Curriculum Vitae

Kenneth D. Mitchell, PhD, FAHA, FASN

Professor
Department of Medical Education
University of Texas Rio Grande Valley
School of Medicine

Education & Training

PhD in Physiology, University of Edinburgh, Scotland (1986)

Work Experience

- Postdoctoral Research Fellow, University of Alabama at Birmingham, Birmingham, AL (1984-1987)
- Reaseach Instructor, University of Alabama at Birmingham, Birmingham, AL (1987-1988)
- Assistant Professor of Physiology, Tulane University School of Medicine, New Orleans, LA (1988-1995)
- Associate Professor of Physiology, Tulane University School of Medicine, New Orleans, LA (1995-2012)
- Professor of Physiology, Tulane University School of Medicine, New Orleans, LA (2012-2024)

Professional Memberships

- American Physiological Society
- American Society of Nephrology
- American Heart Association
- Inrernational Society of Nephrology
- Southern Society for Clinical Investigation

Honors & Awards

Example:

- Fellow of The Council for High Blood Pressure Research (American Heart Association) (Elected-1993)
- Established Investigator of the American Heart Association, 1995-2000)
- Fellow of the American Society of Nephrology (Elected, July 1, 2005)

Research Focus

Dr. Mitchell's research interests are oriented towards evaluating the role of angiotensin II (ANG II) in the regulation of renal hemodynamics and tubular reabsorption rate. Emphasis is focused on determining the contribution of ANG II-dependent alterations in renal hemodynamics and tubular reabsorptive function to the development and maintenance of various forms of hypertension. The most recent studies have primarily utilized Cyp1a1-Ren2 transgenic rats [TGR(Cyp1a1Ren2)] with inducible expression of the mouse Ren2 renin gene. A variety of in vivo renal clearance and micropuncture procedures are employed to evaluate whole kidney and single nephron hemodynamics and tubular reabsorptive function in anesthetized normotensive and hypertensive rats.

Whole kidney clearance procedures used include inulin and para-aminohippurate clearances for the determination of glomerular filtration rate and renal plasma flow, respectively. In addition, measurements of the renal blood flow responses (using transit time flow probes) to both intravenous and selective intrarenal arterial administration of various vasoactive agents are used to assess renal vascular responsiveness in normotensive and hypertensive rats. Specific micropuncture procedures that are routinely used in the laboratory include: 1) collection of tubular fluid samples from superficial nephrons for determination of single nephron glomerular filtration rate and tubular reabsorptive function, 2) collection of blood samples from surface peritubular capillaries for determination of postglomerular plasma protein concentration and single nephron plasma flow, 3) measurement of hydrostatic pressures in superficial tubules and peritubular capillaries, 4) microperfusion of superficial tubules and peritubular capillaries, and 5) measurement of tubuloglomerular feedback mediated changes in both single nephron glomerular filtration rate and proximal tubule stop flow pressure. In addition, procedures for the macro- and microanalysis of plasma, urine, and tubular fluid samples collected from the clearance and micropuncture experiments are routinely employed. Furthermore, radioimmunoassay procedures are also used to determine the levels of angiotensin peptides in plasma, kidney tissue, and tubular fluid samples collected from normotensive and hypertensive rats.

Research efforts are specifcialy oriented towards 1) evaluation of the role of platelet-derived growth factor (PDGF) in mediating the renal hemodynamic and morphological derangements that occur in slowly progressive ANG II-dependent hypertension and in ANG II-dependent malignant hypertension, 2) determination of the effects of chronic and acute direct renin inhibition on the renal hemodynamic and morphological derangements in slowly progressive ANG II-dependent hypertension and in ANG II-dependent malignant hypertension, 3) assessment of the effects of alterations in dietary salt intake on the pathogenesis of slowly progressive ANG II-dependent hypertension

and ANG II-dependent malignant hypertension, and 4) determination of the ANG II-independent renal hemodynamics and morphological changes in ANG II-dependent hypertension. Collectively, Dr. Mitchell's research activities are designed to provide novel information regarding the mechanisms responsible for mediating the renal functional and morphological derangements in ANG II-dependent hypertension.

Publications

Dr. Mitchell has made substantial contributions to understanding the role of ANG II in regulation renal hemodynamics and tubular reabsorptive function in normotensive states and in various forms of ANG II-dpendent forms of hypertnsion, as evident by his **72** peer-reviewed published manuscripts and review articles. Selected representative publications are listed below.

1. Mitchell, K.D., and L.G. Navar. Superficial nephron responses to peritubular capillary infusions of angiotensins I and II. Am. J. Physiol. 252 (Renal Fluid Electr. Physiol. 21): F818-F824, 1987.
2. Mitchell, K.D., and L.G. Navar. Enhanced tubuloglomerular feedback during peritubular infusions of angiotensins I and II. Am. J. Physiol. 255 (Renal Fluid Electrolyte Physiol. 24): F383-F390, 1988.
3. Mitchell, K.D., and L.G. Navar. Tubuloglomerular feedback responses during peritubular infusions of calcium channel blockers. Am. J. Physiol. 258 (Renal Fluid Electrolyte Physiol.27): F537-F544, 1990.
4. Mitchell, K.D., and L.G. Navar. Modulation of tubuloglomerular feedback responsiveness by extracellular ATP. Am. J. Physiol. 264 (Renal Fluid Electrolyte Physiol. 33): F458-F466, 1993.
5. Mitchell, K.D., and L.G. Navar. Intrarenal actions of angiotensin II in the pathogenesis of experimental hypertension. In: Hypertension: Pathophys.,Diagnosis and Management, eds. J.H. Laragh and B.M. Brenner. New York: Raven Press, 1995, 2nd edition, vol.1, p.1437-1450.
6. Mitchell, K.D., S.M. Jacinto, and J.J. Mullins. Proximal tubular fluid, kidney, and plasma levels of angiotensin II in hypertensive ren-2 transgenic rats. Am. J. Physiol. 273 (Renal Physiol. 42): F246-F253, 1997.
7. Mitchell, K.D. and J.J. Mullins. Enhanced tubuloglomerular feedback in Cyp1a1-Ren2 transgenic rats with inducible ANG II-dependent malignant hypertension. Am. J. Physiol. Renal Physiol. 289: F1210-F1216, 2005.
8. Opay, A.L., C.R. Mouton, J.J. Mullins, and K.D. Mitchell. Cyclooxygenase-2 inhibition normalizes arterial blood pressure in Cyp1a1-Ren2 transgenic rats with inducible ANG II-dependent malignant hypertension. Am. J. Physiol. Renal Physiology 291: F612-F618, 2006.
9. Mitchell, K.D., S.J. Bagatell, C.S. Miller, C.M. Mouton, D.M. Seth, and J.J. Mullins. Genetic clamping of renin gene expression induces elevation of intrarenal ANG II Levels and hypertension of graded severity in Cyp1a1-Ren2 transgenic rats. J. Renin-Angiotensin-Aldosterone System, 7: 74-86, 2006.

10. Ortiz, R.M., M.L. Graciano, J.J. Mullins, and K.D. Mitchell. Aldosterone receptor antagonism alleviates proteinuria but not malignant hypertension in Cyp1a1-Ren2 transgenic rats. Am. J. Physiol. Renal Physiol. 293: F1584-F1591, 2007.

11. Patterson, M.E., J.J. Mullins, and K.D. Mitchell. Renoprotective effects of neuronal NOS derived nitric oxide and COX-2 metabolites in transgenic rats with inducible malignant hypertension. Am. J. Physiol. Renal Physiol. 294: F205-F211, 2008.

12. Howard, C.G., J.J. Mullins, and K.D. Mitchell. Transient induction of ANG II-dependent malignant hypertension causes sustained elevation of blood pressure and augmentation of the pressor response to ANG II in Cyp1a1-Ren2 transgenic rats. Am. J. Med. Sci. 339(6): 543-548, 2010.

13. Milani, C.J., H. Kobori, J.J. Mullins, and K.D. Mitchell. Enhanced urinary angiotensinogen excretion in Cyp1a1-Ren2 transgenic rats with inducible ANG II-dependent malignant hypertension. Am. J. Med. Sci. 340(5): 389-394, 2010.

14. Graciano, M.L., and K.D. Mitchell. Imatinib ameliorates renal morphological changes in Cyp1a1-Ren2 transgenic rats with inducible ANG II-dependent hypertension. Am. J. Physiol. Renal Physiology 302: F60-F69, 2012.

15. Howard, C.G., and K.D. Mitchell. Renal functional responses to selective intrarenal renin inhibition with aliskiren in Cyp1a1-Ren2 transgenic rats with ANG II-dependent malignant hypertension. Am. J. Physiol. Renal Physiology 302: F52-F59, 2012.