



Project acronym: ANSABS

Project title: Application of Nanopore sequencing to investigate carriage of microbial risks in Arctic bird species

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Discipline: Life Sciences & Biotech: Molecular and cellular biology

Station(s): Rif Field Station (Iceland)

We are becoming increasingly aware of the global risks to health caused by microbial pollutants such as zoonotic pathogens and antimicrobial resistance (AMR). However, we do not fully understand how these microbial contaminants circulate and are maintained in the wider environment, nor how far reaching they are. The Arctic is considered an environment that is very sensitive to change. Yet while it is at high risk from pollutants and infectious disease, the extent of such threats on the Arctic ecosystem, its people and visitors to such northern latitudes, are largely unknown. This project seeks to apply cutting edge genomic techniques (Nanopore sequencing) to pursue the growing body of evidence that wildlife, in particular waterfowl, are reservoirs for zoonotic disease and AMR, with the potential to transmit harmful microbes into the wider Arctic and sub-Arctic environment. To investigate microbial carriage in waterfowl, we collected faecal samples from both a resident species, the eider duck (*Somateria mollissima*) and a long-distance migratory species, the greylag goose (*Anser anser*) at the Rif Field Station, Iceland. From these samples we intend to analyse all samples to investigate the presence of zoonotic risks and AMR using next-generation Nanopore sequencing. Nanopore sequencing will be evaluated alongside traditional yet time consuming microbiological methods to determine how reliable this sequencing technology is at surveilling for zoonotic disease and AMR in the sub-Arctic environment. We hope that the methods developed during this study can help us understand the risks currently faced by the Arctic and sub-Arctic regions and fast-track the use of sophisticated sequencing technology to monitor and ultimately prevent future environmental emergencies and spillover events.