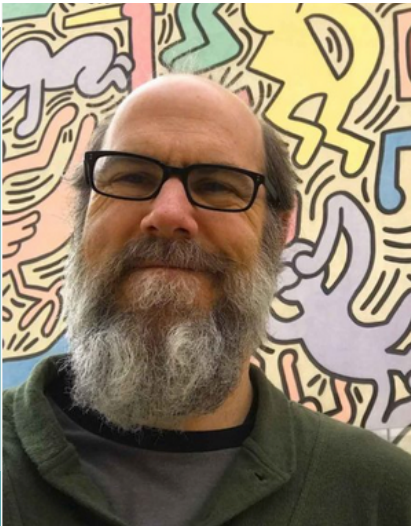


IMEG Seminar Series

The road to global science

Dr. John B. Wallingford



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Body Sculpting: How the embryo builds it self

February 17 th, 2022, 10:00~11:00

The seminar series is for all students and researchers in Kumamoto University. Check your email and find the Zoom ID and passcode.

A major challenge in biology is to understand how form and function arise in developing embryos. The complex tissue rearrangements that assemble embryos and organs are directed by patterned gene expression and in turn executed by specialized cell behaviors. Failure to execute these behaviors results in developmental disorders that are the leading cause of infant mortality in the developed world. The Wallingford Lab seeks to understand the mechanisms linking systems-level programs of gene expression and protein function to discrete cell biological processes in developing embryos. We take a multi-tiered approach, combining systems biology and bioinformatics and novel strategies for *in vivo* imaging, with the ultimate aim of understanding the etiology of human developmental disorders.

References

- Weng, S., Huebner, R.J., Wallingford, J.B. 2021. Convergent extension requires adhesion-dependent biomechanical integration of cell crawling and junction contraction. *BioRxiv*, doi: <https://doi.org/10.1101/2021.01.12.426405>
- Shindo, A. and Wallingford, J.B. 2014. PCP and septins compartmentalize cortical actomyosin to direct collective cell movement. *Science* 343, 649-652.
- Wallingford, J.B., Rowning, B.A., Vogeli, K.M., Rothbächer, U., Fraser, S.E. and Harland, R.M. 2000. Dishevelled controls cell polarity during *Xenopus* gastrulation. *Nature* 405, 81-85.
- (Review) Huebner, R.J. and Wallingford, J.B. 2018. Coming to consensus: A unifying model emerges for convergent extension. *Developmental Cell* 46, 389-396.

You will be fascinated by,

Incredibly organized process of morphogenesis.

Embryos change their body shape dynamically during development. How can they control the processes? The Wallingford lab has shown underlying mechanisms of the "Body Sculpting".

Xenopus!

"Indeed, things show up much more clearly in frogs.."
-Marcello Malpighi (1661)

Convergent extension

This is a collective cell movement to elongate the tissues during development. The planar cell polarity pathway regulates the cells to move with neighbors cooperatively.