

JAKE LEYHR - CV

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Education

Uppsala University

2023

PhD, Evolutionary Developmental Biology

Thesis: "Musculoskeletal Development in Jawed Vertebrates: Gene Function, Cis-Regulation, and 3D Phenotypes in Zebrafish"

Uppsala University

2018

MSc, Biology (Evolutionary Biology)

Thesis: "Characterization of Transcription Factor Regulation During the Development of Zebrafish Craniofacial Structures"

University of Exeter

2016

BSc (Hons), 2:1, Biological Sciences

Thesis: "Development of a Cell-Free Alkane Biosensor"

Publications

1. Harry, C.J., Hibshman, J.D., Damatac, A., Davidson, P.L., Estermann, M.A., Flores-Flores, M., Holmes, C.M., Lázaro, J., Legere, E.A., **Leyhr, J.**, Thendral, S.B., Vincent, B.A., Goldstein, B. (2024) Protocol for fluorescent live-cell staining of tardigrades. *STAR Protocols*, 5:103232. doi:[10.1016/j.xpro.2024.103232](https://doi.org/10.1016/j.xpro.2024.103232)
2. Mayeur, H., Leyhr, J., Mulley, J., Leurs, N., Michel, L., Sharma, K., Lagadec, R., Aury, J.M., Osborne, O.G., Mulhair, P., Poulain, J., Mangenot, S., Mead, D., Smith, M., Corton, C., Oliver, K., Skelton, J., Betteridge, E., Dolucan, J., Dudchenko, O., Omer, A.D., Weisz, D., Lieberman-Aiden, E., McCarthy, S., Sims, Y., Torrance, J., Tracey, A., Howe, K., Baril, T., Hayward, A., Martinand-Mari, C., Sanchez, S., Haitina, T., Martin, K., Korsching, S.I., Mazan, S., Debais-Thibaud, M. (2024) The sensory shark: high-quality morphological, genomic and transcriptomic data for the small-spotted catshark *Scyliorhinus canicula* reveal the molecular bases of sensory organ evolution in jawed vertebrates. *bioRxiv*, doi: [10.1101/2024.05.23.595469](https://doi.org/10.1101/2024.05.23.595469).
3. **Leyhr, J.**, Haitina, T., Bird, N.C. (2023) Hidden in plain sight: does the first intercostal ligament help to stabilize the Weberian apparatus? *bioRxiv*, doi: [10.1101/2023.11.20.567829](https://doi.org/10.1101/2023.11.20.567829) *In Revision at Journal of Anatomy*
4. **Leyhr, J.**, Sanchez, S., Dollman, K.N., Tafforeau, P., Haitina, T. (2023). Enhanced contrast synchrotron X-ray microtomography for describing skeleton-associated soft tissue defects in zebrafish mutants. *Frontiers in Endocrinology*, 14:1108916, doi: [10.3389/fendo.2023.1108916](https://doi.org/10.3389/fendo.2023.1108916)
5. **Leyhr, J.***, Waldmann, L.*, Filipek-Górniok, B., Zhang, H., Allalou, A., Haitina, T. (2022). A novel cis-regulatory element drives early expression of Nkx3.2 in the gnathostome primary jaw joint. *eLife*, doi: [10.7554/eLife.75749](https://doi.org/10.7554/eLife.75749)
6. Waldmann, L.*, **Leyhr, J.***, Zhang, H., Allalou, A., Öhman-Mägi, C., Haitina, T. (2022). The Role of Gdf5 in the Development of the Zebrafish Fin Endoskeleton. *Developmental Dynamics*, 251(9), p1535-1549, doi: [10.1002/dvdy.399](https://doi.org/10.1002/dvdy.399) (Cover feature)
7. Waldmann, L.*, **Leyhr, J.***, Zhang, H., Öhman-Mägi, C., Allalou, A., Haitina, T. (2021). The Broad Role of Nkx3.2 in the Development of the Zebrafish Axial Skeleton. *PLoS ONE*, 16(8), e0255953, doi: [10.1371/journal.pone.0255953](https://doi.org/10.1371/journal.pone.0255953)
8. Janssen, R., Andersson, E., Betnér, E., Bijl, S., Fowler, W., Höök, L., **Leyhr, J.**, Landström, E., Mannelqvist, A., Panara, V., Smith, K., Tiemann, S. (2018). Embryonic expression patterns and phylogenetic analysis of panarthropod sox genes: Insight into nervous system development, segmentation and gonadogenesis. *BMC Evolutionary Biology*, 18(88), doi: [10.1186/s12862-018-1196-z](https://doi.org/10.1186/s12862-018-1196-z)

* Equal contribution.

Conference Presentations

- Grohgan, M., **Leyhr, J.**, Johanson, Z., Haitina, T., Sanchez, S., Dollman, K., Stundl, J., Bronner, M., Fraser, G., Donoghue, P. Investigating the morphogenesis and replacement of lamprey toothlets using synchrotron

imaging. Poster presentation delivered at the 17th *International Symposium on Early and Lower Vertebrates* (Rimouski, Canada - June **2024**).

- **Leyhr, J.**, Leflaëc, E., Debais-Thibaud, M., Bird, NC., Dollman, K., Tafforeau, P., Sanchez, S., Haitina, T. DICE-PPC-SRμCT for describing anatomy, mutant phenotypes, and tissue organisation in three dimensions at near-histological resolution. Poster presentation delivered at the 82nd *Annual Meeting of the Society for Developmental Biology* (Chicago, USA – July **2023**).
- **Leyhr, J.**, Haitina, T., Dearden, R., Johanson, Z., Debais-Thibaud, M., Tafforeau, P., Dollman, K., Marcellini, S., Boisvert, C., Clarac, F., Qu, Q., Bijl, S., Stundl, J., Soukup, V., Robertson, B., Grillner, S., Wallén-Mackenzie, Å., Smith, MM., Brazeau, M., Sanchez, S. A 3D Histological Survey of Vertebrate Jaw Cartilage with Implications for Chondrichthyan Skeletal Evolution. Oral presentation delivered at the 16th *International Symposium on Early and Lower Vertebrates* (Valencia, Spain - June **2022**), and the 6th *International Symposium on Palaeohistology* (Online – March **2022**).
- **Leyhr, J.**, Leurs, N., Debais-Thibaud, M., Haitina, T. Functional divergence of a novel conserved cis-regulatory element of Mohawk homeobox transcription factor during evolution of vertebrates. Poster presentation delivered at the 8th *Meeting of the European Society for Evolutionary Developmental Biology* (Naples, Italy – June **2022**).
- **Leyhr, J.**, Haitina, T. Evolutionary conservation of cis-regulatory elements of craniofacial tendons and ligaments in Gnathostomes. Oral presentation delivered at the 15th *International Symposium on Early and Lower Vertebrates* (Quijing, China - August **2019**).
- Haitina, T., Waldmann, L., **Leyhr, J.** Identification of the evolutionary conserved regulatory element controlling the primary jaw joint formation in zebrafish. Poster presentation delivered at the 2nd *Joint Congress on Evolutionary Biology* (Montpellier, France - August **2018**).
- **Leyhr, J.**, Waldmann, L., Haitina, T. Using tissue-specific cell ablation to study the regeneration of the zebrafish jaw joint. Poster presentation delivered at the 7th *Meeting of the European Society for Evolutionary Developmental Biology* (Galway, Ireland - June **2018**).

Grants and Awards

Yokogawa Spinning Disk Imaging Contest	2023
1 st place award in the microscopy image competition run by the Yokogawa Corporation of America at the MBL Embryology Course – 100 USD	
Society for Developmental Biology Trainee Travel Assistance Grant	2023
Awarded for travel to attend the 82 nd Annual Meeting of the Society for Developmental Biology (Chicago, USA) – 500 USD	
Swedish Developmental Biology Organisation Travel Grant	2023
Awarded for travel to attend the “Embryology: Concepts and Techniques in Modern Developmental Biology” advanced research training course at the Marine Biological Laboratory (Woods Hole, USA) – 5,000 SEK	
European Synchrotron Radiation Facility Beamtime	2021
Award LS-3021 (highlighted proposal) – “ <i>Evolution of the shark skeleton</i> ”. Co-proposed with Dr. Sophie Sanchez, Dr. Tatjana Haitina, Dr. Zerina Johanson, Dr. Moya Meredith-Smith, Dr. Richard Dearden, Dr. Melanie Debais-Thibaud, Dr. Sylvain Marcellini, and Dr. Qingming Qu – 33,000 USD (equivalent)	
Helge Ax:son Johnsons Foundation Grant	2021
“RNA sequencing analysis of the developing zebrafish pectoral fin” – 40,000 SEK	
Anna Maria Lundin Foundation Travel Grant	2020
Awarded for travel and accommodation to present at the 8th European Society for Evolutionary Developmental Biology conference (Naples, Italy) – 12,232 SEK	

Supervision

Master’s student – Elsa Leflaëc – <i>Diversity of the cartilage of vertebrates. A study of the Meckel’s cartilage in chondrichthyans and osteichthyans</i> , Master’s Thesis Project	2023
Master’s students - Paul Ideaser and Antoine Corne - <i>The evolution of jaw cartilage in gnathostomes</i> , Origin and Evolution of Vertebrates Master’s Research Project	2022
Bachelor’s student - Branco Vanhaverbeke - <i>A potential nkx3.2 enhancer in zebrafish: deletion characterization and motif expression analysis</i> , Bachelor’s Research Project	2020

Teaching

Uppsala University (Master's level courses)

Teacher, <i>Evolution and Development</i> (1BG397)	2017 - 2023
Teacher, <i>Developmental Biology including the Development of the Nervous System</i> (1BG510)	2017 – 2023
Teacher, <i>Functional Genomics</i> (1BG322)	2020 - 2021
Teacher, <i>Toxicology</i> (1BG209)	2019

Select Courses

MBL Embryology: Concepts and Techniques in Modern Developmental Biology	2023
EMBO Practical Course 3D Developmental Imaging	2022
Digital Image Analysis for Scientific Applications – focus MAX IV	2022
Laboratory Animal Science for Researchers - Zebrafish	2020

Technical Skills

- Synteny and genomic conservation analysis	- Image analysis in ImageJ, Python
- CRISPR/Cas9 genome editing	- Data analysis in R, RMarkdown, Python
- Tol2 transgenesis	- Adobe Illustrator
- Confocal microscopy	- LaTeX
- Skeletal staining	- GitHub
- 3D segmentation in VGStudio MAX	- 3D printing

Referees

Dr. Tatjana Haitina

Associate Professor
Department of Organismal Biology
Uppsala University
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Dr. Sophie Sanchez

Senior Lecturer
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Dr. Melanie Debais-Thibaud

Professor
Institut des Sciences de l'Evolution de Montpellier,
ISEM
Université de Montpellier
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