

Next Generation Vaccines To prevent future pandemics



HEAD OF THE LABORATORY OF VIRAL ZOOLOGICS
DEPARTMENT OF VETERINARY MEDICINE
UNIVERSITY OF CAMBRIDGE

PROFESSOR JONATHAN HEENEY

CHAIRPERSON: ASSOCIATE PROFESSOR SYLVIE ALONSO



Abstract:

Vaccines based on historical virus isolates provide limited protection from continuously evolving RNA viruses, such as influenza viruses or coronaviruses that spill over from animals to humans. Despite repeated booster immunizations, population-wide declines in the neutralization of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants have occurred. This has been compared to seasonal influenza vaccinations in humans, where the breadth of immune responses induced by repeat exposures to antigenically distinct influenza viruses is confounded by pre-existing immunity. These factors require vaccines that offer broader protection from zoonotic viruses. I'll describe how we developed a unique computational platform to develop Digitally Immune-Optimized and Selected Synthetic Vaccines (DIOSynVax) that induce broad protective immune responses capable of preventing future epidemics and pandemics.

Biography:

Jonathan Heeney qualified with Doctoral degrees in Veterinary Medicine, Veterinary Pathology (U of Guelph, Canada) and a PhD at the National Institutes of Health in the USA under the supervision of Stephen O'Brien, prior to his appointment as a Fellow in Pathology at the Stanford School of Medicine. He received his Doctor of Science at Cambridge University and in 2007 established the Lab of Viral Zoonotics (LVZ) in Cambridge which focusses on the cross-species transmission of viruses, their co-evolution in different hosts and the immune mechanisms of disease and disease protection. The LVZ applies the understanding of immune correlates of protection to develop vaccines to prevent the transmission of zoonotic infections at the animal human interface.

Translational data on immune correlates of protection is applied to the rational design of next generation, broadly protective vaccines for the prevention of epidemics caused by continuously evolving RNA viruses. In 2017 he founded the vaccine Biotech DIOSynVax to take his vaccine discoveries through to clinical development and licensure. Vaccine candidates include a multivalent vaccine covering Mpox and Haemorrhagic Fevers, a multivalent Beta-Coronavirus vaccine as well as vaccines for Seasonal and pre-pandemic Influenza.