


SORBONNE UNIVERSITÉ
CRÉATEURS DE FUTURS
DEPUIS 1257

Inserm
La science pour la santé
From science to health

cnrs

QUINZE-VINGTS

FONDATION
VOIR & ENTENDRE

INSTITUT CARNOT
Voir et Entendre

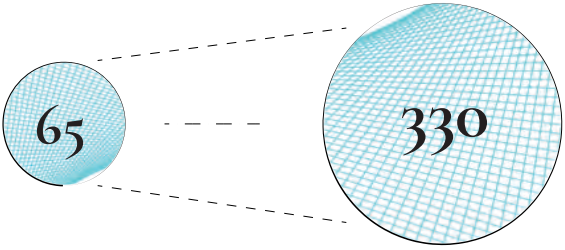
LIFESENSES

LABEX

# INSTITUT DE LA VISION

## Academic,
## Clinical and Industry Research Cluster
## in constant evolution, growth and expansion






**2008**

Biologists
Clinicians

**2018**

Biologists
Clinicians
Neuroscientists
Physicists
Mathematicians
Robotic engineers

**Built in the heart of Paris and its National Eye Hospital des Quinze-Vingts, the Institut de la Vision is one of the most important research centers in Europe on eye diseases and neurosensory sciences.**

**New concept of bringing together leading researchers, clinicians, patients and industry partners to develop groundbreaking technologies and innovative therapies for fighting blindness and improving the lives of visually impaired people.**

# KEY FEATURES

**The Institut de la Vision campus received for the next 10 years the most prestigious national label "University-Hospital Institute" (IHU) for its project FORESIGHT**

## Funding leverage from most competitive funding sources

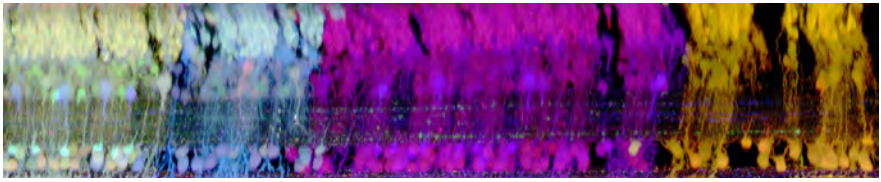
## Creation of 10 spin-offs

Acquisition of Fovea Pharmaceuticals by SANOFI.
2 successful IPO for Pixium Vision (2014)
and Gensight Biologics (2016).
Raised 40M€ from public fundings.
Raised 300M€ from private fundings.

## 60 active patents families

# MULTIDISCIPLINARY RESEARCH

Biologists, Physiologists, Neuroscientists, Geneticians, Immunologists, Physicists, Mathematicians, Clinicians



## RESEARCH DEPARTMENTS

- **DEVELOPMENT**

*Optic nerve regeneration; Stem cells; Neuronal circuits*

- **GENETICS**

*Inherited Retinal Diseases; Gene defects identification; Paracrine signalling*

- **VISUAL INFORMATION PROCESSING**

*Optogenetics; Retinal information processing; Neuromorphic cameras; Computational neuroscience*

- **PHOTONICS**

*New microscopy techniques; Optogenetics control of brain circuits*

- **THERAPEUTICS**

*Gene therapy; Age Related Macular Degeneration; Inflammation; Vascular remodelling; Glaucoma and ocular pain*

## CLINICAL RESEARCH

- **CLINICAL INVESTIGATION CENTER**

- **NATIONAL REFERENCE CENTER FOR RETINAL DYSTROPHIES**

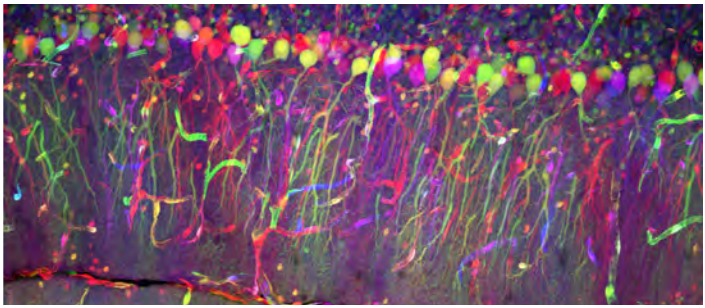
Largest cohorts of patients in Europe

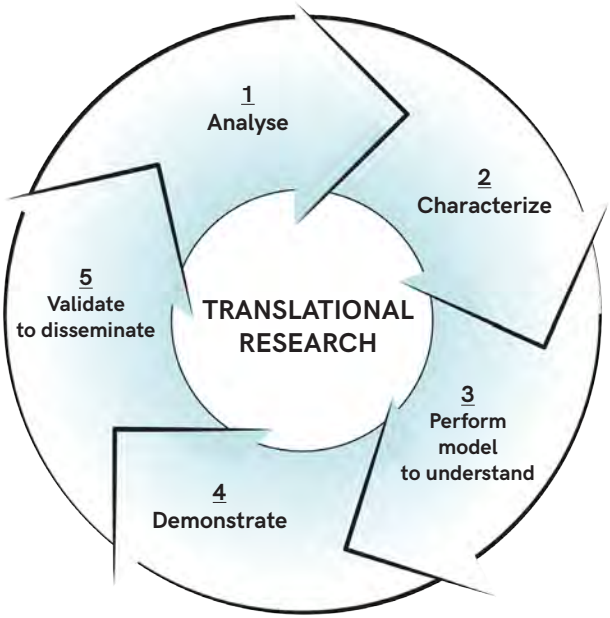
100 ongoing clinical studies

First in-man clinical trials on gene therapies and retinal prosthesis

# PATIENT CENTERED APPROACH

## FROM DISCOVERY TO NEW TECHNOLOGIES






Accelerate delivery of innovation to patients : vision preservation, vision restoration and technologies for diagnostic and follow-up

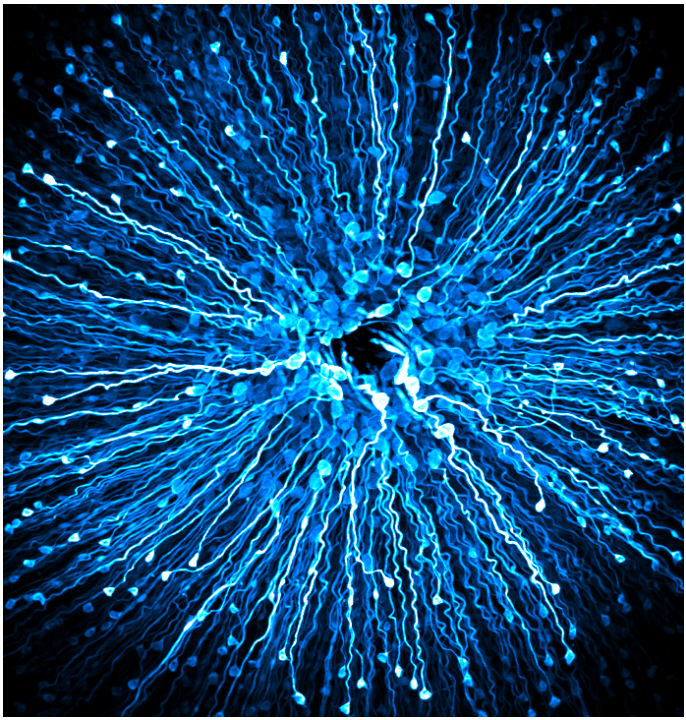
Future clinical trials, emerging therapeutic strategies

# VISION RESTORATION

## OPTOGENETICS

- Breakthrough technology and gene therapy approach using microbial and alguae opsins
- Validation on Non-Human Primates
- Ongoing clinical trial

(GENSIGHT BIOLOGICS)



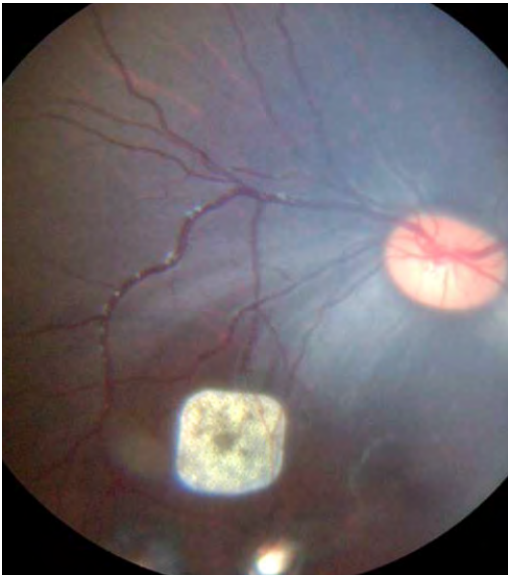
## GENE THERAPY

- Discovery and transfer to clinic of innovative appoach for vision restoration in LEBER Hereditary Optic Neuropathy: PHASE III clinical trials

(GENSIGHT BIOLOGICS)

# VISION RESTORATION

## VISUAL PROSTHESIS



- Biocompatible materials development
- Coding visual information
- Cortical vision and brain plasticity

**World-first clinical trial with retinal prosthesis PRIMA (PIXIUM VISION®) in patients with AMD (with Stanford University)**



## BIO-INSPIRED CAMERAS

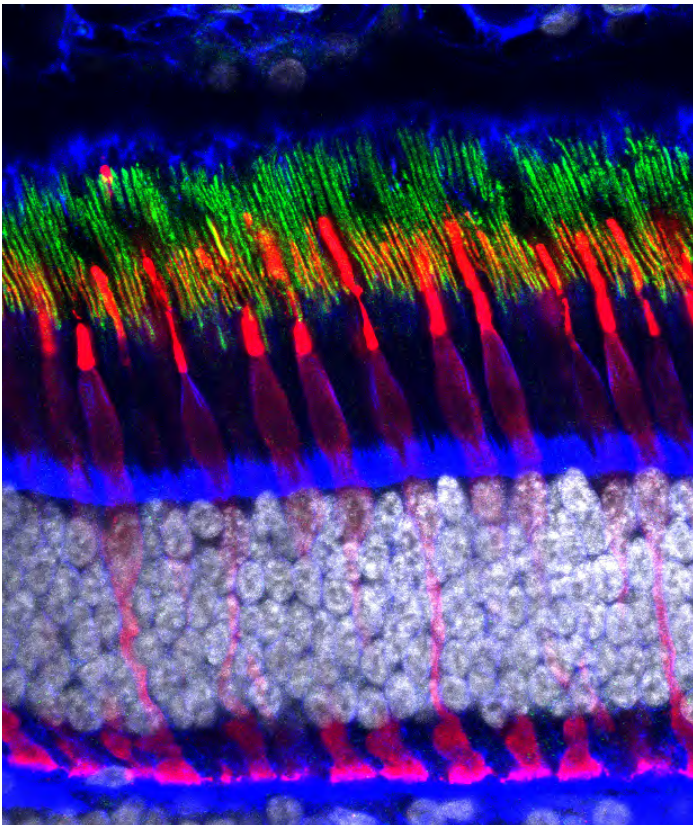
**World leading technology with broad applications for healthcare, autonomous vehicles, robots and surveillance**



# VISION PRESERVATION

## ROD-DERIVED CONE VIABILITY FACTOR

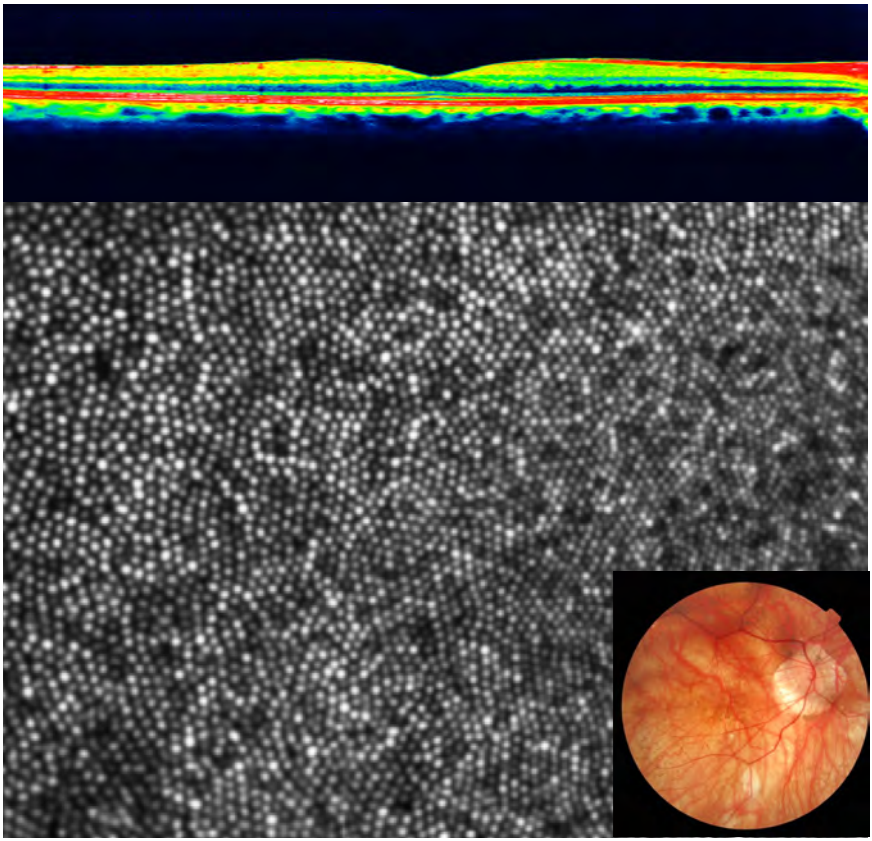
**Gene independent therapeutic strategy for broad range inherited and age-related retinal dystrophies**



- Drug discovery
- Signalling

**Clinical trial preparation (SPARING VISION)**

# HIGH-RESOLUTION REAL-TIME CLINICAL IMAGING



## UNIQUE LEVEL OF EXPLORATION OF RETINAL DISEASES

- Real-time, non-invasive, dynamic, high-resolution imaging
- Better understanding of diseases
- Diagnosis, follow-up, outcome measures

# EXPERIMENTATION IN VIRTUAL, REALISTIC AND ECOLOGICAL CONDITIONS




## STREETLAB, HOMELAB, DRIVING SIMULATOR

- Evaluate therapeutic benefits on daily-life activities of new technologies and therapies
- Elaborate visual rehabilitation strategies
- Develop innovative strategies to precisely assess visual performances
- Design innovative solutions for visually impaired users
- Patients engagement (1400 Volunteers)

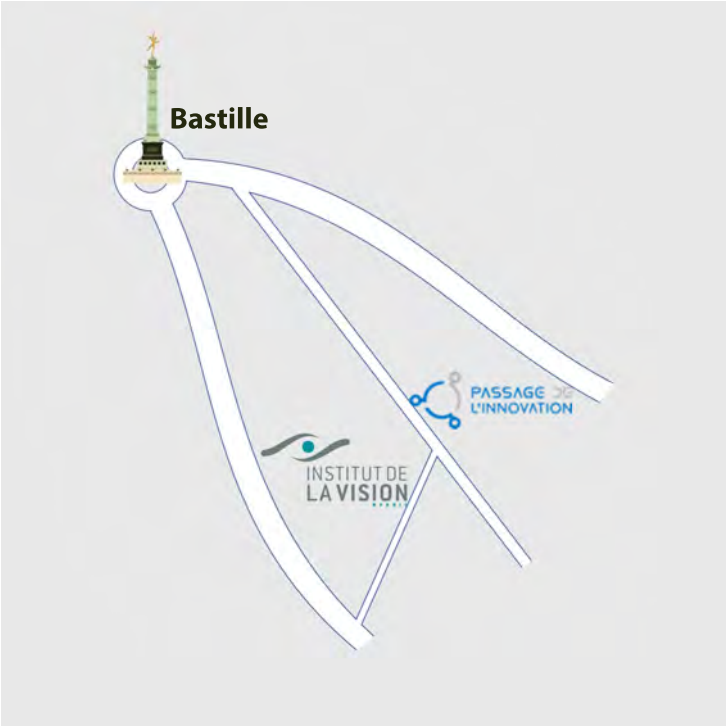
# TECHNOLOGICAL TRANSFER




## GEOGRAPHICAL CLUSTER ON NEUROSENSORY DISEASES FOSTERING THE TRANSFER OF INNOVATIONS

- Awarded by the Carnot label since 2006
- Business incubator (since 2010: 38 SMEs, 750 created jobs, 230M€ and 40M€ raised from private and public fundings)
- Hosted companies (ESSILOR, THEA,...), joint labs, industrial chair
- Close collaborations with IBIONEXT (spin-off creation)

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