JAMES RENNIE BEQUEST

REPORT ON EXPEDITION / PROJECT / CONFERENCE

Expedition/Project/ Conference Title: EMBO Workshop – The mobile genome: genetic and physiological impacts of transposable elements (MGE25-01)

Travel Dates: 4–7 November 2025

Location: EMBL Heidelberg, Germany

Group member(s): Amelia Adriana Orrego

Aims:
-To present the latest findings of my PhD project on the regulation of transposable elements in *Cryptococcus*
-To learn about updated bioinformatics and wet lab methodologies for studying transposable elements
-To have the opportunity to network with experts in the field and explore post-doctoral position opportunities

Photography consent form attached: *(please refer to your award letter)*

☒ Yes
☐ No

OUTCOME (a minimum of 500 words):-

1. Purpose of the award and relevance to my PhD:

The James Rennie Bequest travel funding enabled me to attend and present my work at the EMBO Workshop "The mobile genome: genetic and physiological impacts of transposable elements" (MGE25-01) hosted at EMBL Heidelberg. My PhD research focuses on how RNA interference (RNAi) constrains transposable elements (TEs) in *Cryptococcus*, a major human fungal pathogen, and how TE mobilisation may contribute to clinically relevant phenotypes, including antifungal drug resistance. This specialist workshop was highly aligned with my doctoral project because it brought together researchers working on mobile elements, genome defence, epigenetics, and TE detection approaches across diverse systems.

2. Activities undertaken during the visit

I presented a poster titled "Uncovering Transposable Element Activity Underlying FAA Resistance in the Human Fungal Pathogen *Cryptococcus*". The poster summarised new evidence that uncontrolled transposition in an RNAi-deficient background may contribute to drug resistance, potentially via insertion events affecting gene regulation . This work integrates bioinformatics and wet-lab approaches, including small RNA sequencing and whole-genome sequencing/variant calling analyses, alongside transcript-level assays and mutation-rate experiments.

In addition to presenting, I participated fully in the workshop programme, including talks and discussions focused on: (i) TE impacts on genome function and physiology, (ii) emerging TE detection methods, and (iii) mechanisms of genome defence and small-RNA biology. The workshop format facilitated extended interactions with speakers and other participants, enabling detailed methodological conversations relevant to my analyses of TE insertions and TE-derived small RNAs in *Cryptococcus.*

3. Key outcomes and skills gained

A major outcome of the workshop was receiving targeted feedback on my interpretation of TE activity under antimetabolite stress conditions and in RNAi-deficient strains. These discussions helped me refine how I frame the relative contributions of RNAi-dependent versus additional silencing routes and the conditions under which TEs may escape silencing. Methodologically, the meeting strengthened my understanding of current best practices and emerging strategies for detecting TE insertions (including approaches that leverage long-read sequencing) and for improving small-RNA in non-model systems. Several of the approaches discussed are directly applicable to improving TE-insertion detection and TE-derived small RNA mapping in my datasets. As a result, I have a clearer plan for methodological enhancements I can evaluate and implement in my analyses.

4. Networking and collaboration development

I was able to speak directly with researchers working on mobile elements, RNAi-like pathways, and genome evolution, including those working beyond fungal systems. These conversations were valuable for benchmarking my results against patterns observed in other organisms and for identifying comparable conceptual models of TE “bursts” shaped by TE family, TE load, and environmental stress. The workshop also supported my career development as I approach the final stage of my PhD by creating opportunities to discuss future directions and potential postdoctoral interests.

5. Benefit to the University of Edinburgh and dissemination plan

This workshop increased the visibility of University of Edinburgh research on *Cryptococcus* genome defence within a community that often centres animal and plant TE biology. The feedback and knowledge gained will strengthen the methodological depth and conceptual framing of my PhD project, supporting timely completion and enhancing the quality of future outputs. I plan to disseminate the key learning points from the workshop to our research group through a post-conference update/talk and by sharing notes on relevant tools and approaches for TE insertion detection and small-RNA analysis

6. Use of funds (summary)

The James Rennie Bequest travel funding covered essential travel costs to attend the workshop. In my original budget, I requested £474.74 towards travel expenses. The James Rennie Bequest support enabled me to participate in this specialised training and dissemination opportunity, which was neither compulsory nor assessed as part of my PhD programme.

7. Overall assessment

Overall, the James Rennie Bequest award enabled a high-impact professional development opportunity at a key international workshop in my field. The meeting strengthened my poster presentation, improved my methodological awareness for TE and small-RNA analyses, and supported valuable networking that will contribute to both my doctoral project and my post-PhD career planning.