CITÉ DES ÉNERGIES by cea

BIAM

Green Solutions for Tomorrow

Institut de Biosciences et biotechnologies d'Aix-Marseille

BIAM LSCE, January 2024

BIAM-UMR 7265
INSTITUT DE BIOSCIENCES & BIOTECHNOLOGIES D'AIX-MARSEILLE

cea cnrs Aix*Marseille université Socialement engagée

identity card: joint research unit with CEA's Institute status

A Joint Multi-site Research Unit

Fundamental Division

Hosted Unit in the Cadarache centre

(35 researchers 35 ETA)

Principal Institute: INSB
Principal Section: 23

Secondary Institute: INEE
Secondary Section: 29

Delegation DR12

(12 researchers 10 ETA)

AMU Institutes:
IM2B and ITEM

Doctoral Schools:
62 (Life and Health Sciences),
250 (Chemical Science)
251 (Environmental Science)

(8 EC, 3 ETA)

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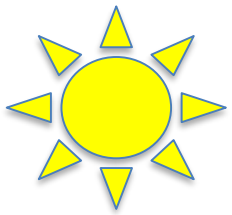
180 people from 24 nationalities including 101 permanent staff from the 3 institutions

Scientific Questions
How does the living adapt to, and explore environmental ressources?

Environmental ressources



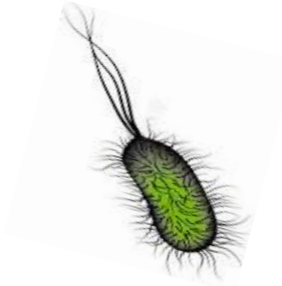
CO_2

Nutriments
(phosphate, metals)

And constraints

Toxics
Climatic changes

Model organisms



And ecosystems

Contaminated environments
In Natura microorganisms-plant-soil interface
Aquatic environmental bacteria

Outputs

Mechanisms & knowledge (Publications)

Contribution to societal challenges

Bioenergy
Biomass, Biofuel, Bioenergy,
High added value compounds

Environmental Engineering
Bio-accumulation, Bio-remediation, Bio-detection,
Biointrants
Carbon sequestration

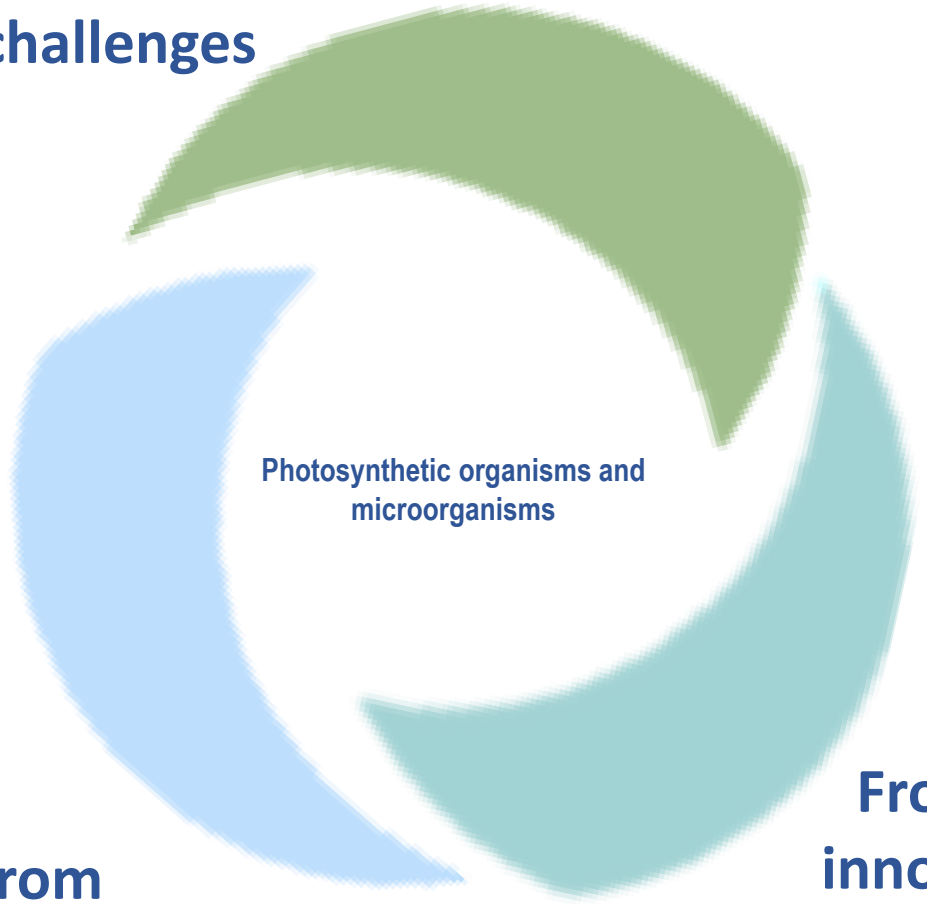
Innovative Biotechnologies
bio-molecules, (nano)materials
Selective metal extraction
and recycling
Theragnostic, health
Applications of nanomaterials

Interdisciplinary approaches, Genetics, Omics, Physiology, Imaging, Biochemistry, Chemistry Physics

Three major research axis

Response and acclimatation to environmental challenges

BIOENERGIE



ENVIRONNEMENT

From photosynthesis to bioenergies

From life principles to innovative biomolecules and biomaterial

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Three major research axis

Response and acclimatation to environmental challenges

Section 23

BIOENERGIE

Transition énergétique

IM2B

Aix*Marseille université Socialement engagée

Photosynthetic organisms and microorganisms

From photosynthesis to bioenergies

Sections 20 & 16

From life principles to innovative biomolecules and biomaterial

Transition climatique et environnementale

Sections 29 et 30

ENVIRONNEMENT

ITEM

Aix*Marseille université Socialement engagée

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BIAM has a strong national and international notoriety

Scientific production:

- ~62 yearly publications, IF > 7
- Papers in highly-rated specialized journals in our field and in general journals like Science, Nature, PNAS, Nature Communications, eLife…
- 2016-2021, 10 WoS "Highly cited papers“

Visibility:

- BIAM’s members are editor associated of 20 journals
- BIAM’s members were involved in the organization of 25 congresses
- More than 60 invitations in national and international meetings
- BIAM’s members are involved in 10 scientific societies
- 3 BIAM’s members at the CNRS ‘comité national’

Awards

- 14 prizes in national and international congress.
- In 2022, nomination in the 30 under 30 of Forbes and award from the Académie des Sciences.

369 rank A articles and 24 book chapters

Mechanism and dynamics of fatty acid photodecarboxylase

D. SORIGUÉ, K. HADJIDEMETRIOU, S. BLANGY, G. GOTTHARD, A. BONVALET, N. COQUELLE, P. SAMIRE, A. ALEKSANDROV, L. ANTONUCCI, A. BENACHIR, S. BOUTET, M. BYRDIN, M. CAMMARATA, S. CARBAJO, S. CUINÉ, R. B. DOAK, L. FOUCAR, A. GOREL, M. GRÜNBEIN, E. HARTMANN, R. HIENERWADEL, M. HILPERT, M. KLOOS, T. J. LANE, B. LÉGERET, P. LEGRAND, Y. LI-BEISSON, S. L. Y. MOULIN, D. NURIZZO, G. PELTIER, G. SCHIRÒ, R. L. SHOEMAN, M. SLIWA, X. SOLINAS, B. ZHUANG, T. R. M. BARENDS, J.-P. COLLETIER, M. JOFFRE, A. ROYANT, C. BERTHOMIEU, M. WEIK, T. DOMRATCHEVA, K. BRETTEL, M. H. VOS, I. SCHLICHTING, P. ARNOUX, P. MÜLLER, AND F. BEISSON fewer
Authors Info & Affiliations

SCIENCE · 9 Apr 2021 · Vol 372, Issue 6538 · DOI: 10.1126/science.abd5687

Live single-cell transcriptional dynamics via RNA labelling during the phosphate response in plants

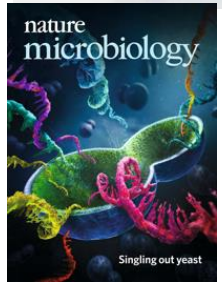
Sahar Hani, Laura Cuyas, Pascale David, David Secco, James Whelan, Marie-Christine Thibaud, Rémy Merret, Florian Mueller, Nathalie Pochon, Hélène Javot, Orestis Faklaris, Eric Maréchal, Edouard Bertrand & Laurent Nussaume

Nature Plants 7, 1050–1064 (2021) | Cite this article

METAL ACQUISITION

Biosynthesis of a broad-spectrum nicotianamine-like metallophore in *Staphylococcus aureus*

Ghassan Ghssein,[1,2,3*] Catherine Brutesco,[1,2,3*] Laurent Ouerdane,[4*] Clémentine Fojcik,[5] Amélie Izaute,[1,2,3] Shuanglong Wang,[4] Christine Hajjar,[1,2,3] Ryszard Lobinski,[4] David Lemaire,[2,3,6] Pierre Richaud,[2,3,7] Romé Voulhoux,[8] Akbar Espaillat,[9] Felipe Cava,[9] David Pignol,[1,2,3] Elise Borezée-Durant,[5] Pascal Arnoux[1,2,3]



Letter | Published: 29 April 2019

Ectosymbiotic bacteria at the origin of magnetoreception in a marine protist

Caroline L. Monteil, David Vallenet, Nicolas Menguy, Karim Benzerara, Valérie Barbe, Stéphanie Fouteau, Corinne Cruaud, Magali Floriani, Eric Viollier, Géraldine Adryanczyk, Nathalie Leonhardt, Damien Faivre, David Pignol, Purificación López-García, Richard J. Weld & Christopher T. Lefevre

Nature Microbiology (2019) | Download Citation

BIAM strengths: national and international recognition

Strong national and international outreach

National Academic Networks (IM2B, GDR)

European Projects
Bilateral Projects: Brazil, Germany, Japan, Israel, USA, China.

Numerous research contracts

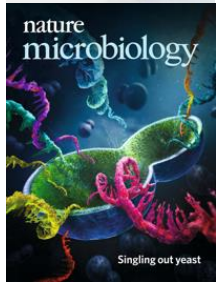
External Resources: around 1,2 M€ per year

Public funding:
ANR: 31 ongoing projects
H2020, PIA, A*MIDEX

Private funding:
TOTAL, ORANO, BIOGEMMA, ROULLIER, LIMAGRAIN, BIOVITIS

Plant biology and Bioenergy teaching in Aix-Marseilles University

369 articles de rang A et 24 chapitres de livre



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Nature Microbiology (2019) | Download Citation

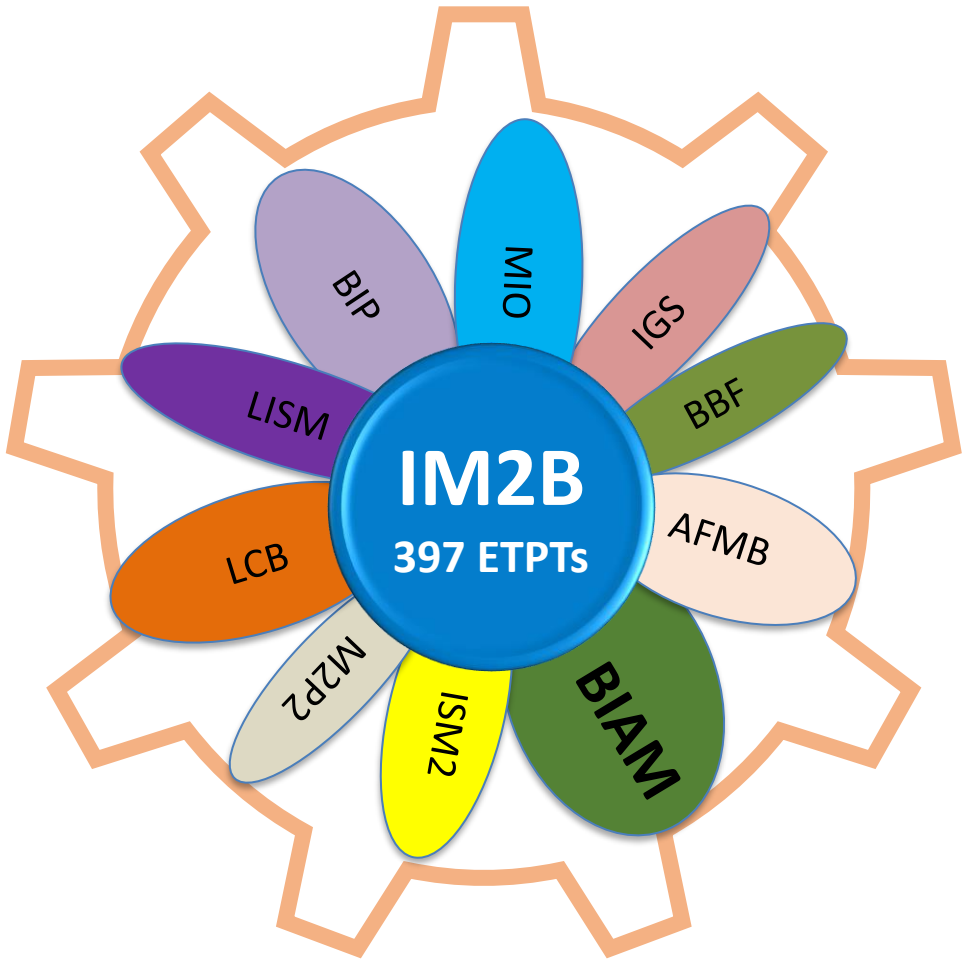
BIAM: an active member of the thematic Institutes of AMU

(IM2B: Microbiology, Bioenergy and Biotechnology)

RESEARCH ⟷ **TRAINING**

10 Laboratories

14 Platforms



Master Level

Stuctural biology and genomic
Fundamental Microbiology
Life chemistry
Environmental biology and biotechnologies

LGBP

PhD Level

A tailor-made program developed by and for students

An interdisciplinary, professionalized and open to the world training

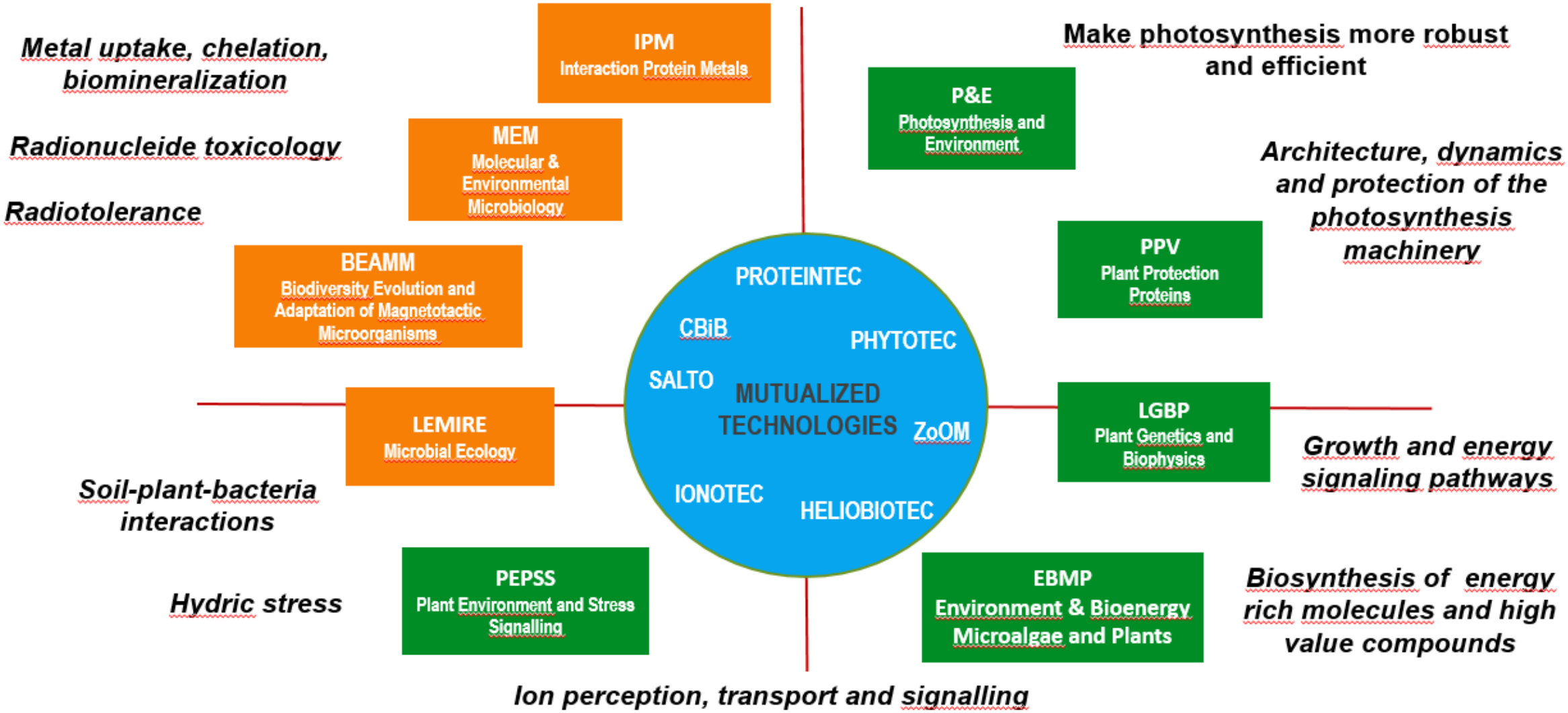
Joining IM2B's Plinius Cursus program is a guarantee of success for a winning doctorate and a training that prepares you for an international career

New Building and new equipments

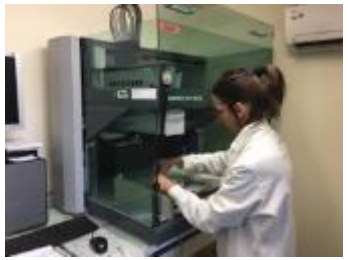
8 000 m^2
20 M€ FEDER/CPER, CD13, Métropole, CEA

1 000 m^2
Plan Campus/Investissement d'Avenir

Nine research teams & seven platforms



Collaborative platforms or ressources

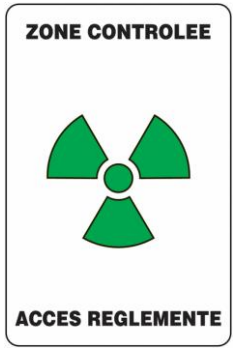


PROTEINTEC

Medium-throughput expression of recombinant proteins
From purification to structural analysis

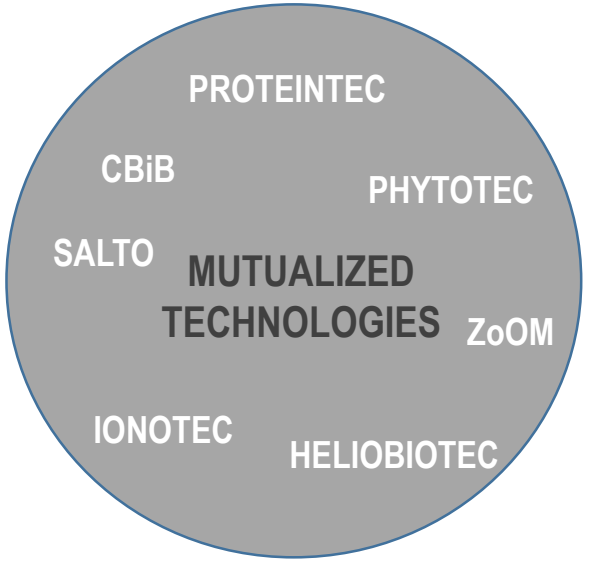
PHYTOTEC

Measures and culture under controlled conditions
Experimentation under modified atmosphere
Isotopic labelling
Environmental stress



SALTO

Microbiology and plant lab for the use of radioisotope tracers or radionucleides



HELIOBIOTEC

Culture in controled photobioreactors
Metabolomic analysis of lipidic compounds
Gas exchange measure

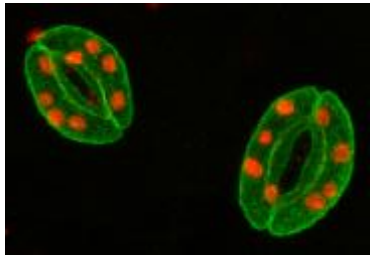
IBISBA 1.0

CBiB (2022)

Bio-Informatics and bio-statistics
Training

ZOOM

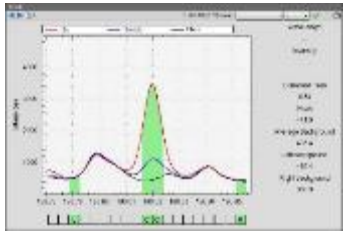
Pool of microscopes (optic, confocal)
Training



IONOTEC

Measure of ion concentration

- ICP-OES
- ICP-MS



INSTITUT DE BIOSCIENCES & BIOTECHNOLOGIES D'AIX-MARSEILLE
cea
cnrs
Aix Marseille université

BIAM contributed to the creation of two startups, a third one enters in the CEA maturation program Magellan

2018

ADEQUABIO
BACTERIES PHOTOSYNTHETIQUES

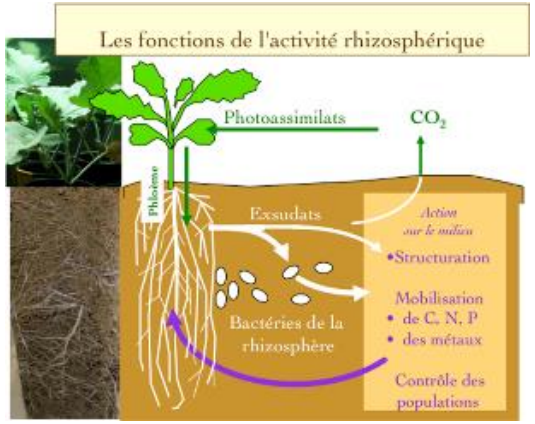
Organic acqueous waste treatment by photosynthetic bacteria

Licensing and collaboration agreement through CEA

BIOINTRANT

Development of biostimulants from soil microorganisms for agriculture

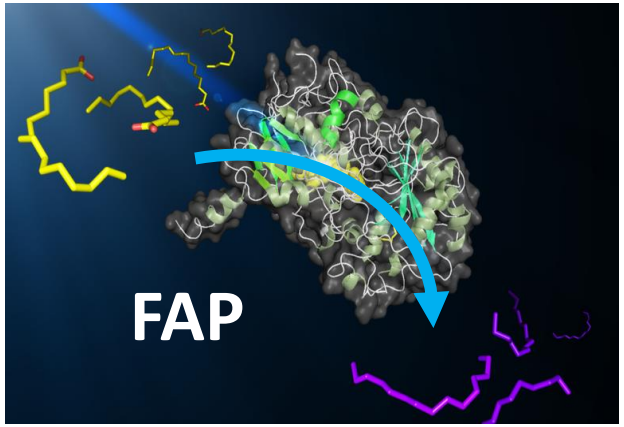
Licensing and collaboration agreement through CNRS



2023

Alcasun
BIOSOURCED ALKANES

Production of pure and biosourced linear hydrocarbons for cosmetics



cea

Magellan programme for StartUp creation

Alcasun project phase 2: maturation of the technology starting 2023

Our DNA: equality, responsibility, integrity

People at the heart of our projects

- Gender equality, training for young employees
- Serenity charter
- Taking account of disabilities

The environment at the heart of our projects

- Eco-responsibility: BIAMagasin, Labo1.5
- numerous actions carried out by the EcoBiam group

Responsible communication at the heart of our projects

- Open science: 95% of the articles produced are in Open access and/or deposited in open archives (HAL, BioRxiv,...).

Scientific integrity

- Mandatory Lab note-books
- Mandatory lecture on scientific ethics to all our student and newcomers

Science with and for Society

Studying nature to help it adapt to climate change (RESTORE and 4 for 1000 project)

From solar radiation to biofuels, cosmetics and nutrition!

In 2022:

- **Educational workshops** in schools: more than 600 students will benefit
- **Family-Friends Day**: 500 visitors at BIAM
- **Fête de la science** in Manosque: 480 schoolchildren + 200 general public on the BIAM stand
- **Visits** to the building: 430 visitors

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