



CNRS • SORBONNE UNIVERSITÉ
Station Biologique
de Roscoff



Biogenouest



INSTITUT FRANÇAIS DE BIOINFORMATIQUE



ODATIS



EMBRC
FRANCE
CENTRE NATIONAL DE RESSOURCES BIOLOGIQUES HUMAINES

AB⁴iMS

ABiMS

Analysis and Bioinformatics for Marine Science

Bureau ODATIS

13 06 2023



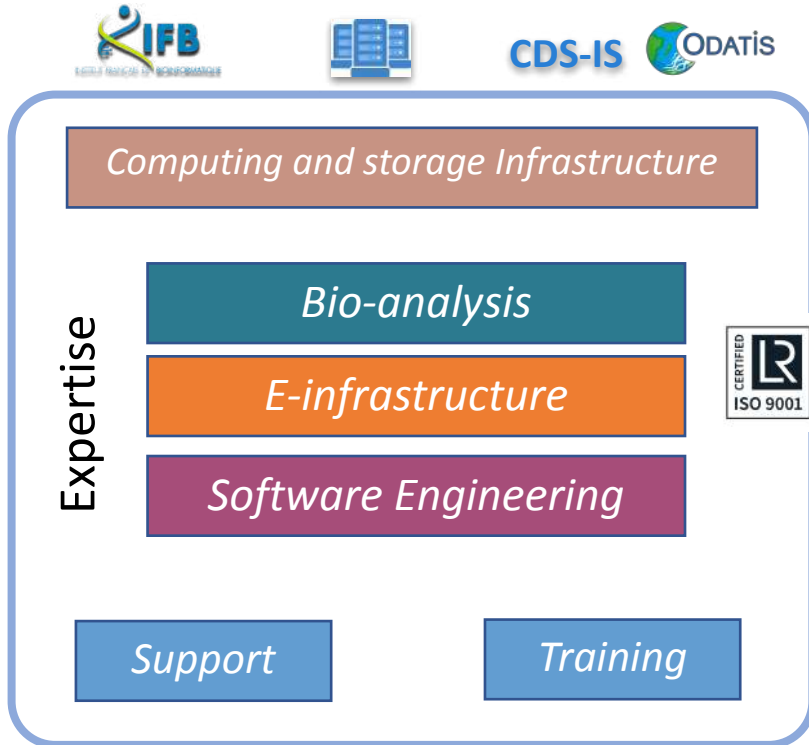
SORBONNE
UNIVERSITÉ
CRÉATEURS DE FUTURS
DEPUIS 1257



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Activities



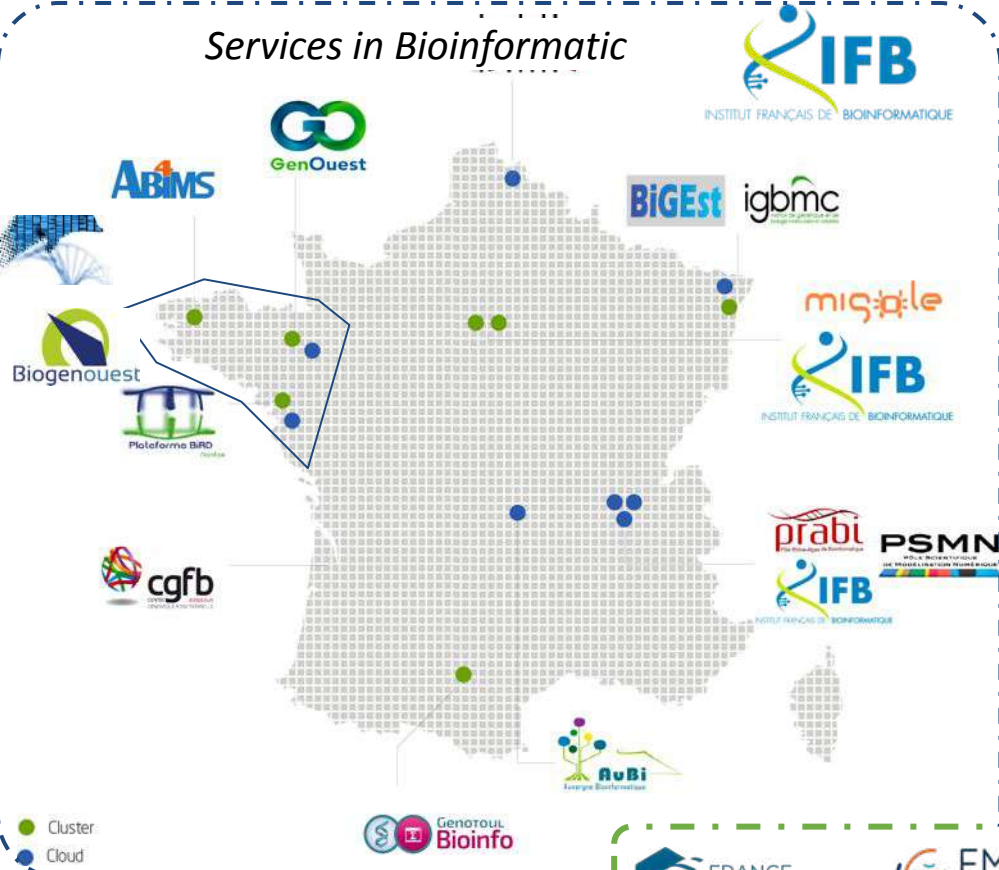
User Communities

1100 Accounts but 400 active users

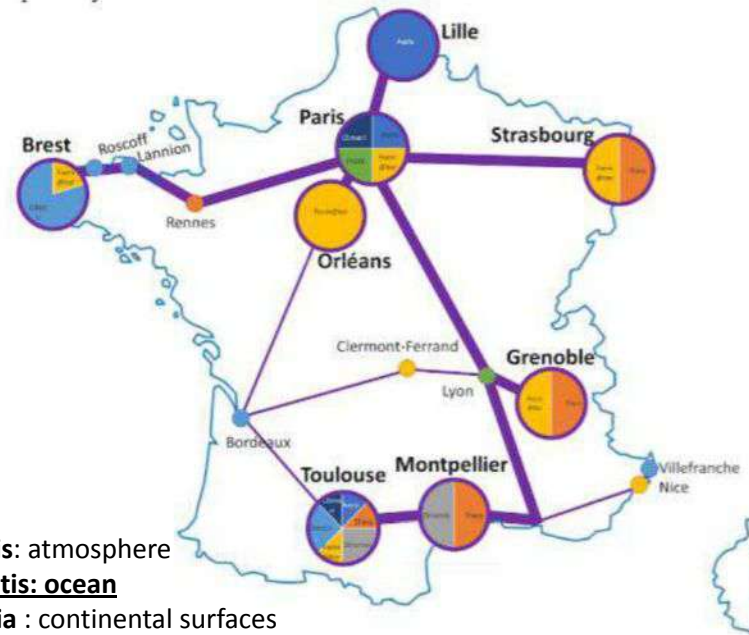


National infrastructures integration

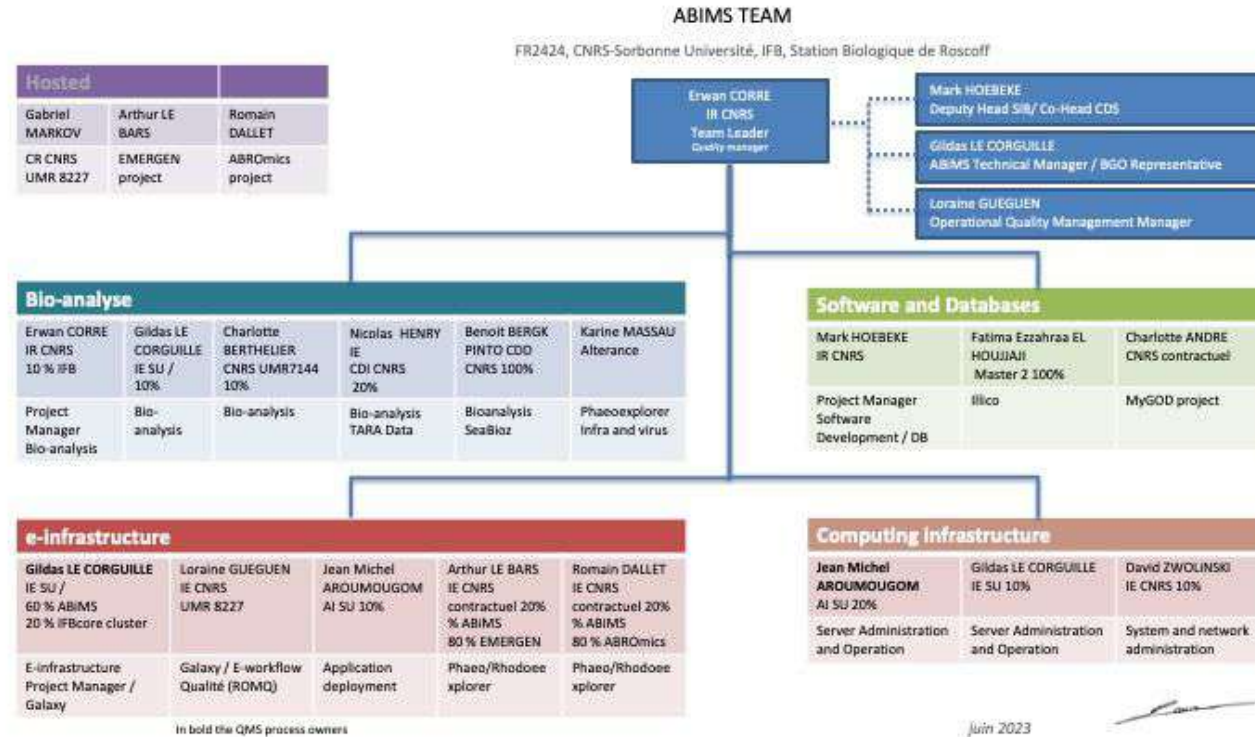
Services in Bioinformatic



Earth observation data



aeris: atmosphere
odatis: ocean
 theia : continental surfaces
 formater : solid earth



Between 12 and 20 peoples : 8 permanents = 4.5 FTP PF

6 PIA-PEPR-PPR as scientific or work package leaders

- **MuDi4LS** : Mututalised Digital Spaces for FAIR Life Scicences
 - **AO-EMBRC** : Augmented-Observatories of EMBRC
 - The **EMERGEN** consortium : conducting genomic surveillance of SARS-CoV-2 variants in France.
 - **ABROMICS** : a digital platform on antimicrobial resistance to store, integrate, analyze and share multi-omics data
 - PPR : **FUTURE-OBS** : Augmented Observatory for Coastal Socio-ecosystems
 - PEPR : **ATLASEA** : Atlas des génomes marins : des données massives à l'innovation
- + EMBRC-Fr, Idealg, Oceanomics , IFB/RENABI Tranche 1,2

9 ANR projects as partners

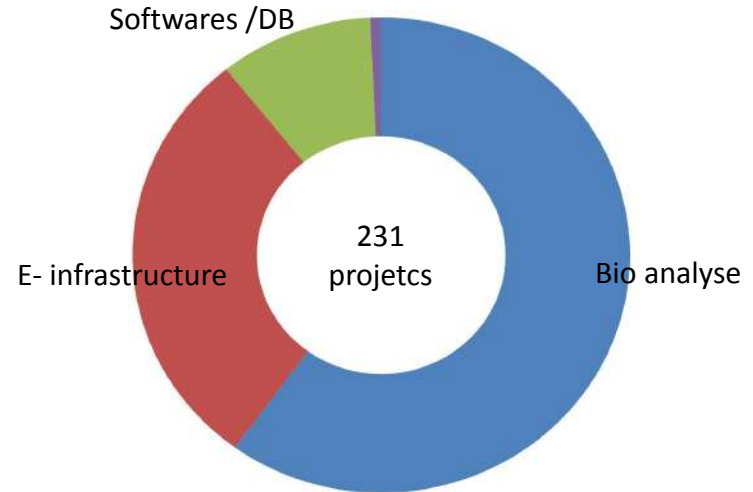
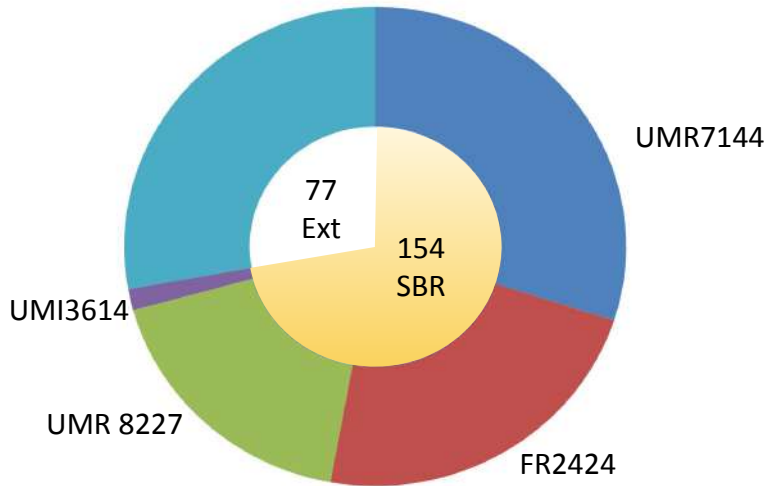
2 National in-situ observation projects

- SNO PHYTOBS
- SNO BENTHOS

European projects

- EOSC Life (2019-2023)
- EMBRIC H2020 (2015/2019)
- ELIXIR
- ESFRI EMBRC-Europe project

	Collaboratives projects	Publications	Acknowledgment	Trainees thematic schools
2017-2022	231	84	101+	492+480







ABiMS Computing Infrastructure

 2400 cpu threads	 2.5 PB storage
 9 TB RAM	 2 GPU cards



The IFB NNCR Cluster Task-Force

 17000 cpu threads	 10.5 PB storage	} 6 SLURM Clusters
 92 TB RAM	 12 GPU cards	

MUDIS4LS




Mutualised Digital Space for FAIR Data in Life and Health Science
 ABiMS - Co-technical coordinator / FAIR Data flow
 Integration and sharing of multi-omics data of Marine Data



ABiMS Co-lead of the IFB NNCR Cluster TaskForce:
 15 mutualized engineers from 6 IFB national platforms

Since 2009, ABiMS was involved in the deployment and development of Galaxy

Development of specific instance dedicated to Metabolomics :  Workflow4Metabolomics

ABiMS is now in charge of the national Galaxy infrastructure :  usegalaxy.fr

5 thematic subdomains:

- *covid19.usegalaxy.fr*
- *ecology.usegalaxy.fr*
- *metabarcoding.usegalaxy.fr*
- *workflow4metabolomics.usegalaxy.fr*
- *proteore.usegalaxy.fr*

1850 tools sorted by thematic section



https://abims.sb-roscoff.fr/resources/genomic_resources

MODEL : algae bacteria protists



MODELS



Webportal

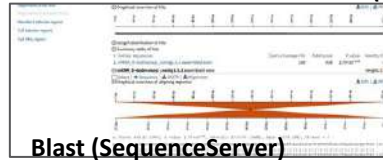


Gene pages (Tripal/Chado)

TOOLS based on GGA environment



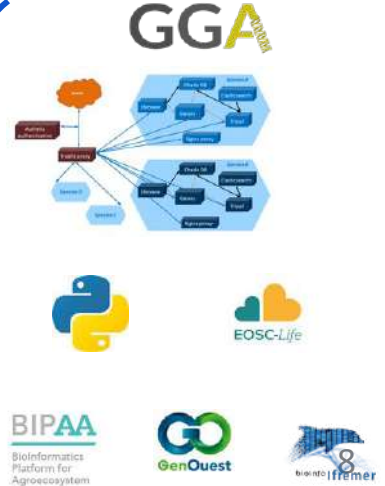
Genome browser and curation (JBrowse/Apollo)



Blast (SequenceServer)



RNAseq (Rshiny)



Automation of data integration and scale up for larger projects

Transcriptome analysis:

- Arctic Krill" J. Y. Toullec (Roscoff)
- Radiolaria F. Not (Roscoff)
- Sepia, Pterois, Heterotis , Saculine J. Henry C.Gaudin (univ. Caen)
- Sabellaria alveolata" F. Nunes (Brest)
- Quercus. J.P. Mevy (Marseille)
- Duck Liver. C. Diot (Rennes)
- Proton therapy. mouse. A Leduc (Caen)

Genome analysis:

- Phaeoexplorer project M. Cock (Roscoff)
- Rhodoexplorer project A. Lipinska, S. Kruger, S. Dittami
- Amoebohyra- dinoflagellate parasite L. Guillou
- Marine Bacteria F. Thomas; S. Dittami (Roscoff)
- Food and Marine Fungy A. Le Breton/ JL.Jany/ L.Meslet Cladiere (Brest)

Holobiont metatranscriptome analysis

- Radiolarian-symbiose " F. Not (Roscoff)
- Palourde V. Pichereau, C. Paillard (Brest)
- Epibiontic flora truite V. Cornet. (Univ.Namur)
- Posidonie symbiose. R. Lami (Banyuls)



Metabarcoding analysis

- SOMLIT ASTAN time series
- TARA Ocean analyses
- Tonga volcanic arc

Metagenome analysis

- Metagenome Virus. A. C. Baudoux (Roscoff)
- Metagenome viral Oysters. JM. Escoubas (Montpellier)
- Metagenome Brown algae holobiont
- Venise Laguna

Diversity / population analysis:

- Larvomix. AquaNIS F. Viard (Roscoff)
- RAD seq : Jaera, Ectocarpus T. Broquet (Roscoff)
- Fishes Coastal Rocky environment

Reference database

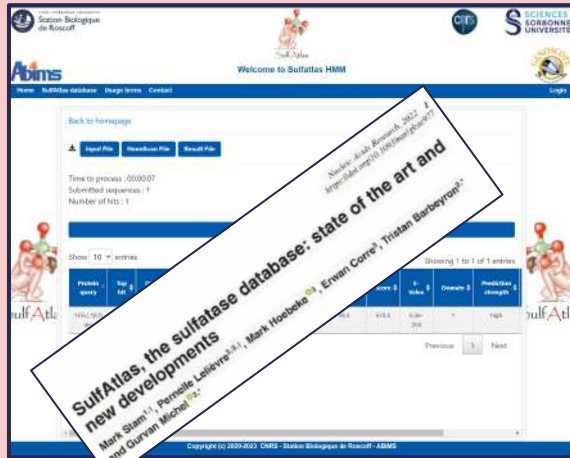
- Marine Micro Eukaryotic transcriptomes reference database (Roscoff– Genoscope-EBI)
- Eukbank: Global eukaryotic diversity (Roscoff- Tara consortium)
- Coastal Invasive species



Software Engineering: panel of activities (requirement collection, specification, development, testing, deployment) producing software applications in response to specific needs for which no shrink-wrapped solutions are available.

Primarily : **Web applications** exposing the contents of **databases** (visualise / search / export / curate).

Sequence-oriented



SulfAtlas, the sulfatase database: state of the art and new developments
 Mark Stam, Pernelle Lalleve, Mark Hoebeke, Erwan Corre, Tristan Barbeyron

SulfAtlas HMM

Pernelle + UMR8227 + CEA

<https://sulfatlas.sb-roscoff.fr/sulfatlashmm>

Hybrid



MyGOD

Charlotte A. + UMR7144 + BGO + MIO

<https://test.sb-roscoff.fr/mygod>

Biodiversity-oriented



BenthObs-B database
 BenthObs-B is a system to store data concerning benthic fauna in France, developed together by the network BenthObs, i.e. a coalition of marine research stations from benthic universities CNRS, MHNH and IRDNER

BenthObs-B

Jukka + FR2424/SO + SNO BenthObs

<https://benthobsb.sb-roscoff.fr>

- Systeme
 - Linux Initiation
 - Linux Advanced
 - Cluster
 - Git
- BioInformatique
 - Galaxy Initiation
 - RNASeq with Galaxy
- Statistics
 - R - Initiation
 - Statistics with R

in discussion

- Python
- FAIR Principles



2 training sessions (5 days)
june - november each years

740 persons trained since 2012 during
110 days of training

Training : regional and national

Regional training

Phylogeny (SeBiMer/ABiMS)

Metabarcoding (SeBiMer/ABiMS) : 4 éditions

Assembly/annotation (SeBiMer/GenOuest/ABiMS) : 1st edition 2021- 2022 (AVISAN)

Thematic schools

11 editions of the Ecole AVISAN, 5 days , 40 trainees + 25 trainers each sessions, (nov 2023)

2 edition of the Ecole AVISAN niv 2, 4 days , 30 trainees + 15 trainers (june 2023)

1 edition of the Ecole AVISAN assembly , 5 days , 30 trainees + 15 trainers (june 2023)

5 editions of SinCellTE , 5 days , 30 trainees + 10 trainers each sessions

Metagenomic school : Pasteur institute, Chemical Ecology thematic school,

GCC (US and Eu); W4M (Fr and Eu); G4B (Fr and Eu)

ANF INSU : Barecoding 2022-2023



On line training

- Tool development and integration into Galaxy
- Tool Shed: sharing Galaxy tools
- Metabolomics
- De novo transcriptomic
- Genome assembly/annotation

FAIR management of marine data

Local

Observatoire Astan

Gen4Bio

National

FUTURE OBS

SNO (s)

AO EMBRC

IS2 MUDIS4LS

European

WGEi EMBRC Europe

EMO-BON

MARCO BOLO

Consolidation of issues and practices
Capitalising on skills through pooled recruitment

Genomics of marine models

Species

Ectocarpus siliculosus

Ectocarpus subulatus

Chondrus crispus

Phylum

Genome portals

Phaeoexplorer :

brown algae

Rhodoexplorer :

red algae

Cyanorak :

Marine Cyanobacteria

Transcriptomes ressources

EuphausiidDB : Krill

MetDB : Marine Protists

ATLasea program

BYTE-Sea : IT
infrastructure and data
management

4500 marine organisms
genome



Infrastructure Calcul et Stockage

LOCAL /REGIONAL

Eskemm Data

DC régional

BigOuest

Infra. ABiMS + GenOuest

AiDA

Infra. de données marines

2 DC Régionaux

NATIONAL

Directives du MSERI

MUDIS4LS

AO EMBRC

ATLASEa

FINANCEMENTS

REGION, CPER, PIA

-> Equipements

DATA CENTER

Achat de services

-> Fonctionnement

Infrastructure de Données Marines, Science des Données et IA

Modèle initialement distribué

IFREMER
Datarmor-Next



SBR-CNRS/SU
ABiMS



IMTA
Cloud-IA



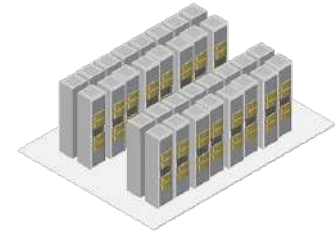
infrastructures
opérationnelles
ODATIS / DATATERRA

recherche
formation

injonction du MESRI : se rapprocher des DC
régionaux



Eskemm DATA



BigOuest



