

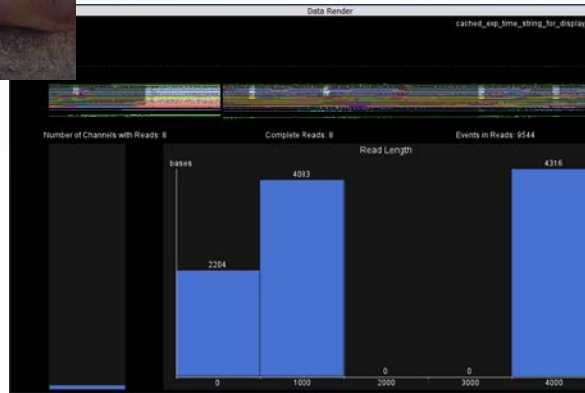
In-Situ Life and Biosignature Detection in the Atacama with the Nanopore MinION Sequencer



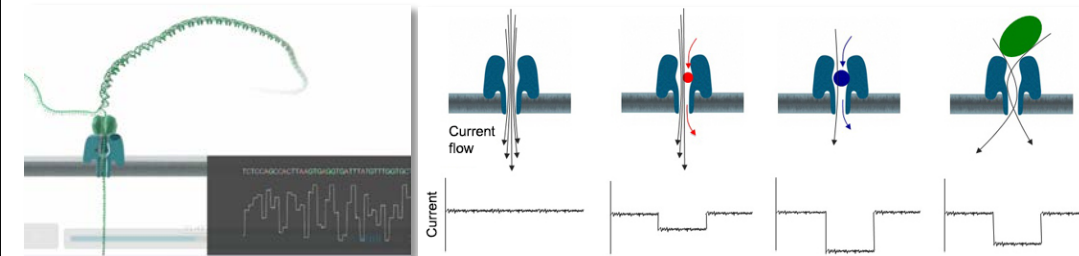
A new nanopore flow-cell technology has been demonstrated to identify DNA in situ in Atacama field testing and will later this year be deployed by ISS astronauts for on-orbit sequencing.

- The MinION is a novel, miniature, off-the-shelf instrument capable of detecting biological polymers such as DNA, RNA and proteins, without the need for bulky sequencing equipment, amplification (requiring selection and mixing of chemical solvents), or centrifuges.

Above - MinION in the halite field at the Yungay site in the Atacama Desert, Chile. Right – MinION field detection of DNA from Atacama halite sample, February 2016



- The portable MinION device was designed by Oxford Nanopore Technologies and uses consumable flow cells that contain a sensor array of several hundred pores. For output, the device plugs directly into a computer USB port.
- Preliminary opportunistic testing of a device in conjunction with PSTAR field deployment (ARADS, B. Glass) in Chile in February 2016 showed that the MinION can detect and sequence DNA in salt samples from the hyper-arid Atacama Desert.
- Additionally, groups from two NASA centers are collaborating to launch a MinION to the ISS in June.



The MinION measures the changes in the current as a biomolecule passes through a protein nanopore, allowing the structural identification of DNA, RNA and proteins.