LONDON CENTRE FOR NEGLECTED TROPICAL DISEASE RESEARCH

Reflections on snakebite from the Venoms and Toxins conference

From 22–24 August 2023, I attended and presented at the *Venoms and Toxins* conference, University of Oxford, as the recipient of a London Centre for NTD Research (LCNTDR) travel grant. The conference is a key event in the field of snakebite envenomation and antivenom development and is well-attended each year by leading researchers within the field.

During the conference, I presented the results of my PhD, which involved creating a computational model of snake venom and antivenom pharmacodynamics. Computation is a powerful tool to elucidate the dynamics underlying envenomation-treatment systems since it can be used for the extensive, rapid, and low-cost exploration of parameter space. The molecular and pharmacokinetic diversity of venoms and antivenom scaffolds currently under development poses significant uncertainty in the design of broadly-effective treatments. Computation can help inform the design of next-generation therapeutics considering these multiple points of variability. Through my research, I developed a quantitative computational framework for antivenom optimisation, in which broadly effective antivenom designs are identified across a range of treatment scenarios. This allows basic design principles for effective treatment to be defined, improving our understanding of the properties of effective antivenoms and helping to guide experimental antivenom discovery pipelines.

It was my first time presenting to a conference audience at this level and was a great experience for my development as an early career researcher. The presentation helped disseminate my research and promote two papers I've authored on the subject. It was a chance to gain feedback from experts within the field and to illustrate the benefits of computation in the design of next-generation snakebite therapeutics.
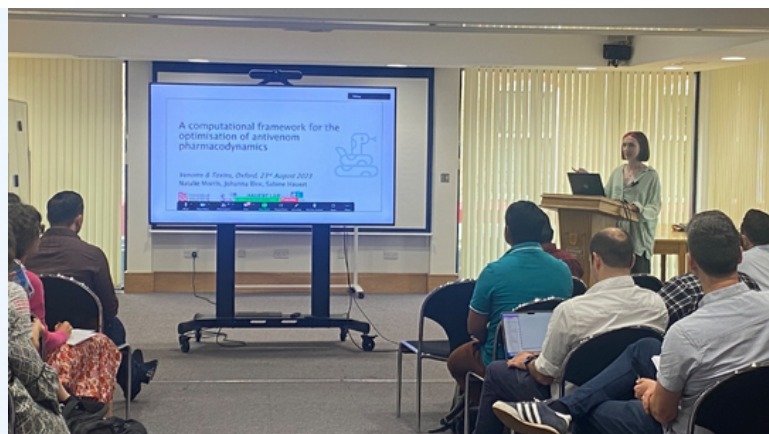
Natalie Morris presenting at Venoms and Toxins, United Kingdom, 2023

One of the most exciting aspects of attending this conference was the opportunity to meet researchers whose work has influenced my PhD project. The conference enabled me to engage with these individuals and discuss the potential applications of computational modelling in their experimental work. I greatly valued these discussions which provided me with insights into real-world challenges in the field and highlighted a number of potential areas for future work using the models I have built.

In summary, the LCNTDR travel grant enabled me to present my PhD findings to the snakebite community, and to network with experts in the field. This experience has been highly beneficial for my growth as an early career researcher. The feedback I received during the conference has further motivated me to continue my involvement within the field of envenoming. I am moving into industrial R&D working in pharmacokinetic-pharmacodynamic modelling for drug development next year, and the discussions at this conference have highlighted several areas in which industry collaboration could be of significant benefit in accelerating the development and testing of next-generation snakebite therapeutics. I am deeply grateful for the support provided by the LCNTDR travel grant and the opportunity it has afforded me to disseminate my research.

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