**Rapid microbial surveillance using Nanopore DNA sequencing**

Martin Hjorth Andersen1, Rasmus Hansen Kirkegaard1, Mads Albertsen1, Per Halkjær Nielsen1

1 Center for Microbial Communities, Department of Chemistry and Bioscience, Aalborg University, Aalborg, Denmark

Wastewater treatment plants depend heavily on microbial communities to clean sewage water, which has to pass strict nutrient requirements before the effluent goes into waterways. The biological processes are generally stable. However, problems do occur occasionally, can arise quickly and lead to process breakdown. To mitigate this, operators have to act fast to control problematic microbes. With current methods, it is often impossible to predict a system crash before it is too late. Monitoring the microbial community for critical changes is tedious, as the process from sample to results take several days and requires expert knowledge as well as expensive lab facilities.

In this project, we developed rapid protocols to make a profile of all bacteria and detect problematic microorganisms, such as pathogens or process critical bacteria from wastewater treatment plants, onsite in a matter of hours. This will provide actionable information to plant operators in time to mitigate a process breakdown. The key to this is the development of simple, cheap and easy to use protocols that will ultimately allow plant operators to monitor and report the microbial status as a routine measurement alongside simple process characteristics such as pH and temperature.