

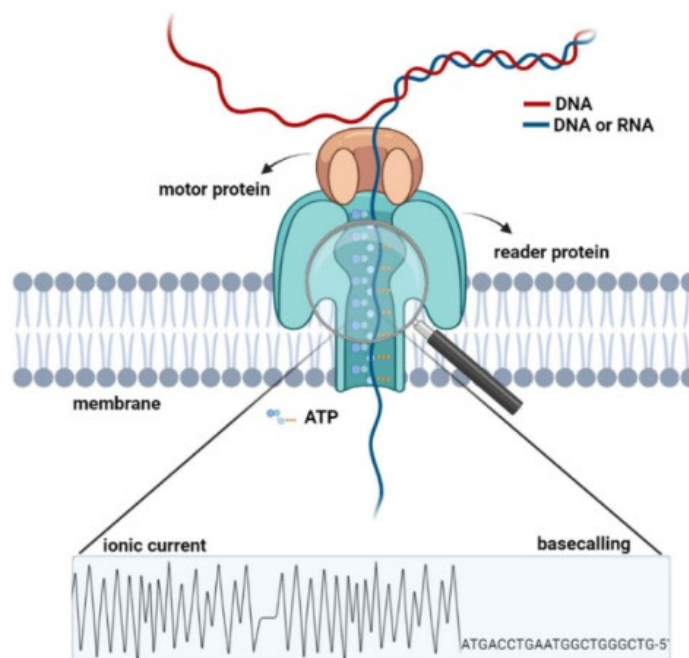
Project

Third-generation sequencing using Nanopore long-reads to detect antibiotic resistance

Brief description

The World Health Organization (WHO) considers **antibiotic resistance** a major global health threat. Despite efforts to control it, resistant infections are increasing, reducing treatment effectiveness and raising illness, death rates and healthcare costs. Genomic approaches for early detection of resistance genes can help fight against antibiotic resistance. **Nanopore-based Third-Generation Sequencing** enables real-time analysis of unamplified DNA molecules as they pass through protein nanopores, producing long reads that span more than 10 kb without a reduction in sequence quality. This capability facilitates the resolution of plasmids, transposons, and other mobile elements central to the horizontal transfer of antibiotic resistance genes.

The Oxford Nanopore MinION, a portable, USB-powered sequencer, extends these advantages to field and clinical settings by combining affordability, scalability, and rapid turnaround times.



Objective

The aim of this study is to sequence the genome of *E. coli* strains isolated from a wastewater treatment plant to detect antibiotic resistance genes using third-generation sequencing technology with Nanopore Oxford Technology. The project's goals include the extraction, preparation, sequencing and bioinformatic analysis of genomic DNA from *E. coli* bacterial isolates.

Methodology

Molecular biology (DNA extraction, library preparation), genomic sequencing and bioinformatic analysis.

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