



Sequencing DNA in the palm of your hand

Mette Nyegaard

nyegaard@biomed.au.dk, Bartholin Building, room 249

Background

Nanopore sequencing is a new way of sequencing DNA or RNA. It is performed using a portable device (MinION), which weighs under 100 g and plugs directly into a laptop.

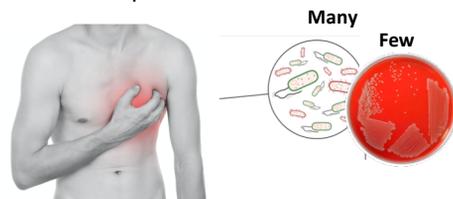
The sequencing is fast and performed in real time. As it directly sequences all DNA fragments loaded onto the device, it has been used to monitor Ebola outbreaks and microbes in extreme climates.



The unmet need

Infective endocarditis (IE) is an infection caused by bacteria that enter the bloodstream and settle in the heart valve or a blood vessel. In the acute form, IE develops suddenly and may become life threatening within days.

Today, diagnose and choice of treatment are based primarily on culture-based techniques. This can take a week and will only identify those strains that grows in culture. IE is one out of many medical conditions, where nanopore has the potential to revolutionize patient care.



Project

The aim is to use nanopore sequencing to fast and reliably identify the bacteria strains in infective endocarditis in clinical samples. When the nanopore is working, there are endless possibilities for other projects.

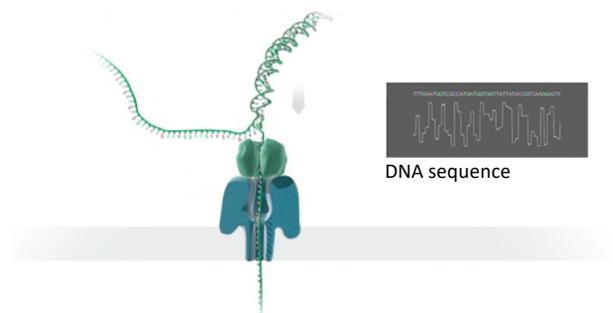
Techniques

- Small amount of laboratory work (including DNA isolation and preparing DNA for run)
- Run the Minion
- Bioinformatics (use available tools, unix)

Skills I am looking for. As nanopore sequencing is under enormous development, I am looking for someone who is interested in bioinformatics (DNA) and finds it funny and interesting to invent and test new things.

How the nanopore works

A nanopore is a small hole. As each long DNA string is pulled through the pores, a small nucleotide-specific change in the ionic current across the membrane allow identification of the bases.



The project is performed in collaboration with clinicians from Aarhus University Hospital, with whom you will interact.

Read more about Oxford Nanopore and what people have used it for: <https://nanoporetech.com/>