



IBMP | Exploring the plant world

INSTITUT DE BIOLOGIE MOLÉCULAIRE DES PLANTES

CCM meeting
November 8-9, 2018

affiliated with

University of Strasbourg



PLANTS AND SCIENCE ARE INDISSOCIABLE

Basic research

R. Hooke- 1665
Cork cell



G.Mendel -1900
Heredity laws



M. Beijerinck-1898
TMVirus



B. McClintock-1983
Transposons



R. Jorgensen - 1990
Gene silencing



Biodiversity



Angiosperm



Gymnosperm



Fern



Algae



Moss

Biomolecules



Resin
Lignin ...



Pharmacology



Food additive



Cosmetic

IBMP | MISSIONS

Generate fundamental knowledge about plants

Integrate translational applied research



Disseminate our discoveries through outreach activities

Provide world-class education and training

IBMP | KEY FACTS



The largest unit of CNRS for plants sciences

| 180 coworkers

| 16 research teams

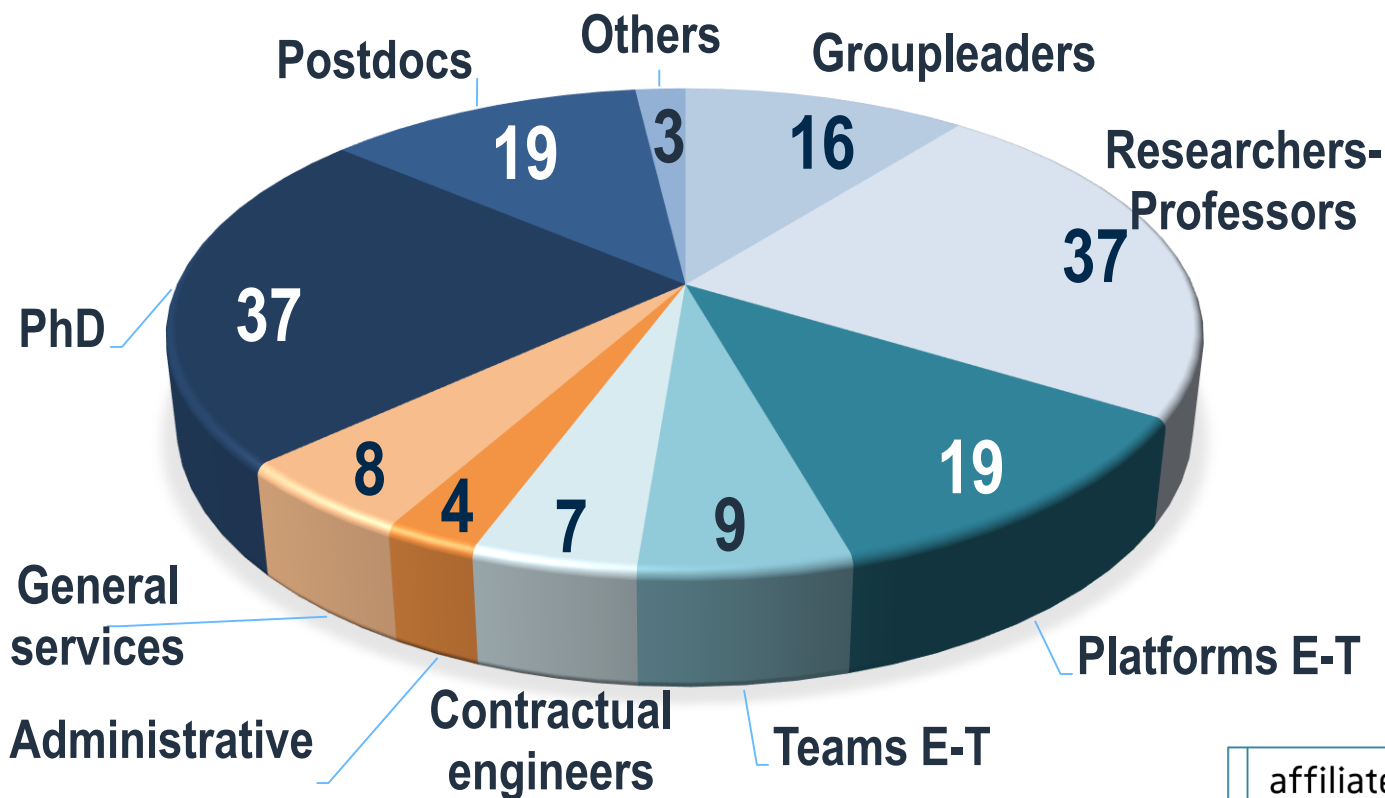
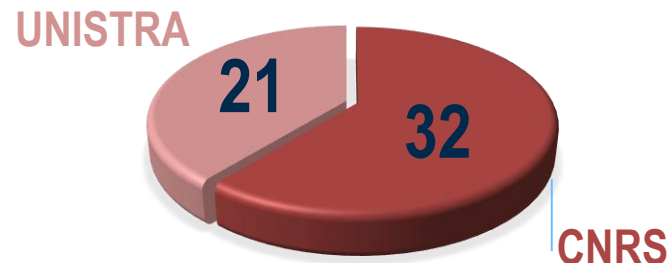
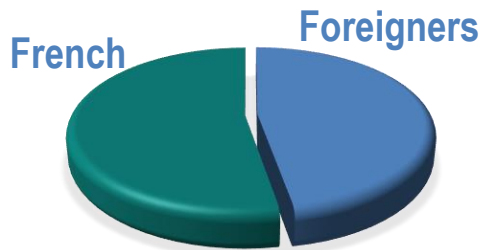
| 6 technological platforms

affiliated with

University of Strasbourg



IBMP | AN INTERNATIONAL INSTITUTE



affiliated with
University of Strasbourg

| PhD students training



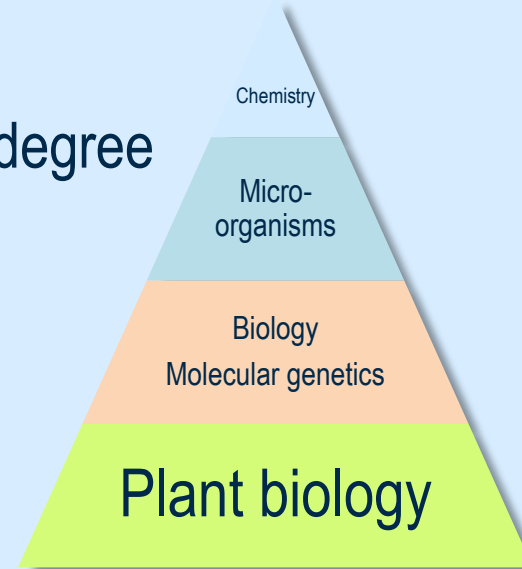
www.cnrs.fr

| Pupils - High school



penLAB
DÉPARTEMENT PÉDAGOGIE ET MÉTHODES DE LABORATOIRE

| License degree
| Masters
| DUT



14 Ass. Profs, 7 Profs

CNRS researchers, Engineers

70 Internships per year

IBMP | PLANT PRODUCTION



www.cnrs.fr

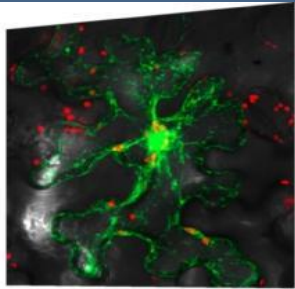
20 plant species

200.000 plants / year

Controlled environment

Modern growth chambers



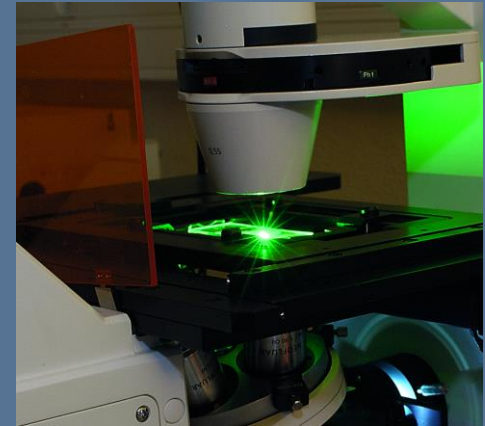


Confocal microscopes

4D fluorescence microscope

FLIM

High resolution electron
microscope SEM



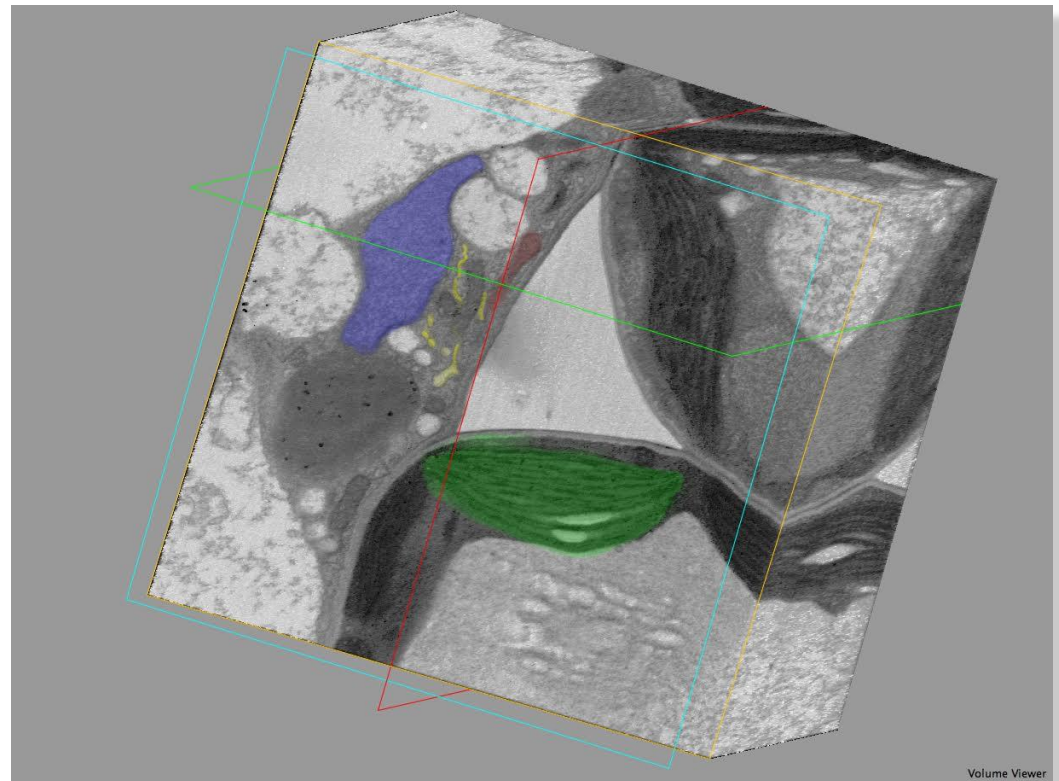
For all the campus
Last generation apparatus
Plants, animals, materials

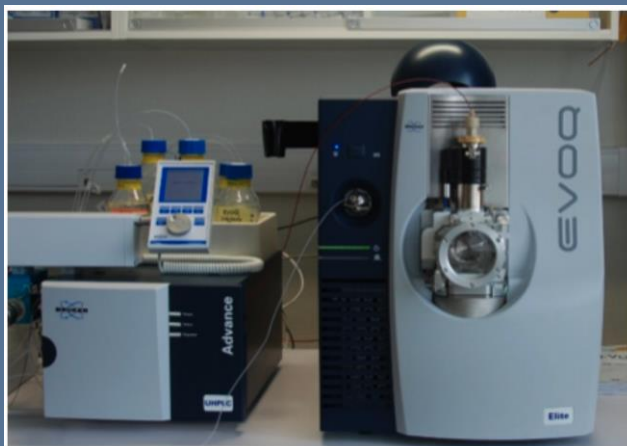
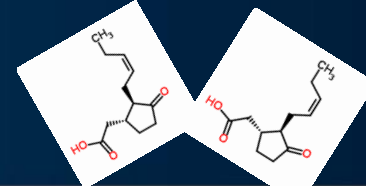
IdEx Unistra 2017



Series of Field Emission Scanning Electron Microscopes (FE-SEM)

3D reconstruction of Arabidopsis cells using the « serial block face imaging » approach





UPLC-MS/MS Advance/EvoQ (Bruker)



GC-MS/MS SCION (Bruker)

UPLC/MS/MS

GC/MS

GC-FID

SolariX

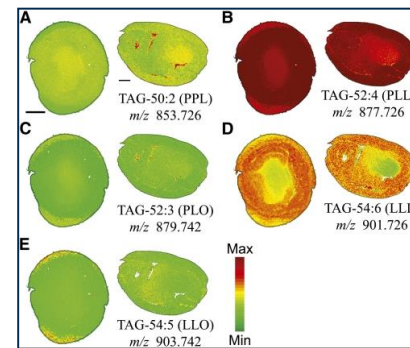
Identify, discover new metabolites
A domain in expansion

CPER 2015-2020

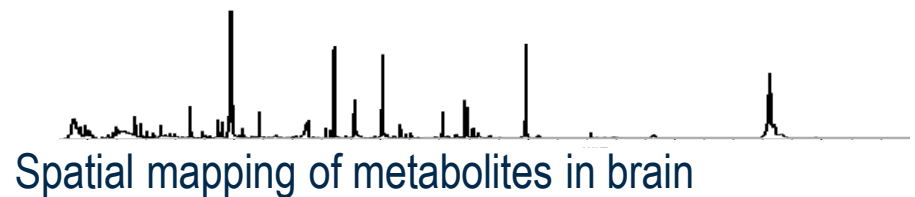
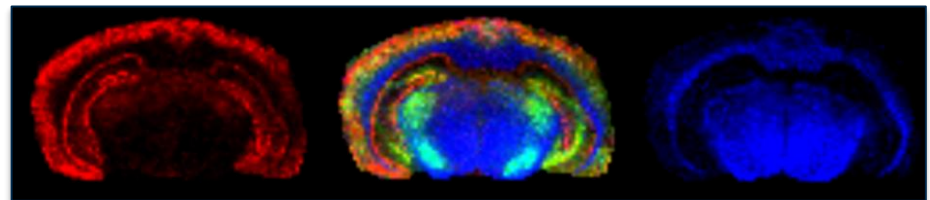
Spatio-temporal identification of molecules in biological samples



Solarix FT-ICR, 7 Tesla (Bruker)



Spatial mapping of lipids in embryos of cotton



Spatial mapping of metabolites in brain

INFORMATICS | HIGH CAPACITY OF STORAGE AND ANALYSIS



Bioinformatics

Software development

Infrastructure

Computing cluster 64 cores
Servers hosting and web services
Software engineering

Know how



FPLC Akta

Protein production



MISeq, Qbit, Bioanalyser

NGS



Informatics space

Storage and analysis



Solarix FT-MS

MS + MALDI imaging

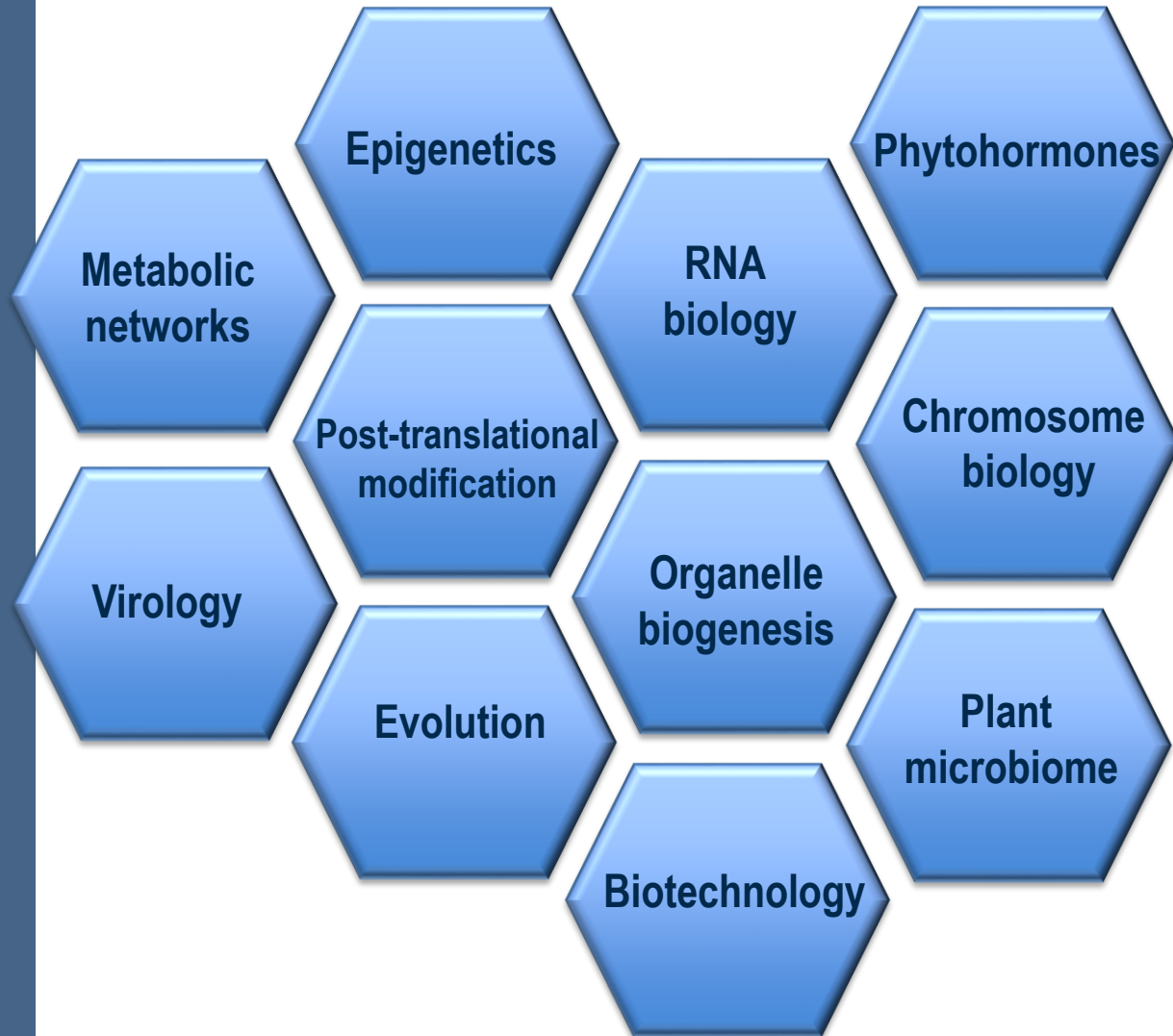


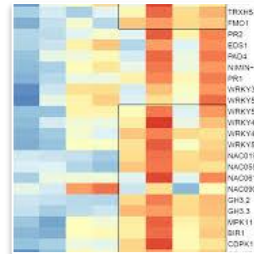
Serial block face scanning
electron microscope

3D imagery

Last generation equipment

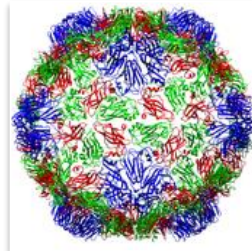
IBMP | RESEARCH EXPERTISE





Regulation of gene expression

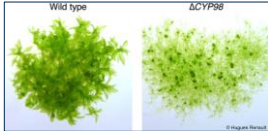
Plant development and growth



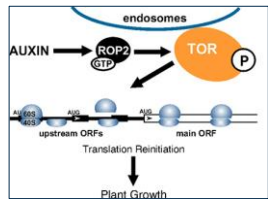
Biotic and abiotic stresses

Plant bioactive molecules

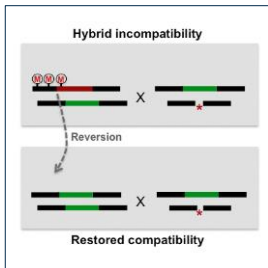




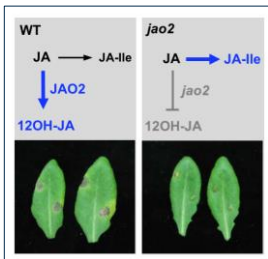
A phenol-enriched cuticle is ancestral to lignin evolution in land plants
Nature Communications



GTPase ROP2 binds and promotes activation of target of rapamycin, TOR, in response to auxin
EMBO J



Hybrid incompatibility caused by an epiallele
Proc Natl Acad Sci



Jasmonic acid oxydase 2 (JAO2) hydroxylates jasmonic acid and represses basal defense and resistance responses against *Botrytis cinerea* infection
Mol Plant



Nanobody-mediated resistance to Grapevine fanleaf virus in plants.
Plant Biotechnol J



Polycytidylation of mitochondrial mRNAs in *Chlamydomonas reinhardtii*
Nucleic Acids Res



RNA degradation by the plant RNA exosome involves both phosphorolytic and hydrolytic activities.
Nature Communications

IBMP | BEYOND THE BORDERS

| LabEx

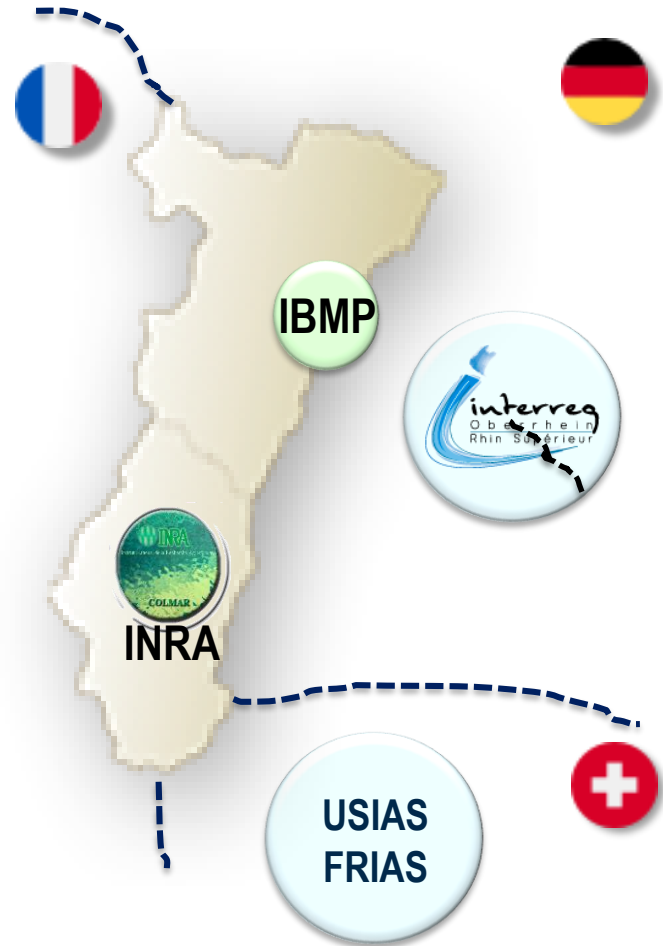


4 teams



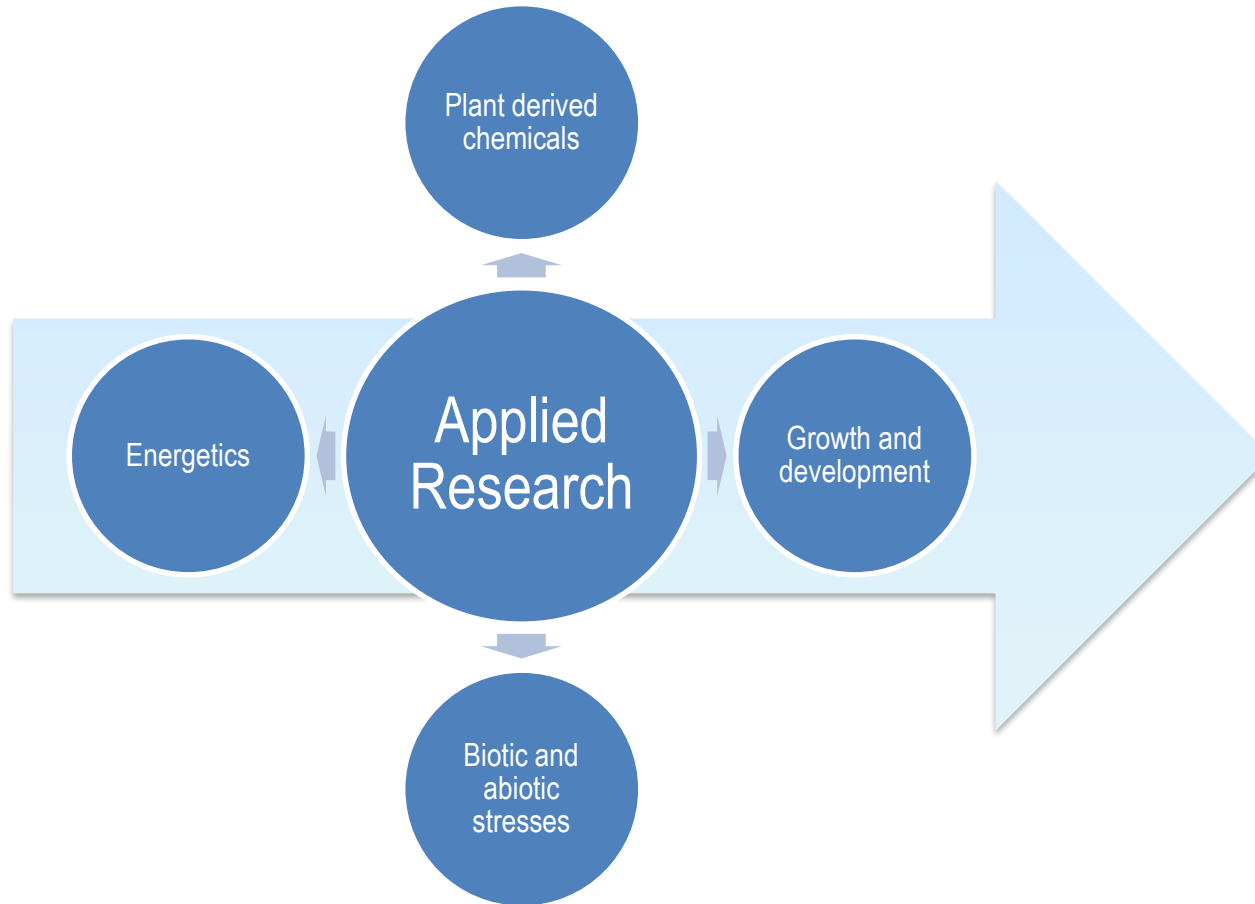
3 teams

| International associated laboratories



| Develop applied plant research

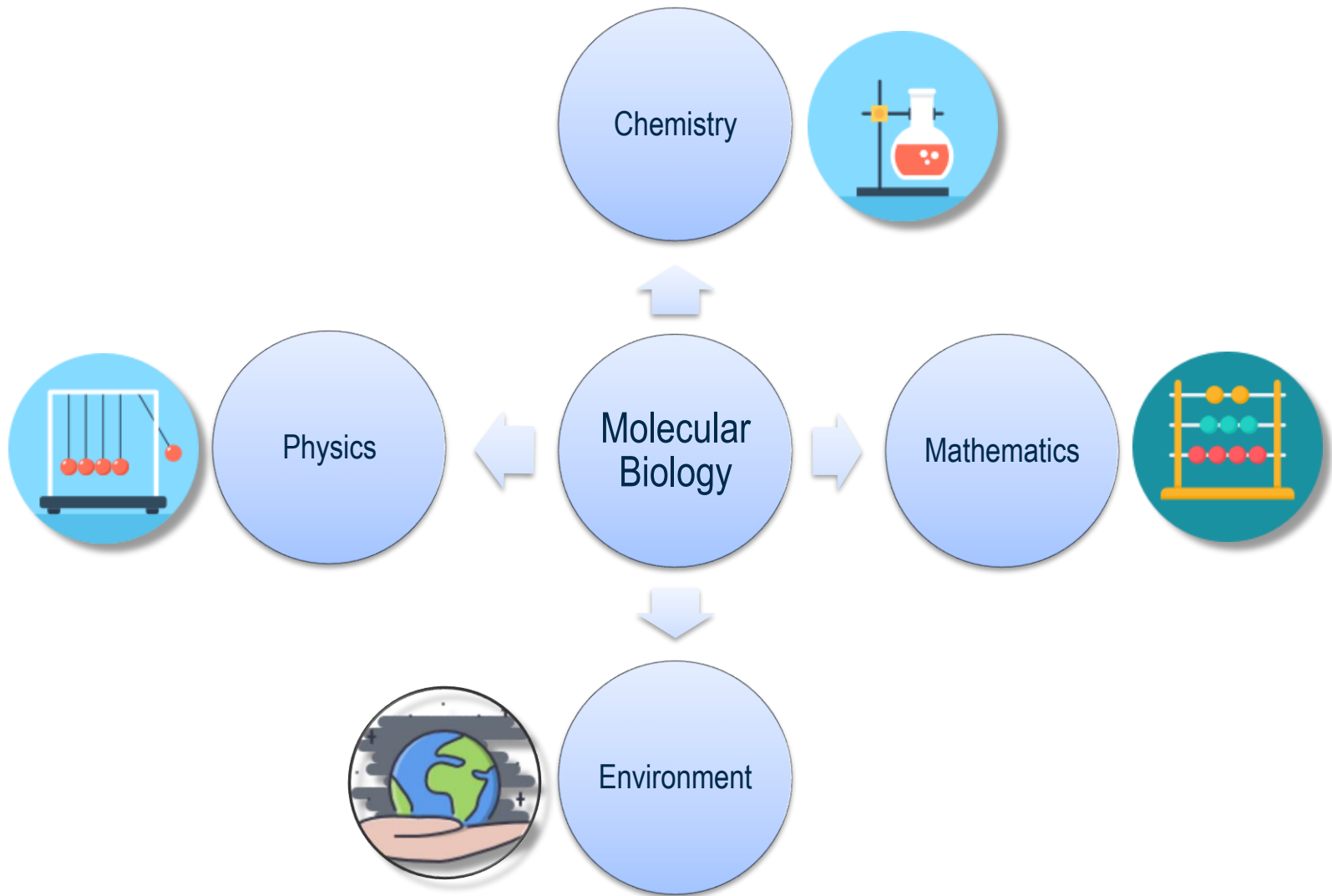
| From Arabidopsis to crops or plants of economical interest



| Climate change

| Food sustainability

| Human health



Plant protection

| Jasmonate signaling: how plants control their defense

| Synthesis and production of biomolecules

| LabCom Terpfactory

Bioactive molecules

| Elimination of micropollutants

Human health

Plant Biotechnology Valorisation

| Gibberelin and adaptation to environmental changes

Growth regulation

| Plant microbiota identification

Growth Biomolecules



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