BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Ralph Rabkin	Professor of Medicine, Emeritus
eRA COMMONS USER NAME rabkin.ralph	

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
University of Cape Town, Cape Town, S. Africa	MB, ChB	1960	Medicine
University of Witwatersrand, Johannesburg, S. Africa	MD	1976	Medicine

A. Personal Statement

I am an Active Emeritus Professor Medicine/ Nephrology at Stanford University. I began my long career in investigative medicine over 40 years ago. My first major contribution was one of the earliest randomized clinical trials evaluating beta-blockade for angina (Rabkin R et al. The prophylactic value of propranolol in angina pectoris. Am J Cardiol. 1966;18:370-83.). Moving from clinical investigation, (e.g. The effect of renal disease on the renal uptake and excretion of insulin in man. Rabkin R et al, NEJM, 1970, 282:182-187), my research became more basic orientated and focused on the renal metabolism of peptide hormones (Factors influencing the handling of insulin by the isolated rat kidney. Rabkin, R. and A.E. Kitabchi. J. Clin. Invest. 1978, 161:169-175. The handling of immunoreactive vasopressin by the isolated perfused rat kidney. Rabkin, R et al. J. Clin. Invest. 1979. 63:6-13). More recently I have focused on the mechanisms accounting for the resistance to growth hormone and insulin-like growth factor-1 in uremia to explain their role in the impaired body growth and muscle wasting that is common in chronic kidney disease (CKD). Intrigued by my findings in rats with CKD, that exercise can correct some of the skeletal muscle abnormalities in signal transduction and IGF-1 and myostatin gene expression, I have been motivated to go from the bench to the bedside, and have brought together an outstanding group of clinical investigators with expertise in exercise rehabilitation as well as clinical trials in ESRD patients and together we submitted an application for VA Merit Review Funding to study “Exercise to Prevent Muscle Mass and Functional Loss in Elderly Dialysis Patients”, that has just been funded for 4 years

Positions and Honors

Positions and Employment

1968 - 1969 Senior, then Chief Research Officer, University of Cape Town/Medical Research Council, Renal Metabolic Research Unit, Cape Town, South Africa
1969 - 1970 Specialist Physician and Lecturer, Renal Unit, University of Cape Town, South Africa
1970 - 1972 Senior Specialist Physician and Senior Lecturer, Renal Unit, University Cape Town, Cape Town, South Africa
1972 - 1975 Principal Renal Physician and Head, Renal Division, University of Witwatersrand, Johannesburg, South Africa
1975 - 1978 Associate Professor of Medicine, Division of Nephrology, University of Tennessee Center for the Health Sciences, TN
1978 - 1983 Associate Professor of Medicine, Stanford University, Stanford, CA
1983 - 1989 Tenured Associate Professor of Medicine, Stanford University, Stanford, CA

1986 - 1992 NIH Fellowship Training Program Director, Division of Nephrology, Stanford University School of Medicine, Stanford, CA
1991 - 1992 Visiting Scientist, Genentech, Inc., South San Francisco, CA
1982 - 1995 Chief, Nephrology Section, VA Palo Alto Health Care System (VAPAHCS), Palo Alto, CA
1998 - 1999 Visiting Scientist and Consultant, Genentech, Inc., South San Francisco, CA
1989 - 2002 Professor of Medicine, Stanford University, Stanford, CA
2002 -present Professor of Medicine, Emeritus (Active), Stanford University, Stanford, CA
Staff Nephrologist (part time) VAPAHCS, Palo Alto, CA
2007 - 2010 Senior Research Scientist, Palo Institute for Research and Education, Inc.

Other Experience and Professional Membership

American Society for Clinical Investigation
Western Association of Physicians
Western Society for Clinical Research
International Society of Nephrology
American Heart Association
American Society of Nephrology
American Federation for Clinical Research
International Society of Nutrition and Metabolism in Renal Disease
International Insulin-like Growth Factor Society
NIH Advisory Committee on Nutritional Influence on the Course of Chronic Renal Disease (1998)
Council Member - International Society Nutrition and Metabolism in Renal Disease (1994-1998)
Stanford University Administrative panel on Human Subjects in Clinical research (2000-2011)

Honors

1969 Glaxo-Allenbury Award for Research in Endocrinology and Metabolism
1974 Charlotte Roberts Trust Fund Kidney Research Award
1982 Elected Fellow, Royal College of Physicians and Surgeons, Glasgow, UK
1982 Member, American Society of Clinical Investigators
1989 Juvenile Diabetes Foundation International Award – Training for Established Scientists
2003 Elected a Fellow American Heart Association

B. Selected Peer-reviewed Publications (from 137)

1. **Rabkin R**, Fervenza FC, Maidment H, Ike J, Hintz R, Liu F, Bloedow DC, Hoffman AR, Gesundheit N. (1996). Pharmacokinetics of insulin-like growth factor-1 in advanced chronic renal failure. Kidney Int. 49(4):1134-40
2. Ike J, Fervenza F, Hintz R, Liu F, Hoffman AR and **Rabkin R**. Early experience with extended use of insulin-like growth factor-1 in the treatment of advanced chronic renal failure: Effect on renal function and insulin-like growth factor binding proteins. (1997). Kidney International, 51:840-849.
3. Tsao T, Hsu FW and **Rabkin R.** IGF-I receptor binding, autophosphorylation and kinase activity in kidney and muscle of acutely uremic rats. (1997) Am J Physiology. 41:F325-F332.
4. Schaefer F, Chen Y, Tsao T, Nouri P, and **Rabkin R.** (2001). Impaired JAK-STAT signal transduction contributes to growth hormone resistance in chronic uremia. J Clin Invest 108: 467-475.

5. Tsao T, Fawcett J, Hsu FW, Chin Y and **Rabkin R**. (2002). Effect of prolonged uremia on insulin-like growth factor-I receptor autophosphorylation and tyrosine kinase activity in kidney and muscle. Experimental Nephrology. 10:285-292.

6. Sun D, Zheng Z, Tummala P, Oh J, Schaefer F, **Rabkin R**. (2004) Chronic uremia attenuates growth hormone induced signal transduction in skeletal muscle. J Am Soc Nephrol, 15:2630-6.

7. Schaefer F, Yoon S, Nouri P, Tsao T, Deng E, Tummala P and **Rabkin R**. (2004); Growth hormone-mediated janus associated kinase-signal transducers and activators of transcription signaling in the growth hormone-resistant potassium-deficient rat. J Am Soc Nephrol 15:2299-306.

8. Sun D, Chen Y and **Rabkin R**. (2006) Work-induced changes in Skeletal Muscle IGF-1 and Myostatin Gene Expression in Uremia. Kidney International 70(3):453-9.

9. Zahn JM, Sonu R, Vogel H, Crane E, Mazan-Mamczarz K, **Rabkin R**, Davis RW, Becker KG, Owen AB, and Kim SK. (2006). Transcriptional Profile of Aging in Human Muscle Reveals a Common Aging Signature. PloS Genetics. Jul;2(7):e115. PMCID: PMC1513263.

10. Endotoxin attenuates growth hormone-induced hepatic insulin-like growth factor I expression by inhibiting JAK2/STAT5 signal transduction and STAT5b DNA binding. (2007) Am J Physiol Endocrinol Metab. Chen Y, Sun D, Krishnamurthy VM, **Rabkin R.** 292(6):E1856-62.

11. **Rabkin R**, Awwad I, Chen Y, Ashley EA, Sun D, Sood S, Clusin W, Heidenreich P, Piecha G, Gross ML. Low-dose growth hormone is cardioprotective in uremia. (2008) J Am Soc Nephrol. 2008 19(9):1774-83..

12. Chen Y, Sood S, Biada J, Roth R, **Rabkin R.** (2008). Increased workload fully activates the blunted IRS-1/PI3-kinase/Akt signaling pathway in atrophied uremic muscle. Kidney Int. 73(7):848-55.

13. Landau D, Eshet R, Troib A, Gurman Y, Chen Y, **Rabkin R**, Segev Y. Increased renal Akt/mTOR and MAPK signaling in type I diabetes in the absence of IGF type 1 receptor activation. (2009). Endocrine. 36(1):126-34.

14. Chen Y, Sood S, Biada J and **Rabkin R** (2010). Uremia attenuates growth hormone-stimulated insulin-like growth factor-1 expression, a process worsened by inflammation. Kidney Int. 2010 78(1):89-95.

15. Chen Y, Sood S, McIntire K, Roth R, **Rabkin R.** Leucine stimulated mTOR signaling is partly attenuated in skeletal muscle of chronically uremic rats especially when work overloaded. (2011) American Journal of Physiology. Endocrinology and metabolism. 301, E873-871,.

16. Troib A, D Landau, L Kachko, **R Rabkin** and Y Segev. Decreased epiphyseal growth plate growth hormone receptor signaling in chronic kidney disease related growth retardation. (2013) Kidney International, 2013. In press

17. Acute uremia suppresses leucine induced signal transduction in skeletal muscle. McIntire K, Chen Y, Sood S and **R. Rabkin**. Kidney International. (2013) In press

Research Support

VA Merit Review Grant

Co-PIs Jonathan Myers PhD, and Ralph Rabkin MD 10/1/13-9/30/17

Exercise to Prevent Muscle Mass and Functional Loss in Elderly Dialysis Patients. ~$1 million.

Completed Research Support Past 5 years

VA Merit Review Grant (Rabkin, PI) 4/1/05-3/31/13
Muscle Wasting in Uremia
This study carried out with humans with ESRD and animals with CKD examines the mechanisms of muscle wasting in uremia, especially the role of the GH-IGF-1 axis.

United States-Israel Bi-National Science Foundation (Rabkin, PI) 9/1/08-8/31/12
The Role of Bone Local GH-IGF System in CKD and its Modulation by Non-pharmacologic Approaches
This study is directed at studying the GH-IGF-1 axis in the epiphyseal cartilage of growing rats with uremia.
Role: PI in a multiple-PI study

R21 DK077311-02S1 (Rabkin, PI) 8/1/09-7/31/11
Testosterone Replacement Therapy in Advanced Chronic Kidney Disease
This study is designed 1) To determine whether physiologic testosterone replacement is effective in improving muscle mass, strength and quality of life in males with low serum testosterone levels and advanced CKD, a common abnormality in this condition; 2) To elucidate the mechanisms whereby testosterone stimulates muscle hypertrophy in CKD.

Veterans Affairs Merit Review Grant (Rabkin, PI) 4/1/05-3/31/09
Growth Hormone Resistance in Uremia
This study carried out with Humans and animals examines the mechanisms of altered growth hormone (GH) mediated signal transduction in skeletal muscle in uremia and attempts to identify circulating inhibitors of GH action in uremia.

R01 DK068517 (Rabkin, PI) 5/1/06-4/30/10
NIH/National Institute of Diabetes and Digestive and Kidney Diseases
Skeletal Muscle Growth Hormone Resistance in Uremia
This study in rodents (rats and mice) examines the mechanisms of inflammation induced growth hormone resistance in uremia and the mechanisms for the impaired expression of IGF-1 in uremic muscle.

United States-Israel BiNational Science Foundation (Rabkin Co-PI) 9/1/04-8/31/08
The Relative Contribution and Interrelationship of GH, IGF-1 and AII in Diabetic Nephropathy
This study is directed at studying the GH-IGF-1 axis and AII in diabetic nephropathy in rodents.
Role: USA PI

Palo Alto Institute for Research and Education, Inc. (Rabkin, PI) 6/1/10-9/30/10
Leucine Stimulated Muscle Protein Synthesis in Uremia
This pilot study examined the impact of uremia on leucine stimulated mTOR signaling and protein synthesis in a rat model of chronic kidney disease. It serves as the basis for examining the effectiveness of leucine containing supplements in the management of muscle wasting in humans with kidney failure.