

Portable Laboratory for *In Situ* Identification of Microorganisms

System for the analysis of metagenomes and metatranscriptomes that integrates all analysis steps into a single platform, fast, user-friendly, and on-site



Problem addressed – Need

This technology represents a significant advance by providing complete information on the composition and function of a microbial community in a remarkably short timeframe. Before this development, generating such detailed data during fieldwork was not feasible. The ability to process sequencing data in real time allows for immediate results, facilitating a more dynamic and accurate design of samples and experiments, enabling quick decision-making.

Proposed solution

The combination of technologies enables a thorough analysis of the metagenome directly at the sampling site. This involves isolating and extracting DNA from the sample, sequencing the DNA, including bioinformatic analysis of the DNA sequence, and applying statistical methods to the results.

The device has been tested in various locations under extreme conditions, including Antarctica and volcanic rocks in Las Palmas.

It has diverse applications, such as detecting antibiotic resistance, handling urgent clinical situations, or rapidly monitoring biotechnological systems with involved microbiomes. In the agri-food industry, it proves useful for swift monitoring in fermenters or bioreactors, as well as in purifiers, bioleaching systems, water control, or pathogen detection.

Innovative aspects – Key advantages

- Portability: Ability to work directly in the field thanks to the reduced size of all its components.
- Autonomy: It does not require electrical sources or internet connection. It does not need large computational resources.
- Promptness: Less than 24 hours elapse from sample collection to results presentation.
- Affordability: The cost of the complete analysis is a few hundred euros.
- Power: Comprehensive results of the metagenome are obtained, in line with the state of the art, including genes, species, functions, and individual genomes.

Stage of Development

Prototype already tested in different environments and extreme cold conditions

Intellectual Property

SqueezeMeta analysis software registered under notary 4756/2019.

Intended collaboration

Licensing and/or co-development

Contact

Transfer CNB

Email: transferencia@cnb.csic.es
comercializacion@csic.es

Reference CSIC/XX/0XX