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## EDUCATION

**Harvard University** Cambridge, MA, USA  
Ph.D. in Systems Biology 2016  
Dissertation: *“On the growth of microtubule asters spanning millimeter-sized cells”*

**Princeton University** Princeton, NJ, USA  
B.S.E. in Chemical Engineering with Honors 2010  
Certificate in Quantitative and Computational Biology

## RESEARCH EXPERIENCE

**Research Institute of Molecular Pathology** Vienna, Austria  
**Max Planck Institute of Molecular Cell Biology and Genetics** Dresden, Germany  
**Max Planck Institute for the Physics of Complex Systems** 2016-present  
postdoctoral fellow  
Advisors: Elly Tanaka, Jan Brugués, Frank Jülicher

**Harvard Medical School** Boston, MA, USA  
**Marine Biological Laboratory** Woods Hole, MA, USA  
Graduate Researcher 2011-2016  
Advisor: Timothy J. Mitchison

**Princeton University** Princeton, NJ, USA  
Senior Thesis, Advisor: Stanislav Y. Shvartsman 2008-2010

**Princeton University** Princeton, NJ, USA  
Project Lab in Quantitative and Computational Biology 2008-2009  
Advisor: Amy Caudy and Coleen Murphy

**Institute of Industrial Science, University of Tokyo** Tokyo, JAPAN  
Summer Research Intern, Advisor: Kennichi Hatanaka 2007

## TEACHING EXPERIENCE

**Boston University** Boston, MA, USA  
Guest Lecturer, PY501: Mathematical Physics November 2015

**Harvard University** Cambridge, MA, USA  
Teaching Fellow, SPU27: Science and Cooking Fall 2012

## PROFESSIONAL ASSOCIATIONS

American Society for Cell Biology, Tau Beta Pi Engineering Honor Society, Sigma Xi Scientific Research Society

## GRANTS AND AWARDS

<b>ELBE Postdoctoral Fellowship</b> Center for Systems Biology Dresden	2016-2019
<b>Graduate Student Research Fellowship</b> Honjo International Scholarship Foundation	2012-2015
<b>Conference Speaker Travel Award</b> American Society for Cell Biology annual meeting 2014	2014
<b>Graduate Student Fellowship</b> Harvard University	2010-2012
<b>Best Senior Thesis Award</b> Program in Quantitative and Computational Biology, Princeton University	2010

## PREPRINTS

- Ishihara, K.\***, Mukherjee, A.\*, Gromberg, E., Bruges, J., Tanaka, E., Jülicher, F. (2021) Topological morphogenesis of neuroepithelial organoids. *bioRxiv*, <https://www.biorxiv.org/content/10.1101/2021.08.08.455385v1> (\*co-first authors)

## RESEARCH ARTICLES

- Quail, T., Golfier, S., Elsner, M., **Ishihara, K.**, Jülicher, F., Bruges, J. (2021) Capillary forces drive pioneer transcription factor-mediated DNA condensation. *Nature Physics*, <https://doi.org/10.1038/s41567-021-01285-1>
- Ishihara, K.**, Decker, F., Caldas, P., Pelletier, J.F., Loose, M., Bruges, J., and Mitchison, T.J. (2021). Spatial Variation of Microtubule Depolymerization in Large Asters. *Mol. Biol. Cell* mbcE20110723.
- Rieckhoff, E.M., Berndt, F., Elsner, M., Golfier, S., Decker, F., **Ishihara, K.**, and Bruges, J. (2020). Spindle Scaling Is Governed by Cell Boundary Regulation of Microtubule Nucleation. *Curr Biol* 30, 4973–4983.e10.
- Ishihara, K.**, George, A.B., Cornelius, R., and Korolev, K.S. (2020). Traveling fronts in self-replicating persistent random walks with multiple internal states. *New Journal of Physics* <http://doi.org/10.1088/1367-2630/aba219>
- Ishihara, K.**, Korolev, K. S., & Mitchison, T. J. (2016). Physical basis of large microtubule aster growth. *eLife*, 5, e19145. <http://doi.org/10.7554/eLife.19145> (Science Sketches video abstract: <https://youtu.be/jfjA2S-fE9U>)
- Wühr, M., Güttler, T., Peshkin, L., McAlister, G. C., Sonnett, M., **Ishihara, K.**, et al. (2015). The Nuclear Proteome of a Vertebrate. *Current Biology*. <http://doi.org/10.1016/j.cub.2015.08.047>
- Ishihara, K.**, Nguyen, P. A., Groen, A. C., Field, C. M., & Mitchison, T. J. (2014). Microtubule nucleation remote from centrosomes may explain how asters span large cells. *Proceedings of the National Academy of Sciences of the United States of America*, 111(50), 17715–17722. <http://doi.org/10.1073/pnas.1418796111>
- Nguyen, P. A., Groen, A. C., Loose, M., **Ishihara, K.**, Wühr, M., Field, C. M., & Mitchison, T. J. (2014). Spatial organization of cytokinesis signaling reconstituted in a cell-free system., *346(6206)*, 244–247. <http://doi.org/10.1126/science.1256773>
- Petry, S., Groen, A. C., **Ishihara, K.**, Mitchison, T. J., & Vale, R. D. (2013). Branching microtubule nucleation in *Xenopus* egg extracts mediated by augmin and TPX2. *Cell*, 152(4), 768–777. <http://doi.org/10.1016/j.cell.2012.12.044>
- Kim, Y., Iagovitina, A., **Ishihara, K.**, Fitzgerald, K. M., Deplancke, B., Papatsenko, D., & Shvartsman, S. Y. (2013). Context-dependent transcriptional interpretation of mitogen activated protein kinase signaling in the *Drosophila* embryo. *Chaos (Woodbury, N.Y.)*, 23(2), 025105. <http://doi.org/10.1063/1.4808157>

## REVIEW ARTICLES

- Rieckhoff, E. M., **Ishihara, K.**, & Bruges, J. (2019). How to tune spindle size relative to cell size? *Current Opinion in Cell Biology*, 60, 139–144. <http://doi.org/10.1016/j.ceb.2019.06.007>
- Ishihara, K.**, & Tanaka, E. (2018). Spontaneous symmetry breaking and pattern formation of organoids. *Current Opinion in Systems Biology*, 11, 123–128. <http://doi.org/10.1016/j.coisb.2018.06.002>
- Mitchison, T. J., **Ishihara, K.**, Nguyen, P., & Wühr, M. (2015). Size Scaling of Microtubule Assemblies in Early Xenopus Embryos. *Cold Spring Harbor Perspectives in Biology*. <http://doi.org/10.1101/cshperspect.a019182>
- Ishihara, K.**, Nguyen, P. A., Wühr, M., Groen, A. C., Field, C. M., & Mitchison, T. J. (2014). Organization of early frog embryos by chemical waves emanating from centrosomes. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369(1650). <http://doi.org/10.1098/rstb.2013.0454>
- Mitchison, T., Wühr, M., Nguyen, P., **Ishihara, K.**, Groen, A., & Field, C. M. (2012). Growth, interaction, and positioning of microtubule asters in extremely large vertebrate embryo cells. *Cytoskeleton*, 69(10), 738–750. <http://doi.org/10.1002/cm.21050>

## BOOK CHAPTERS

- Ishihara, K.**, Ranga, A., Lutolf, M. P., Tanaka, E. M., & Meinhardt, A. (2017). Reconstitution of a Patterned Neural Tube from Single Mouse Embryonic Stem Cells. *Methods in Molecular Biology (Clifton, N.J.)*, 1597, 43–55. [http://doi.org/10.1007/978-1-4939-6949-4\\_4](http://doi.org/10.1007/978-1-4939-6949-4_4)
- Groen, A. C., Nguyen, P. A., Field, C. M., **Ishihara, K.**, & Mitchison, T. J. (2014). Glycogen-supplemented mitotic cytosol for analyzing Xenopus egg microtubule organization. *Methods in Enzymology*, 540, 417–433. <http://doi.org/10.1016/B978-0-12-397924-7.00023-6>
- Field, C. M., Nguyen, P. A., **Ishihara, K.**, Groen, A. C., & Mitchison, T. J. (2014). Xenopus egg cytoplasm with intact actin. *Methods in Enzymology*, 540, 399–415. <http://doi.org/10.1016/B978-0-12-397924-7.00022-4>

## REFERENCES

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