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## Brendan Latham

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### Professional Summary

I am a final-year PhD life scientist in Professor James Windmill's insect acoustical systems lab, with a unique interdisciplinary background in [insect RNA biology and bioinformatics \(BSc\)](#), [human anatomy \(MSc with Distinction\)](#), and [advanced imaging \(PhD\)](#). A recent collaboration involved imaging the *Drosophila* midgut to help investigate intestine-microenvironment interactions in regeneration and cancer. My MSc training included [a review of colorectal cancer liver metastasis treatment](#) and [hands-on cadaveric and specimen-based training in human anatomy \(including intestinal\)](#), culminating in a first-author chapter published by Springer Nature in *Biomedical Visualisation, Vol. 2* ([Latham et al., 2019](#)). More recently, my work on insect micro-CT imaging was featured on the cover of the *Journal of The Royal Society Interface* ([June 2024 issue, Latham et al., 2024](#)). Passionate about tackling new life science challenges as part of a team, I secured a [UK-Canada visiting-researcher award](#), which supported a three-lab, three-country collaboration on *fly larval development*, currently under submission ([Dominguez, Latham et al., 2024](#)). I have also presented our findings through [conference presentations](#) and as an [invited speaker at public engagements](#).

### Education

- **PhD** in *Electronic & Electrical Engineering*, Insect Acoustic Systems, University of Strathclyde, 2020-present
- **MSc (with Distinction)** in *Medical Visualisation & Human Anatomy*, University of Glasgow and School of Simulation & Visualisation (GSA), 2017-2018 ([transcript](#)) ([publication](#))
- **BSc (Honours) (2:1)** in *Biology*, RNA research, University of Aberdeen, 2012-2016 ([transcript](#)) ([dissertation](#))

### Research experience

#### RNA biology and biochemistry

My Honours research explored RNA interference gene knockdown using *Tribolium* as an insect model - [Read Report](#)

- Three genes were targeted: 1) ADP/ATP Translocase, 2) Alpha Tubulin, 3) Heat Shock Protein 90 (Hsp90)
- I delivered each dsRNA reagent (designed and patented from the [Bowman Lab](#)) via **microinjection**
- Mortality was measured over eight days for six treatments, including a positive and negative control
- Peak mortality was calculated using a one-way ANOVA and Fisher's post hoc test
- I harvested specimens on the day of peak knockdown and followed [a standard protocol](#) for **RNA extraction**
- I determined RNA solution concentrations by **spectrophotometry**, then used [a kit](#) for **reverse transcription**
- I quantified gene expression by **RT-qPCR**, using pre-designed primers and then [another BIO-RAD protocol](#)
- I also used **gel electrophoresis** to measure gene expression, via **densitometric analysis** in ImageJ
- *Results:* Significant mortality across all gene knockdown treatments, with >95% suppression

I have received ≥ 95% 1<sup>st</sup> Class Grade A accreditation in [cell biology](#), [biochemistry](#), [genetics](#) modules (see [transcript](#))

#### Bioinformatic analysis

I conducted bioinformatic analyses to assess the species-specificity of the dsRNA sequences

- I used the [ExPASy Translate Tool](#) to identify the protein sequence fragment from the longest reading frame
- I conducted a [BLAST Search](#) to compare the fragment to database sequences
- I constructed phylograms of the aligned sequences using [MEGA Software](#)
- *Results:* The dsRNA targeting Hsp90 showed the highest specificity, with only five ≥ 15 bp alignments

#### *Drosophila* research and intestinal work

- Experience handling *Drosophila* in the lab (BSc training in Biology)
- Discussion of *Drosophila* as an example of non-systemic RNA interference ([Honours Research, p. 11](#))
- Discussion of fruitfly and mosquito Johnson's organ in review article ([Díaz-García, Latham et al., 2023, p. 9](#))
- Advanced training in human anatomy including examination of human intestinal specimens (Distinction)
- I provided seven  $\mu$ -CT imaging datasets of the *Drosophila* midgut to [Cai Johnson](#) in a recent collaboration

## Advanced imaging

Since my MSc experience isolating structures from CT, MRI, PET imaging data via [3D Slicer](#) (e.g., [see technical report](#)):

- **micro-computed tomography** imaging (proficient)
  - specimen preparation including **tissue staining** and **insect dissection**
  - segmentation and morphometric measurements using [Dragonfly](#) and [CT Analyser](#)
- **light microscopy** (proficient)
- Image analysis via [ImageJ](#) (proficient)
- laser scanning Doppler vibrometry (proficient) (non-contact measurements visualised, e.g. [animation](#))
- **fluorescence microscopy** (beginner) ([preliminary study imaging the presence of resilin protein](#))
- **confocal microscopy** (beginner) (no direct experience, but familiar with literature, e.g. [Nishino et al., 2019](#))
- **scanning electron microscopy** (beginner) (minimal experience, [Lee Lab](#) secondment in Minnesota, USA)

I gave an oral presentation to the [Scottish Imaging Network](#) (SINAPSE) at its 2022 Annual Scientific Meeting

## Skills

### Publications

1. 1<sup>st</sup> author: [Latham et al. \(2024\)](#) *Journal of The Royal Society Interface*
2. 1<sup>st</sup> author: [Latham et al. \(2019\)](#) *Springer Nature*
3. 2<sup>nd</sup> author: [Dominquez, Latham et al. \(2024\)](#) (**submitted**)
4. 2<sup>nd</sup> author: [Díaz-García, Latham et al. \(2023\)](#) *Bioinspiration & Biomimetics*

### Conferences

1. *Invertebrate Sound & Vibration (ISV) Conference 2023*, Lincoln, England, UK (poster) – [Read Abstract](#)
2. *14<sup>th</sup> International Congress of Neuroethology 2022*, Lisbon, Portugal (poster) – [Read Abstract](#)
3. *14<sup>th</sup> SINAPSE (Imaging Network) ASM 2022*, Glasgow, Scotland, UK (oral)
4. *4<sup>th</sup> Doctoral School Multidisciplinary Symposium (DSMS) 2022*, University of Strathclyde (oral)
5. *3<sup>rd</sup> DSMS 2021*, University of Strathclyde (oral)

### Communication skills (written and oral)

- [Research proposal](#) that secured funding to visit the University of Toronto to conduct *Ormia* fly research
- I have an SQA Grade A in Higher English ([reflective essay on the natural world](#))
- Invited speaker engagements: 1) [Pint of Science 2022](#); 2) [Clydeview school](#); 3) [Glasgow Science Festival](#)

### Awards and recognition

- Academic: 1) funding [award letter](#) from UKRI/Mitacs; 2) Invitation to Review for *Royal Society Open Science*
- Public: 1) [3 Minute Thesis](#) speaking competition local finalist; 2) [Images of Research 'Highly Commended'](#)

### Labs and insect models

- 1) [Dr Bowman](#) (*Tribolium*); 2) [Prof Mason](#) (*Ormia*); 3) [Prof Lee](#) (*Ormia*); 4) [Prof Windmill](#) (*Gryllus*, *Drosophila*)

### Project management and teamwork

- 2020-present, I independently designed and led my own PhD project and managed my own budget (£5,200)
- 2023, secondment, I enjoyed conducting fly lab-experiments with Prof Mason and Prof Lee and their teams
- 2020-present, I co-ordinated with workshop; arranged visit to [Prof Bailey](#); brought [Dr Williams](#) into my team
- 2020-present, met several conference abstract deadlines and submitted proposal to UKRI by their deadline
- 2020-present, I gave 1-to-1 lab tuition/collaborations: [Prof Hofstetter](#), [M. Maleque](#), [Cai Johnson](#), [R. Stoakes](#)

### Employment History

- 2023, *visiting researcher*, 3 months, University of Toronto, Canada, UKRI grant, contact: [Prof Andrew Mason](#)
- 2019-2020, *trainee barista*, 4 months, Glasgow, Costa Coffee, contact: [Marcela Mclellan](#)
- 2018-2019, *charity*, 1 y, Glas., Navigators UK Christian ministry, [SC038484 (S.)], contact: [Darren Jackson](#)
- 2016-2017, *retail*, ~7 months, Harris Tweed Isle of Harris Ltd., contact: [Catherine Campbell](#)
- 2016, *volunteer biologist*, 1-month, Peruvian Amazon, dungbeetle biodiversity data, contact: [Dr Chris Kirkby](#)

### References

- Available on request and via hyperlinks