Titel:
The development and use of an *ex vivo* primary cell model of the human airway epithelium to investigate pulmonary viral infections

Abstract:
Pulmonary infections (especially Influenza and recently SARS-CoV-2) are one the infection with the most negative impact on the human health worldwide. This is highlighted by Influenza causing between 500-700.000 yearly deaths and SARS-CoV-2 recently causing a worldwide pandemic with millions of deaths. Thus, research within the field of viral pulmonary infections is highly relevant. Historically, most research within this field has depended on either conventional monolayer cancer cell models such as A549 or murine models. However, a question can be raised if these models of research is sufficient in investigating the complexity of an infection in the human airway epithelium with e.g. Influenza A Virus.

Along with researchers from Bern and Belfast, our group set up a unique cell culture model which mimics the complexity of the human airway epithelium. By isolating cells from the nasal cavity of a human donor and exposing these cells to varying growth conditions we can develop a fully functional ciliated epithelium with mucus production, cilia movement and basal cells for tissue repair. This model allows us to investigate the mechanisms of viral infections in the human airway's *ex vivo* without the need for animal models to reach that type of tissue complexity.

Using this model we recently published a paper called "Influenza A induces lactate formation to inhibit type I IFN in primary human airway epithelium". Here, we highlight an evasion strategy performed by Influenza A virus during infection to increase infectivity of the human airway epithelium. In addition to more studies like this we hope and aspire to further develop the model to reach a new level of complexity and get closer to completely mimic what happens in the human airway epithelium during viral infections.