

# Lucy Erin O'Brien

## Curriculum vitae

- I. **Department of Molecular and Cellular Physiology** www.stemdynamics.org  
**Stanford University School of Medicine** lucye@stanford.edu  
PERSONAL INFORMATION 279 Campus Drive, Beckman B141 415.260.6579 (cell)  
Stanford, California USA 94305-5345
- II. **Assistant Professor** Mar 1 2013 - Feb 28 2017  
PROFESSIONAL APPOINTMENTS Stanford University School of Medicine, Stanford, California (present appointment)  
*Department of Molecular and Cellular Physiology*  
*Member:*  
Stanford Institute for Stem Cell Biology and Regenerative Medicine  
Stanford Cancer Institute  
Bio-X  
  
Stanford University School of Medicine, Stanford, California  
*Department of Molecular and Cellular Physiology*
- Staff Research Associate** 2010 - Jan 31 2013  
University of California, Berkeley, California  
*David Bilder Lab, Department of Molecular and Cellular Biology*
- Postdoctoral Fellow** 2005 - 2009  
University of California, Berkeley, California  
*David Bilder Lab, Department of Molecular and Cellular Biology*
- Postdoctoral Fellow** 2002  
University of California, San Francisco, California  
*Keith Mostov Lab, Department of Anatomy*
- III. Expedition leader and instructor, wilderness skiing and kayaking 2002 - 2005  
OTHER EMPLOYMENT Field researcher, U.S. Fish & Wildlife Service 1992 - 1993
- IV. **Ph.D. in Biomedical Sciences** 1993 - 2001  
EDUCATION University of California, San Francisco, California  
*Keith Mostov Lab, Department of Anatomy*
- B.A. in Biochemistry, magna cum laude** with high honors 1988 - 1992  
Harvard University, Cambridge, Massachusetts
- V. **16 total, 1 submitted**  
SCHOLARLY PUBLICATIONS
- 16 Liang, J., Balachandra, S., & **O'Brien, L.E.** (submitted, 2016) Homeostatic control of adult organ size through apoptosis-coupled stem cell divisions.
- 15 **O'Brien, L.E.** (2013) Invited Preview - Setting boundaries with stem cells: Regional specificity in the *Drosophila* midgut. *Cell Stem Cell* **13**:375-376.

- 14 **O'Brien, L.E.** & Bilder, D. (2013) Beyond the Niche: Tissue-level coordination of stem cell dynamics. *Annu. Rev. Cell Dev. Biol.* **29**:107-136.
- 13 **O'Brien, L.E.**, Soliman, S., Li, X., & Bilder, D. (2011) Altered modes of stem cell division drive adaptive intestinal growth. *Cell* **147**:603-614.
- Highlighted in:*
- Sarkar, A. & Hochedlinger, K. (2011) A gutsy way to grow: Intestinal stem cells as nutrient sensors. *Cell* **147**:487-489.
  - Baumann, K. (2011) Stem cells: Having the guts to grow. *Nat. Rev. Mol. Cell Biol.*, **12**:768-769.
  - Faculty of 1000, 03 Nov 2011. F1000.com/13357359.
  - Hershon, B. "How to grow a gut." *AAAS Science Podcast*. Nov 17, 2011.
  - Balintfy, J. "Intestinal stem cells respond to food by supersizing the gut." *NIH Radio Interview*. Nov 29, 2011
- 12 Kim, M., **O'Brien, L.E.**, Kwon, S.H., & Mostov, K.E. (2010) STAT1 is required for redifferentiation during Madin-Darby canine kidney tubulogenesis. *Mol. Biol. Cell* **21**:3926-3933.
- 11 **O'Brien, L.E.** & Mostov, K.E. (2006) Using three-dimensional cell culture to examine Rho-protein function during epithelial morphogenesis. *Meth. Enzymol.* **406**:676-691.
- 10 Yu, W., Datta, A., Leroy, P., **O'Brien, L.E.**, Mak, G., Jou, T.S., Matlin, K., Mostov, K.E., & Zegers, M.M.P. (2005)  $\beta$ 1-integrin orients epithelial polarity via Rac1 and laminin. *Mol. Biol. Cell* **16**:433-445.
- 9 Mostov, K.E., Brakeman, P., Datta, A., Gassama, A., Katz, L., Kim, M., Leroy, P., Levin, M., Liu, K., Martin, F., **O'Brien, L.E.**, Verges, M., Su, T., Tang, K., Tanimizu, N., Yamaji, T., & Yu, W. (2005) Formation of multicellular epithelial structures. *Novartis Found. Symp.* **269**:193-200.
- 8 **O'Brien, L.E.**, Tang, K., Kats, E.S., Schutz-Geschwender, A., Lipschutz, J.H., & Mostov, K.E. (2004) ERK and MMPs sequentially regulate distinct stages of epithelial tubule development. *Dev. Cell* **7**:21-32.
- *Highlighted in:* Rosario, M. & Birchmeier, W. (2004) Making tubes: Step by step. *Dev. Cell* **7**:3-5.
- 7 Zegers, M.M.P., **O'Brien, L.E.**, Yu, W., Datta, A., & Mostov, K.E. (2003) Epithelial polarity and tubulogenesis in vitro. *Trends Cell Biol.* **13**:169-176.
- 6 Yu, W., **O'Brien, L.E.**, Wang, F., Bourne, H., Mostov, K.E., & Zegers, M.M.P. (2003) Hepatocyte growth factor switches orientation of polarity and mode of movement during morphogenesis of multicellular epithelial structures. *Mol. Biol. Cell* **14**:748-763.
- 5 **O'Brien, L.E.**, Zegers, M.M.P., & Mostov, K.E. (2002) Opinion: Building epithelial architecture: Insights from three-dimensional culture models. *Nat. Rev. Mol. Cell Biol.* **3**:531-537.
- 4 **O'Brien, L.E.**, Jou, T.S., Hansen, S.H., Pollack, A.L., Zhang, Q., Yurchenco, P.D. & Mostov, K.E. (2001) Rac1 orients epithelial apical polarity through effects on basolateral laminin assembly. *Nature Cell Biol.* **3**:831-838.
- *Featured in:* Alberts, B. *et al.* (2007) Chapter 19: Cell-cell junctions and the basal lamina govern apico-basal polarity in epithelia. *Molecular Biology of the Cell*, 5th ed., p. 1155
- 3 Lipschutz J.H., **O'Brien L.E.**, Altschuler Y., Avrahami D., Nguyen Y., Tang K., & Mostov K.E. (2001) Analysis of membrane traffic in polarized epithelial cells. *Curr.*

*Protoc. Cell Biol.* **15**:Unit 15.5.

- 2 **O'Brien, L.E.** & Mostov, K.E. (2001) Getting from here to there. *Nature Cell Biol.* **3**:E116.
- 1 Lipschutz, J.H., Guo, W., **O'Brien, L.E.**, Nguyen, Y.H., Novick, P. & Mostov, K. E. (2000) Exocyst is involved in cystogenesis and tubulogenesis and acts by modulating synthesis and delivery of basolateral plasma membrane and secretory proteins. *Mol. Biol. Cell* **11**:4259-4275.

## VI. Invited Seminars

PRESENTATIONS	University of Calgary Alberta, Canada	<i>scheduled May 2017</i>
	National Institute of Biological Sciences Beijing, China	Aug 2016
	University of Glasgow Beatson Institute	Sep 2015
	Imperial College London MRC Clinical Sciences Centre	Sep 2015
	Buck Institute for Research on Aging	Apr 2015
	University of Pennsylvania Department of Gastroenterology	Mar 2015
	USC Keck School of Medicine Department of Biochemistry and Molecular Biology	Mar 2015
	<i>Eleven faculty candidate seminars, January-April 2012:</i>	
	University of California, San Francisco Cardiovascular Research Institute	Apr 2012
	Oregon Health Sciences University Center for Spatial Systems Biomedicine	Apr 2012
	Stanford University Department of Molecular and Cellular Physiology and Department of Developmental Biology	Mar 2012
	University of California, Berkeley Department of Molecular and Cellular Biology	Mar 2012
	University of Colorado, Denver Department of Pediatrics	Feb 2012
	University of California, Berkeley Department of Nutritional Science	Feb 2012
	University of California, San Diego Dept of Cell and Developmental Biology	Feb 2012
	Princeton University Department of Molecular Biology	Jan 2012
	University of California, Santa Barbara Dept of Molecular, Cellular, and Developmental Biology	Jan 2012
	University of Michigan Department of Cell and Developmental Biology	Jan 2012

## Talks at International and National Meetings

Gordon Conference on Tissue Niches & Resident Stem Cells in Adult Epithelia Hong Kong, China	Aug 2016
Cold Spring Harbor Meeting on Stem Cell Biology Cold Spring Harbor, New York	Oct 2015
European Drosophila Research Conference Heidelberg, Germany	Sep 2015
Society for Developmental Biology Annual Meeting Seattle, Washington • <i>Plenary speaker</i>	Jul 2014
International Congress of Endocrinology Annual Meeting San Diego, California	Jun 2014
FASEB Experimental Biology Annual Meeting Chicago, Illinois	Apr 2014
American Society for Cell Biology Annual Meeting Philadelphia, Pennsylvania	Dec 2010
Life Sciences Research Foundation Annual Meeting Baltimore, Maryland	Oct 2010
Santa Cruz Developmental Biology Meeting Santa Cruz, California	Jul 2010
Cold Spring Harbor Meeting on Stem Cell Biology Cold Spring Harbor, New York	Sep 2009
American Society for Cell Biology Annual Meeting San Francisco, California	Dec 2002

**Talks at Regional Meetings**

West Coast Salt and Water Club Meeting Avila Beach, California Mar 2015  
 • Keynote speaker

**Talks in Campus Forums**

Biochemistry Department, Wednesday lunch club Aug 2016  
 Collective Behavior Interest Group May 2016  
 Stanford Center for Systems Biology Lunch Series Jan 2016  
 Regenerative Medicine@Stanford (ReMS), STEMREM250 Apr 2015, Mar 2013  
 Stanford Institute for Stem Cell Biology, Annual Retreat Nov 2013  
 Dev Bio Department, Dev Bio Data Discussion (3D) Oct 2013  
 Biology Department, Think 'n Drink Jun 2013  
 MCP Department, Annual Retreat Sep 2016, Oct 2012

VII. Gabilan Junior Faculty Fellow, Stanford University 2013  
 HONORS FASEB Gastrointestinal XIV Conference, Distinguished Poster Award 2011  
 & AWARDS International Society for Stem Cell Research Annual Meeting, Best Poster Award 2010  
 Life Sciences Research Foundation, Genentech Foundation Fellow 2007-2009  
 American Heart Association Postdoctoral Fellowship 2006  
 American Heart Association Predoctoral Fellowship 1998-2001  
 American Society for Cell Biology, Worthington Travel Award 1999  
 Department of Defense Science and Engineering Predoctoral Fellowship 1993-1996  
 Harvard College Detur Prize 1989  
 International Science and Engineering Fair, First Place Category Award 1988  
 Westinghouse (*now Intel*) Science Talent Search, National Scholarship Winner 1988

VIII. **Invited Journal Referee**EDITORIAL  
SERVICE

*American Journal of Physiology*  
*Cell Stem Cell*  
*Development*  
*Developmental Biology*  
*Developmental Cell*  
*Journal of Cell Science*  
*Journal of Physiology*  
*Molecular and Cellular Biology*  
*PLOS Biology*  
*PLOS Genetics*  
*PLOS ONE*  
*Science*  
*Stem Cell Reports*

IX.  
GRANTS**Current Funding**

- Stanford Discovery Innovation Fund in the Basic Biomedical Sciences NIH/NIGMS  
*O'Brien, PI* 07/01/2016 - 6/30/2018  
*Deconstructing Notch-based fate decisions by combinatorial culture of stem and daughter cells*  
 This award supports the establishment of an *in vitro* culture system to investigate Notch activation and fate decisions in primary midgut stem cells.
- 1R01 GM116100 NIH/NIGMS *O'Brien, PI* 04/01/2016 - 03/31/2021  
*Dynamic mechanisms of fate control during epithelial organ renewal*  
 The goal of this award is to investigate the mechanisms that decide between symmetric and asymmetric fate outcomes following stem cell division.
- 1R03 DK104027 NIH/NIDDK *O'Brien, PI* 01/01/2015 - 12/31/2016  
*Mechano-sensitive control of intestinal stem cell divisions in Drosophila*  
 The goal of this award is to identify mechano-sensitive mechanisms controlling intestinal epithelial renewal.
- Beckman Technology Innovation Mini-Grant *O'Brien, PI* 04/01/2014 - [no end date]  
*Force sensing in vivo: Measuring real-time tension forces in the Drosophila intestinal epithelium*  
 The purpose of this mini-grant is to support the implementation of FLIM technology for real time FRET tension sensor measurements in the Drosophila gut epithelium.

**Completed Funding**

- 1K01 DK083505 NIH/NIDDK *O'Brien, PI* 02/01/2010 - 01/31/2015  
*Nutrient regulation of stem cell mediated intestinal renewal in Drosophila*  
 The goals of this award were to determine the cellular and molecular mechanisms controlling nutrient-stimulated intestinal adaptation in Drosophila, and to foster the scientific training and independence of the PI.
- Center for Biological Imaging at Stanford Seed Grant *O'Brien, PI* 08/15/2013 - 08/14/2014  
*High resolution imaging of intestinal stem cell divisions in live adult Drosophila*  
 The purpose of this award was to develop real time, in vivo imaging of stem cell divisions in the adult Drosophila midgut.

X.  
TRAINEES

- XinXin Du, Ph.D. (joint with Riedel-Kruse, BioE) Apr 2013-date  
 Stanford Dean's Fellowship 2013-14  
 NIH F32 Kirschstein National Research Service Award 2015-17  
 Platform talk, US Drosophila Research Conference, Orlando Florida Jul 2016

Minisymposium talk, American Society for Cell Biology Annual Meeting  
San Francisco *scheduled Dec 2016*

Jackson Liang (MCP Grad Program) Jul 2013-date  
NSF Graduate Research Fellowship 2015-18  
Poster Prize, MCP Annual Retreat 2014  
Platform talk, European Drosophila Research Conference, Heidelberg Germany Sep 2015  
Platform talk, International Society for Stem Cell Research, San Francisco Jun 2016  
Platform talk, US Drosophila Research Conference, Orlando Florida Jul 2016  
Poster presentation, Gordon Conference on Epithelial Stem Cells, Hong Kong Aug 2016  
Minisymposium talk, American Society for Cell Biology Annual Meeting  
San Francisco *scheduled Dec 2016*

Leslie Jaramillo Koyama (Dev Bio Grad Program) Jun 2014-date  
Oral presentation, Bay Area Colossal Fly Meeting, Stanford Oct 14

Paola Moreno-Roman (Biology Grad Program) Jul 2013-date  
Bio-X Bates Fellowship 2014-17  
Oral presentation, Bay Area Colossal Fly Meeting, Stanford Mar 16

Erin Sanders (Dev Bio Grad Program) Jun 2014-date  
NSF Graduate Research Fellowship 2016-19

XI.  
CLASSROOM  
TEACHING

**BIOS-200** Foundations in Experimental Biology *6 units*  
• Discussion Leader Fall 2014, *scheduled Fall 2016*  
31 students (Total over 3 10-week sessions), 6 hours

**BIO-214/BIOC-224/MCP-221** Advanced Cell Biology *4 units*  
• Section Leader Winter 2016  
9 students, 2 hours

**MCP 207** MCP Bootcamp *3 units*  
• Course Co-organizer (with Feng) & Instructor Sep 26-30, 2016  
3 students, 1 week

XII.  
UNIVERSITY  
SERVICE

**Qualifying Exam and Thesis Committees**

Theresa Logan-Garabisch	Neuroscience
Ellen Rim	Dev Bio
Teni Anbarchian	Dev Bio
Susanna Brantley	Dev Bio
Mary Mirvis	MCP
Kevin (KC) Hart	Biology
Natalie Chavez	Biology
Phillip Miller	MCP

**Dissertation Defenses, Committee Chair**

Blair Benham-Pyle	Cancer Bio
Erin Turk	Biology
Emily Abrash	Biology
Dan Van de Mark	Biology
Arjun Adhikari	Chem E

**Graduate Recruitment Activities**

Graduate student interviews	Mar 2016, Feb 2014, Mar 2013
Oral presentations to prospective MCP students	Mar 2016, Feb 2014
MCP graduate recruitment dinner - hosted at home	Mar 2016
Poster presentation, Biosciences Recruitment Poster Session	Feb 2014

**Other Service**

Cell and Molecular Biology Training Grant	Jul 2013-date
Ethics Training - Discussion leader	May 2015
CMB Symposium - Poster judge	May 2014
Henzi-Gabor Postdoctoral Travel Grant Committee	Sep 2016-date

XIII.  
SERVICE  
TO THE  
DISCIPLINE

**Membership**

American Society for Cell Biology	1994-date
Women in Cell Biology Mentoring Theater	12/5/2013
ASCB Membership Committee	2006-2012
Genetics Society of America	2005-date
Annual Drosophila Conference - Session chair	Jul 2016
International Society for Stem Cell Research	2010-date
Junior Investigators' Committee	2016-date
Annual Meeting - Abstract selection committee	2016
Faculty of 1000, Stem Cells and Regeneration Section	2016-date

**Grant Reviewer**

Medical Research Council (United Kingdom), Program in Gut Signaling and Metabolism

**Other Professional Service**

Association of Women in Science - Career Discussion Panel	5/15/14
Neuwrite West's "Brains and Bourbon" Science Radio Show	7/25/14