & Ma, R., 1 Feb 2016, In : Experimental Biology and Medicine. 241, 4, p. 343-352 10 p.

Sponsored Projects

A Pilot Study on Impact of RTA405 on Glomerular Filtration Rate (GFR) in Type II Diabetic Rats: Phase I

Ma, R.

Reata Pharmaceuticals, Inc.

1/07/11 → 30/09/12

Exaggeration of TRPC6 Function by ROS in Vascular Myocytes, a Mechanism for Enhanced Vessel Contraction in Diabetes

Ma, R.

American Heart Association - Sth Central

1/07/11 → 30/06/13

Grants-in-Aid (For: Sarika Chaudhari)

Ma, R.

Sigma Xi

1/05/15 → 31/05/16

I-mfa, a Potential Target for the Treatment of Diabetic Kidney Disease

Ma, R.

Intramural Research(UNTHSC)

1/05/15 → 31/08/16

Impact of BTE-31 on Glomerular Filtration Rate and Renal Plasma Flow in Rats

Ma, R.

SUNY Stony Brook

1/11/13 → 31/12/13

Inhibitor of Myogenic Family α , Store-operated Ca^{2+} Channel, and Diabetic Nephropathy

Ma, R.

NIDDK: Diabetes & Digestive & Kidney

11/07/16 → 30/06/17

I-mfa, a Potential Therapeutic Target of Diabetic Nephropathy

Ma, R.

American Heart Association - SouthWest

1/01/16 → 31/12/17

NADPH Oxidases-Derived ROS Downregulate TRPC6 in Mesangial Cells in Diabetes

Ma, R.

NIDDK: Diabetes & Digestive & Kidney

1/12/12 → 30/04/13

Protection of Renal Function with RTA405 in Rats with Diabetic Chronic Kidney Disease

Ma, R.

Reata Pharmaceuticals, Inc.

1/04/12 → 31/03/13

Store-operated Ca²⁺ Channel and Diabetic Kidney Disease (For: Elizabeth Chen)

Ma, R.

Intramural Research(UNTHSC)

1/06/16 → 31/05/17

Store-operated Ca²⁺ Entry and Renal Protection in Diabetic Nephropathy (For: Sarika Chaudhari)

Ma, R.

Intramural Research(UNTHSC)

1/01/15 → 31/08/16

Store-operated Ca²⁺ signaling and renal inflammation in diabetic kidney disease (For: Suna Burghul)

Ma, R.

Intramural Research(UNTHSC)

5/06/17 → 31/05/18

Store-Operated Ca²⁺ Signaling in Kidney Glomerular Mesangial Cells

Ma, R.

NIDDK: Diabetes & Digestive & Kidney

1/12/17 → 30/11/21

Sympathetic Threshold in Obstructive Sleep Apnea: The Role of Oxidative Stress

Ma, R.

Intramural Research(UNTHSC)

18/05/15 → 31/08/16