

PROMOTION RECOMMENDATION  
THE UNIVERSITY OF MICHIGAN  
MEDICAL SCHOOL  
DEPARTMENT OF NEUROLOGY  
DEPARTMENT OF MOLECULAR AND INTEGRATIVE PHYSIOLOGY

Vikram Shakkottai, M.B.B.S., Ph.D., assistant professor of neurology, Department of Neurology, and assistant professor of molecular and integrative physiology, Department of Molecular and Integrative Physiology, Medical School, is recommended for promotion to associate professor of neurology, with tenure, Department of Neurology, and associate professor of molecular and integrative physiology, without tenure, Department of Molecular and Integrative Physiology, Medical School.

Academic Degrees:

Ph.D.	2004	University of California, Irvine
M.B.B.S.	2000	Christian Medical College, India

Professional Record:

2016-present	Assistant Professor of Molecular and Integrative Physiology, University of Michigan
2010-present	Assistant Professor of Neurology, University of Michigan
2008-2010	Clinical Lecturer, Department of Neurology, University of Michigan

Summary of Evaluation:

Teaching: Dr. Shakkottai has been an outstanding teacher in the clinical setting and in the research laboratory. He has also been involved in formal didactic lecturing for undergraduate and graduate students. Dr. Shakkottai is involved in medical student teaching on the inpatient neurology service. He has been the faculty planner for the Clinical Lecture Series for neurology residents since 2015. This involves setting up a curriculum, identifying faculty expertise in various topics, and ensuring that all areas of clinical neurology are represented. Dr. Shakkottai has been teaching Motor Systems as part of Physiology 592 since 2013. Dr. Shakkottai has also given hour long guest lectures for “Sensory and Motor Systems (MCDB 352)” and “Cell Biology of Neurodegeneration” on cerebellar physiology and pathophysiology. In all of his teaching, Dr. Shakkottai has received exemplary reviews by his students. In partnership with the National Ataxia Foundation, a patient advocacy group, Dr. Shakkottai lectures at the Annual Ataxia Meeting on topics relating to diagnosis, management and research on ataxia.

Over the past six years, Dr. Shakkottai has served as the primary research mentor for ten undergraduate students and three graduate students, two of whom have chosen to join his laboratory for their thesis. Dr. Shakkottai has served as a member of the thesis committee of six graduate students. In sum, Dr. Shakkottai is an excellent teacher who is eager to educate and

counsel students, residents, fellows and persons with ataxia across a number of disciplines in medicine and research.

Research: Dr. Shakkottai's laboratory studies the role that cerebellar neuronal dysfunction plays in behavioral change and neurodegeneration. The ultimate goal of these studies is to develop novel therapies for ataxia, a group of disabling, currently untreatable disorders. The Shakkottai lab uses a combination of single cell electrophysiology, biochemistry, immunohistochemical techniques and in vivo viral and drug delivery to investigate the role of ion channels in normal cerebellar neuronal function and in ataxia. Dr. Shakkottai's current work aims to find a shared mechanism for neuronal dysfunction in the most common inherited ataxias resulting from expansions in glutamine encoding CAG repeats in the respective disease genes (termed polyglutamine ataxias). Work in the Shakkottai lab has previously identified alterations in membrane excitability resulting from reduced expression of potassium channels (BK and GIRK1) in spinocerebellar ataxia type 1 (SCA1), a well-studied and one of the more common polyglutamine ataxias. Since joining the Neurology faculty, Dr. Shakkottai has published 19 peer reviewed research papers. Dr. Shakkottai has been successful at obtaining significant independent research funding. He received a K08 award in 2010 that finished this year. He received an R01 that started in 2013. He has obtained private foundation grants from the National Ataxia Foundation and Dystonia Medical Research Foundation, and philanthropic funding from private donors. Dr. Shakkottai has given Grand Rounds or equivalent talks at multiple universities nationally. He has been an invited speaker at meetings at national and international sites, including the Ataxia Investigators Meeting (Las Vegas, NV), meeting of the American Neurological Association (Baltimore, MD), meeting of the American Academy of Neurology (Toronto, Canada), Gordon Research Conference on the Cerebellum (New London, NH), and the Gordon Research Conference on CAG triplet repeat disorders (Barga, Italy).

#### Recent and Significant Publications:

Shakkottai VG\*, do Carmo Costa M, Dell'Orco JM, Sankaranarayanan A, Wulff H, Paulson HL: Early changes in cerebellar physiology accompany motor dysfunction in the polyglutamine disease, Spinocerebellar Ataxia type 3. *Journal of Neuroscience* 31:13002-13014, 2011.  
\*corresponding author

Chopra R, Shakkottai VG: The role for alterations in neuronal activity in the pathogenesis of polyglutamine repeat disorders. *Neurotherapeutics* 11:751-763, 2014.

Luna-Cancalon K, Sikora KM, Pappas SS, Singh V, Wulff H, Paulson HL, Burmeister M, Shakkottai VG: Alterations in cerebellar physiology are associated with a stiff-legged gait in Atcayji-hes mice. *Neurobiology of Disease* 67:140-148, 2014.

Shakkottai VG: Physiologic changes associated with cerebellar dystonia. *Cerebellum* 13:637-644, 2014.

Dell'Orco JM, Wasserman AH, Chopra R, Ingram MAC, Hu Y-S, Singh V, Wulff H, Opal P, Orr HT, Shakkottai VG: Neuronal atrophy early in degenerative ataxia is a compensatory mechanism to regulate membrane excitability. *Journal of Neuroscience* 35:11292-11307, 2015.

Service: Within the institution, Dr. Shakkottai serves as director of the Brain Bank. As the Brain Bank director, Dr. Shakkottai supervises the Brain Bank coordinator, who performs tissue collection, distribution and freezer maintenance. Dr. Shakkottai also serves on the Department of Neurology recruitment committee, and reviews applications to ensure that applicants from a diverse background are appropriately evaluated for possible recruitment. Dr. Shakkottai served on the Admissions Committee for the Neuroscience Graduate Program (2012-2014), and on graduate student preliminary exam committees. At the national level, Dr. Shakkottai serves as a member of the Research Advisory Board of the National Ataxia Foundation and helps the board make decisions on research funding. He regularly serves as an ad hoc member of NIH study sections, has served as an ad hoc member for a VA study section and reviews grants for national and international disease foundations including the Telethon Foundation (Italy) and Ataxia UK (UK). Dr. Shakkottai serves as the director of the Ataxia Program. He sees patients with ataxia and other balance disorders six half-days a month. He founded the Multidisciplinary Ataxia Clinic in order to improve quality of care for patients with degenerative balance disorders. Feedback from patients has been excellent. Patients are referred from across the country. Dr. Shakkottai regularly fields emails and phone calls nationally and internationally from patients with ataxia who have questions about their diagnosis and management. Dr. Shakkottai also serves as an attending on either the inpatient Neurology ward or the Neurology consult service for two-four weeks each year.

#### External Reviewers:

Reviewer A: "...Vikram established himself as one of the leaders in physiological studies of ataxia. Work in his lab is funded by an R01 grant from the NINDS... He is a member of the National Ataxia Foundation Medical Research Advisory Board and recently became a director of Michigan Brain Bank. These are very important functions for the national and international ataxia field."

Reviewer B: "Dr. Shakkottai's creativity, productivity, and focus on rigorous, high quality basic research in the context of neurological disorders has distinguished him as one of the most promising clinician/scientists in the field of Neurology... Dr. Shakkottai has developed a novel and highly clinically relevant research program that I and many colleagues believe will lead to a revolution in how we think about and treat cerebellar ataxias and other degenerative disorders... His science is making a significant impact on a wide range of neuroscientists and Neurologists and is highly likely to lead to new approaches to treating neurodegenerative disorders."

Reviewer C: "He has developed an impressive portfolio of publications, established his laboratory and secured major federal funding. His science is having an impact on the field of cerebellar neurodegeneration. Dr. Shakkottai is on an upward trajectory and will contribute to the field for many years to come."

Reviewer D: "There is no other neurologist at the junior faculty level working on cerebellar ataxia and movement disorder who has expertise in electrophysiology. Dr. Shakkottai has already made unique and important contributions to ataxia that he is highly promising to

continue to be a wonderful physician scientist to contribute to improved diagnosis, understanding, and treatment of cerebellar ataxia and related disorders.”

Reviewer E: “...Dr. Shakkottai has established himself as a solid and innovative neuroscientist, very well respected in his field. This is clearly supported by the quality and quantity of his scientific production.”

Reviewer F: “Dr. Shakkottai is well-trained, both in clinical medicine and in molecular genetics. This alone poises him as a unique resource... Much of his work focuses on the molecular substrates for the inherited ataxias. This is a challenging area, involving sophisticated molecular investigations, and is highly relevant to disease... Judging from his publications, Dr. Shakkottai is not afraid of taking on difficult problems. He appears to command a range of techniques which have allowed him to answer some important questions.”

Summary of Recommendation:

Dr. Shakkottai is a well-trained neurologist who is a highly regarded clinician and teacher. He has a growing national reputation for his research in the field of ataxia. I am pleased to recommend Vikram Shakkottai, M.B.B.S., Ph.D. for promotion to associate professor of neurology, with tenure, Department of Neurology, and associate professor of molecular and integrative physiology, without tenure, Department of Molecular and Integrative Physiology, Medical School.



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Marschall S. Runge, M.D., Ph.D.  
Executive Vice President for Medical Affairs  
Dean, Medical School

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