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UMR1318

INRAE, AGROPARISTECH

Jean-Pierre Bourgin Institute (IJPB)

Management

Helen NORTH, head

Key Figures

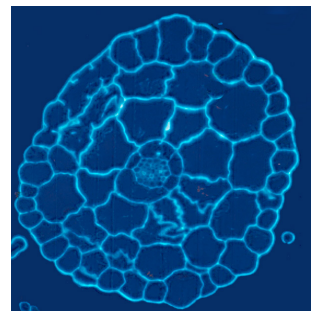
- 86 researchers and teacher-researchers
- 47 PhD and post-doctoral students
- 45 engineers
- 93 technicians and administrative staff

- 6 scientific platforms at the Plant Observatory
- 3 500 m² greenhouse
- 300 m² culture rooms
- 5 phenotyping robots

- 17 patents

Mission and Objectives

The "Institut Jean-Pierre Bourgin" (IJPB) gathers a unique set of resources and skills in biology, chemistry and mathematics dedicated to plant research. It covers a very wide field of activity, ranging from fundamental work on the development, genetics and physiology of plants in interaction with their environment, to research aimed at the food and non-food use of plant products, in the context of sustainable agriculture.



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The research unit is particularly involved in studying:

- the evolution and functioning of plant genomes;
- the response of plants to the constraints of their environment and the associated biodiversity;
- various fundamental aspects of plant biology, from the cell to the whole plant level;
- modeling of complex biological phenomena for predictive purposes;
- characterization of various plant molecules (cellulose, lignins, lipids) and their industrial uses.

Our research focuses on the model plant *Arabidopsis thaliana*, as well as on plants of agronomic interest (maize, pea, camelina, tomato, barley...). Complementary models are also studied: the moss *Physcomitrium patens*, in order to understand the evolution of terrestrial plants and the grass *Brachypodium distachyon* as a model of temperate zone cereals.



Centre
Île-de-France - Versailles-Grignon



Route de Saint-Cyr
78000 Versailles
Tél. : + 33 (0)1 30 83 00 00
contact-ijpb@inrae.fr

www.inrae.fr/en/research-inrae-ile-france-versailles-grignon-centre



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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 poles:

Genomes:

- Essential mechanisms that determine the structure and the function of genomes
- Recombination, polyploidy and epigenetic regulations
- Genetic variation and responses to abiotic stress
- Innovative biotechnological strategies for plant resources and their use

Development, Signalling, Modelling:

- Developmental mechanisms from the cellular level to the organ and the whole plant level
- Mechanisms underlying cell wall integrity, and their importance in response to stresses
- Seed formation and seed quality
- Modelling towards a multiscale understanding of spatial development

Biomass, Environment, Adaptation, Metabolism:

- Improving quality of plant resources for their dedicated uses (bioenergy, plant fibers, lipids, green chemistry)
- Seed composition and germination
- Responses and adaptations to environmental conditions (and their combinations) and their integration at the whole plant scale
- Nitrogen metabolism and nutrition

Collaborations

IJPB is strongly involved in many national and European networks, as well as in international collaborations. These scientific networks involve academic and private sector partners. These collaborations are funded by the European or National Research Agency, or by various international collaboration networks.

The IJPB unit is also involved in two Carnot Institutes (partnership research structures serving the innovation of companies and the socio-economic actors): Plant2Pro and 3BCAR.

Teaching

Training and teaching are major missions at IJPB, as a member of AgroParisTech and Université Paris-Saclay. IJPB staff is involved in the Paris-Saclay Graduate Schools "Biosphera" and "Life Science and Health".

The SPS network (Saclay Plant Sciences, University Research School) of which IJPB is a founding and principal member, also strongly supports teaching and training, and the organization of summer schools with a strong involvement of scientists from our research unit.

Finally, IJPB is very active in outreach toward all publics, including school children.



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