Blair Benham-Pyle, PhD (she/her/hers)

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SNAPSHOT *I am an interdisciplinary scientist trained in molecular, cellular, and developmental biology. I use planaria to study regeneration, stem cell regulation, and behavior. I aim to lead an innovative and accomplished research program that illuminates how diverse cell types across an animal coordinate tissue function and prevent disease progression during injury repair.*

ACADEMIC TRAINING

2016 **Stanford University,** Stanford, CA
PhD, Cancer Biology
Mechanical strain induces E-cadherin-dependent Yap1 and β-catenin activation to drive cell cycle re-entry
Mentor: Professor W. James Nelson

2010 **Yale University,** New Haven, CT
B.S./M.S. Molecular Biophysics and Biochemistry, *cum laude*
Endophytic analysis of tropical plants yields a platform for novel drug discovery
Mentors: Professor Scott Strobel and Professor Michael Cappello

CAREER DEVELOPMENT AWARDS

2017 – 2020 Jane Coffin Childs Memorial Fund Postdoctoral Fellowship Recipient
2015 – 2016 Stanford University Gerald J. Lieberman Fellowship Recipient
2012 – 2015 NSF Graduate Research Fellowship Award Recipient
2010 – 2011 Luce Scholarship Award Recipient
2008 – 2009 Beckman Scholarship Award Recipient

RESEARCH POSITIONS

2016 – **Postdoctoral Associate,** Stowers Institute for Medical Research, October 2016 – Present
Member of the Alejandro Alvarado Sanchez Laboratory; funded by the Jane Coffin Childs Postdoctoral Fellowship; discovering mechanisms that integrate size, behavior, and regenerative capacity.

2011-2016 **Graduate Researcher,** Stanford University, September 2011 – August 2016
Member of the W. James Nelson Laboratory; collaborated with Beth Pruitt Laboratory; funded by the NSFGRFP and Stanford Lieberman Fellowship; investigated mechanical signaling by cell-cell adhesions regulating cell cycle progression.

2010-2011 **Visiting Scholar,** IDM, Fudan University, Shanghai, China, July 2010 – June 2011
Member of the Sun Ling Laboratory and working in collaboration with Dr. Xu Tian; sponsored by the Luce Scholars Program; investigated the effect of pregnancy and lactation on mouse body composition and metabolism.

2008-2010 **Student Researcher,** Yale University, May 2008 – June 2010
Member of the Scott Strobel and Michael Cappello Laboratory groups; funded by the Beckman Scholars Program; pursued a project analyzing bioactive natural products of endophytic fungi and bacteria isolated from Amazonian rainforest plantlife. Results were presented in Master's Thesis and co-authored manuscript.

2005 **Research Assistant,** California Institute of Technology, Summer 2005
Assisted a graduate student in Dr. David Tirrell's laboratory to analyze the stability of fluorinated amino acids in leucine zipper proteins.

1st AUTHOR PUBLICATIONS

Benham-Pyle BW, Brewster CE, Kent AM, Mann FG, Chen S, Scott AR, Box AR, Sánchez Alvarado A,Identification of rare transient somatic cell states induced by injury and required for whole-body regeneration. *BioRxiv* (2020). *In Revision for peer-reviewed publication..*

Arnold CP*, **Benham-Pyle BW***, Lange JJ, Wood CJ, Sánchez Alvarado A, Wnt and TGFβ coordinate growth and patterning to regulate size-dependent behavior. *Nature* **7**, 1-5 (2019) * Authors contributed equally to the work

Highlighted in: Holstein, TW. What makes Flatworms go to pieces. *Nature News and Views* (2019)

Benham-Pyle BW, Sim JY, Hart KC, Pruitt BL, Nelson WJ. Increasing β-catenin/Wnt3A activity levels drive mechanical strain-induced cell cycle progression through mitosis. *eLife* 19799 (2016)

Tan J*, **Benham-Pyle BW***, Weis W, Nelson WJ. Regulation of cadherin-catenin biology by mechanical force and phosphorylation in S. Suzuki, S. Hirano *The Cadherin Superfamily* (2016) * Authors contributed equally to the work

Benham-Pyle BW, Pruitt BL, Nelson WJ. Mechanical strain induces E-cadherin-dependent Yap1 and β-catenin activation to drive cell cycle entry. *Science* **348**, 1024-1027 (2015).

Highlighted In: Baumann, K, Mechanotransduction: Adhesion forces promote transcription, *Nat. Rev. Mol. Cell Biol.* **16**, 390-391 (2015); F1000 Recommended.

CO-AUTHOR PUBLICATIONS

Arnold CP, **Benham-Pyle BW**, Sánchez Alvarado A. Planarian Fission Induction Protocol. *Protocol Exchange* DOI: 10.21203/rs.2.10324/v1 (2019)

Humphries D, Mosites M, Otchere J, Twum A, Woo L, **Benham-Pyle BW**, Jones-Sanpei H,Harrison LM, Bungiro RD, Wilson M, Bosompem K, Cappello M, Epidemiology of hookworm infection in Kintampo, Ghana: risk factors for infection and high rate of albendazole treatment failure, *Am J Trop Med Hyg* **84**, 792-800 (2011).

ACADEMIC SERVICE

2020 – **American Society for Cell Biology Public Policy Committee**, Associate Member

2018 – **Stowers Institute for Medical Research Crossroads Committee,**
Postdoctoral Chair, September 2019 –
General Member, May 2018 – August 2019

2017 **Developmental Biology Gordon Research Seminar,** Co-Chair

2015 – 2016 **Stanford Cancer Biology Graduate Admission Committee,** Member

2013 – 2016 **Stanford University Graduate Life Office**,
Head Community Associate, Rains Houses, August 2015 – August 2016
Community Associate Financial Officer, Rains Houses, June 2014 – August 2015
Neighborhood Community Associate, Rains Houses, September 2013 – June 2014

2014 – 2015 **Biosciences Committee for Graduate Admissions and Policy,** Member

2012 – 2015 **Stanford Biosciences Student Association,**
President, May 2014 – July 2015
Financial Officer, May 2013 – May 2014
NSF Fellowship Mentor, September 2012 – 2015

2013 **Stanford Cancer Biology Program**, NSFGRFP Mentorship Program Coordinator

2009 – 2010 **Yale University,** First-Year Counselor, Davenport College

2008 – 2010 **Yale Bioethics Society**, Founding Member, Sept. 2008 – May 2010, Troubadour 2009 -2010

SOCIETY MEMBERSHIPS

2019 – Society for Developmental Biology

2012 – American Society for Cell Biology

TEACHING/OUTREACH

2017 – **Shawnee Mission High Schools,** Visiting Lecturer, Introduction to Biotechnology
2019 **BIO711: Evolution and Model Systems**, Lecturer, Stowers Institute Graduate School (GSSIMR)
2015 **BIO 129A: Cellular Dynamics I,** Teaching Assistant, Stanford University
2014 **BIO 129A: Cellular Dynamics I**, Teaching Assistant, Stanford University
2013 – 2014 **Stanford Institutes of Medicine Summer Research Program**, Lecturer
2013 **CBIO 101: Introduction to Cancer Biology**, Teaching Assistant, Stanford University
2011 – 2012 **Foundation for a College Education**, Tutor/Mentor
2011 – 2013 **Stanford ESP: SPLASH!** Teacher

MENTORING

2019 – **Carolyn Brewster**
Bioinformatics Specialist, December 2019 – Present
M.S. Bioinformatics Intern, University of Oregon, January 2019 – December 2019

2019 – **Aubrey Kent**
PhD Student, July 2019 – Present
Rotation Student, Spring 2019

SELECTED ADDITIONAL AWARDS

2021 Intersections Science Fellow
2019 Best Oral Presentation, Stowers Institute Young Investigator Science Retreat
2017 Runner-Up Best Poster Presentation, Stowers Institute Young Investigator Science Retreat
2015 Stanford School of Medicine OGE Student Award for Excellence in Service to Graduate Students
2015 Stanford School of Medicine OGE Travel Grant Award, $1000
2014 Stanford School of Medicine OGE Travel Grant Award, $1000
2006 Mounds Park Academy High School Valedictorian
2006 KARE 11 News Academic All Star
2005 Lois E. Williams Chemistry Award
2005 WPI Science and Mathematics Award

ORAL CONFERENCE PRESENTATIONS

2020 **B. Benham-Pyle**, Rare and transient somatic cell states are induced by injury and required for whole body regeneration. Selected from abstracts and presented at the Society for Developmental Biology 79th Annual Meeting, Virtual Meeting, July 9-16.

2019 **B. Benham-Pyle**, A single-cell reconstruction of planarian regeneration identifies wound-induced transcriptional states required for Tissue Repair. Selected from abstracts and presented at 2019 American Society for Cell Biology Annual Meeting, Washington, DC, December 7-11.

2019 **B. Benham-Pyle**, A single-cell reconstruction of planarian regeneration identifies wound-induced transcriptional states required for tissue repair. Stowers Institute Young Investigator Science Retreat, Kansas City, MO, September 5-6. *Winner Best Oral Presentation Award.*

2019 **B. Benham-Pyle**, A single-cell reconstruction of planarian regeneration. Selected from Gordon Research Seminar: Developmental Biology talks and presented at the Gordon Research Conference: Developmental Biology, Mount Holyoke, South Hadley MA, June 16-20.

2018 **C. Arnold and B. Benham-Pyle**, Study of planarian fission identifies polarity signaling as a link between size-scaling and size-dependent behavior. Selected from abstracts and presented at 2018 American Society for Cell Biology Annual Meeting, San Diego CA, December 8-12.

2018 **C. Arnold and B. Benham-Pyle**, Planarian fission reveals a role of polarity signaling in regulation of animal behavior. Selected from abstracts and presented at the 2018 International Planaria Meeting, Madison WI, July 16-20.

2016 **B. Benham-Pyle**, Increasing β-catenin/Wnt3A activity levels drive mechanical strain-induced cell cycle progression through mitosis. Selected from abstracts and presented at the 2016 American Society for Cell Biology Annual Meeting, San Francisco CA, December 3-7.

2015 **B. Benham-Pyle**, Mechanical strain drives proliferation through cell-cell junction signaling. Selected from abstracts and presented at 38th Annual Stanford Cancer Biology Conference, Santa Cruz CA, September 18-20. *Winner Best Oral Presentation Award.*

2015 **B. Benham-Pyle**, Mechanical strain induces E-cadherin dependent Yap1 and β-catenin activation to drive cell cycle progression. Selected from abstracts and presented at Gordon Research Conference: Developmental Biology, Mount Holyoke, South Hadley MA, June 21-26.

2014 **B. Benham-Pyle**, Mechanisms of cell cycle re-entry upon mechanical strain. Presented at 3rd Annual Human Frontiers Science Program Meeting, Stanford CA, May 28-30.

2014 **B. Benham-Pyle**, Beta-catenin and Yap1 mediate a cell cycle response to strain in epithelial monolayers. Presented at 33rd West Coast Salt and Water Club Annual Meeting, Avila Beach CA, March 7-8.

2013 **B. Benham-Pyle**, A proliferative response to strain in epithelial monolayers. Presented at 36th Annual Stanford Cancer Biology Conference, Santa Cruz CA, September 9-11.

2013 **B. Benham-Pyle**, Beta-catenin and Yap1 as mediators of stretch-induced proliferation in epithelial monolayers. Presented at 2nd Annual Human Frontiers Science Program Meeting, National University of Singapore, August 5-6.

2013 **B. Benham – Pyle**, A proliferative response to stretch in epithelial monolayers. Presented at 32nd West Coast Salt and Water Club (WCSWC) Annual Meeting, Morro Bay CA, March 8-10.

POSTER CONFERENCE PRESENTATIONS

2019 **B. Benham-Pyle**, C. Brewster, S. Chen, A. Peak, A. Box, S. McKinney, A. Sánchez Alvarado. A single-cell reconstruction of planarian regeneration. Society for Developmental Biology Annual Meeting, Boston MA, July 26-29.

2018 **B. Benham-Pyle**, S. Chen, A. Peak, A. Box, S. McKinney, A. Sánchez Alvarado. Radiation-induced stem cell loss and re-population in Schmidtea mediterrannea may uncouple tissue remodeling from tissue regeneration. Stowers Institute Young Investigators Science Retreat, Kansas City MO, September 6-7.

2017 C. Arnold, **B. Benham-Pyle**, J. Lange, S. Loethen, A. Sánchez Alvarado. The Wnt pathway integrates anterior-posterior axis specification and asexual reproduction in the planaria *Schmidtea mediterranea.* Stowers Institute Young Investigators Science Retreat, Kansas City MO, August 24-25. *Runner-Up Best Poster Presentation.*

2014 **B. Benham-Pyle**, J.Y. Sim, B. Pruitt, W.J. Nelson, Cell cycle re-entry upon mechanical strain requires sequential nuclear translocation and transcriptional activation of Yap1 and Beta-catenin. Gordon Research Conference: Signaling by Adhesion Receptors, Bates College, June 22-27.

2013 **B. Benham-Pyle**, B. Pruitt, and W.J. Nelson, Yap1 and Beta-catenin mediate a proliferative response to stretch in epithelial monolayers. 2013 American Society of Cell Biology Annual Meeting, New Orleans LA, December 14-18.

2012 **B. Benham-Pyle**, A cell cycle response to strain epithelial monolayers. 35th Annual Stanford Cancer Biology Meeting, Pacific Grove, CA, September 13-15.

2010 **B. Benham-Pyle,** Endophytic Analysis of Parasitic Tropical Plants Yields Novel Anti-Staphylococcal Natural Product. Flash Talk and Poster at Beckman Winterfest, January 23 2010.

2009 **B. Benham-Pyle** and Scott Strobel, Endophytic analysis of tropical plants yields a platform for drug discovery. ACS 237th National Meeting, Division of Medicinal Chemistry, March 22-26.

2008 **B. Benham-Pyle** and Scott Strobel, Endophytic analysis of tropical plants seeking bioactive natural products. ACS 236th National Meeting, August 17-20.

2008 **B. Benham-Pyle,** Endophytic Analysis of Parasitic Tropical Plants Yields Novel Anti-Staphylococcal Natural Product. Beckman Symposium, July 24 2009.