

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement
- A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- The statistical test(s) used AND whether they are one- or two-sided
Only common tests should be described solely by name; describe more complex techniques in the Methods section.
- A description of all covariates tested
- A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
Give P values as exact values whenever suitable.
- For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection Seabird (Seasave), Globe Software (<https://doi.org/10.17882/70460>)

Data analysis Seabird (SBE data processing), R-cran, Globe(<https://doi.org/10.17882/70460>), ArcGIS(R), ODV(R)

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

The data acquired and generated during this study are available from the corresponding author on reasonable request and with permission of the cruise/project Pls (S. Hourdez and D. Jollivet).

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

Life sciences Behavioural & social sciences Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://doi.org/10.1038/nr-reporting-summary-flat.pdf)

Ecological, evolutionary & environmental sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This study describes the recently discovered hydrothermal vent field 'La Scala' on the Woodlark Ridge, near the Solomon Islands. The manuscript presents the water column chemical and acoustic data that led to the discovery of La Scala as well as the main chemical, geological and biological features of the vent field.
Research sample	All (chemical, physical, biological and geological) data were acquired during the CHUBACARC cruise onboard R/V L'Atalante in May 2019 (doi: 10.17600/18001111).
Sampling strategy	Water column samples were collected using CTD-rosette based on the acoustic and physical anomalies recorded by the sensors. ROV samples were collected over the course of the dives based on the direct observations.
Data collection	Data were collected during the CHUBACARC cruise and were automatically logged into the SISMER system (https://campagnes.flotteoceanographique.fr/campagnes/18001111/fr/)
Timing and spatial scale	Data were collected in May 2019 from different platforms (CTD-rosette, ROV) ponctually. The study was restricted to the vent field area.
Data exclusions	NA
Reproducibility	NA
Randomization	NA
Blinding	NA
Did the study involve field work?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Field work, collection and transport

Field conditions	Field work involved the use of an ROV at more than 3300 m depth, deployed from a dedicated research vessel. Conditions were most of the time calm to moderate seas.
Location	Woodlark Ridge, Solomon Sea, SW Pacific Ocean (9°47S/155°03W), 3300 m water depth.
Access & import/export	The government of Papua New Guinea gave us the authorization to work in their national waters with a local observer on board. The cruise started and finished in New Caledonia. All equipment and samples were shipped either directly onboard the Research Vessel from France or using the commercial lines. Only biological samples (including DNA/RNA) were shipped by plane from NC to France.
Disturbance	No environmental disturbance was caused by the study

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Included in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology and archaeology
<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input checked="" type="checkbox"/>	<input type="checkbox"/> Human research participants
<input checked="" type="checkbox"/>	<input type="checkbox"/> Clinical data
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dual use research of concern

Methods

n/a	Included in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging