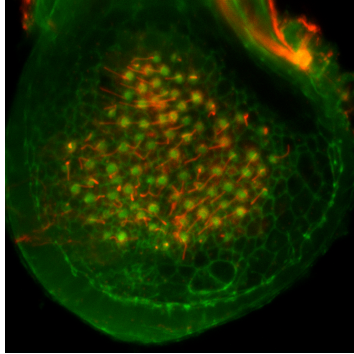


# Four-year PhD Project: Modelling axial polarity in the developing zebrafish ear

**Supervisors: Dr Tanya Whitfield with Professor Nick Monk**

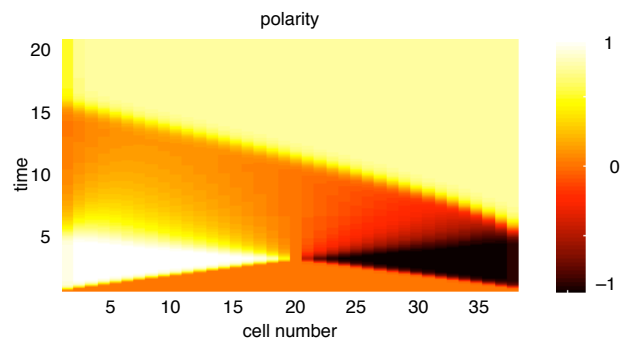
MRC Centre for Developmental and Biomedical Genetics and Department of Biomedical Science,  
University of Sheffield



This project addresses a fundamental biological question: how does an initially symmetric field of cells acquire polarity and asymmetry, resulting in an asymmetric final structure?

The project will use the developing zebrafish inner ear—the organ of hearing and balance—as a model system to explore developmental mechanisms of axis formation and symmetry-breaking.

The project will use genetic, molecular and imaging methods to obtain quantitative data on molecular dynamics during ear development in the zebrafish embryo. Computational models (with a user-friendly Matlab interface) will be used to assess which mechanisms can best account for the experimental data.



The student will primarily be based in the **Whitfield lab** ([cdbg.shef.ac.uk/research/whitfield/](http://cdbg.shef.ac.uk/research/whitfield/)), within the **MRC Centre for Developmental and Biomedical Genetics**. Training will also be given throughout by Professor Nick Monk (School of Mathematics and Statistics) ([nick-monk.staff.shef.ac.uk/](http://nick-monk.staff.shef.ac.uk/)) to support the mathematical and computational aspects of the project.

The project is fully funded by a **four-year studentship from the BBSRC**. You will be an enthusiastic and motivated individual, with a strong interest in developmental biology, who is also interested in applying a quantitative approach to their experimental findings. You should have, or expect to obtain, a First or Upper Second Class degree in a relevant subject. Entry is in 2012.

**For further information**, please contact **Dr Tanya Whitfield** ([t.whitfield@sheffield.ac.uk](mailto:t.whitfield@sheffield.ac.uk)).

**To apply**, see [http://www.sheffield.ac.uk/bms/prospective\\_pg/phd](http://www.sheffield.ac.uk/bms/prospective_pg/phd). **This studentship will remain available until filled; early applications are encouraged.**

## References

Hammond KL and Whitfield TT (2011). Fgf and Hh signalling act on a symmetrical pre-pattern to specify anterior and posterior identity in the zebrafish otic placode and vesicle. *Development* **138**, 3977-1987.

Schamberg S, Houston P, Monk NAM and Owen MR (2010). Modelling and analysis of planar cell polarity. *Bull. Math. Biol.* **72**, 645-680.

Whitfield TT, Hammond KL (2007). Axial patterning in the developing vertebrate inner ear. *Int. J. Dev. Biol.* **51**, 3977-3987.