

# Shyama Nandakumar

Molecular Cellular and Developmental Biology  
5202 Biological Sciences Building,  
1105 N.University Ave,  
Ann Arbor, MI, USA  
48109

+1-734-239-4766

shyama@umich.edu

## Education and Qualifications

University of Michigan, Ann Arbor, MI, USA

PhD in Molecular Cellular and Developmental Biology, degree expected May 2020

Graduate Teacher Certificate, Center for Research on Learning and Teaching, expected May 2020

SRM University, Chennai, India

B.Tech in Genetic Engineering, 2013

## Research Experience

Doctoral Research

01/2015-present

Molecular, Cellular and Developmental Biology, University of Michigan, Ann Arbor, MI

Research Advisor: Dr. Laura Buttitta

- Understanding cell cycle re-entry in adult *Drosophila melanogaster* neurons.
- Development of flow cytometric and *in situ* assays to measure changes in ploidy in individual brains with age
- Characterisation of cell cycle exit in neurons and glia in the developing pupal brain
- Characterisation of changes in GAL4 driver expression in ageing brains
- Analysis of gene expression changes with age in different parts of the *Drosophila melanogaster* CNS

Doctoral Rotation Student

09/2014 to 01/2015

Molecular, Cellular and Developmental Biology, University of Michigan, Ann Arbor, MI

Research Advisor: Dr. Jayakrishnan Nandakumar

- Analysis of cajal body protein TCAB1 interaction with human Telomerase
- In vitro* and *in vivo* studies on effects of point mutations in TCAB1 on Telomerase interaction

Undergraduate Research Intern

01/2013 to 08/2013

Laboratory for Nanomedicine, Brigham and Women's Hospital & Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA

Research Advisor: Dr. Shiladitya Sengupta

- Development of 3D endothelial-epithelial co-culture system and mathematical models to characterise tumorigenic and metastatic prostate and breast cancer cell interaction with human endothelium
- Development of a mathematical model to study tumor-endothelial interactions in metastatic progression
- Characterisation of nanoscale conduit-mediated transformation of endothelial cells in metastatic cell-endothelial cell co-culture

Undergraduate Researcher

08/2011 to 02/2012

Department of Molecular Biology, Umeå University, Umeå, Sweden

Research Advisor: Dr. Matthew Francis

- Generation of separation of function mutants in *Yersinia pseudotuberculosis* periplasmic peptidyl-prolyl cis-trans isomerase *surA* involved in type III secretion system and pathogenicity
- Synthesis of transgenic mutant *surA* protein
- Assays of *surA* mutant motility

**Research Interests**

- Roles of variant cell cycles in different developmental and cellular contexts
- Compensatory cellular proliferation and hypertrophy in wound healing and regeneration
- How G0 is established and maintained in long lived cells, and understanding the relationship between ageing and the compromised postmitotic state of differentiated tissues

**Teaching and Mentoring Experience**

University of Michigan 2014-Present

*Graduate Student Mentor*

MCDB 801 Supervised Teaching (Fall 2018, Winter 2019)

- Provided guidance to first time GSIs teaching various classes
- Led discussions about pedagogy
- Observed GSI's discussions and lab classes and provided feedback
- Guided GSIs writing teaching philosophies

*Graduate Student Instructor*

MCDB 427 Molecular Biology (Fall 2015, Fall 2017)

- Led 2 discussion sections
- Designed and supervised weekly alternative learning sessions
- Prepared lecture materials and delivered lecture

*Buttitta Laboratory*

Trained and mentored 8 undergraduates and 6 junior graduate students hands on in flow cytometry, fluorescence and confocal microscopy and fly husbandry

**Professional Outreach and Professional Society Service**

<i>Females excelling more in Math, Engineering and the Sciences</i> , Capstone event University of Michigan	08/2015
<i>Volunteer Instructor</i> , Ann Arbor Hands-on museum	05/2016 12/2016

**University Service**

President, MCDB Graduate Student Council	2017-2018
Treasurer, MCDB Graduate Student Council	2016-2017
Student Representative, Admissions Committee, MCDB	2015-2018
Organiser, Retreat Committee, MCDB	2015-2017
Social Committee, MCDB Graduate Student Council	2014-2016
Student Representative, MCDB Faculty Search	2018-Present

**Invited Talks and Posters**Connell Memorial Symposium: Breakthroughs in Biology

<i>An Unexpected awakening: Cell cycle Reentry in the ageing Drosophila melanogaster brain</i>	05/2019
<i>Polyploidy in Organ Development, Repair, and Disease</i>	
<i>Polyploid neurons in the adult Drosophila melanogaster brain</i>	10/2018
<u>GSA Annual Drosophila Conference 2018, Philadelphia USA</u>	
<i>Cell cycle re-entry in the ageing Drosophila brain (Poster)</i>	04/2018

Champalimaud Research Symposium, Lisbon, Portugal*Cell cycle re-entry in the ageing Drosophila brain (Poster)* 10/2017GSA Annual Drosophila Conference: Wound healing and Regeneration Workshop, 2017, San Diego, CA, USA*Cell cycle re-entry in the optic lobes of the adult Drosophila brain (Talk)* 03/2017Midwest Drosophila Conference, 2016, Monticello, IL, USA*Cell cycle re-entry in the optic lobes of the adult Drosophila brain (Talk)* 11/2016MCDB Annual Retreat, 2016, Ann Arbor, MI, USA*Cell cycle re-entry in the adult Drosophila brain (Talk)* 05/2016Midwest Drosophila Conference, 2015, Monticello, IL, USA*Hyperploidy in the adult Drosophila brain (Talk)* 10/2015**Honours and Awards**

Barbour Scholar, University of Michigan 2018-Present

UMMS-OGPS Service to the University and Community Award Nominee 2018

MCDB Annual Retreat – Best poster 05/2015, 10/2017

Rackham Doctoral Pre-candidate research grant 06/2015

**Publications**

Connor, Y., Tekleab, S., **Nandakumar, S.**, Walls, C., Tekleab, Y., Husain, A., ... Sengupta, S. (2015). Physical nanoscale conduit-mediated communication between tumour cells and the endothelium modulates endothelial phenotype. *Nature Communications*, 6, 8671.

Connor, Y., Tekleab, Y., Tekleab S., **Nandakumar, S.**, Bharat, D. and Sengupta, S. (2019). A mathematical model of tumor-endothelial interactions in a 3D co-culture. , *Scientific Reports* (In Press)