

PROMOTION RECOMMENDATION  
UNIVERSITY OF MICHIGAN  
MEDICAL SCHOOL  
DEPARTMENT OF SURGERY

Krishnan Raghavendran, M.D., associate professor of surgery, with tenure, Department of Surgery, Medical School, is recommended for promotion to professor of surgery, with tenure, Department of Surgery, Medical School.

Academic Degrees:

M.D.	1985	Jawaharlal Institute of Post Graduate Medical Education, Pondicherry, India
B.S.	1980	Delhi University, Delhi, India

Professional Record:

2008-present	Associate Professor of Surgery, University of Michigan
2007-2008	Associate Professor of Surgery, State University of New York at Buffalo
2003-2008	Assistant Professor of Anesthesiology, State University of New York at Buffalo
2000-2007	Assistant Professor of Surgery, State University of New York at Buffalo
1996-1999	Clinical Assistant Professor of Surgery, University of Texas Health Sciences Center, San Antonio, TX

Summary of Evaluation:

Teaching: Dr. Raghavendran has an outstanding teaching ability and is an excellent mentor to undergraduate and medical students, residents, fellows, and peers. He performs didactic lectures including the basic science lecture series, M3 Critical Care Summer Session, M4 Boot Camp, Resident Critical Care Summer School, and teaching conferences for general surgery, trauma, burn, and morbid and mortality. He teaches all aspects of clinical and surgical skills to the trainees in the clinic, operating room and the inpatient floor. Residents from the Emergency Department and Surgery Department learn to follow through and complete evidence-based consultations in the Emergency Department. This conscientious surgeon spends hundreds of hours devoted to dozens of trainees on a yearly basis. From the beginning of his career, Dr. Raghavendran has received awards for his teaching excellence. Teaching evaluations often include comments about him being an outstanding instructor, that his vast knowledge, thoughtfulness and insightfulness, encourages the trainees' development, thus forming future model surgeons. Dr. Raghavendran is the clerkship director for the M-4 rotation in the SICU, director for both the surgical critical care and acute care Surgery fellowships and co-director for the advance trauma life support national curriculum for acute trauma resuscitation and management.

Research: Dr. Raghavendran is a highly respected scientist in the research area of acute lung contusion and ventilator-associated pneumonia. He has made important findings such as using a technique of passive immunization with antibody directed against MCP-1, the injury post lung contusion was more significant as compared to animals treated with control antibody. Further steps taken in the study define a potential biologic that has anti-inflammatory activity, which could serve as a novel therapeutic for acute lung inflammation. His insightful and dynamic work has made an impact in this field. Further demonstration that Dr. Raghavendran is a leading scientist are the 50 peer reviewed publications in high impact journals, such as *Surgery*, *Journal of Immunology*, and *Shock*, one book, seven book chapters, and 56 abstract presentations. He has been the principal investigator on several grants, including the current R01 grant titled "Mechanisms of MCP-1 in lung contusion with and without gastric aspiration" funded by NIH/NHLBI. Dr. Raghavendran has submitted several additional grants indicating his continued scientific mission. Dozens of extramural invited presentations attest to his national and international recognition. Dr. Raghavendran is on the editorial board of *Shock*, and *ISRN Inflammation*, and is a reviewer for over 15 publications.

Recent and Significant Publications:

Machado-Aranda DA, Madathilparambil S, Yu B, Raghavendran K: Electroporation mediated in-vivo gene delivery of the Na<sup>+</sup>/K<sup>+</sup>-ATPase pump reduced lung injury in a mouse model of lung contusion. *J Trauma* 72:32-39, 2012.

Suresh MV, Yu B, Machado-Aranda D, Bender MD, Ochoa-Frongia L, Helinski JD, Davidson BA, Knight PR, Hogaboam CM, Moore BB, Raghavendran K: Role of macrophage chemoattractant protein 1 in acute inflammation following lung contusion. *American Journal of Respiratory and Molecular Biology* 46:797-806, 2012.

Machado-Aranda D, Wang Z, Yu B, Suresh MV, Notter RH, Raghavendran K: Increased phospholipase A<sub>2</sub> and lyso-phosphatidylcholine levels are associated with surfactant dysfunction in lung contusion injury in mice. *Surgery* 153:25-35, 2012.

Suresh MV, Lakshminrusimha S, Knight PR, Gugino SF, Davidson BA, Helinski JD, Nielsen LC, Russell JA, Yu B, Pennathur S, Raghavendran K: Pulmonary artery reactivity and oxidative stress in injury and inflammation in lung contusion. Accepted for publication, *Shock* 39:278-285 2013.

Nemzek-Hamlin JA, Hwang H, Hampel J, Yu B, Raghavendran K: Development of a murine model of blunt hepatic liver injury. Accepted for publication, *Comparative Medicine* 4/13.

Service: Service to community and profession are important to Dr. Raghavendran. He is very active with several institutional committees involving trauma and critical care quality control, resident academic development, research mentoring, and the University of Michigan India Strategy Group. He has been appointed as an associate faculty for global health at the University of Michigan. National service activities include the Surgical Section Committee and the Research Committee for the Society of Critical Care Medicine and the Publications Committee

for the Society of University Surgeons. Dr. Raghavendran has established collaboration with the Apex Trauma Institute, affiliated with the All India Institute of Medical Sciences (AIIMS), in New Delhi, India. He is helping to develop all the components for a trauma system with the health care professionals and administration, including developing curriculum, and delivering lectures. AIIMS surgeons, anesthesiologists, emergency physicians, and nurses are part of a travel program developed by Dr. Raghavendran to come to the University of Michigan. While at UM, these health care providers learn about establishing a trauma burn center and other phases of care for trauma/burn patients such as plastic surgery and orthopedic surgery. Dr. Raghavendran is an attending surgeon in the Acute Care Surgery Division, Section of General Surgery, which includes patients with trauma, burns and in need of surgical critical care. His commitment to patient care is demonstrated by his compassion to patients and their family members.

#### External Reviewers:

Reviewer A: "In addition to his national reputation [as] an outstanding surgical scientist, Dr. Raghavendran has also achieved international recognition for his efforts to improve trauma and burn care in India. He has developed strong collaborations and made major contributions to advancement of the trauma system in this country."

Reviewer B: "He has established an international collaboration with Apex Trauma Institute affiliated with the All India Institute of Medical Sciences...he has submitted funding for a Global Challenge Award from the University of Michigan for the establishment of [an] electronic trauma registry as a catalyst for the transfer of health service research in a developing nation. This activity in his native country of India is significant in helping to develop more functional and competent trauma services within this large developing nation."

Reviewer C: "His research contributions and record of NIH funding place him in the top 5% of all academic trauma surgeons in the country."

Reviewer D: "His clinical skills and teaching skills have never been questioned. Simply he is exceptional. From an academic standpoint he is a funded surgical investigator by the NIH with an exceptional record of publications."

Reviewer E: "His research in the molecular pathophysiology of lung injury following trauma, aspiration and infection have furthered knowledge in the field and have the potential to impact clinical care going forward."

Reviewer F: "He has high marks on his teaching capabilities....He is an active participant in the most prestigious surgical societies....He has numerous awards and is active administratively in professional organizations locally, nationally and internationally."

Reviewer G: "Dr. Raghavendran has produced an important body of academic work, which is frequently cited and has significantly influenced our thinking about pulmonary injuries and ventilator-associated pneumonia."

Summary of Recommendation:

Dr. Krishnan Raghavendran is recognized by his peers as an excellent clinician, surgeon and teacher, and is highly regarded for his contributions to research. I strongly recommended Krishnan Raghavendran, M.D. for promotion to professor of surgery, with tenure, Department of Surgery, Medical School.

A handwritten signature in black ink, reading "J. O. Woolliscroft", written over a horizontal line.

James O. Woolliscroft, M.D.

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*Lyle C. Roll Professor of Medicine*

May 2014