CHEMISTRY

In-situ geomicrobiological sampling device under severe conditions

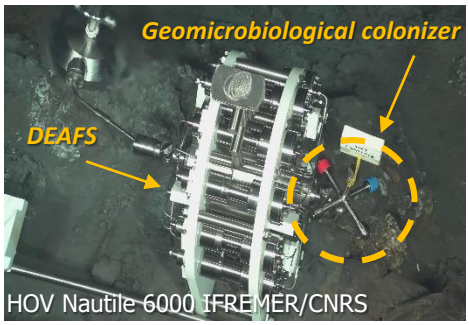
The biological interest of hydrothermal environments sheltered by mid-ocean ridges is tremendous. Their singular functioning, high productivity and biotope loaded with toxic compounds make them extreme environments compared to others known to date. These ecosystems, still relatively unaffected by human activities, constitute a real window on evolution due to the originality of the life they shelter.

Finally, the microorganisms which colonize these environments have remarkable characteristics (growth at very high temperature, high pressure, original and thermostable compounds, etc.) and are of major biotechnological and industrial interest.

DESCRIPTION*

With a successful experience in the development of the first DEep sea Autonomous Fluid Sampler (DEAFS), the laboratory has developed a device that can be deployed on the same hydrothermal sites in order to study hydrothermal microbiological colonization. This device is a Geomicrobiological colonizer that can be either a DEAFS add-on or a standalone system.

Stand-alone prototype – *should be removed from sea-bed in May 2021.*



DEAFS with add-on prototype *– tested in-situ for 15 months while DEAFS tests and have been removed from the seabed in September 2020. Samples analysis are in progress.*

TECHNICAL SPECIFICATIONS

Extreme conditions	400 bars, 300°C and pH = 3
Geometry	4-axis structure, one in the axis of the hydrothermal flow and three axes perpendicular to the flow
Microbiological support	Micro-perforated titanium tubes containing synthetic basaltic glass fragments

TOULOUSE TECH TRANSFER

COMPETITIVE ADVANTAGES

- Microbiological device that can be positioned directly on the hydrothermal flow

APPLICATIONS

- Exploration of the seabed (short term)
- Exploration of accessible marine deposits (long term)

INTELLECTUAL PROPERTY

- Published patent

DEVELOPMENT STAGE

- Technology validated in relevant environment

1	2	3	4	**5**	6	7	8	9

- Tested for 15 months in a real environment - Lucky Strike Hydrothermal Field. Analysis of samples in progress. EMSO-Azores deep-sea observatory

LABORATORIES

GÉOSCIENCES ENVIRONNEMENT TOULOUSE

mio Institut Méditerranéen d'Océanologie

CONTACT

T. +33 (0)5 62 25 50 60
systemes@toulouse-tech-transfer.com
www.toulouse-tech-transfer.com

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