

# ***CIBER-BBN***

## ***NANOMEDICINE AREA***

***CIBER-BBN Director: Prof. Pablo Laguna***  
***Area Coordinator: Prof. M.-Pilar Marco***  
***Area Project Manager: Dr. Johanna Scheper***

***V Conferencia Anual de Plataformas***  
***Tecnológicas***  
***Barcelona, 14 and 15 of February, 2012***

# General Objective, Mission and Vision of the CIBER-BBN

## GENERAL OBJECTIVE

Development of *specific therapies* and *systems or technologies* for prevention, diagnosis and follow-up diseases

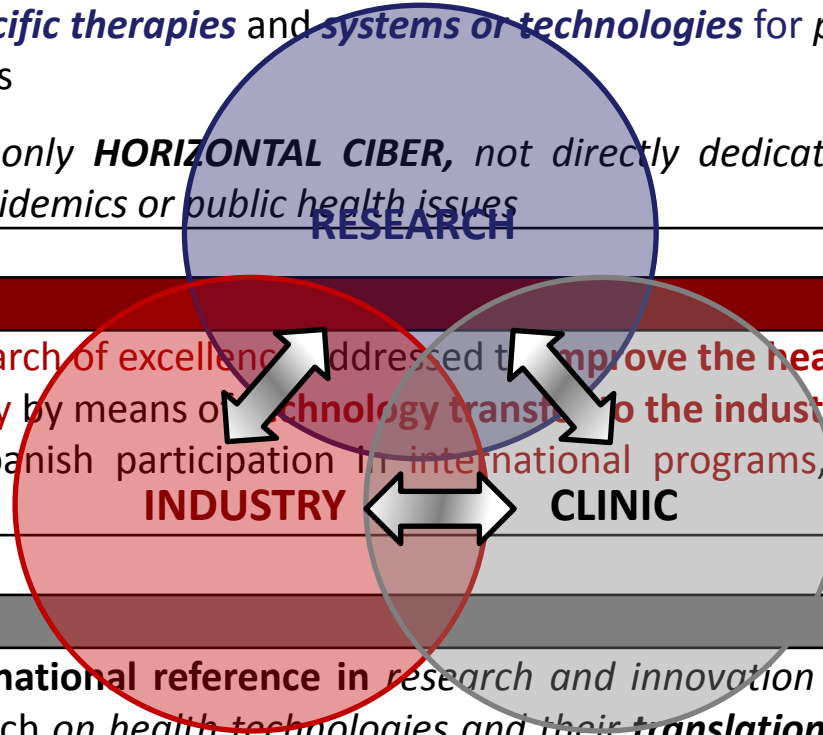
- This is the only **HORIZONTAL CIBER**, not directly dedicated to a specific field of diseases, epidemics or public health issues

## MISSION

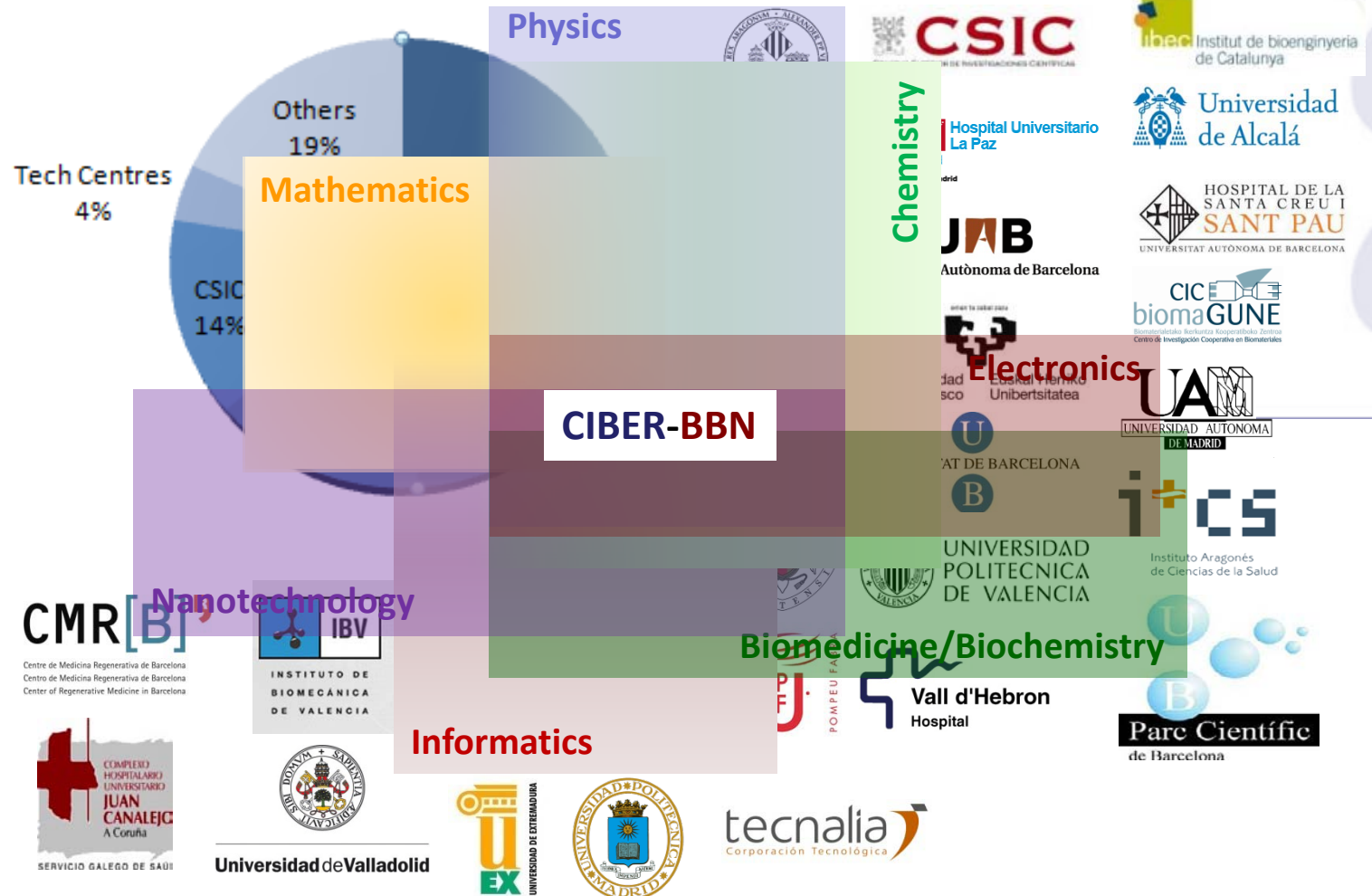
1. Performing research of excellence addressed to **improve the health system.**
2. Create prosperity by means of **technology transfer to the industry**
3. Promote the Spanish participation in international programs, networks and decision forums

## VISION

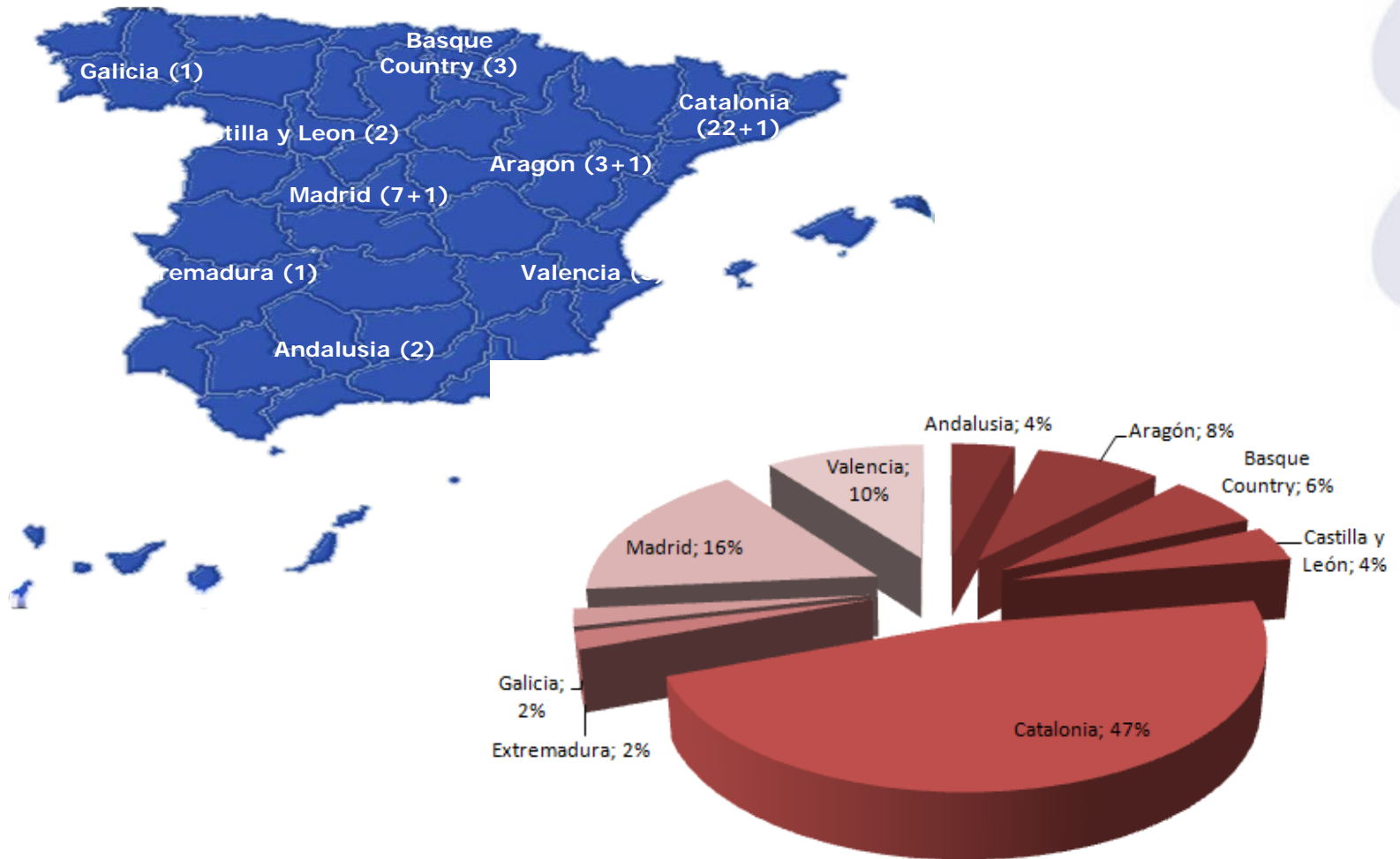
To become an **international reference in research and innovation** and to achieve a **leader role** in the research on health technologies and their **translational transfer** to the clinical practice.



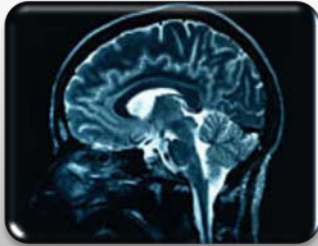
# Composition of the CIBER-BBN



# Geographical Distribution of the CIBER-BBN

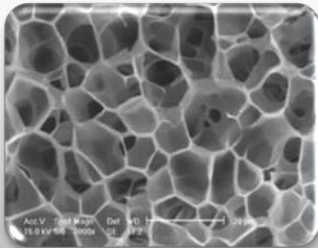


# RESEARCH AREAS



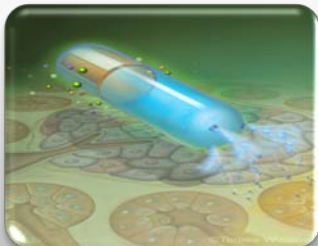
## BIOENGINEERING

- Multimodal Diagnosis
- Intelligent Devices



## BIOMATERIALS

- Regenerative Medicine
- Endoprotheses & Implants



## NANOMEDICINE

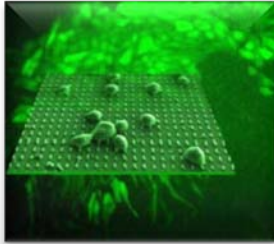
- Molecular Diagnostics & Biosensors
- Therapeutic Nanoconjugates & Drug delivery Systems



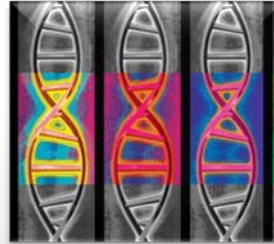
# SCIENTIFIC PRIORITY LINES

ciber-66n

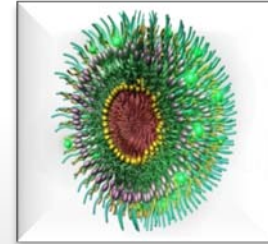
## BASIC RESEACH



**Microtechnology  
Nanotechnology  
Material Sciences**



**Cell Biophysics  
Epigenetics**



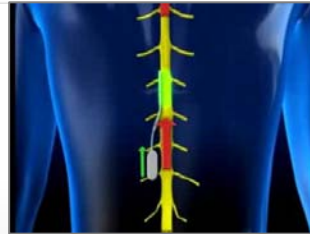
**Bioreceptors  
Active Molecules  
& Nanoconjugates**

# SCIENTIFIC PRIORITY LINES

## APPLIED RESEARCH



**PoC & Lab Devices  
for Diagnostics  
& Drug Screening**

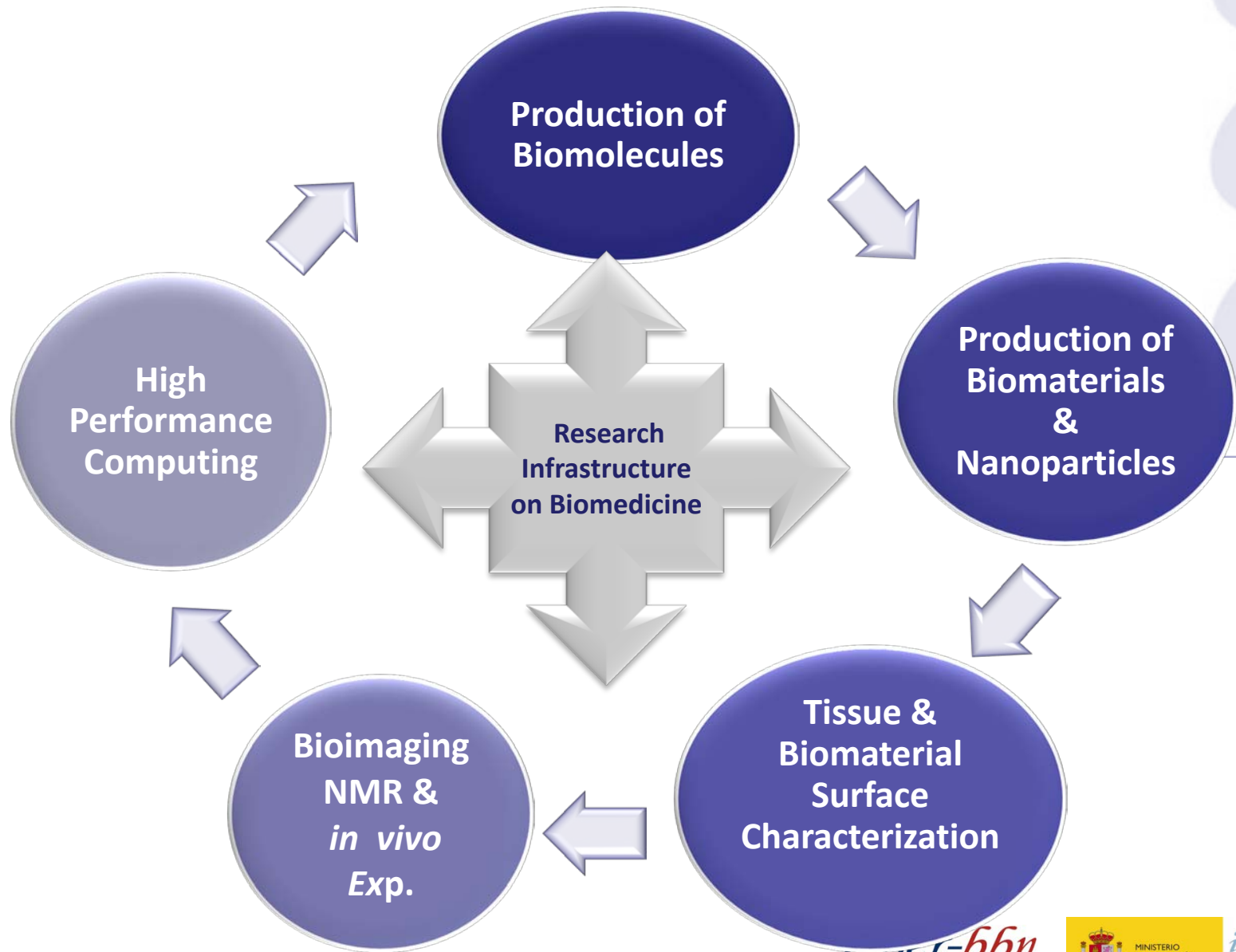


**Smart Materials  
for Implant  
Applications**



**Nanoconjugates  
for Therapy and  
Drug Delivery  
Systems**

# TECHNOLOGICAL PLATFORMS





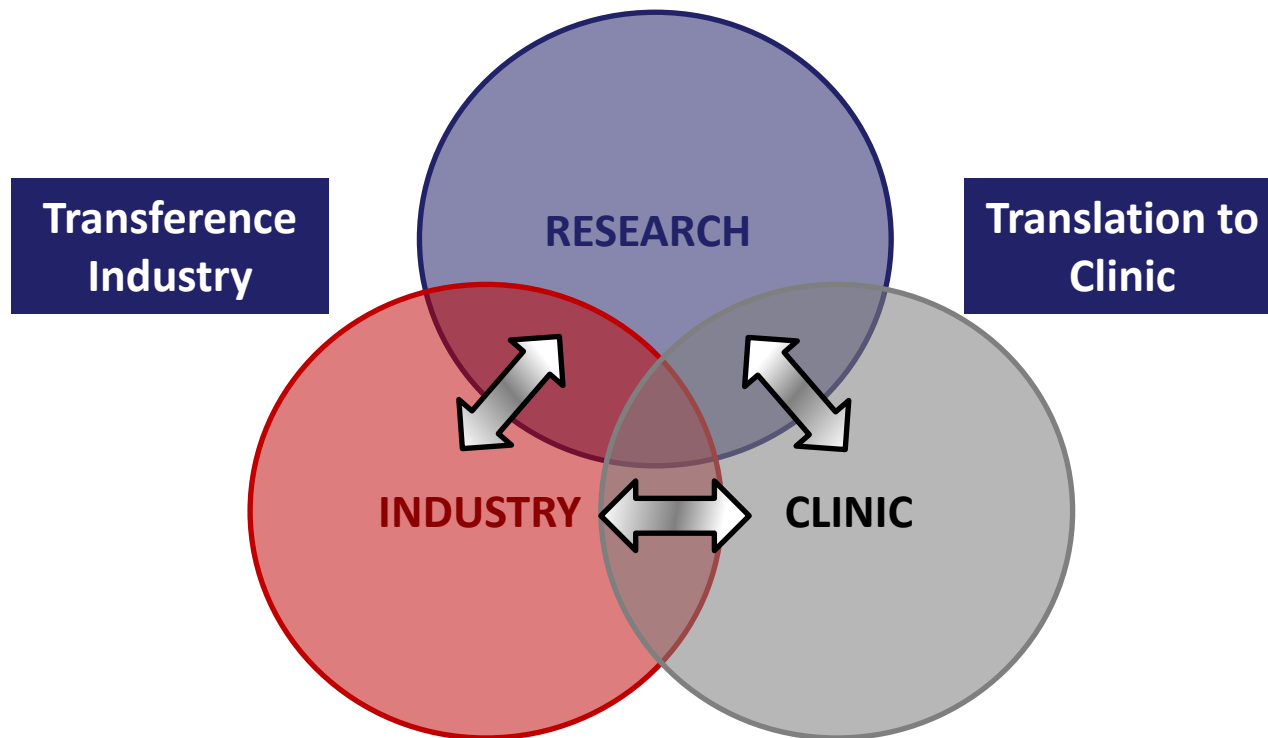
# INTRAMURAL RESEARCH PROJECTS (I)

<i><b>Acronym</b></i>	<i><b>Title</b></i>	<i><b>Partners</b></i>
<b>CELL-NANO-THYROID</b>	New orthotopic/ectopic nude mice model of human thyroid carcinoma.	<b>Leiva</b> , Mangues, Schwartz, Pedraz, J. Blanco
<b>GLYCO-HIV</b>	Glyconanoparticles & glycodendrimers as new tools to fight HIV transmission	<b>Penadés</b> , Albericio, Alcamí*, Yuste*
<b>NAINBO</b>	Nano-engineering inclusion bodies as new biomaterials for cell proliferation	<b>Veciana</b> , Villaverde, Vilaboa
<b>NANOCOMETES</b>	Dev. of vehicles for treatment of metastatic colorectal cancer	<b>Mangues</b> , Schwartz, Villaverde, Albericio, M. Máñez, Pavía
<b>NANOHYPER-THERMIA</b>	New nanoparticles and protocols for enhanced hyperthermia	<b>Pozo</b> , Santamaría, Vilaboa, Martínez Máñez, Penadés, Fernández, Palacio*
<u><b>NANOMEDIAG</b></u>	Nanobioanalytical platform for med. diagnosis of infectious diseases	<b>Samitier</b> , Marco, González
<b>NANOSTEMNESS</b>	Targeting Cancer Stem Cells for Therapy of Advanced Breast Cancer	<b>Schwartz</b> , Villaverde, Veciana, Boisseau*, Gaspar*
<b>NANOXEN</b>	Use of optical molecular nanoswitches to control nervous functions	<b>Sanz</b> , Izpisúa, Eritja, Llobet*, Palou*
<u><b>OLIGOCODES</b></u>	Universal Diagnostic Platform Based On Oligo. Cod. Np & DNA Microarray Sensor	<b>Marco</b> , Samitier, Eritja, Garagorri, Albericio, Civeira*
<b>NANORETINA</b>	Nano-scaffolds for the reimplantation of detached retina	<b>Pozo</b> , Aguiló, Veciana, Mansó*, Muñoz Negrete*

# INTRAMURAL RESEARCH PROJECTS (II)

<i>Acronym</i>	<i>Title</i>	<i>Partners</i>
<b>BIO-GATES</b>	Bio-gated scaffoldings for diagnosis and delivery applications	<b>M. Máñez</b> , Marco, Eritja, Peris, Vallet, Schwartz, Penadés
<b>LIVERPOC</b>	Advanced Diagnostic Tool for Early Identification of Liver Failure	<b>Lechuga</b> , Marco, Doblaré,
<b>METALOTRIGGER</b>	Metalloproteinase-sensitive multifunctional carriers colorectal cancer	<b>Schwartz</b> , Albericio
<b>NADD</b>	Nucleic acids derivatives as potential drugs	<b>Eritja</b> , Gómez, Solans, Muñoz, Pedraz, Albericio
<b>NANOBIKIDE</b>	New nano approaches for HIM microbicide drugs	<b>Gómez</b> , Solans, Eritja, Muñoz Fernández
<b>NANOFABRY</b>	Nanomedicines for enzymatic replacement therapy in Fabry disease	<b>Schwartz</b> , Albericio, Sanz, Veciana, Villaverde, Manges
<b>NANOPHOR</b>	Electrophoretic and photonic tec. for pathogenic microbes identification	<b>Pozo</b> , Aguiló, Roa
<b>NANOPROVIR</b>	Tuning nano-achitecture and function in protein-only artificial viruses	<b>Villaverde</b> , Manges, Veciana, Schwartz, Eritja
<b>NANO-TRANS-BRAIN</b>	Nanocarriers for antiapoptotic drug transport across the Blood-Brain-Barrier	<b>Solans</b> , Eritja, Sanz, Gómez, Pelegrí*

# STRATEGIC CHALLENGES: Transference & Translation



# STRATEGIC CHALLENGES: Transference

## CHALLENGE A

***Transferring the results into the private sector***, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

### ➤ Specific Objectives: *Patenting & Transferring*

1. Protect the intellectual property
2. Licensing a greater number of patents to the private sector

### ➤ Action Lines: *Patenting & Transferring*

1. Create a **normalized framework** to favor **intellectual property protection**
2. Activities to promote **transfer** of the know-how and achievements to the **private sector**

### ➤ Specific Objectives: *Strength relation with the private sector*

3. Strengthen the relation with the private sector
4. Increase the participation of the CIBER-BBN on collaborative projects with industries
5. Favor collaboration with companies to support exploitation

### ➤ Action Lines: *Strength relation with the private sector*

3. Organization of **Specialized Forums** with companies sharing common interests
4. **Boost** contacts **National/International Technological Platforms and Enterprise Associations.**

### ➤ Specific Objectives: *Spin-offs*

5. Creation of Spin-offs

# STRATEGIC CHALLENGES: Patents & Transferring

## CHALLENGE A

*Transferring the results into the private sector*, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

### ➤ Action Lines: *Patenting & Transferring*

1. Create a **normalized framework** to favor **intellectual property protection**
2. Promote **transfer** of the know-how and achievements to the **private sector**

### *Normalized procedure*

1. Notification to the **CIBER-BBN Technology Transfer Manager** (Dr. Fernando Santos)
  - Elaboration of summary report of the invention and the transfer potential
2. Contacts with the **consorciated TTOs**, negotiation of the percentage of contribution to the invention of each institution, and coordination of the IP issues between them.
3. Selection of a specialized **Patent Agent Company**
  - Request of the elaboration of a **Patentability Report**
4. The **Patent Agent Company** elaborates the **Patent Request Document** and manages the Patent Application

### *Funding Scheme*

1. Elaboration of a funding scheme to suport the costs derived from the patent application
  - **Genoma España** (up to 75% of the cost can be covered, maximum 4000 €)
  - **CIBER-BBN** and **Consortiated Institutions** collaborate on covering the costs



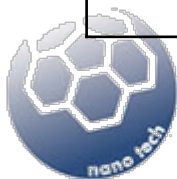
# STRATEGIC CHALLENGES: Patents & Transferring

## CHALLENGE A

*Transferring the results into the private sector*, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

### ➤ Action Lines: Patenting & Transferring

1. Create a **normalized framework** to favor **intellectual property protection**
2. Promote **transfer** of the know-how and achievements to the **private sector**
  - Prospective studies and technological surveillance
  - Dissemination of the CIBER-BBN technological offer
  - Participation in congresses, technological fairs and partnering events



International Nanotechnology  
Exhibition & Conference  
**nano tech 2011**



**biospain**  
2012



### 2008-2011:

- Biospain 2008
- Nanotech Tokyo 2009
- Bio USA 2009
- Bio Europe 2010
- Biospain 2010
- Biofit 2010
- Nanotech Tokyo 2011
- Imagenenano 2011

### 2012:

- Biospain 2012
- Bio USA 2012
- EuropaBIO 2012

# STRATEGIC CHALLENGES: Specialized Forums (I)

## CHALLENGE A

***Transferring the results into the private sector***, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

➤ **Action Lines: *Strength relation with the private sector***

3. Organization of Specialized Forums & Partnering

Speciality	Location/Institution	City
<i>Ocular therapy</i>	ISCIII	Madrid
<i>Cartilage therapy</i>	University of Navarra	Pamplona
<i>Regenerative Medicine</i>	Hospital La Paz	Madrid
<u><i>Future Trends in Molecular Diagnostics</i></u>	CSIC	Barcelona
<u><i>Drug Delivery Systems</i></u>	PCB	Barcelona
<i>Biomat. &amp; Nanostruct. in biomedicine</i>	Imaginenano Int.Congres	Bilbao
<i>Biomedical Imaging</i>	PCB	Barceloma

# STRATEGIC CHALLENGES: *Specialized Forums (II)*

## CHALLENGE B

*Transferring the results into the private sector*, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

➤ **Action Lines: *Strength relation with the private sector***

3. Organization of Specialized Forums & Partnering

Speciality	Location/Institution	City
Drug delivery systems	PCB	Barcelona

**14 companies**



**18 CIBER-BBN**



# STRATEGIC CHALLENGES: *Specialized Forums (II)*

## CHALLENGE B

***Transferring the results into the private sector***, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system***.

### ➤ Action Lines

#### 3. Organization of Specialized Forums & Partnering

Speciality	Location/Institution	City
Future Trends in Molecular Diagnostics	CSIC	Barcelona

#### 15 companies



#### 16 CIBER-BBN





# STRATEGIC CHALLENGES: Boost relations

## CHALLENGE A

*Transferring the results into the private sector*, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system.***

➤ **Action Line: Strength relation with the private sector**

4. **Boost contacts National/International Technological Platforms and Enterprise Associations.**

federación española  
de empresas de  
fenin **TECNOLOGÍA SANITARIA**



**NANOMED**  
S P A I N



**SM-BIOPOWER**

**asebio**

**materplat**

**ciber-66n**  
Centro Investigación Biomédica en Red  
Biotecnología, Biomateriales y Nanomedicina

MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

ISC  
Instituto  
de Salud  
Carlos III



## Outcomes ???

# Outcomes: Patents

## CHALLENGE A

***Transferring the results into the private sector***, in order to favor that the developments accomplished as a result within the CIBER-BBN research, ***enter into the market and arrive to the health system***.

### ➤ Action Lines: *Patenting & Transferring*

1. Create a **normalized framework** in which to favor **intellectual property protection**
2. Promote **transfer** of the know-how and achievements to the **private sector**

Title	Institution	Licensed	Exploiter
<i>Curepos de incusión terapéuticos</i>	<b>CIBER-BBN</b>	SI	Janus Devopment
Equipo de medicion para scaffolds y tejidos	<b>CIBER-BBN</b>	SI	EBERS
<i>Procedimiento para NP metalicas</i>	<b>CIBER-BBN</b>	NO	
Proteina morfogenetica de hueso II	<b>UMA/CIBER-BBN</b>	NO	
Polímeros hidrófilos para mallas quirurgicas	<b>CSIC /CIBER-BBN</b>	NO	
Dispositivo sensor	<b>CSIC/CIBER-BBN</b>	NO	
Mét histológico para la preservación de epítapos	<b>CIBER-BBN</b>	NO	
Microcámara y dispositivo de cul. celular RMN	<b>CIBER-BBN</b>	NO	
Derivados lipofílicos de ácidos nucleicos	<b>CSIC/CIBER-BBN</b>	NO	
Oligonucl. modificados regul. de la expr. Génica	<b>CSIC/CIBER-BBN</b>	NO	
Proc. de obtención de un biomaterial metalico	<b>CSIC/CIBER-BBN</b>	NO	
Partículas de Mg para aplicaciones biomédicas	<b>CSIC/CIBER-BBN</b>	NO	
Disp. y Mét. para Monitorización de la Ingesta	<b>UPM/CIBER-BBN</b>	NO	
Met. & Reagents for targeted delivery	<b>UAB/CIBER-BBN</b>	NO	
Med cultivo cel. Prolif .de epit, esclerocorneal	<b>CIBER-BBN</b>	NO	

# Outcomes: Collaborative Research projects

## 2011-2012: New 4 INNPACTO Projects

### VITILIGO:



CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



UNIVERSIDAD DE  
ALCALÁ

### POLYSFERA:



### KIT-ALZHEIMER:



THROMBOTARGETS EUROPE



CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



### NANOCARDIOCOCO:



alphaSIP



CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

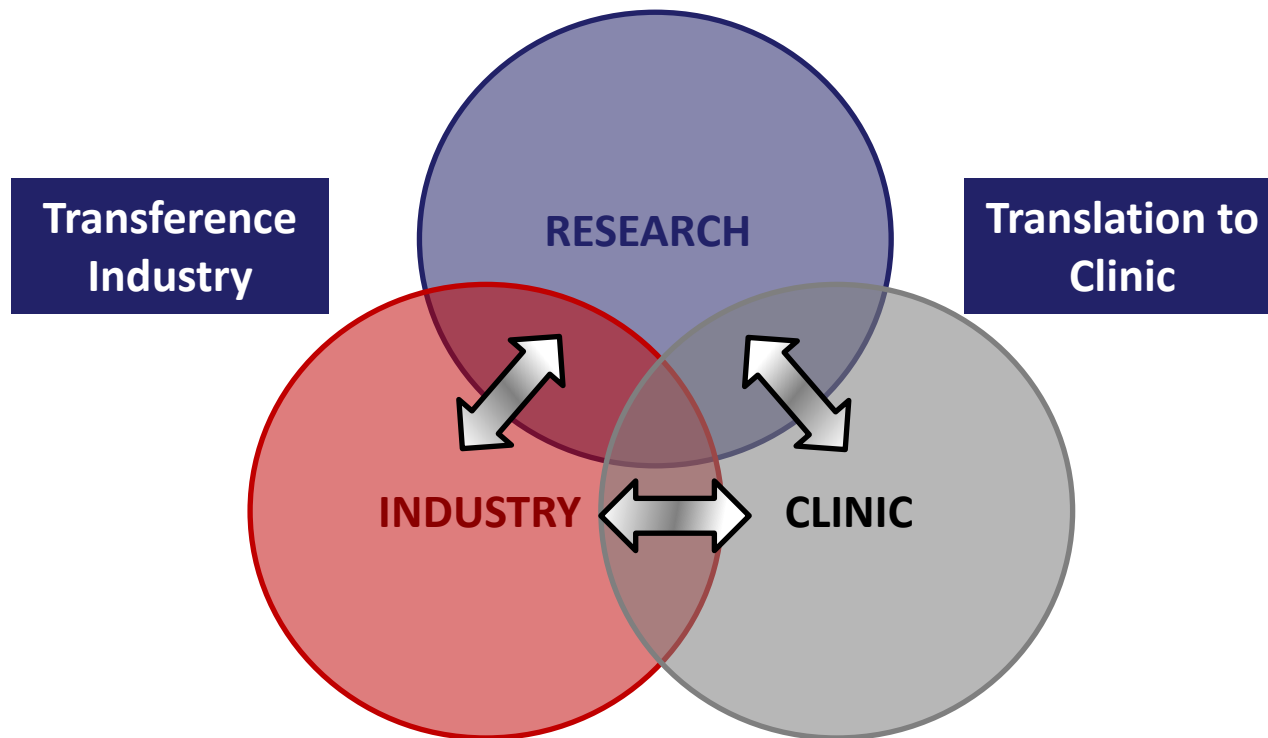


# Outcomes: *Bilateral Contracts with Companies*

## Contracts with companies

Company		Country	Institution
	Unisensor SA	Belgium	IQAC-CSIC
	Pharmasan Labs	USA	IQAC- CSIC
	PharmaMar	Spain	Hospital Sant Pau
	Praxis Pharmaceutical	Portugal	CicBiomagune
	Procter & Gamble	Spain	IQAC-CSIC
	Arquebio	Spain	IBB-UAB
	Laboratorios Hipra	Spain	ICMA-CSIC
	Syngenta	Spain	IQAC-CSIC
	Malaysian Rubber Board	Malaysia	IQAC-CSIC

# STRATEGIC CHALLENGES: Transference & Translation





# STRATEGIC CHALLENGES: Translational research

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH*.

### ➤ Specific Objectives

1. To establish **collaborations with healthcare institutions** and hospitals.
2. **Strengthen collaborations with other CIBERs and Clinical Research Centers.**
3. **Foster collaborations with the pharmaceutical sector.**
4. Disseminate and deliver results **to the clinical field**
5. Foster **participation of the CIBER-BBN in clinical and pre-clinical studies.**

### ➤ Action Lines

1. Creation of **Advisory Medical Board**
2. Boost contacts with **healthcare networks and associations**
3. **Organization** of specialized **clinical forums** & partnering.
4. **Adhesion of clinical groups** to the CIBER-BBN.
5. **Mobility plan** within hospitals.

# STRATEGIC CHALLENGES:

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH*.

### ➤ Action Line:

1. Creation of an **Advisory Medical Board (CAM)**.

Name	Speciality	Institution	City
Dr. Enrique Gómez	Traumato y ortopedia	Hospital Fund. Jiménez Díaz	Madrid
Dr. Ángel Arenal	Cardiología no invasiva	Hospital Gregorio Marañón	Madrid
Dr. J. Tabernero	Onco-hematología	Hospital Vall d'Hebrón	Barcelona
Dr. Jorge Matías	Neurociencias	Hospital Clínico San Carlos	Madrid
Dr. José M. Ruíz	Oftalmología	Complejo univ. hospitalario	Albacete
Dr. Emilia Barrot	Neumología y E. Resp	Hospital Virgen del Rocío	Sevilla
Dr. Joan Bigorra	Innovación	Hospital Clínic de Barcelona	Barcelona

# STRATEGIC CHALLENGES

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH.*

### ➤ Action line

2. Boost contacts with **healthcare networks and associations**



# STRATEGIC CHALLENGES

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH.*

### ➤ Action Line:

3. Organization of specialized **clinical forums** & regulatory aspects

YEAR 2012: Description	Details
<b>1 SEPAR/CIBER-BBN , Bilateral meeting</b> ➤ Participación en la XII Reunion de Areas de Invierno ➤ Participación en el 45 Congreso Nacional SEPAR	<b>Barcelona, January 26</b> •Zaragoza, 10 February •Madrid, 8-11 de Junio
<b>2 Forum Prosthesis, Implants and Tissue Engineering</b>	In parallel with the <i>Orthopedic Surgery and Traumatology Meeting of the Spanish Society</i>
<b>3 Forum on Oncology</b>	In parallel with the <i>Annual Congress of the Medical Oncology Spanish Society</i>
<b>4 Introducción En Aspectos Regulatorios De Productos Sanitarios Y Productos Combinados De Terapia Avanzada</b>	Escuela Nacional de Sanidad Madrid, June, 7th ( <i>tentative date</i> )
<b>5 Forum of Advanced Therapies: Introduction to regulatory aspects</b>	Barcelona
<b>6 CAIBER/CIBER-BBN Bilateral meeting</b>	

# STRATEGIC CHALLENGES: Clinical Groups

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH*.

### ➤ Action Line:

4. Adhesion of **Clinical Groups**.

## ISCIi Official Call

**Title: “PROCEDIMIENTO DE SOLICITUD DE GRUPO CLÍNICO VINCULADO ”**

1. Reasoned application of a CIBER-BBN group.
2. The clinical group belongs to a hospital linked to a CAIBER unit.
3. The clinical group has to have demonstrated experience in development of clinical assays.
4. It belongs a hospital of the National Health System .
5. The group has to have a demonstrated research career .

Name	Speciality	Institution	City
<b>Dr. Luis Martí Bonmatí</b>	Medical Imaging & Radiology	Hospital La Fe	Valencia



# STRATEGIC CHALLENGES: Clinical Groups

## CHALLENGE B

To *drive the investigation* performed in the NANOMEDICINE AREA *to a more TRANSLATIONAL RESEARCH*.

### ➤ Action Line:

5. Mobility Plan within Hospitals.

## Training Program

Title: Call for Funding short Stages of PhD students on Hospitals

*Will open soon*

## Outcomes ???

# SUMMARY & CONCLUSIONS

ciber-bbn

- CIBER-BBN is a biomedical network performing research in the Bioengineering, Biomaterials and Nanomedicine fields, but with a strong intention to deliver the results of their research to the private and to the clinical sector.
- Although a strong effort has been made to create a framework to protect intellectual property and to facilitate contact with industries, the number of products licensed or in exploitation is still low
  - The activities in this direction should be maintained and additional efforts have to be performed (probably in collaboration with the private sector) to convert our results on products contributing to the prosperity of our country
- Action lines have been initiated to foster relations with hospitals and clinical associations and to boost the translational transfer of the CIBER-BBN research to the clinical sector,
  - The results of this activities still cannot be evaluated, but it seem clear that this is an aspect that the CIBER-BBN needs to continuously promote in order to facilitate communication and to enhance the translational character of its research

**CIBER-*BBN***

**NANOMEDICINE AREA**

*Thank you for your attention*  
**CIBER-*BBN* Director: Prof. Pablo Laguna**

**Area Coordinator: Prof. M.-Pilar Marco**

**Area Project Manager: Dr. Johanna Scheper**

***V Conferencia Anual de Plataformas  
Tecnológicas***

***Barcelona, 14 and 15 of February, 2012***