

# DYLAN T. BURNETTE

**Office Address:**

Department of Cell and Developmental Biology  
Vanderbilt University Medical School  
MRB3 Room 3130  
Nashville, TN 37032, USA  
(+615) 343 1024  
Place of Birth: Dalton, GA; May 11, 1977

**Home Address:**

6344 Banbury Station  
Brentwood, TN 37027  
(+410) 925 7705

**Education**

---

- 2008-2013 **Postdoctoral Fellow**  
Eunice Kennedy Shriver National Institute of Child Health and Human Development, **NIH**, Bethesda, MD  
*Advisor: Dr. Jennifer Lippincott-Schwartz*  
*Project: Applying high-resolution microscopy to study cytoskeletal dynamics within motile cells.*
- Dec. 2007 **Ph.D.** in Molecular, Cellular, and Developmental Biology  
**Yale University**, New Haven, CT.  
*Advisor: Dr. Paul Forscher*  
*Thesis title: "Neuronal Growth Cone Actomyosin II Contractile Systems: Dynamic Barriers Controlling Microtubule Distribution and Function"*
- May 2000 **B.S.** in Biology  
**University of Georgia**, Athens, GA.

**Academic Appointments**

---

- 2014-2017 **Assistant Professor**  
Department of Cell and Developmental Biology  
**Vanderbilt University School of Medicine**, Nashville, TN

**Employment:**

- 1998-2000 **Undergraduate Research Assistant**  
Department of Cell Biology, **The University of Georgia**, Athens, GA  
*Advisor: Dr. Jacek Gaertig*  
*Project: Characterizing sites of the post-translation modifications, poly-glycylation and poly-glutamylolation, on the C-termini of tubulin isoforms in *Tetrahymena thermophila*.*
- 1998 **Summer Undergraduate Research Fellow**  
Department of Avian Medicine, The University of Georgia, Athens, GA  
*Advisor: Dr. John Maurer*  
*Project: Identifying polymorphisms in the genes encoding p-pili in *E. coli* isolated from avian lungs.*

## Professional Organizations

---

The American Society for Cell Biology  
The American Heart Association

## Professional Activities

---

### Intramural

2016-present Member of the graduate student steering committee for CDB.  
2014-present Member of the following graduate student thesis committees  
Meredith Weck, CDB, *Advisor*: Dr. Matthew Tyska  
Annabelle Williams, CDB, *Advisor*: Dr. David Bader  
Alex Auner, Department of Physics, *Advisor*: Dr. Shane Hutson

### Extramural

2016 Reviewer and organizer for the Myosin, Kinesin, and Dynein poster sessions at the annual meeting of the American Society for Cell Biology.  
2009-Present Ad-hoc Referee for: *Journal of Cell Science*, *Molecular Biology of the Cell*, *Journal of Cell Biology*, *Developmental Cell*, *Biophysical Journal*, *PNAS*, *Nature Communications*, and *Plos One*.  
2013 Career Panel for Yale graduate students visting NIH  
2013 Career Panel for the PRAT Fellows at NIGMS  
2011 Presenter and Discussant- Single Cell Studies in Aging Research Workshop, National Institute of Aging, NIH

### Special awards or recognition

2016 12th Place, Nikon Small World Photomicrography Competition  
2014 20th Place, Nikon Small World Photomicrography Competition  
2013 5th Place, Olympus BioScapes International Imaging Competition  
2012 3rd Place, Nikon Small World Photomicrography Competition  
2012 Performance Award, NIGMS, NIH  
2011 Merton Bernfield Memorial Award for "Outstanding research performed by a scientist in training" from the American Society for Cell Biology  
2005-07, 14 Honorable Mention, Olympus BioScapes Imaging Competition  
2004, 09 Honorable Mention, Nikon Small World Photomicrography Competition  
1998 President's Award for "Best undergraduate oral presentation" from the American Society for Microbiology, Southeastern Branch  
1995 Eagle Scout Award, Boy Scouts of America

## Teaching Activities

---

2017 **CBIO 8313 - Introduction to Modern Biological Microscopy**  
- Co-director along side Dr. Irina Kaverina  
- Teaching lectures on topics spanning simple optical aberrations to super-resolution microscopy

- This is a semester long course required for all 2<sup>nd</sup> year CDB graduate students designed to teach them the theoretical and practical aspects of microscopy.
- 2016 **Bio Regulations- Cell Biology Section**
  - Gave two lectures on Cell Motility
  - BioReg is a semester long course which is required for all first year IGP graduate students at Vanderbilt and is designed to introduce them to a wide range of areas of biological research.
- 2016 and 2017 **CBIO 338 – Noble Prize Course**
  - Gave one lecture on Dr. Eric Betzig’s scientific work
  - Mentored one graduate student preparing her presentation on Dr. Betzig’s life
- 2016 **CBIO 8313 - Introduction to Modern Biological Microscopy**
  - Gave two lectures on 1) single molecule-based super-resolution microscopy and 2) traction force microscopy.
- 2015 **Bio Regulations- Cell Biology Section (see above)**
- 2015 **Quantitative Imaging: from Cells to Molecules- Cold Spring Harbor**
  - Gave the super-resolution lecture covering single molecule, structured light, and stimulated depletion based techniques.
  - This was a two week course organized by Hunter Elliott, Torsten Wittmann, and Jennifer Waters.
- 2015 **CBIO 8313 - Introduction to Modern Biological Microscopy**
  - Gave four lectures on 1) Confocal microscopy, 2) single molecule-based super-resolution microscopy, 3) structured light-based super-resolution microscopy and 4) traction force microscopy.
- 2015 **CBIO 338 – Noble Prize Course (see above)**
- 2014 **Bio Regulations- Cell Biology Section (see above)**
- 2013 **Physiology Course, Marine Biological Institute, Woods Hole, MA**
  - Teaching assistant for Dr. Jennifer Lippincott-Schwartz’s two week section
  - Responsible for developing potential cell biology projects for the students and then guiding them during course of the project that they chose.
  - Also assisted the students in preparing the presentation of their results.
- 2009 **Physiology Course, Marine Biological Institute, Woods Hole, MA (see above)**
- 2004 **An Issues Approach to Biology, Yale University, New Haven, CT.**
  - Gave 1 lecture a week covering the in depth science supporting the discussion of issues presented during class.
- 2003 **An Issues Approach to Biology (see above)**

#### Lab members supervised in research

Nilay Taneja (VISP graduate student) 2015-present  
 Adian Fenix (IGP graduate student) 2014-present  
 Abigail Neinenger (IGP graduate student) 2017-present  
 James Cooper (undergraduate student) 2016-present

John Lewis (undergraduate student) 2014  
Deeya Patel (high school student) 2017

### **Graduate students supervised during rotations**

Colbie Chinowsky- 2017  
Veronica Farmer- 2016  
Andrea Cuentas Condori- 2015

### **Research Program**

---

#### **Extramural Support to D.T. Burnette**

##### **Vanderbilt University**

- 2017-2019 Scientist Development Grant from the AHA (Burnette PI)  
“Mechanisms of sarcomere assembly in healthy and diseased heart muscle cells”  
\$77,000/year for 3 years  
The major goal of this project is to characterize how the contractile core of the sarcomere (i.e., A-band) assembles in control cardiomyocytes and in those harboring disease causing mutations within  $\beta$  myosin II.
- 2017-2022 R35 Maximizing Investigators' Research Award (MIRA) to be reviewed by the MIRA study section (NIGMS) in March 2017. (Burnette PI)  
“Decoding the roles of myosin II isoforms within living cells”  
\$250,000/year for 5 years  
The MIRA is designed to fund every project in the lab, which falls under the mission of NIGMS. As such, the goals of this application are to define how different isoforms of myosin II drive cell migration, cell division, and muscle development.

##### **National Institutes of Health (post-doc)**

- 2009-2013 Pharmacology Research Associate (PRAT) postdoctoral Fellowship from NIGMS, NIH

##### **Internal Support to D.T. Burnette**

2014-Present Start-up funds from Vanderbilt University.

- 2015-2016 GI Cancer Career Development Award, GI SPORE of Vanderbilt-Ingram Cancer Center  
\$50,000  
The major goal of this project was to determine the role of Heat shock protein 90 in the formation of contractile systems in colorectal cancer cells.

##### **Support to Burnette Lab Members**

###### **External**

- 2017-2019 NRSA (F31) pre-doctoral fellowship from NHLBI/NIH to Aidan Fenix  
2016-2018 Pre-doctoral fellowship from AHA to Aidan Fenix

2015 American Society for Cell Biology Travel Fellowship to Nilay Taneja  
2014 American Society for Cell Biology Travel Fellowship to Aidan Fenix

### **Internal**

2017-2019 Program in Developmental Biology training grant to Abigail Neinenger  
2014-2016 Vanderbilt International Scholars Program fellowship to Nilay Taneja.  
2014-2015 Molecular Biophysics training grant to Aidan Fenix

## **Publications and Presentations**

---

### **Articles in refereed journals:**

Balikov DA, Crowder SW, Boire TC, Lee JB, Gupta MK, Fenix AM, Lewis HN, Ambrose CM, Short PA, Kim CS, **Burnette DT**, Reilly MA, Murthy NS, Kang ML, Kim WS, Sung HJ. (2017) Tunable Surface Repellency Maintains Stemness and Redox Capacity of Human Mesenchymal Stem Cells. **ACS Appl Mater Interfaces**. Jun 16. doi: 10.1021/acsami.7b06103.

Taneja N, Fenix AM, Rathbun L, Millis BA, Tyska MJ, Hehnlly H, **Burnette DT**. (2016) Focal adhesions control cleavage furrow shape and spindle tilt during mitosis. **Scientific Reports**. Jul 19;6:29846. doi: 10.1038/srep29846.

Fenix AM, Taneja N, Buttler CA, Lewis J, Van Engelenburg SB, Ohi R, and **Burnette DT**. (2016) Expansion and concatenation of non-muscle myosin IIA filaments drive cellular contractile system formation during interphase and mitosis. **Molecular Biology of the Cell**. mbc.E15-10-0725; First Published on March 9, 2016.

Sengupta P, Satpute-Krishnan P, Seo AY, **Burnette DT**, Patterson GH, Lippincott-Schwartz J. (2015) ER trapping reveals Golgi enzymes continually revisit the ER through a recycling pathway that controls Golgi organization. **Proc Natl Acad Sci U S A**. 2015 Dec 8;112(49):E6752-61.

Battle C, Ott CM, **Burnette DT**, Lippincott-Schwartz J, Schmidta CF. (2015) Primary cilia bend and pivot in response to both intracellular contractility and extracellular shear forces. **Proc Natl Acad Sci U S A**. Feb 3;112(5):1410-5.

**Burnette DT**, Shao L, Ott C, Pasapera AM, Fischer RS, Baird MA, Davidson MW, Betzig E, Lippincott-Schwartz J. (2014) A contractile and counterbalancing adhesion system controls the 3D shape of crawling cells. **Journal of Cell Biology**, Apr 14;205(1):83-96.

**Burnette DT**, Sengupta P, Dai Y, Lippincott-Schwartz J, Kachar B. (2012) Bleaching/blinking assisted localization microscopy for superresolution imaging using standard fluorescent molecules. **Proc Natl Acad Sci U S A**. 108(52):21081-6.

- Cox S, Rosten E, Monypenny J, Jovanovic-Talisman T, **Burnette DT**, Lippincott-Schwartz J, Jones GE and Heintzmann R. (2011) Bayesian localisation microscopy reveals nanoscale podosome dynamics. *Nature Methods*. 9(2):195-200.
- Burnette DT**, Manley S, Sengupta P, Sougrat R, Davidson MW, Kachar B, Lippincott-Schwartz J. (2011) A role for actin arcs in the leading edge advance of migrating cells. *Nature Cell Biology*. 13(4):371-81.
- Burnette DT**, Ji L, Schaefer AW, Medeiros NA, Danuser G, Forscher P. (2008) Actomyosin II Arcs Coordinate Microtubule Transport and Bundling in the Growth Cone Neck. *Developmental Cell*. 15(1):163-9.
- Burnette DT**, Schaefer AW, Ji L, Danuser G, and Forscher P. (2007) Filopodial actin bundles are not necessary for microtubule advance into the peripheral domain of Aplysia neuronal growth cones. *Nature Cell Biology*. 9(12):1360-9.
- Medeiros NA, **Burnette DT**, Forscher P. (2006) Myosin II functions in actin-bundle turnover in neuronal growth cones. *Nature Cell Biology*. 8(3):215-26.
- Qin H\*, **Burnette DT\***, Bae YK, Forscher P, Barr MM, Rosenbaum JL. (2005) Intraflagellar transport is required for the vectorial movement of TRPV channels in the ciliary membrane. *Current Biology*. 5(18):1695-9.  
\* denotes equal contributions
- Redeler V, Levilliers N, **Burnette D**, Geartig J, Vinolo E, Rossier J, Jaillard D, Bre MH. (2005) Mutations of tubulin glycylation sites reveal a crosstalk between the C-terminus of  $\alpha$ - and  $\beta$ -tubulin and affect the ciliary matrix of Tetrahymena. *Journal of Biological Chemistry*. 280(1):596-606.
- Matroule JY, Lam H, **Burnette DT**, Jacobs-Wagner C. (2004) Cytokinesis checkpoint during development: Rapid pole-to-pole shuttling of a signaling protein by localized kinase and phosphatase in Caulobacter. *Cell*. 118(5):579-90.
- Zhang XF\*, Schaefer AW\*, **Burnette DT\***, Schoonderwoert VT, Forscher P. (2003) Rho dependent contractile responses in the neuronal growth cone are independent of classical peripheral retrograde actin flow. *Neuron*. 40:931-944.  
\* denotes equal contributions
- Xia L, Hai B, Gao Y, **Burnette D**, Thazhath R, Duan J, Bre MH, Levilliers N, Gorovsky MA, Gaertig J. (2000) Polyglycylation of tubulin is essential and affects cell motility and division in Tetrahymena thermophila. *Journal of Cell Biology*. 149(5):1097-106.

## **Invited Reviews**

Fenix AM, **Burnette DT**. (2015) A small part of myosin IIB takes on a big role in cell polarity. *Journal of Cell Biology*. 2015 Apr 13;209(1):11-2.

Millis BA, **Burnette DT**, Lippincott-Schwartz J, Kachar B. (2013) Superresolution imaging with standard fluorescent probes. *Curr Protoc Cell Biol*. 2013 Sep 24

## **Burnette- Recent Invited Talks**

---

- 2017 **CelluART Conference**, Toledo, OH
- 2016 **SUNY Upstate Medical University**, Department of Cell and Developmental Biology, Syracuse, NY
- 2016 **University of Tennessee**, Department of Biochemistry, Cellular, and Molecular Biology, Knoxville, TN
- 2016 **Marquette University**, Biological Sciences, Milwaukee, WI
- 2015 **Cold Spring Harbor Laboratories**, QICM, Cold Spring Harbor, NY
- 2014 **University of Georgia**, Cell Biology Department, Athens, GA
- 2014 **Gordon Conference on Adhesion Signaling**, Bates College, Lewiston, ME
- 2014 **NIGMS**, Pharmacological Research Fellows Training Program, Bethesda, MD
- 2013 **American Society for Cell Biology**, Mitosis and Meiosis Microsymposium, Annual Meeting, San Francisco, CA
- 2013 **Duke University Medical School**, Department of Cell Biology, Durham, NC
- 2013 **Vanderbilt University School of Medicine**, Department of Cell and Developmental Biology, Nashville, TN
- 2013 **Colorado State University**, Department of Biochemistry and Molecular Biology, Ft. Collins, CO
- 2012 **Indiana University**, Department of Biology, Bloomington, IN
- 2012 **Washington University School of Medicine**, Department of Cell Biology and Physiology, St Louis, MO
- 2012 **NIH**, Quantitative biology at the single-cell level symposium, Bethesda, MD
- 2012 **Johns Hopkins University**, Translational Tissue Engineering Center (TTEC), Department of Biomedical Engineering, Baltimore, MD
- 2012 **NIH**, National Heart Lung and Blood Institute, Bethesda, MD
- 2012 **Ottawa Hospital Research Institute**, Ottawa, Ontario, Canada
- 2012 **University of Maryland**, Cell Dynamics Symposium, College Park, MD
- 2011 **American Society for Cell Biology**, Bioengineering and Mechanobiology Minisymposium, Annual Meeting, Denver, CO
- 2011 **National Institute of Aging**, Single Cell Studies in Aging Research Workshop, NIH, Bethesda, MD
- 2011 **National Institute of Neurological Disorders and Stroke**, Cellular and Developmental Neurobiology Section, , NIH, Bethesda, MD
- 2011 **Dickinson College**, Biology Department, Carlisle, PA
- 2011 **Pittsburg Conference and Expo (PITTCO)**, Atlanta, GA

## **Research Presentations by Burnette Lab Members**

---

- 2016 **Nilay Taneja:** Invited Talk, The American Society of Cell Biology Annual Meeting
- 2016 **Aidan Fenix and Nilay Taneja:** Posters at the American Society of Cell Biology Annual Meeting
- 2015 **Aidan Fenix and Nilay Taneja:** Posters at the American Society of Cell Biology Annual Meeting
- 2014 **Aidan Fenix:** Poster at the American Society of Cell Biology Annual Meeting