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UMR1417

## Plant and Cell Physiology Laboratory (LPCV)

### Management

Eric Maréchal, Director  
Juliette Jouhet, Deputy Director  
Laurent Blanchoin, Deputy Director

### Key figures

- 37 researchers and lecturer-researchers
- 36 PhD and post-docs
- 21 engineers, technicians and administrative staff

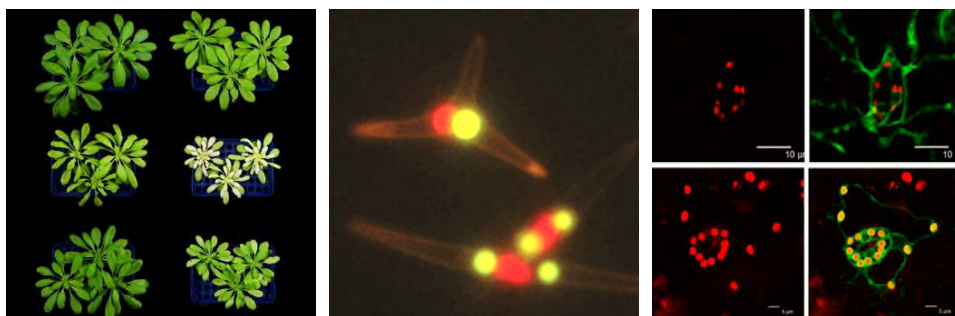
### Keywords

- Plants and algae
- Photosynthesis
- Metabolism
- Flowering
- Abiotic stress
- Cytoskeleton

### Mission and objectives

LPCV is located at the CEA Grenoble. It is part of the Grenoble Interdisciplinary Research Institute (IRIG), which brings together nine multidisciplinary joint research units.

LPCV studies the functional organization of eukaryotic cells (plants, micro-algae, human cells, yeasts) with a specific focus on plant and micro-algal cells.



This research, carried out at both molecular and cellular levels, aims to improve understanding of:

- photosynthesis and metabolic pathways;
- cell division and morphogenesis processes;
- cell responses and adaptation to fluctuating environmental conditions.

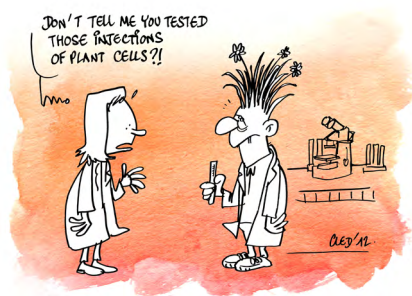
The laboratory brings together skills in biochemistry, cell and molecular biology, microscopy and image analysis, bioinformatics and statistics

### Research

LPCV has nine research teams which address three main research topics:

#### • Photosynthesis and metabolism

This topic deals with molecular, physiological and ecophysiological questions related to light capture, CO<sub>2</sub> assimilation and metabolism in photosynthetic organisms, plants and micro-algae, with possible applications in the fields of biomass, bioenergy and green chemistry.



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#### LPCV Teams

- Photosynthesis
- Chlorogenesis
- Photosymbiosis
- ChromDev
- Lipid
- Flo\_RE
- StrucDev
- MetalStress
- CytoMorphoLab

#### Technical facilities

- Lipidomics platform (LIPANG)
- µLiFe platform for molecular and cellular imaging
- Plant culture technical support facility
- Micro-algae culture technical support facility
- Cell culture technical support facility
- Eukaryotic production system technical support facility
- Organ and tissue imaging technical support facility
- Ionomeric technical support facility ICPMS



#### • Morphogenesis and development

This topic focuses on characterizing what determines cell shape and polarity, cytoskeleton dynamics, membrane biogenesis, developmental transitions at the organism level and the dynamics of genetic expression.

#### • Response and adaptation to a fluctuating abiotic environment

This topic deals with photosynthetic organism responses to the effects of global climate change, with in-depth studies of habitat-related factors such as light, temperature, nutrients, in particular in ocean and mountain habitats. It is also concerned with understanding plant and micro-algal responses to heavy metals and radionuclides, with possible applications in soil and water depollution.

## Collaboration and expertise

### Local

LPCV collaborates with several IRIG member laboratories (including the Institute for Structural Biology (IBS), the Chemistry and Biology of Metals Laboratory (LCBM), and the Biosciences and Bioengineering for Health Laboratory (BGE), as well as with the Institut Laue-Langevin (ILL) and the European Synchrotron Radiation Facility (ESRF). LPCV also works closely with Université Grenoble Alpes laboratories: Centre de Recherche sur les Macromolécules Végétales (CERMAV), Laboratory of Alpine Ecology (LECA), and Station Alpine Joseph Fourier (Lautaret research facility).

### National

LPCV collaborates with organizations nationwide:

- Paris: Institute of Physico-Chemical Biology (IBPC); Institut de biologie de l'ENS; Institut Curie; Institut Pierre Gilles de Gennes; Genoscope
- Aix-Marseille: Institute of Biosciences and Biotechnologies (BIAM)
- Montpellier: Institute of Functional Genomics (IGF); Plant Health Institute (PHIM); Biochemistry and Plant Molecular Physiology (BPMP)
- Perpignan: Plant Genome and Development Laboratory (LGDP)
- Rennes: Institute of Genetics, Environment and Plant Protection (IGEPP)
- Strasbourg: Institut de Biologie Moléculaire des Plantes (IBMP)
- Roscoff: Biological Station (SBR)
- Villefranche-sur-Mer: Laboratoire d'Océanographie (LOV)

### International

The main collaborative projects are with Germany, the USA, the UK, Japan, China, and Canada. They mainly involve phytoplankton, photosymbiosis, metabolic pathways, lipids, transcription factors, flowering, temperature and drought resistance and the cytoskeleton.

LPCV is also involved in the European CropBooster programme, in collaboration with Belgium, Denmark, the Netherlands, Germany, the UK and Italy.

## Teaching and training

LPCV is heavily involved in teaching activities, particularly in the context of the PLANTA International Master's degree, set up in 2018 by lecturers from the unit, in association with the University of Milan.



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