Molecular Virologists engineer viruses to prevent, treat and cure diseases.

Nuclease-based gene therapy for permanent correction of Cystic fibrosis

By engineering baculovirus to deliver all the “tools” required to insert a functional copy of the CFTR gene into the genome of lung cells, we hope to be able to provide a safe and effective treatment for CF patients irrespective of their CFTR mutation status, gender or genetic background.

Antibody-based protection against Ebola virus infection by vectored immunophylaxis.

We are developing a VIP approach to protect against Ebola virus disease in humans.

Development of a vaccine to protect against Toxoplasma gondii infection in sheep

We aim to develop recombinant ORFV and adenovirus vectors expressing protective antigens from T. gondii and to evaluate immunogenicity and protective efficacy of a prime-boost vaccination strategy in sheep. We anticipate that immunized sheep will develop a robust immune response against T. gondii leading to a reduction in tissue cysts and protection against congenital infection.

Nuclease-based gene therapy for permanent correction of alpha-1 antitrypsin deficiency

We are currently employing the use of AAV and baculovirus gene therapy vectors and two different cutting-edge genome editing technologies (TALENs and CRISPR) to insert a functional copy of the AAT gene, permanently, into a “safe harbour” within the human genome.

Oncolytic virotherapy using Newcastle Disease Virus and parapox Disease ORF virus.

Our goal is to develop “armed” oncolytic ORFV and NDV viruses with improved immunomodulatory functions for the treatment of solid tumors in humans and companion animals.

Pathogenesis of ovine betaretroviruses

This research will contribute to our understanding of virally-induced cancers and uncover novel mechanisms governing neoplastic transformation of epithelial cells, which may be exploited for therapeutic purposes.