

Instituts  
thématiques



**Inserm**



Institut national  
de la santé et de la recherche médicale

## Innovations; evolutions of the french system

*Prof. André Syrota*  
*CEO & Chairman, Inserm*

***The biomedical innovation in XXI<sup>st</sup> century:  
Challenges, trends, testimonies***  
***Chaire d'Innovation technologique Liliane Betancourt***  
**Séminaire organisé par le Pr Elias Zerhouni**  
***Collège de France 3 May 2011***

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## Biotech-Pharma challenges (I)

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### **Global demographic & epidemiological revolution**

- Emergence of new infectious agents
- Healthy life expectancy (WHO)
- Increase of ageing population
- Age related chronic diseases
- Impact of sedentary & malnutrition
- Orphan diseases
- Society expectations « well being »

*Need for R&D in new biotherapeutics & diagnostics*

## Biotech-Pharma challenges (II)

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- Economy of knowledge & Innovation
- Main global feature : Asia, Europe, America
- Strong implication of academic sector : network, consortium
- With local & overseas companies
- Complexity of IP& TT mechanisms in the Biotech field
- Economic, social and ethical issues

***Academic research as a socio-economical pivot***

# Tech Transfer French Policy Milestones

1982 : Research and technology framework law

1984 : Higher education and Universities Law

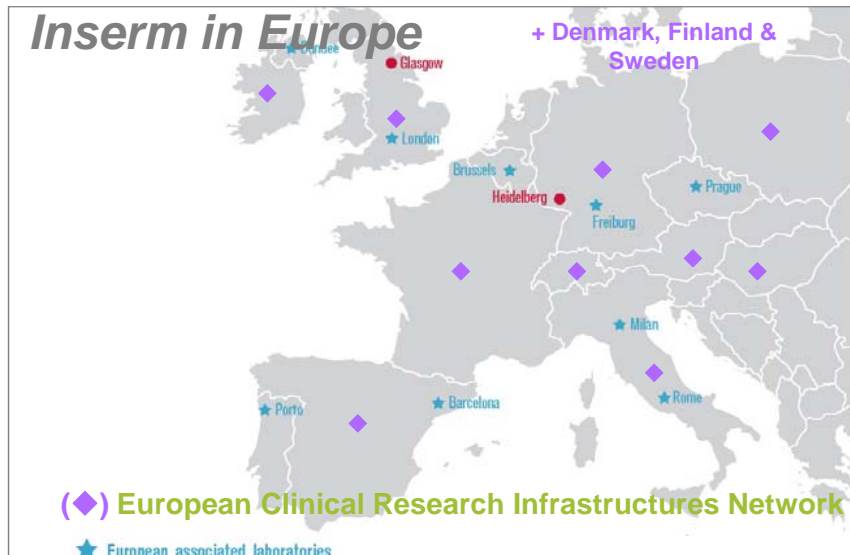
**1999 : Innovation and research law**

2006 : Research program law

**2007 : Autonomy of universities law**

**2010 : National loan: Investments for the future**

## Inserm in Europe



## Inserm Worldwide



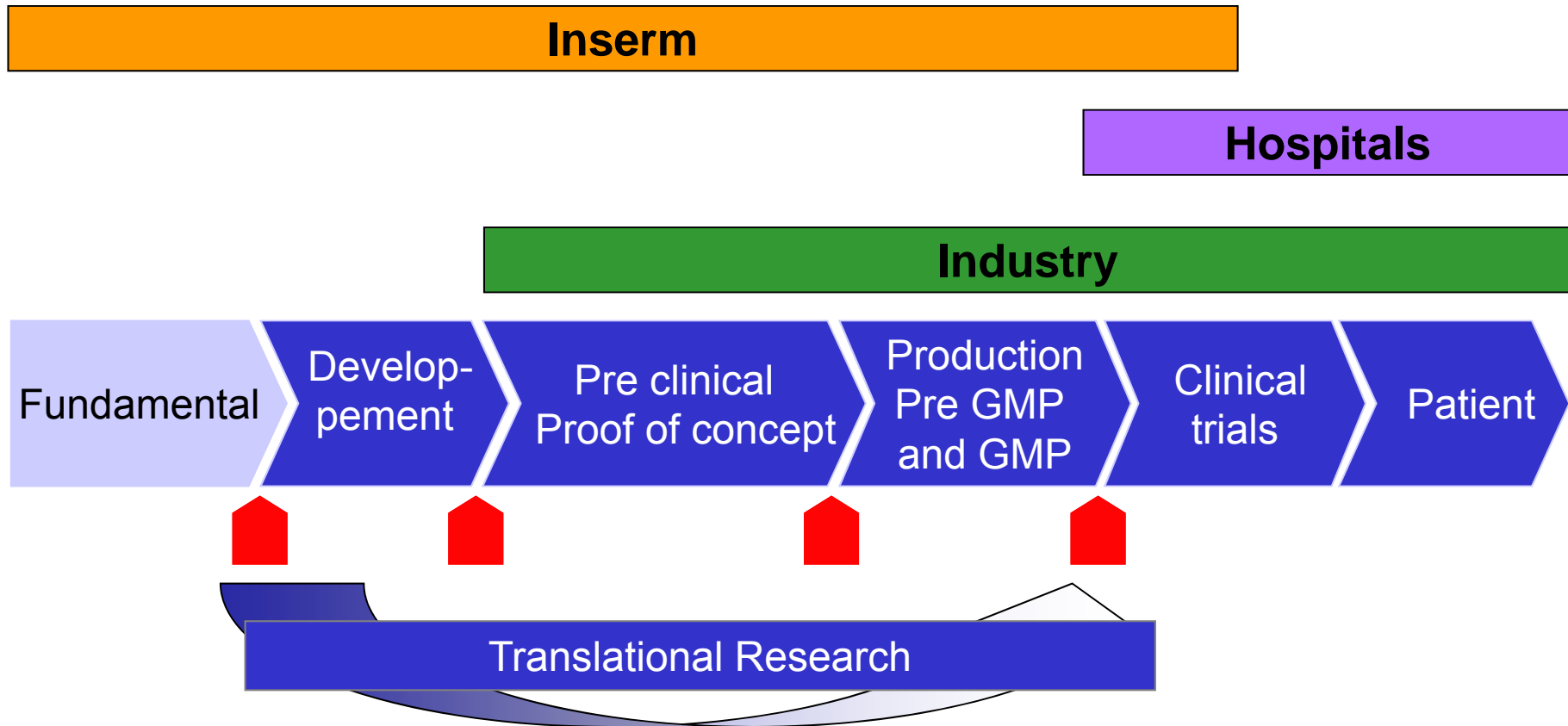
## Inserm in brief

### Inserm in France

- Budget : 834 M€(2009)
- 10 thematic institutes (2009)
- 8,364 employees
- 316 Research Units
- 27 research centers
- 54 Clinical Research Centers
- 857 patent families
- ~500 private partners
- ~1000 on-going industry agreements
- 112 spin-off companies

# Transferring knowledge in France

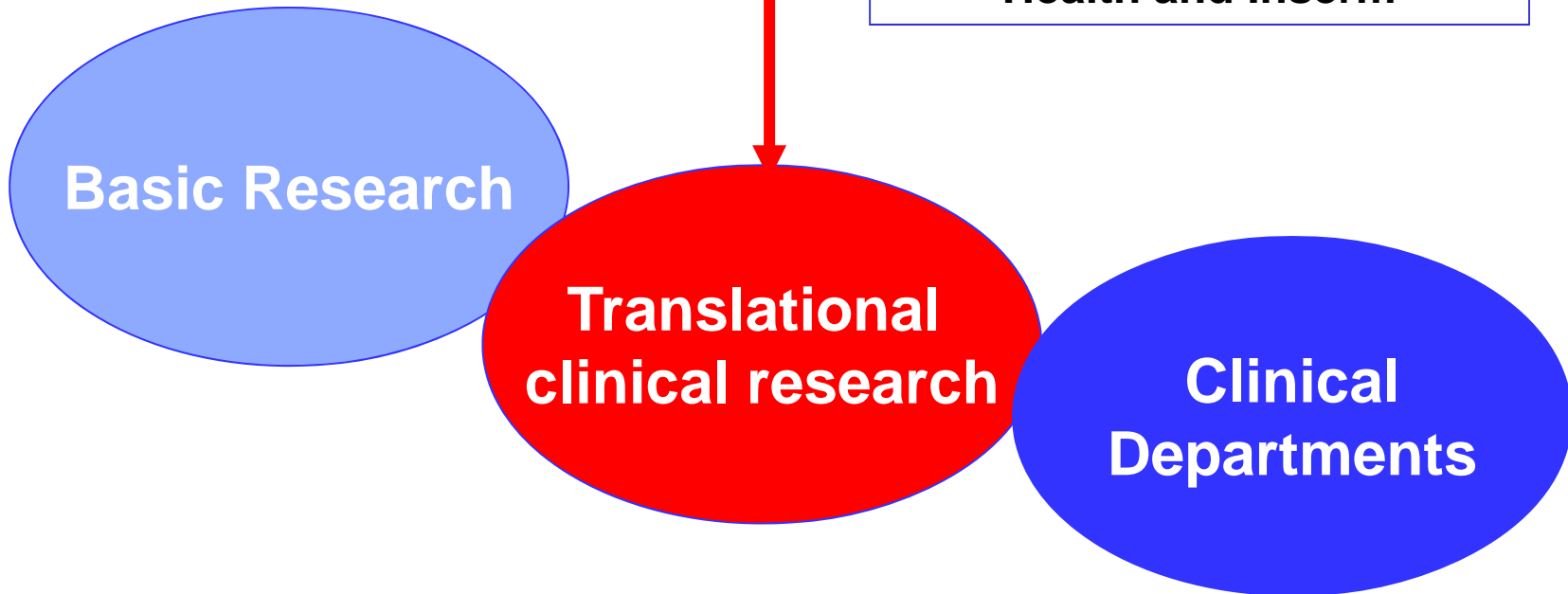
**Inserm : the only one actor covering from fundamental research to clinical research**



## Clinical Investigation Centres (CIC)

**Inserm  
Basic Research Units**

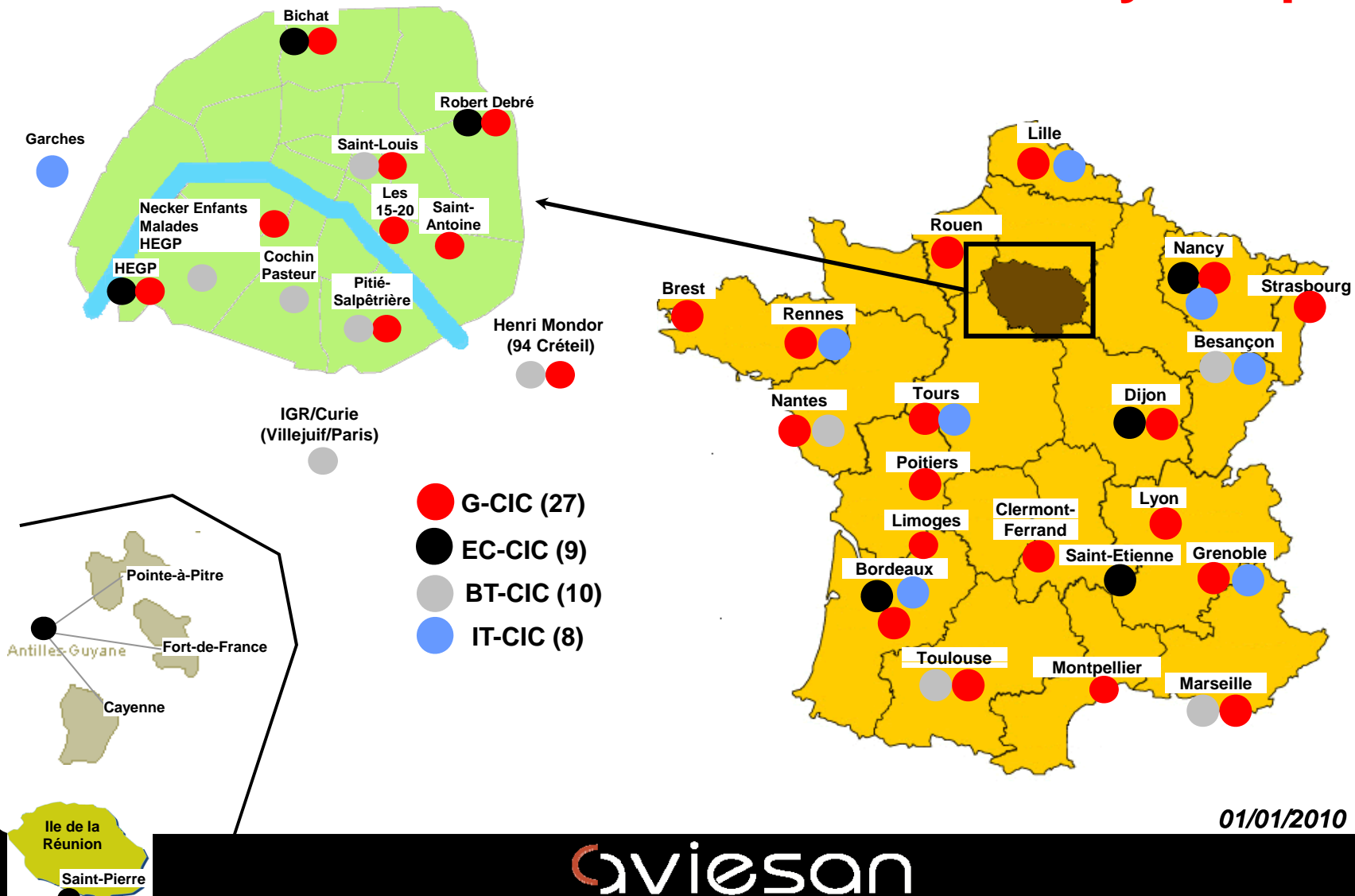
Infrastructures supported by  
both French Ministry for  
Health and Inserm



**Within University Hospitals**

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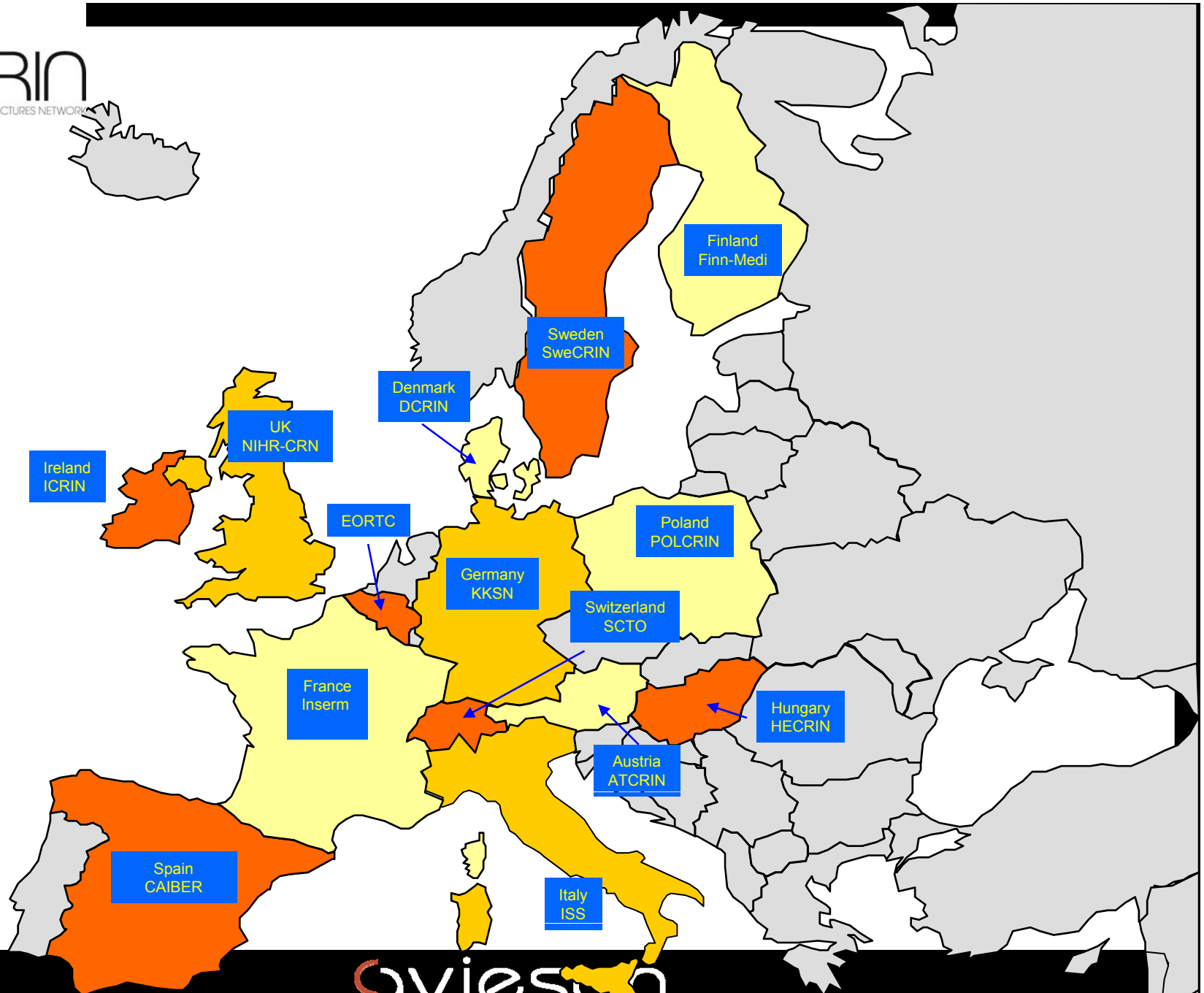
# 54 Clinical Investigation Centers (CIC) in 20 out of 29 University Hospitals



01/01/2010

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# Biobanks Network

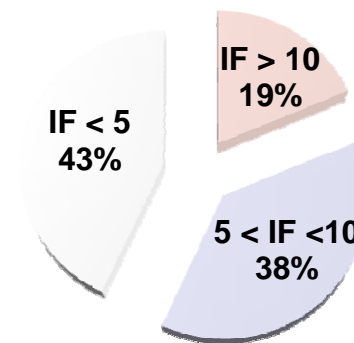
Under Inserm coordination, a national network of 64 biobanks distributed in France including tumor banks and microorganisms centers



National distribution of 64 biobanks

## Research groups using collections...

- More than 600 research projects
- 200 top ranked research groups



Impact factor of 453 scientific publications of 134 top ranked research teams (A, A+), published over the past 5 years .

- Public and private research groups
- Scientific collaborations with more than 100 pharma, diagnostic and biotech industries
- EU and International research groups and projects - **BBMRI EU network**

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## Open innovation trends are a challenge, but mostly a strong opportunity to strengthen innovative value creation

- ▶ **Inserm Transfert** is committed to developing novel knowledge transfer processes that support the need for open innovation in the health sector.
  - IP generating, medium term, strategic partnerships are being established, with an increasing deal value
- ▶ Major issues:
  - Need for novel public-private rules regarding IP rights within pre-competitive research
  - Risk of “downstream paralysis” if too many consortia with too many partners adopting too stringent rules within early stage partnered research efforts
  - Truly prospective/offensive IP strategies are still exception; risk of suboptimal exploitation of innovative results
  - Subcritical investment on IP matters on the academia part: insufficient strategies, and lack of funding, especially for the defense of portfolios, generating “waste”

# Proof Of Concept under financed

The benefit of 2 years “PoC-ing”

- ▶ **Inserm Transfert** started managing the **Proof of Concept fund of Inserm** beginning of 2009
- ▶ In two years, 177 new innovative projects have been assessed, 40 of them were funded with 4 M€
  - 26 projects needed a “bit of help” with a financing from 3 k€ to 65 k€
  - 14 projects needed 18-24 months of nurturing with a financing from 100k€ to 300 k€
- ▶ 15 nurtured projects went a step forward
  - 1 start up was created
  - 2 license agreements were signed
  - 2 R&D collaborations were contracted
  - 6 patents were filed
  - 4 well-advanced negotiations with industrials are going on

# Seed investment underfunded and underperforming

Inserm Transfert Initiative: achievements and perspectives

## ▶ Inserm Transfert Initiative : a seed fund of 4,2 M€

- Tickets averaging 150 k€ - 300 k€
- 15 portfolio companies, bearing 180 jobs
- Portfolio companies raised in 2010 : 8.9 M€
- 3 exits (2 IPOs, 1 industrial)
- Pending profit +50 %

## ▶ Inserm Transfert Initiative is raising 35 M€-50 M€

- To invest tickets of 1 M€-2 M€ to secure a proof of concept safely and attract industrial partnerships or venture funds
- With industry partners (1/3 of funds raised ) to better anticipate strategic issues and promote business relations between corporate partners and seed companies
- Within a long term investment vehicle (15-18 years) with “long-term legal constraints”
- Allowing for a ~3% management fee to secure strong nurturing and managerial commitment to seed projects, including technology transfer, science, business, IP strategy and people aspects

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## Tech Transfer French Specificities

- Several national research organisations (CNRS, INSERM, INRA, INRIA, CEA, ...): “thematic field oriented” with a long tradition in TT
- Since 4 years: emerging “local” entities:
  - at regional level (i.e. Bretagne, Aquitaine, Alsace)
  - at city level when big enough (Paris, Lyon, Toulouse)

→ ***non coordinated system, & differences among structures***

## What we have learnt from the last decades (1)

- Economy of knowledge and innovation
- Main global feature: Asia, Europe, America
- Strong implication of academic sector
- With local & overseas companies
- Complexity of IP & TT
- Economic, social, environmental, ethical issues

→ *academic sector is key for innovation*

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## What we have learnt from the last decades (2)

- Needs to identify and make accessible skills and know how of research labs (especially to SME's)
- Adapt IP portfolio to industry needs (from patent to technology « grasping »)
- Listen to the market, target high innovative sectors
- Switch from research culture to research & innovation paradigm

→ ***Tech transfer organisations play a crucial role***

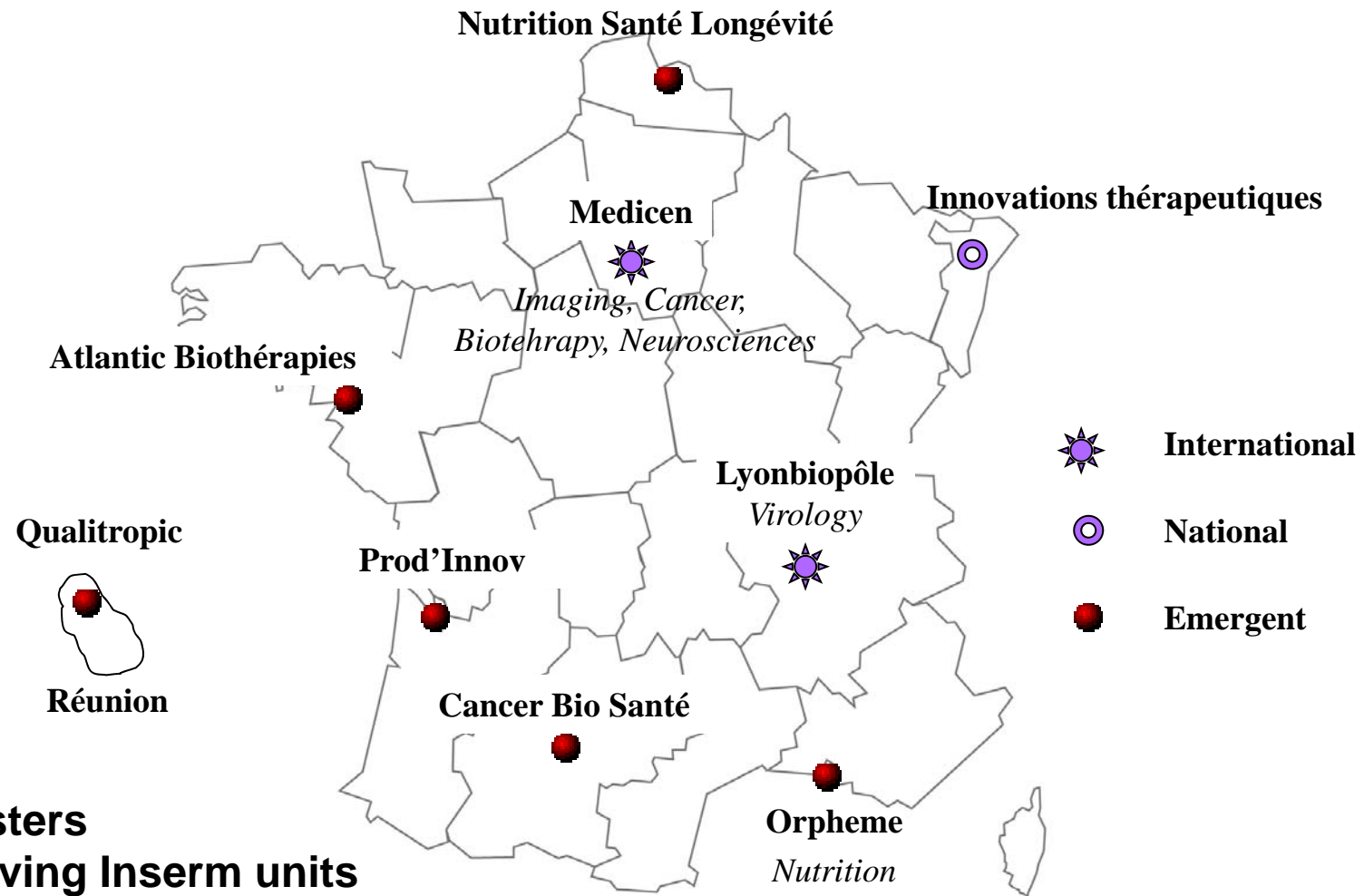


## What we have learnt from the last decades (3)

- Clusters are more and more considered as vectors where tacit knowledge is shared
- They emphasize cross fertilization between education, research and industry
- They foster innovation & reinforce local dynamics
- They need coordination, advanced services and relationships with both public and private partners

→ *Company clustering enhance competitiveness*

# Developing clusters



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## 9 Members:



### *Rationalisation of the Life Sciences and Health research:*

Inserm as the unique coordinator of all French research programmes in the sector (mission statement entrusted by the Ministry of Higher Education and Research and the Ministry of Health to the new Director-General of Inserm – November 2007)

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Alliance nationale pour les Sciences de la Vie  
et de la Santé

*National Alliance for Life Sciences and Health*

*Created on April 8, 2009*

# Ten Thematic Institutes

*covering the entire field of Life Sciences and Health research*

**Genetics,  
Genomics  
Bioinformatics**

**Cell Biology  
Development**

**Neurosciences  
Cognitive Sciences  
Neurology,  
Psychiatry**

**Immunology  
Hematology  
Respiratory  
diseases**

**Microbiology  
Infectious  
diseases**

**Molecular  
and  
Structural  
Biology**

**Circulation  
Metabolism  
Nutrition**

**Cancer**

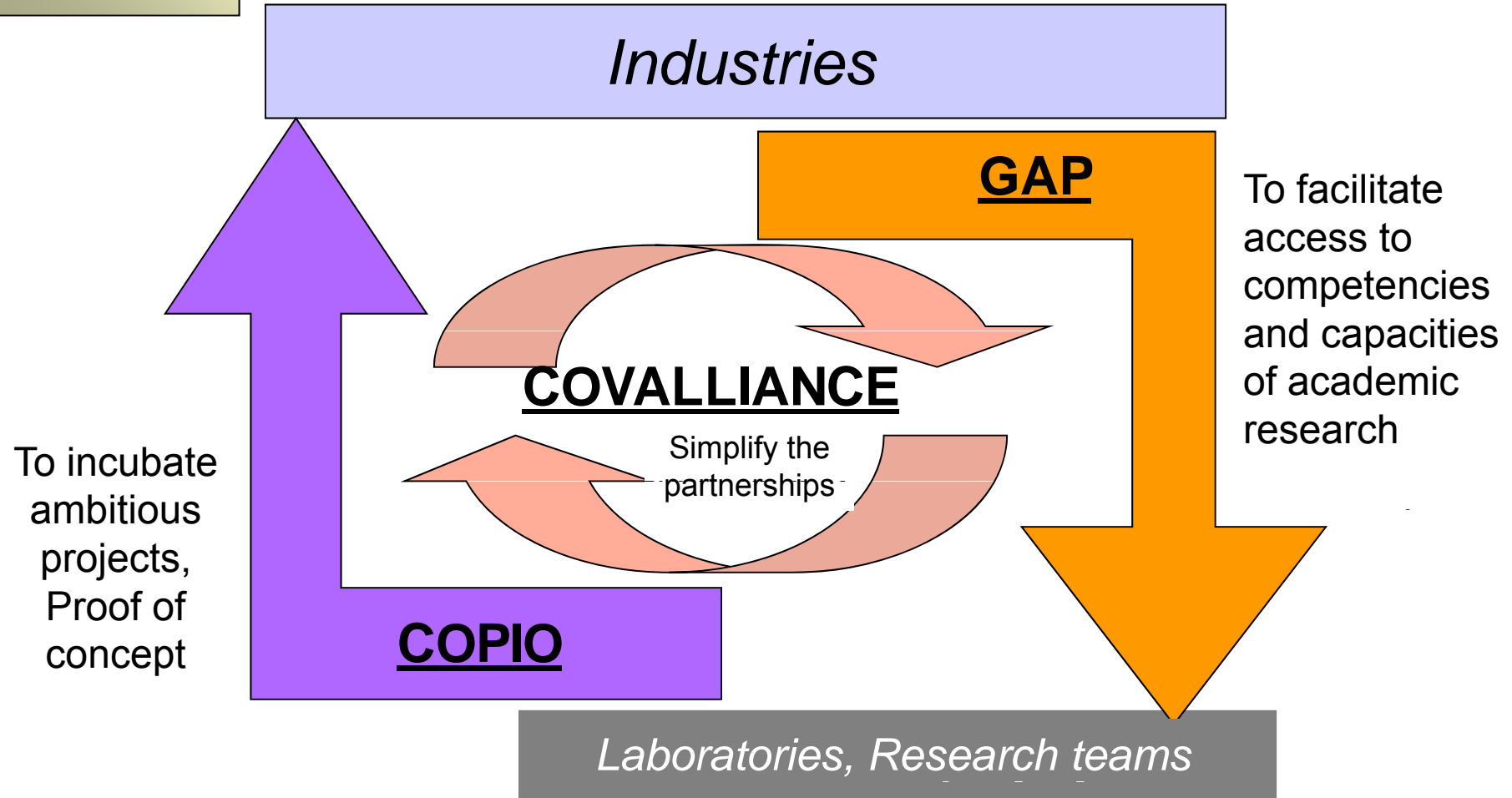
**Public  
Health**

**Health  
Technologies**

ITMO

Health  
Technologies

## To reinforce attractiveness and partnerships between public research and health industries



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# **COPIO**

## ***The Inter Organism Steering Committee***

**Representatives of :**

**- CNRS, Inserm, CEA, Institut Pasteur, Institut Curie,  
Inra, Inria,  
Institut Télécom, APHP, IRD**

**+ Industry (Sanofi-Aventis) and University (UPMC)**

**→ *a set of scientists and representatives of TTOs***

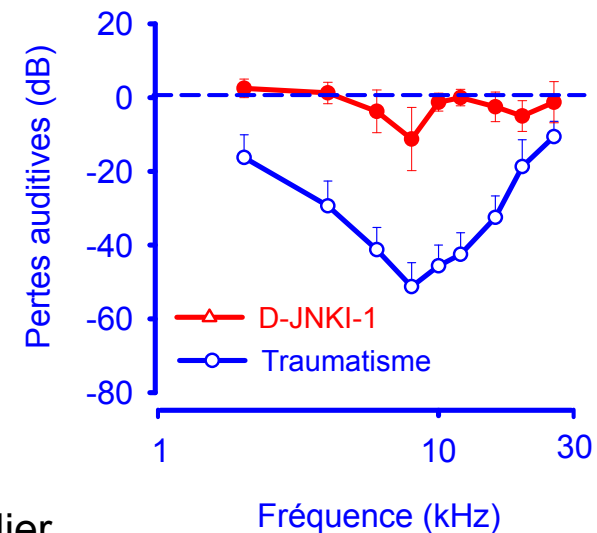
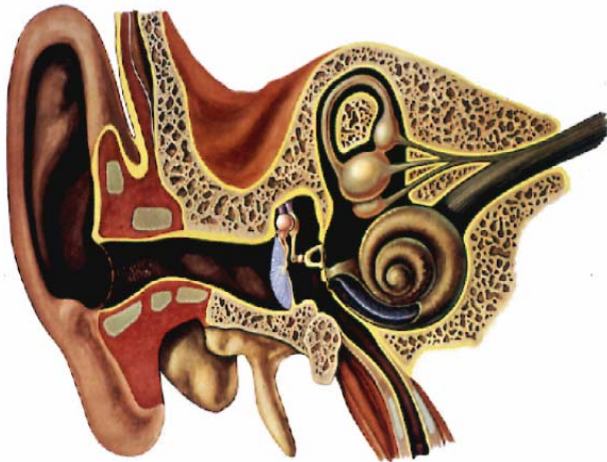
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# Project SAMI

## (Santé, Audition et Micro-système Implanté)

« Implantable system for drug delivery for the treatment of deafness and tinnitus »



Inserm UMR 583 – Institut des Neurosciences de Montpellier  
Centre Investigation Clinique – Inserm / CHRU Montpellier  
Service ORL – CHRU Montpellier

CEA-leti – Minatec Pôle Innovation, Grenoble,

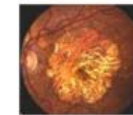
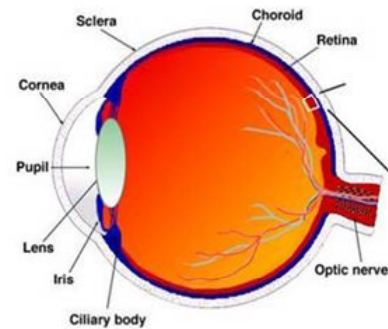
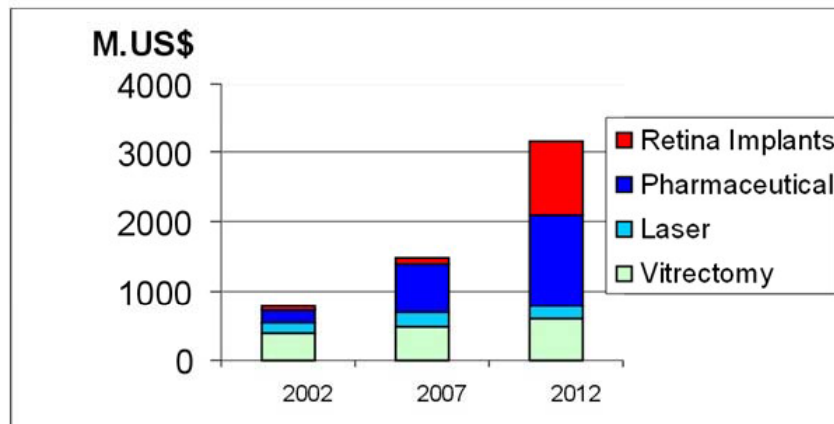
UMR Montpellier 2 University / Cnrs 5635 – Institut Européen des Membranes, Montpellier

IEMN – Electronique et de Microélectronique et de nanotechnologie, Cnrs / Lille University

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# Projet IMPLANTS

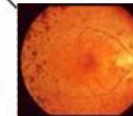
## Diamond implants for retinal stimulation



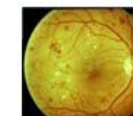
**Macula Degeneration**  
(30M patients)



**Diabetic retinopathy**  
(20M patients)



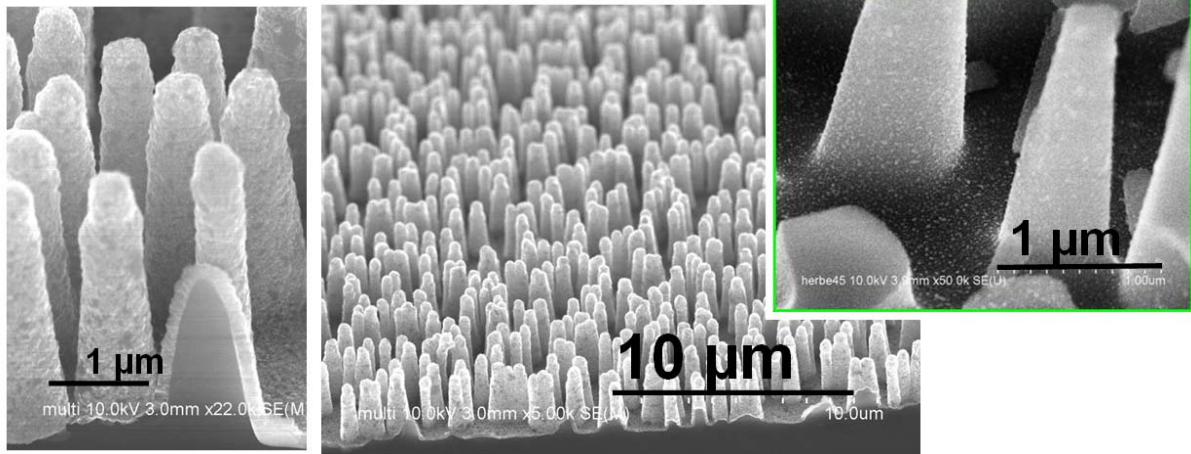
**Glaucoma**  
(6M patients)



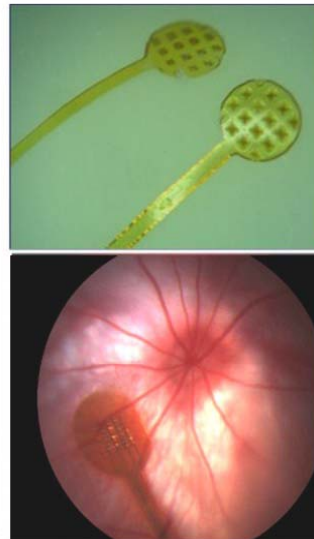
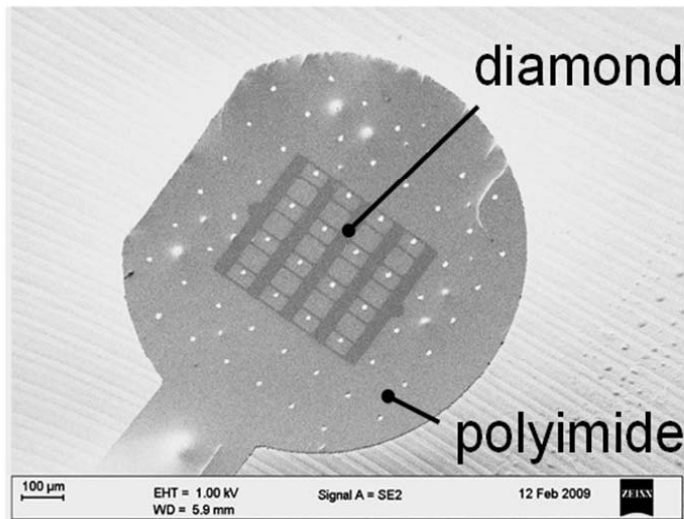
**Retinal Diseases**  
- Pigment. Retinites  
- LHON, Stargardt's, (...)  
(2M patients)

*Ocular pathologies. In the treatment approaches of eye pathologies , implants are expected to occupy a rising position (left). The most frequent eye pathologies and number of patients concerned in total EU + US in 2012 (right).*





*Structure of a nano-3D diamond surface exhibiting high surface for enhanced electrochemical properties. The diamond layer section on the (left)- is continuous although only 80nm thick. (centre) growth is made on Si grass at large scale. (right) the film uniformly covers the bottom of the tips.*



*The first soft nanostructured diamond implants on polyimide (black and white).  
The first 3D micropatterned implants and a subretinal implant seen at the rat eye fundus in vivo.*

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## What do we expect now?

- ❑ Setting up a coordinated organization of technology transfer involving research agencies, universities and industry
- ❑ With high professionalism and trained staff
- ❑ Strengthening regional TTO close to labs & industry needs
- ❑ Supporting technology “proof-of-concept” (maturation, prototyping, transnational research) for innovative applications

**Bring value to academic inventions  
& boost tech transfer for the public benefit**

**→ *The National Loan and CoVAlliance***

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## A permanent Committee for a better coordination : the CoVAlliance Committee.

- To favor and simplify Public-Private partnership
- A light structure where all the members of Aviesan meet monthly

- Nov 18, 2009, the creation of the Covalliance Committee is approved by Aviesan
- Feb. 10. **2010**, first meeting of the CoVAlliance committee,



## The National Loan: a major opportunity for boosting R&I in France (2010)

**35 billion €**

**21.9 devoted to  
Research and  
Higher Education**



- To launch top-level initiatives for **a limited number of research fields of excellence**
- To offer attractive positions to international **scientific leaders**

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## National Loan

### ***First 5 calls completed***

*including 4 projects lead by Inserm*

- **Equipments of Excellence** : 1bn €  
=> Research equipment from 1 to 20M€
    - 400M€ for the acquisition
    - 600M€ endowment for operational costs
    - 52 projects funded (340M€); 15 in « Biology and Health »
  - **Large cohorts** : 200M€ fund (endowment)  
=> 10 cohorts funded
  - **National Research Infrastructures**: 450M€  
=> 10 projects funded, involving Inserm and CNRS
  - **University Hospital Institutes**: 0.85 bn €
  - **Laboratories of Excellence**: 1bn € (endowment)
- + one project of **Pre-industrial Demonstrator in Biotechnology**, also lead by Inserm : **PGT** (Vector for Gene therapy) – 20 M€



## National Loan

*2 calls in  
evaluation*

*2 ongoing  
calls*

- **Initiatives of Excellence:** 7.7 billions € fund
- **Research & Technology Institutes:** 2 billions €  
(25% consumable = 500 millions €)
- **Calls for competitive clusters :**
  - Collaborative R&D projects: 300 Millions €
  - Mutualised innovation plate-forms: 200 Millions €
- **“Sociétés de valorisation”:**
  - 10-12 **SATT** (acceleration TT companies): 900 Millions €
  - 5 national thematic TT companies: 50 Millions €
  - France Brevet (IP fund): 50 Millions €

## **SATT: new tech transfer system**

- **Merger between TT local services of universities and engineering schools**
  - To reach a critical mass of TT professionals
  - To manage significant IP portfolio in a single entity
  - To increase Marketing capabilities & bargaining power
  - To Add value to inventions (potential innovations)
- **Frame agreement with national research organizations i.e Inserm Transfert**
  - To access high profile services in specific fields (Health, Agro, etc.)
  - To expand international network & global markets

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# SATT core missions

## **Provide a large range of services related to TT and commercialisation activities:**

- Promote innovation culture at campus level
- Support collaborative research
- Detect innovations at labs (invention disclosures)
- Manage IP portfolio
- Organize company scouting and answer industry requests

## **Organize vertical integration of TT activities**

- Educational sessions to researchers and master degree
- Project engineering from early stage technology to commercialization and transfer
- Defining IP & TT strategies
- Support patenting process and IP costs, up to prosecution
- Financial support to innovative projects (patents, maturation, pre-incubation, incubation, etc.)





END