BIOGRAPHICAL SKETCH

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NAME: Shortliffe, Linda M Dairiki

eRA COMMONS USER NAME (credential, e.g., agency login): SHORTLIFFE.LINDA

POSITION TITLE: Stanley McCormick Memorial Professor of Urology Emerita

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Harvard University, Cambridge, MA	B.A.	1971	History and Science
Stanford University, Stanford, CA	M.D.	1975	Medicine
Intern, Surgery Stanford U Med Ctr, Stanford, CA		1975-76	Surgery
Resident Surgery, New England Med Ctr, Boston MA		1976-77	Surgery
Resident Urology, Stanford U Med Ctr, Stanford, CA		1977-1980	Urology
Chief Resident Urology, Stanford U Med Ctr, Stanford, CA		1980-1981	Urology
Staff Pediatric Urology, Children's Hospital of Philadelphia, Philadelphia, PA		1986-1987	Pediatric Urology

A. Personal Statement

I have spent 36 years in academic urology and the most recent 30 in academic pediatric urology and have investigated 1) urinary tract infection 2) urinary tract physiology and dilation, 3) effect of sex hormones on the urinary tract, and 4) noninvasive quantitative imaging of renal anatomy and function. I have previously collaborated with Dr. Vasanawala to writing on magnetic resonance imaging of the genitourinary tract in children and this proposal aligns closely with my long-term interests in examining nonionizing radiation and obstruction. I am the current academic research mentor for Fellow in Pediatric Urology and serve on the legislature mandated nonprofit California Council for Science & Technology (CCST).

B. Positions and Honors

1971	Research Assistant, Massachusetts General Hospital Psychiatry Laboratories, Director-Seymour Kety MD, Steven Matthysse PhD
1981-1988	Assistant Professor Surgery (Urology), Stanford University School of Medicine
1981-1986	Chief, Urology Section, Palo Alto Veterans Administration Hospital
1986-1987	Staff Pediatric Urologist, Children's Hospital of Philadelphia
1988-1993	Associate Professor of Surgery (Urology) with tenure, Stanford University School of Medicine
1991-2012	Chief of Pediatric Urology (Founding), Stanford University Medical Center
1991-2012	Chief of Pediatric Urology, Lucile Salter Packard Children's Hospital at Stanford
1993-	Professor of Urology (tenured), Stanford University School of Medicine
1993-2008	Stanford Urology Residency Program Director
1995-2011	Chair Department of Urology, Stanford University School of Medicine
2008-2009	William and Flora Hewlett Foundation Fellow, Radcliffe Institute Center for Advanced Study at

Harvard University
2005-2010 Pediatric Urology (Founding) Fellowship Director
2005-2015 Stanley McCormick Memorial Professor of Urology
2015- Stanley McCormick Memorial Professor of Urology Emerita

Government Research Service

1990-1994 Member NIDDK-D Special Grants Chartered Review Committee
1992 Deputy Chair, Consensus Panel on Impotence. NIH, NIDDK, OMR
2002 Chair, Bladder Research Program Review Group NIDDK-NIH, 2001-2002; *Overcoming Bladder Disease: a Strategic Plan for research. A report of the Bladder Research Program Review Group* (Shortliffe, LM Dairiki, Chair) National Institute of Diabetes & Digestive & Kidney Diseases, NIH, US Department of Health and Human Services Administrative Document (1-217 p). available on-line in full at *http://www2.niddk.nih.gov/NR/rdonlyres/07B67810-CFC8-467D-BA0A-8EAC8CA72519/0/Bladder_Disease_2002_Strategic_Plan.pdf*
2002-2004 Member, External Advisory Committee, Urologic Diseases in America (UCLA/RAND), (NIDDK)
2013-2020 Member, External Expert Panel (EEP) Urologic Diseases in American (UCLA/RAND) project
2017-2020 California Council on Science & Technology (CCST)

Honors

2003-2005 Featured Physician, ***National Library of Medicine Exhibit***, "Changing the Face of Medicine"
2004 Best of Session Poster: Pediatrics—Imaging/Infections & Vesicoureteral Reflux, Annual Meeting AUA 2011, MacLeod, L, Balise, R, and Shortliffe LD: "Ultrasonography Renal Parenchymal Area Predicts Vesicoureteral Reflux after Urinary Tract Infection" May 15, 2011, Washington DC.
2006 Stanley McCormick Memorial Professor
2008 Stanford University Asian American Faculty Award
2008-2009 William and Flora Hewlett Foundation Fellow, Radcliffe Institute Center for Advanced Study at Harvard University
2012 Distinguished Alumnae, Pediatric Urology, Children's Hospital of Philadelphia, June 28, 2012.
2012 2nd prize Pediatrics Session Western Section-AUA Pediatrics--"Differential Renal Parenchymal Area Predicts Need for Surgical Intervention", Payne, R, and LD Shortliffe, November 2012.
2012-2013 Clayman Institute, Stanford Faculty Research Fellow
2015 American Urological Association Distinguished Service Award
2016 New York Academy of Medicine, Valentine Medal

C. Contributions to Science

Immunologic Responses to Prostatic and Urinary Tract Infections and Inflammation. Significant confusion exists in the diagnosis of prostatitis. The difference between true infection related to bacteria and inflammation due to other causes still exists. I investigated these differences and developed 2 assays to distinguish among true infection, inflammatory responses, and painful syndromes that have no associated infection or inflammation. We defined the influence of fastidious organisms within prostatitis. I was the Principal Investigator on: Research Advisory Grant (RAG), Veterans Administration Medical Center, Palo Alto, 1982--for work on Prostatitis, Merit Review Research Award, Veterans Administration Medical Center, Palo Alto, (Program 821, Cost Center 103) 1983-1986, Immune Responses to Prostatic Inflammation Principal Investigator--Merit Review Research Award-renewal, Veterans Administration, Palo Alto, 1986-89 that allowed me to perform this work.

1. **Shortliffe, LMD,** Wehner, N., and Stamey, T.A.: The Use of a Solid-phase Radioimmunoassay and Formalin-fixed Whole Bacterial Antigen in the Detection of Antigen-specific Immunoglobulin in Prostatic Fluid. J. Clin. Invest. 67:790-799, 1981
2. **Shortliffe, LMD.** Wehner, N., and Stamey, T.A.: The Detection of a Local Immunoglobulin Response to Bacterial Prostatitis. J. Urol. 125: 509-515, 1981.
3. **Shortliffe, LD**., and Wehner, N.: The characterization of bacterial and nonbacterial prostatitis by prostatic fluid immunoglobulins. Medicine. 65: 399-414, 1986, **DOI:** 10.13140/2.1.2052.6084.
4. Davenport, M, Mach, KE, **Shortliffe, LD**, Banaei, N, Wang, TH Liao, JC: New and Developing Diagnostic Technologies for Urinary Tract Infections. Nat Rev Urol. 2017 Mar 1 doi:

10.1038/nrurol.2017.20. [Epub ahead of print], PMID: 28248946 DOI: 10.1038/nrurol.2017.20

Effect of Hormones on the Urinary Tract and other Organs. From my laboratory's observations that pregnancy caused nonobstructive dilation of the urinary tract, I became interested in the effects of sex hormones on the developing urinary tract. We found that withdrawal of sex hormones (gonadectomy (oophorectomy or orchiectomy models) causes increased collagen/smooth muscle ratio and decreased compliance and some of these changes can be restored with hormonal replacement. I was the PI on grant: Principal Investigator, 1 R01 DK51419-01 (NIDDK-NIH) Effect of Pregnancy and Hormones on Kidney and Urinary Tract, 6/1/96-6/1/2000.

1. Hsia, T-Y and **Shortliffe, LD**: The effect of pregnancy on the rat urinary tract. J Urol. 154: 684-689, 1995.
2. Rodriguez, LV, Wang, B, Shortliffe, **L.M. Dairiki**: Structural changes in the bladder walls of pregnant and hormone treated rats: correlation to bladder dynamics. British Journal of Urology International, 94:1366-1372, 2004.
3. **Shortliffe, L.M.D.,** Ye, Y., Behr, B., Wang, B., Testosterone Changes Bladder and Kidney Structure in Juvenile Male Rats, *The Journal of Urology*® (2013), doi: 10.1016/j.juro.2014.01.012
4. **Shortliffe, LMD**, Hammam, O, Han, X, Kouba, E, Tsao, PS, Wang, B. Dietary fructose in pregnancy induces hyperglycemia, hypertension, and pathologic kidney and liver changes in a rodent model. Pregnancy Hypertension. 12Aug 2015. http://dx.doi.org/10.1016/j.preghy.2015.08.002

Investigation of Nonobstructive Causes of Urinary Tract Dilation. My work on pregnancy led to investigation of nonobstructive causes of urinary tract dilation. This led to a series of studies that improve understanding of urinary tract dilation and the interpretation of urinary tract imaging. Our work showed that changing urinary flow, bladder fullness, inflammation and/or infection, sex hormones, partial obstruction, and various drugs will change urinary tract pressures and compliance. I was PI on all of these investigations.

1. Smyth, T.B., **Shortliffe, LMD**, and Constantinou, C.E.: The effect of urinary flow and bladder fullness on renal pelvic pressure in the Sprague-Dawley rat. J. Urol., 146:592-596, 1991.
2. Issa, M.I., **Shortliffe, LD**., and Constantinou, C.E.: The effect of bacteriuria on renal and bladder pressures in the Sprague-Dawley rat. J. Urol. 148(2): 559-563,1992.
3. Fichtner, J, Boineau, F, Lewy, J., **Shortliffe, LD**: Oxybutynin lowers elevated renal pelvic pressures in congenital hydronephrosis of the rat, J. Urol 160 (3(1)): 887-891, 1998
4. Angell, SK, Pruthi, RS, and **Shortliffe, LD**: The urodynamic relationship between renal pelvic and bladder pressure with varying urinary flow rates in rats with congenital vesicoureteral reflux. J. Urol, 160 (1): 150-156, 1998.

Establishing Quantitative Renal Measures for Noninvasive and Nonionizing Radiation Imaging Techniques. My concerns related to invasive imaging procedures (including radiation and psychological trauma) in children, have led me to investigate nonionizing radiation and quantitative imaging for estimating renal function and assessing growth. I have examined this parameter in MRI and renal ultrasonography. We have shown that our technique of renal parenchymal volume/area can estimate renal function and is correlates well in longitudinal growth patterns; others have started using this technique and shown that there may be predictive value to this parameter. I was the PI on these studies. The current project is an extension of my interests in developing pediatric imaging procedures with limiting ionizing radiation, trauma, and invasive techniques.

1. Payne, R, Saranathan, M, Vasanawala, S, Shortliffe, LD: Principles of MRI Imaging. Pediatric and Adolescent Urography. Palmer, L and Palmer, J (eds). Springer, 2014.
2. Rodriguez, LV, Spielman, D, Herfkens, RJ, and **Shortliffe, L.M. Dairi**ki: Magnetic resonance imaging (MRI) for the Evaluation of Hydronephrosis, Reflux, and Renal Scarring in Children. J. Urology, 2001 Sept; 166(3):1023-7.
3. Heuer R. Sommer G. **Shortliffe LD.** Evaluation of renal growth by magnetic resonance imaging and computerized tomography volumes. [Evaluation Studies. Journal Article] Journal of Urology. 170(4 Pt 2): 1659-63; discussion 1663, 2003 Oct.
4. Kouba, E, Newman, B, **Shortliffe, LD**: Analysis of Kidney Ultrasonographic Dimensions by Body Habitus and Position. J. Urol 2016; 196 (3): 943-949 DOI: http://dx.doi.org/10.1016/j.juro.2016.02.044, PubMedID 26874315.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/1bA3DfxX-nZ/bibliography/40084090/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

1 R15 HL128988-01A1 (Rahimian) 7/22/16 – 2018
Diabetes, Estrogen, and Endothelial Dysfunction
Major Goals:

1) **Liquid Fructose, insulin resistance and obesity**: to study the effect of fructose on endoplasmic reticulum stress, autophagy and inflammasome-mediated dysbiosis in experimental animals
2) **Liquid Fructose, atherosclerosis and cardiovascular system**. To supplement fructose to a mouse model, the LDL receptor knock-out female mouse to investigate the effect of fructose on blood pressure and on cardiac hypertrophy.

Role: Consultant (unpaid)

R01EB026136 (Vasanawala) 4/5/18 –1/31/22
Development and Validation of Radiation-Free Pediatric Renal Function Quantification
Major Goals:

To develop robust, automated comprehensive pediatric renal MRI for safer and more accurate renal function evaluation in children. The techniques will facilitate widespread application in the community setting and permit robust evaluation of renal function, for both children and adults.

Role: Co-PI

Completed Research Support

NIH 1 R01 DK51419-01 (Shortliffe) 6/1/96 **–** 6/1/2000
Effect of Pregnancy and Hormones on Kidney and Urinary Tract
Major Goals:

1) To extend previous studies showing that urinary tract dilation during pregnancy is caused by increased urinary tract smooth muscle compliance and not obstruction and confirm that these renal and urinary tract changes are accompanied by increased blood and tissue flow.
2) To examine smooth muscle contractility in the rabbit bladder during and after pregnancy and with estrogen and progesterone manipulation
3) To examine whether pregnancy, estrogen, and progesterone cause changes in collagen architecture and distribution in the kidney and bladder and whether such changes return to baseline after parturition.
4) To describe the pathogenesis of pyelonephritis during pregnancy and determine whether the infected urinary tract undergoes physiologic changes during pregnancy that result in increased likelihood of pyelonephritis.

Role: PI