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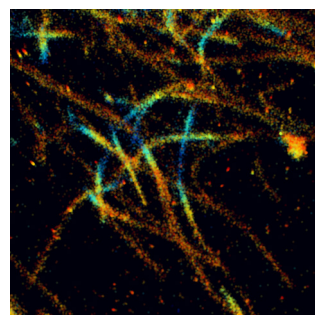
INRAE, AGROPARISTECH

Institute Jean-Pierre Bourgin for Plant Sciences (IJPB)

Mission and Objectives

The Institute Jean-Pierre Bourgin for Plant Sciences (IJPB) is one of the largest plant science research centres in Europe and is renowned for its unique combination of experimental resources and multidisciplinary expertise in biology, chemistry and applied mathematics.

Our research aims to develop concepts and tools that extend our fundamental knowledge about plant sciences and agronomy towards innovative solutions for complex scientific and social challenges. In addition to scientific discovery, our remit also includes transfer and sharing through teaching, training, outreach and partnerships.



Pictures: © INRAE, IJPB (right: Alexis Pasquell)

IJPB research exploits a range of plant models (*Arabidopsis thaliana*, *Brachypodium distachyon*, *Physcomitrium patens*, *Brassica napus*, *amaranthus*, maize, sorghum, wheat, barley, pea, camelina and tomato) as well as microbial models.

The IJPB is affiliated to two governing bodies. Firstly, INRAE with personnel belonging to both the Plant Biology and Breeding (BAP) and Food, Bioproducts and Waste (TRANSFORM) divisions. Our second governing body is AgroParisTech, whose personnel are in the Life and Health Sciences (SVS) department. The IJPB also belongs to the circle of 14 entities of the Université Paris-Saclay and is a founding member of its Graduate School of Research dedicated to Plant Sciences (SPS-GSR).

Our Plant Observatory (PO) encompasses 5 technical platforms and the Versailles Arabidopsis Stock Centre (VASC). This set of resources is dedicated to multi-level plant phenotyping, covering the entire process from sample production to analysis. Accredited by the French IBiSA platform network since 2012, the PO is a Strategic Regional Platform of INRAE since 2013, listed in Pluginlabs. The PO belongs to the SMaCS consortium of the Université Paris-Saclay, as well as the France-Biolmaging national infrastructure.

Management

Helen North, IJPB director

Sylvie Coursol, deputy director

Magali Nawrocki-Serin, deputy director

Bertrand Dubreucq, deputy director

Eric Jenczewski, deputy director

Key Figures

- 284 staff, comprising 189 permanent staff (September 2024)
- 75 researchers, lecturers or professors
- 114 engineers and technicians
- 95 non-permanent staff and students

The Plant Observatory dedicated to multi-level plant phenotyping

- 3,000 m² of glasshouses (S2 and S3 level including a quarantine area)
- 300 m² of growth chambers (S2, S3 and quarantine area)
- 100 m² of *in vitro* growth chambers
- 80 m² of lysimeter boxes
- 100 m² of seed conservation facilities
- 3 phenotyping robots
- 1,400 m² dedicated to plant imaging, biochemical and metabolic analyses



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IT

Plant Science, Diversity,
Health & Biotechnology

IT

Digital Sciences &
Systems Modelling

IT

Microorganisms, Health
& Environment

IT

Agroecosystems
& Environment

Topics



Research

Our research is organized around 3 scientific axes, providing the framework for 17 scientific priorities that unite teams and projects around key questions identified by our governing bodies such as climate change mitigation, the agroecological transition and biosourced products.

Axis 1: Advancing our knowledge of basic plant functions and interactions

- Genome and epigenome dynamics
- Cellular and molecular plant physiology
- Plant development and reproduction
- Primary and specialized plant metabolism
- Perception of environmental constraints and signalling
- Multiscale modelling of plant complexity
- Plant-microorganism and plant-plant interactions

Axis 2: Designing Smart Crops for sustainable agriculture in the face of climate change

- Exploring and exploiting natural variability
- Understanding and improving water, N and C use efficiency
- Adaptation to the biotic and abiotic environment
- Gene editing and biotechnological applications for trait improvement
- Leveraging biostimulation and biocontrol in agroecology

Axis 3: Towards novel plant-based products for food and non-food uses

- Biomass production and transformation
- Seed production and quality
- Green chemistry and molecular pharming
- Developing and engineering value-added bioproducts
- Biostimulation and biocontrol solutions

Collaborations

The IJPB has ongoing collaborations with teams from 34 countries, including 15 from the European Union, supported by national and European funding agencies (i.e. H2020, PRIMA, ANR-PRCI, PHC, EMBO), as well as socio-economic partners. We are also part of the Carnot Institutes Plant2Pro and 3BCAR. We have close relationships with competitive clusters such as Vegopolys Valley and Vitagora, as well as with the seed industry organisation SEMAE, the maize breeders' association ProMaïs, technical institutes, and the Biocontrol and PlantAlliance consortia; these are instrumental in facilitating our interactions and developing new partnerships.

Teaching, Training and Outreach activities

Teaching and training are an integral part of IJPB activities. Our leadership in higher education is exemplified by the Erasmus Mundus Joint Master in Biological and Chemical Engineering for a Sustainable Bioeconomy (Bioceb). We also support English-language initiatives, participating in an Erasmus project that prepare graduates to address the challenges of increasing plant proteins in the food industry for healthy diets. Additionally, we host international Ph.D. students and post-doctoral researchers for summer schools and IJPB staff contribute to the Paris-Saclay Graduate Schools 'Biosphera', 'Life Science and Health' and 'Chemistry'. Outreach to share our science and innovations is also a key priority.



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