



## KEYNOTE SPEAKER: Grand Prize Winner of the Science & SciLifeLab Prize for Young Scientists 2013

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# Daniel Streicker

## Putting the brakes on emerging viruses: from risk prediction to control at the source

### Abstract

Pathogen transmission from wildlife to humans (“spillover”) causes a variety of emerging and re-emerging viral infections, from Mpox to Nipah to Ebola. Conventional responses to mitigate the burden of spillover are implemented after viruses begin spreading in new host species. This reactive approach guarantees a sustained health burden from re-emerging viruses and preserves opportunities for new viruses to establish transmission among humans. Incorporating spillover prevention into the global health toolbox is conceptually enticing, but practically elusive.

I will present progress towards overcoming two barriers to prevention: identifying high risk viruses prior to their emergence and predicting whether efforts to curtail virus transmission within wildlife hosts will succeed or backfire. I will show how incorporating genomics and machine learning into comparative studies of hundreds of viruses can challenge dogmas about viral origins and allow us to prioritize high-risk viruses for laboratory experiments and surveillance. Taking lessons from the field, I will present long term ecological and genomic studies in South America which revealed the pitfalls of culling bats to prevent the spillover of rabies virus.

This finding opened doors towards using potentially revolutionary self-disseminating vaccines to prevent spillover by suppressing virus transmission within wild bat populations. Stopping viral spillover remains an outstanding challenge, but the modern influx of data, laboratory and computational tools bring us closer to success than I ever imagined.

### Biography

Daniel Streicker is a Wellcome Trust Senior Research Fellow and Professor of Viral Ecology at the MRC-University of Glasgow Centre for Virus Research and the School of Biodiversity, One Health and Veterinary Medicine at the University of Glasgow, UK. He received his PhD from the University of Georgia’s Odum School of Ecology in 2011 and started his lab at the University of Glasgow in 2013 after receiving a Sir Henry Dale Fellowship from the Wellcome Trust and Royal Society.



His research integrates field ecology, genomics, and computational biology to investigate the mechanisms by which viruses persist in wildlife populations, adapt to novel hosts, and emerge to cause human or livestock disease. Focusing primarily on bat-borne viruses, including rabies, his work has advanced understanding of cross-species transmission and informed innovative approaches to wildlife vaccination, surveillance, and disease control. His field studies on bats in Peru, ongoing since 2007, make this one of the longest running and spatially expansive studies of viral zoonoses in wildlife. In 2025, he co-founded ChiroptoLab, the first purpose-built facility dedicated to research, training and outreach on bat viruses in Latin America.

Since winning the 2013 Science & SciLifeLab Prize for Young Scientists, Daniel’s discoveries have been recognized with the 2014 Wellcome-Beit Prize, a 2015 National Geographic Emerging Explorer Award, the 2020 Philip Leverhulme Prize in Biological Sciences, and the 2024 Fleming Prize from the Microbiology Society.