

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Anuj Kumar, associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	1997	Wright State University
B.S.	1991	Wright State University

Professional Record:

2009 – present	Associate Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2003 – 2009	Assistant Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
1998 – 2003	Post-doctoral Fellow, Yale University

Summary of Evaluation:

Teaching – Professor Kumar has made major contributions to teaching at both the undergraduate and graduate levels during his time in rank. These contributions include teaching a large-enrollment core course for life science majors in which he has incorporated active learning techniques and small group discussion; an upper-level specialty course in his research area in which he uses cooperative learning and group project approaches to teach systems biology and genome science; and a graduate seminar required for all first year doctoral students. The topics and his approach to teaching are cutting edge. Professor Kumar has also played a critical role in the departmental Masters Pathways Program. This program aids students pursuing a Masters degree to prepare for a full Ph.D. program; it is very useful for undergraduate students who have the potential for graduate studies, but are not yet ready for a rigorous Ph.D. program. Professor Kumar has directed the program since 2012 and is involved in extensive mentoring. He has also been a dedicated mentor to trainees in his research laboratory who have been deeply influenced by his positive and careful approach to their training and personal development.

Research – Professor Kumar studies cellular responses to stress, using several different species of yeast, which are powerful model systems for studies of eukaryotic cell biology. Investigations in yeast have laid the foundation for significant breakthroughs in understanding cell functions in higher eukaryotes, including humans. One important advantage of using these yeast strains is that they are a good model for studying pseudohyphal growth, which underlies invasive growth in pathogenic fungi such as *Candida albicans* and can cause fungal disease in humans. A distinguishing feature of Professor Kumar's work is his focus on systems biology with his use of genome-wide and high-throughput approaches to address a diversity of questions in cell biology, including signaling pathways that influence cell growth, nutrient sensing, and autophagy. He is expert in both the generation and computational analysis of large datasets, and also the detailed investigation of cell signaling pathways using standard cell biology techniques. His current work

on mRNA localization in the cell, the formation of ribonucleoprotein complexes and their contribution to pseudohyphal growth is at the cutting edge of cell biology research. He is a co-PI on two major R01 grants from the National Institutes of Health, and his research is continuing on a strong upward trajectory.

Recent and Significant Publications:

“Pooled segregant sequencing reveals genetic determinants of yeast pseudohyphal growth,” with Q. Song, et al., *PLoS Genetics*, 10, 2014, e1004570 (PMCID:PMC4140661).

“Genetic networks inducing invasive growth in *Saccharomyces cerevisiae* identified through systematic genome-wide overexpression,” with C. A. Shively, et al., *Genetics*, 193, 2013, 1297-1310 (PMID: 23410832).

“TEAK: Topology enrichment analysis framework for detecting activated biological sub-pathways,” with T. Judeh, et al., *Nucleic Acids Research*, 41, 2013, pp. 1425-1437. (*Corresponding authors).

“Phylogenetic and preliminary phenotypic analysis of yeast PAQR receptors: Potential antifungal targets,” with N. Y. Villa, *Journal of Molecular Evolution*, 73, 2011, pp. 134-152.

Service – Professor Kumar served as an associate chair for graduate studies, and the chair of the Graduate Studies Committee. Within the university, he served on the Rackham Minority Fellowship (RMF) Nomination Review Committee and the Advisory Committee for the Michigan Post-baccalaureate Research Education Program (Michigan PREP). Also noteworthy is his invitation to serve on several editorial boards.

External Reviewers:

Reviewer (A)

“Some of Dr. Kumar’s recent contributions have been particularly notable – for example, he published a beautiful paper in *PLoS Genetics* (2014) describing a pooled segregant approach to unraveling the complex genetics underlying the pseudohyphal growth phenotype in budding yeast. This work took advantage of both classic genetic and the most recent functional genomic approaches to reveal important new determinants of pseudohyphal growth, and to provide insight into the evolution of complex traits.”

Reviewer (B)

“I consider Dr. Kumar’s new methodologies, resources, and research findings novel and significant contributions to the field... ..this is a very impressive body of work – the majority of Anuj’s papers have been published in excellent journals, and the collective set speaks to his creativity and scholarly dedication as an internationally recognized scientist.”

Reviewer (C)

“...Anuj is a first-rate and rigorous scientist who also is a conscientious and well respected colleague. Every indication is that his research work is proceeding excellently. He pursues problems aggressively and I am convinced the new directions his efforts are taking will continue to bring novel insights into the filamentous fate transition. He has satisfactorily competed for extramural funding. It is clear from his recent publications that his research program is thriving and will continue to flourish.”

Reviewer (D)

“...Anuj is well recognized among yeast researchers. He established himself during his post-doctoral stint as a skilled practitioner of genomics, proteomics, and bioinformatics, and I believe he continues to be recognized for that. He has established a focused, coherent research program to which he applies a modern, productive experimental and intellectual approach. Anuj has admirably focused his efforts on an important developmental pathway, and it looks to me like he is among the half dozen or so leaders in this area. I am confident he will continue to make significant contributions to his field.”

Reviewer (E)

“Anuj is an exceptionally talented and accomplished geneticist and systems biologist. I do not know anyone quite at his level from his generation. He competes primarily with PIs 10 years his senior, and he certainly holds his own! ... Anuj is a world-class, innovative, high-quality scientist, and is deserving of promotion to professor.”

Reviewer (F)

“Mass spectrometry-based quantitative phosphoproteomic will be promising to unveil system-level regulation of filamentation and glucose signaling. Additional remarks are that he published several nice review articles such as in *Nature*... and *Genomics*.”

Reviewer (G)

“...Dr. Kumar is a talented scientist of significant accomplishment, and I recommend him for this promotion in the strongest possible terms. ...his work is rigorous and his papers, which are published in the key journals in his field...are full of data and interesting results. Moreover, they are beautifully written and well received.”

Summary of Recommendation:

Professor Kumar has made important scientific contributions widely recognized at the national and international levels. He has a strong record of teaching and service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Anuj Kumar be promoted to the rank of professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.



Andrew D. Martin, Dean
Professor of Political Science and Statistics
College of Literature, Science, and the Arts

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