

Johanna Bischof, PhD

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Research Interests

- Formation and maintenance of patterns on the single-cell and organism level during development and regeneration
- Regeneration of the nervous system
- Role of the nervous system in regeneration
- High-resolution live-cell imaging

Research experience and positions

- Sept 2016 – present **Postdoctoral Researcher**
In the lab of Dr Michael Levin at Tufts University and the Allen Discovery Center at Tufts
“Pattern determination and the role of the nervous system in planaria regeneration”
“Encoding and transmission of target morphology in the regenerating Planarian”
- Oct 2012 **PhD thesis**
– Aug 2016 In the lab of Dr Peter Lenart at EMBL Heidelberg
“The molecular mechanism of Surface Contraction Waves in the starfish oocyte”
- March 2012 **Master thesis II** (5 month research project included in MRes course)
– Aug 2012 In the lab of Prof William Wood at the University of Bath
"The Role of integrins and actin binding proteins in immune cell migration in *Drosophila* embryos"
- Oct 2011 **Master thesis I** (5 month research project included in MRes course)
– March 2012 In the lab of Dr Paul De Bank at the University of Bath
"Evaluation of Silk/Gelatin scaffolds from muscle tissue engineering”
- Feb 2011 **Bachelor thesis** at the Centre for Regenerative Therapies, TU Dresden
– June 2011 In the lab of Prof Schwille

“Development of a biophysical assay for simultaneous detection of three different interaction partners in living cells based on Fluorescence cross-correlation spectroscopy (FCCS)”

Aug 2010
– Oct 2010 **Work placement** at the Healing foundation, University of Manchester,
In the lab of Prof Mace
“Macrophage differentiation in wound healing”

Education

Oct 2012
– Aug 2016 **Doctor of Natural Sciences (PhD) at EMBL Heidelberg and University of Heidelberg**
Grade: 1.0 (Highest grade on a scale from 1.0 (best) to 4.0 (worst)), magna cum laude

Sept 2011
– Oct 2012 **Master of Research (MRes) in Regenerative Medicine**
One-year degree.
Grade: Degree with distinction (Highest grade)

Oct 2008
– Aug 2011 **Bachelor of Science in Molecular Bioengineering, Dresden University of Technology, Dresden**
Three-year degree.
Grade: 1.5 (on a scale from 1.0 (best) to 4.0 (worst))

Publications

- 1) Pietak*, **Bischof***, LaPalme, Morokuma, Levin; Neural Control of Body-plan Axis in Regenerating Planaria, **2019**, *PLOS Computational Biology*, in press – pdf available
* authors contributed equally to this work
- 2) Durant, **Bischof**, Fields, Morokuma, LaPalme, Hoi, Levin; Early Role of Bioelectric Signaling in the Establishment of Anterior/Posterior Polarity During Planarian Regeneration, **2019**, *Biophysical Journal*, doi:10.1016/j.bpj.2019.01.029
- 3) Klughammer, **Bischof**, Schnellbacher, Callegari, Lenart, Schwarz; Cytoplasmic flows in starfish oocytes are fully determined by cortical contractions, **2018**, *PLOS Computational Biology*, doi:10.1371/journal.pcbi.1006588
- 4) Levin, Pietak, **Bischof**; Planarian Regeneration as a Model of Anatomical Homeostasis: Recent Progress in Biophysical and Computational Approaches, **2018**, *Seminars in Cell and Developmental Biology*, doi: 10.1016/j.semcd.2018.04.003

- 5) **Bischof**, Brand, Somogyi, Majer, Thome, Mori, Schwarz, Lenart; A cdk1 gradient guides surface contraction waves, **2017**, *Nature Communications*, doi:10.1038/s41467-017-00979-6

Research Support

NIH R01, In review

Decoding anatomical information transfer in planaria via tissue transplantation

Role: Co-Author, Dr. Michael Levin, PI (\$1,250,000)

The Paul G. Allen Frontiers Group, 2015 – current

Reading and Writing the Morphogenetic Code

Michael Levin, PI (\$ 10,000,000)

Role: Postdoctoral Researcher, Participant Only

EMBL International PhD Fellowship, 2012 – 2016

4-year full scholarship (€ 90,000, plus lab overhead fees)

German Academic Scholarship Foundation, 2011 – 2012

1-year full academic scholarship for Master's degree outside of Germany (£ 10,000)

German Academic Scholarship Foundation, 2008 – 2011

3-year educational support scholarship for outstanding undergraduate students (€5,500)

Teaching experience

2017 - present	Organizer and Instructor of the weekly undergraduate journal club
2017 - present	Lecturer and Lab Instructor: Bio52 – Experiments in Cell Biology (14 students), Team taught course, Section: The role of bioelectricity in planarian regeneration
2016 - present	Evaluator of independent undergraduate research reports and presentations (Bio194)
2014	Lecturer and Lab Instructor: EMBO course 'Marine animal models in evolution and development' (8 students), Team taught course, Section: Microinjection and confocal microscopy on starfish oocytes
2013	Lecturer and Co-Organizer: Graduate student introductory course (50 students), Team taught course, Sections: Basic Laboratory Techniques, Model Systems in Biology

- 2013 - 2015 Lecturer and Lab Instructor: Graduate student introductory course (10 students), Team taught course, Section: Cell Biology and Biophysics
- 2013 Lecturer and Lab Instructor: EMBO course 'Current Methods in Cell Biology' (10 students), Team taught course, Section: Microinjection, confocal microscopy and automated image analysis to understand meiosis in starfish oocytes

Student Mentoring and Supervision

Amrutha Chintalapudi, Sophomore 2016 – Senior 2019; Regeneration of the nervous system

Margot Day, Sophomore 2016 – Senior 2019; Repatterning in double-head regeneration, **Senior Thesis with Honors**

Linda Lee, Sophomore 2016 – Senior 2019; Exploring the cytoskeleton in planaria

Claire Kerns, Junior 2019 – present; Exploring the cytoskeleton in planaria

Alice Gelman, Master Student 2019 – present; Regeneration of the nervous system

Joshua LaPalme, Research Assistant, 2017 – present; Long-term repatterning in planaria

Sophie Loman, Research Assistant, 2018 – present; Regeneration of the nervous system

Kelsie Miller, Senior Research Technician, 2018 – present; Automated systems for maintenance of a planarian colony, Molecular analysis of planaria regeneration

Hans Gonzembach, Research Technician, 2017 – present; Planarian colony maintenance

Invited Seminars

2018 Duke University, Biology Department, Durham, Host: Dr. Fred Nijhout

2016 European Molecular Biology Laboratory (EMBL), Host: Dr. Peter Lenart

Conference presentations

- 1) EMBO workshop Molecular and cellular basis of regeneration and tissue repair, 2018, *Transplantation of bodyplan information between planaria* (Poster)

- 2) The International Planaria meeting, 2018, *Transplantation of bodyplan information between planaria* (Poster)
- 3) Nature Regeneration Conference, 2017, *Transplantation of bodyplan information between planaria* (Talk)
- 4) Symposium on Dynamics and Mechanisms of Cytokinesis, 2016, *Polar body extrusion and the role of surface contraction waves in starfish oocyte cytokinesis* (Talk)
- 5) Biophysical Society 60th Annual Meeting, 2016, *Surface Contraction Waves in the starfish oocyte* (Talk)
- 6) Physics of Cells and Tissues Conference, 2015, *Surface Contraction Waves in the starfish oocyte* (Talk)
- 7) Gordon Conference on Motile and Contractile Systems, 2015, *Surface Contraction Waves in the starfish oocyte* (Poster)
- 8) Biophysical Society 58th Annual Meeting, 2014, *Surface Contraction Waves in the starfish oocyte* (Poster)
- 9) EMBO Meiosis meeting, 2014, *Surface Contraction Waves in the starfish oocyte* (Poster)
- 10) Jaque Monod Conference on Cell Cycle: Bridging the scales, 2014, *Surface Contraction Waves in the starfish oocyte* (Poster)
- 11) EMBO workshop Oocyte maturation and Fertilization, 2013, *Surface Contraction Waves in the starfish oocyte* (Poster)

Academic Service

2019	Poster Judge at the 2019 Scientista Symposium ‘Science without Borders’
2018 – present	Mentor in the Postdoctoral Association Mentoring Circle Program
2017 – 2018	Poster Judge at the ASBMB Northeast Regional Meeting
2013	Member of the Core Organizing Team for the 15 th EMBL PhD Symposium ‘Competition in Biology’ (21/11-23/11/2013)

Science communication, outreach and writing

2019	Presenter at Pint of Science Night
2017	Bunker Hill Community College – Career panel for STEM students

- 2017 - present Judge at the local and regional Science and Engineering Fair
- 2017 Presenter at the AAAS Science Days: Science in the classroom
- 2014 – 2016 Member of the ‘EMBL agents for outreach’, including presentations at Science Movie night, Friends of EMBL events, ‘Meet a PhD student’ lunch
- 2014 Two-time presenter at the Heidelberg Science Slam
- 2011 – 2015 Regular contributor for the Life Science section of the online newspaper ‘Experimentation’

Prizes and Awards

- 2015 Best short talk at Physics of Cells and Tissues Conference
- 2015 Best poster at the Gordon Conference “Motile and Contractile Systems”

References

Michael Levin, Vannevar Bush Professor
Director, Allen Discovery Center at Tufts University
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Tufts University
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Kelly McLaughlin, Associate Professor
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Dr. Peter Lenart
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