



Institute for  
Integrative Biology  
of the Cell



**A fundamental  
research institute  
opening up  
to companies**



# I2BC in numbers



## Workforce

**650** employees



## Equipment

Equipment asset value: **15** M€



## Budget

Consolidated annual budget: **58** M€

Contracts: **14** M€/year

Payroll: **35** M€ (permanent workers)



## Campus

Combined **26,000** m<sup>2</sup>  
of scientist estate



## International

**50** nationalities (including students)

Half of our scientific output is part of international collaborations, mainly with collaborators in the USA, Germany and the UK



## Scientific outputs

**300** publications/year (with more than 50% coming from international collaborations)

**30-40** defended theses/year



## Organization

**5** disciplinary departments:

biochemistry, biophysics & structural biology -  
cell biology - genome biology - microbiology - virology

**60** research groups

**15** technological platforms grouped into

**6** poles and

**200** users trained/year



## Education

**80** Professors and Assistant Professors from  
**7** universities (mainly from the Paris-Saclay University)

Teaching students from undergraduate,  
through master to PhD degree levels

**120** PhD students (1/3 from outside Europe)





## Foreword

In a swiftly changing world marked by significant and globalized societal demands, fundamental research stands as a crucial asset. It not only advances knowledge but also serves as a source for groundbreaking innovations in healthcare, energy, and environmental sustainability.

As one of Europe's foremost institutes for basic biological research and the principal center for molecular and cellular biology at Paris-Saclay University, I2BC is dedicated to offering a molecular, mechanistic, and integrative perspective on the complexity of life. Our focus revolves around cellular machineries, their evolutionary processes, and their remarkable adaptability. Our studies encompass various scales, from individual molecules to entire organisms, spanning a spectrum of living species (from bacteria and archaea to human cells and their viruses) investigating both normal and stress-induced conditions.

At I2BC, our scientists employ a wide range of disciplinary approaches to unravel and characterize biological processes. We draw on cutting-edge technologies offered by our 15 nationally recognized and IBiSA accredited facilities, integrated into French infrastructures such as FRISBI, France-BioImaging, France Génomique and the Institut français de bio-informatique. We also call upon a diverse community of computer scientists, physicians, mathematicians, statisticians, chemists, and physicists, outside of the I2BC, to achieve a multidisciplinary understanding of cellular processes.

Given the broad spectrum of our research topics, our findings have far-reaching implications across diverse industrial sectors. These span from diagnosing and treating human, animal, and plant pathologies to applications in cosmetics, nutrition, aging, energy and environmental sciences. This brochure aims to spotlight our potential for partnership, showcasing the diverse expertise within I2BC research groups and the methodologies mastered by our facilities.

We firmly believe that forging robust, enduring partnerships with companies, foundations, and corporate sponsorship is essential. Collaboratively addressing major scientific challenges holds the promise of making a significant impact on societal issues and fostering innovation-driven advances.

**Frédéric Boccard**  
Head of the I2BC

## **I2BC Scientific challenges**



### **Architecture and dynamics of cellular structures, and associated pathologies**

#### **Scientific challenges**

- Analysing the role of the cytoskeleton and motors for force generation, and mechanosensing in cell proliferation and migration
- Studying physicochemical properties and function of non-membrane compartments (liquid organelles, self-assemblies)
- Understanding the roles of membrane remodeling and dynamic interactions between cellular compartments

### **Processing of genetic information and its dysfunctions**

#### **Scientific challenges**

- Characterizing molecular processes and mechanisms responsible for genome maintenance and chromosome segregation
- Analysing relationships between chromosome organization, gene expression and genome maintenance mechanisms
- Studying the roles of RNAs and RNA modifications in cellular physiology

### **Host-microbe interactions: infectious diseases and symbiosis**

#### **Scientific challenges**

- Studying host defense mechanisms, including how hosts are reprogrammed to fight against microbes
- Understanding how microbes interact, invade, persist, proliferate, evade, differentiate and/or cause disease in their hosts
- Identifying new targets for the development of antimicrobial strategies

### **Bio-inspired engineering for energy, health and environment**

#### **Scientific challenges**

- Engineering novel enzymes and modules for supramolecular assemblies
- Detailed characterization of photosynthesis and its regulation; development of artificial photocatalysts for solar energy conversion
- Understanding specialized metabolites and biosynthetic pathways, and creating novel molecules of therapeutic or energetic interest by synthetic biology



# ■ Why collaborate with I2BC

## **Cutting-edge scientific innovation, advanced infrastructure, strategic location**

I2BC, as a leading fundamental research institute, stands at the forefront of technological advancement, pioneering novel scientific methodologies, tools, and approaches. Our goal is to harness these innovations in collaboration with our industrial partners.

Nestled in the heart of Paris-Saclay, ranked among the world's top 8 innovation hubs, I2BC offers a wealth of multidisciplinary expertise. Coupled with access to state-of-the-art equipment and close proximity to esteemed academic research and private R&D institutions, our institute provides an unparalleled advantage.

With the establishment of innovative enterprises, start-ups, incubators and technology transfer offices in the Paris-Saclay cluster, open innovation is becoming a leitmotif for our scientists and engineers. The concentration and complementarity of the region's innovation actors make the I2BC a central starting point to explore and exploit.

### **Partnering with I2BC guarantees you:**

- Expert evaluations, consultations, tests, measurements, and analyses, through our scientific infrastructure and platforms to explore innovative pathways for your company's product development
- Opportunities for subsidized collaborations, enabling joint applications for national and international project proposals, including programs like ANR (public-private partnerships) and European ITN. This collaboration can take various forms, such as bilateral research agreements or shared research missions with doctoral students (e.g. CIFRE) between your company and an I2BC research team

### **Other key benefits:**

- Accredited under the French tax credits incentive for research activities (CIR) and private-public collaboration (CICO)
- Adherence to high-quality management principles, with several I2BC platforms holding ISO9001/NFX50-900 certifications

### **They work with the I2BC**

AB Sciences  
Adisseo  
Amatera Biosciences  
Annoroad  
de Sangosse  
Flash Therapeutics  
FN3PT – innov3PT  
IFP Energies nouvelles  
Kelonia  
Lucas Meyer Cosmetics  
Nanobacterie  
Oncodesign  
Osivax  
PiLeJe  
Sanofi  
Stallergenes Greer  
Urania Therapeutics  
Valerio Therapeutics  
Viroxis

### **They fund I2BC projects**

AFAF – Fondation maladies rares  
ANR  
ANRS-MIE  
AFM-Thélon  
ARC  
Ensemble contre le sida  
ERC  
Fondation pour la recherche médicale  
Fondation Bettencourt Schueller  
Friedreich Ataxia Research Alliance  
La ligue contre le cancer  
Région Île-de-France  
Sidaction  
Vaincre l'Alzheimer

- High resolution CryoEM/CryoET analyses in Paris-Saclay @ I2BC and synchrotron SOLEIL
- High resolution images of cells (electron and photon microscopies)
- Up-to-date sequencing and multi-omics approaches
- Multiscale characterization of biological systems
- Integrative modeling of biomolecular systems using bioinformatic analyses on heterogeneous data

Our 15 platforms are integrated in national excellence networks:

- 14 platforms are labelled IBiSA
- 14 platforms belong to national infrastructures as FRISBI, France-Biolmaging, France Génomique, Institut français de bio-informatique...
- 4 platforms have quality label ISO9001 / NFX50-900

## Platforms

15 platforms grouped in 6 poles:

### Integrative bioinformatics facility

1 engineer full-time, 15 associated engineers and researchers

#### Expertise

- Genome organization and evolution
- Gene expression and RNA biology
- Protein structure, dynamics and interactions (AlphaFold2, interactomes, molecular dynamics and docking)
- Integrative multiscale bioinformatics

#### ➡ Contact

bioinformatics@i2bc.paris-saclay.fr

### Sequencing facility

5 engineers

#### Expertise

- Genomics and transcriptomics
- Epigenomics and epitranscriptomics
- Nanopore direct DNA/RNA sequencing
- Illumina DNA/RNA sequencing
- Single cell

#### ➡ Contact

sequencing@i2bc.paris-saclay.fr

### Biophysics facility

14 associated researchers

#### Expertise

- X-band and high field electron paramagnetic resonance spectroscopies
- Resonance Raman and Fourier transform infrared spectroscopies
- Transient absorption spectroscopy and super-resolution microscopy

#### ➡ Contact

biophysics@i2bc.paris-saclay.fr

### Bioimaging facility

7 engineers

#### Expertise

- Cytometry analysis and cell sorting in L1 or L2 environment
- Wide field, confocal and super-resolution imaging in fluorescence microscopy
- Cellular electron microscopy: from sample preparation to TEM and FIB-SEM imaging

#### ➡ Contact

imagerie-gif@i2bc.paris-saclay.fr

### Proteomics facility

3 engineers

#### Expertise

- Proteome analysis, differential protein expression and enrichment
- Interactome analysis
- Protein modification analysis (post-translational and chemical modifications)

#### ➡ Contact

proteomics@i2bc.paris-saclay.fr

### Structural biology facility

8 engineers, 13 associated researchers

#### Expertise

- Cryo-electron microscopy and tomography of macromolecular complexes
- NMR characterization of protein structure and modifications
- High-throughput crystallization
- Quality control of protein and protein interactions
- Selection of high affinity artificial binders for any chosen protein target

#### ➡ Contact

structuralbiology@i2bc.paris-saclay.fr



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université  
PARIS-SACLAY





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[www.i2bc.paris-saclay.fr](http://www.i2bc.paris-saclay.fr)

[partnership@i2bc.paris-saclay.fr](mailto:partnership@i2bc.paris-saclay.fr)

Campus CNRS

91198 Gif-sur-Yvette, France

