Shannon Taylor

Curriculum Vitae

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Education

2021-current **PhD in Biology** *University of Oxford*.
Title: **Evolving vertebral counts without evolving the segmentation clock.**
Quantitative characterization of the morphodynamics of body axis growth in two species of Lake Malawi Cichlid
Found that species differ only in size at early segmentation, suggesting that divergent inputs to a conserved process can result in phenotypic evolution
Developed and validated a method to reverse-engineer gene regulatory networks onto moving cells in developing tissues

2019-2020 **Masters in Science with Distinction in Genetics** *University of Otago*.
Title: **Using hybridization chain reaction to investigate the homology of gene regulatory networks**
Detailed spatial and temporal characterization of the *Nasonia vitripennis* pair rule network
Mathematical modelling to show extensive functional homology to *Drosophila*

2018 **Bachelor of Biomedical Science (Honours)** *University of Otago*
First Class Honours.
Thesis title: The role of *Numb* in Honeybee Ovary Activation

2015-2017 **Bachelor of Biomedical Science** *University of Otago*
Overall GPA (Undergrad & Honours)– 8.1/9.
Major: Molecular Basis of Health and Disease

Grants and Awards

2021 **Clarendon Scholarship in Zoology** 3.5 years of full support (fees + stipend).

2021 **William Georgetti Scholarship** 10,000NZD of conference and travel funding.

2022 **Jenkinson fund** £2000 for project titled "Quantifying genetic and morphological epigenetic landscapes in cichlid fish".

Research Experience

Apr. 2021-current **Department of Biology, University of Oxford** *PhD student, Verd lab.*

2015-2021 **Department of Biochemistry, Otago University** *Laboratory for Evolution and Development.* Various roles, detailed below:.

Jul. 2020 - Mar. 2021 Writing up fellowship and Research Assistant.

Apr. 2019 - Jun. 2020 Masters student.

Dec. 2018 - Mar. 2019 Research assistant.

Mar. 2018 - Nov. 2018 Honours student.

Dec. 2015 - Nov. 2018 Undergraduate Research assistant.

May-Aug. 2019 **Department of Zoology, Cambridge University** *Visiting student, Laboratory for Development and Evolution* Laboratory visit investigating *Nasonia* segmentation using hybridization chain reaction and live imaging. .

Best publications

2024 Spiess, K., **Taylor, S.E.**, Fulton, T., Toh, K., Saunders, D.„ Hwang, S., Wang, Y.„ Paige, B., Steventon, B., Verd, B., "Approximated gene expression trajectories for gene regulatory network inference on cell tracks," *iScience* 29 (9): 10.1016/j.isci.2024.110840 (co-first author) .

2022 **Taylor, S.E.** and Dearden, P.K. "The Nasonia pair rule gene regulatory network retains its function over 300 million years of evolution" *Development* 149 (5): dev199632.https://doi.org/10.1242/dev.199632.

2019 **Taylor, S.E.**, Tuffery, J., Bakopoulos, D., Lequeux, S., Warr, C., Johnson, T.K., and Dearden, P.K. The torso-like gene functions to maintain the structure of the vitelline membrane in Nasonia vitripennis, implying its co-option into Drosophila axis formation. *Biology Open*, 8: bio046284 doi: 10.1242/bio.046284 .

Other publications

in prep. Taylor, S.E. Verd, B. "Evolving vertebral counts without evolving the segmentation clock" In preparation for submission.

2020 **Taylor, S.E.** and Taylor, S.J. "When 'xmasangels' Tweet: a Reception Study of Craftivism as Christian Witness" *Ecclesial Practices* 7 (2) 0.1163/22144471-bja10016.

2020 Harrop, T.W.R, Le Lec, M.F., Jauregui, R., **Taylor, S.E.**, Inwood, S.N., van Stijn, T., Henry, H., Skelly, J., Ganesh, S., Ashby, R.L., Jacobs, J.M.E., Goldson, S.L., Dearden, P.K. Genetic diversity in invasive populations of Argentine stem weevil allows adaptation to biocontrol. *Insects*, 11(7), 441.

2017 Cridge, A.G, Lovegrove, M.R, Skelly, J.G, **Taylor, S.E**, Peterson, G.E.L, Cameron, R.C, Dearden, P.K The honeybee as a model insect for developmental genetics *Genesis*, 55(5). DOI: 10.1002/dvg.23019.

Relevant skills

Quantitative imaging Expertise in quantitative confocal imaging in two, three, and four (3D + time) dimensions. Expertise in all facets of sample preparation and fluorescence imaging.

Biology of non-model species	Strong expertise (5 years) working with *Nasonia vitripennis*. Experience rearing and embryo collection for nine different non-model species; vertebrate and invertebrate.
Quantitative image analysis	Python, napari, ImageJ, pyclesperanto, OMERO; eg. development of fully automated and reproducible pipelines to segment cells and nuclei in three dimensions, and quantitatively analyse shape.
Mathematical modelling	Experience using Marcov chain monte carlo to reverse engineer gene regulatory network parameters. Experience simulating and analysing boolean models of dynamical processes.

References

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