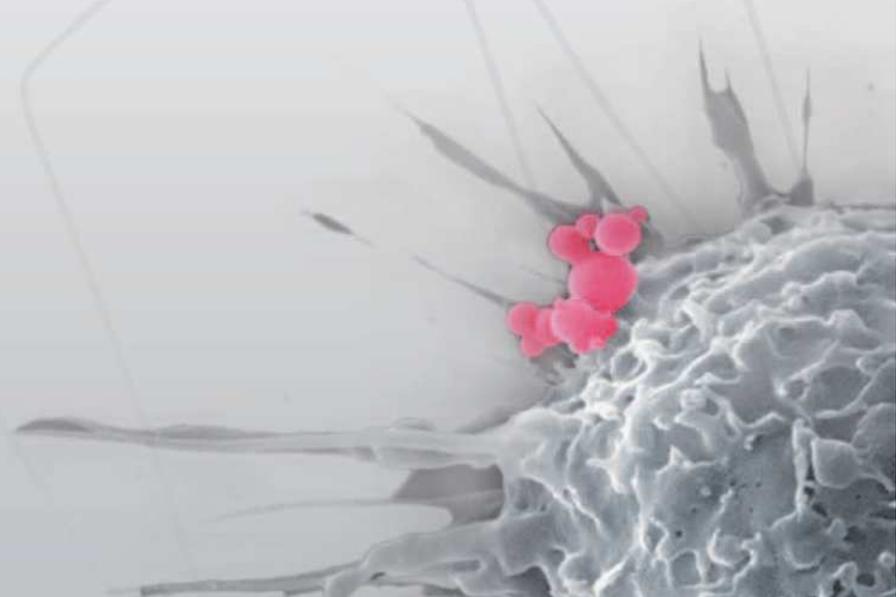




**nanoimmunotech**  
global solutions  
in nanobiotechnology

**Christian Sánchez Espinel**  
Director Técnico  
cristianespinel@nanoimmunotech.es

[www.nanoimmunotech.es](http://www.nanoimmunotech.es)



## Indice

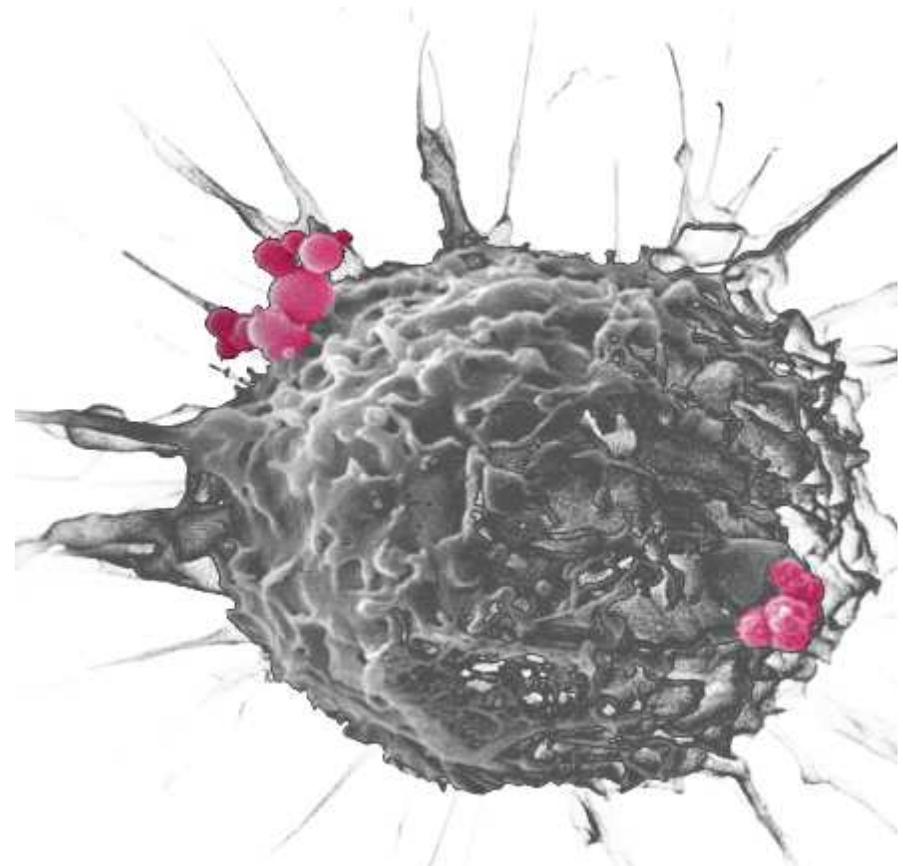
Empresa

Nanobiotechnología

Funcionalización

Caracterización

Conclusiones





## Indice

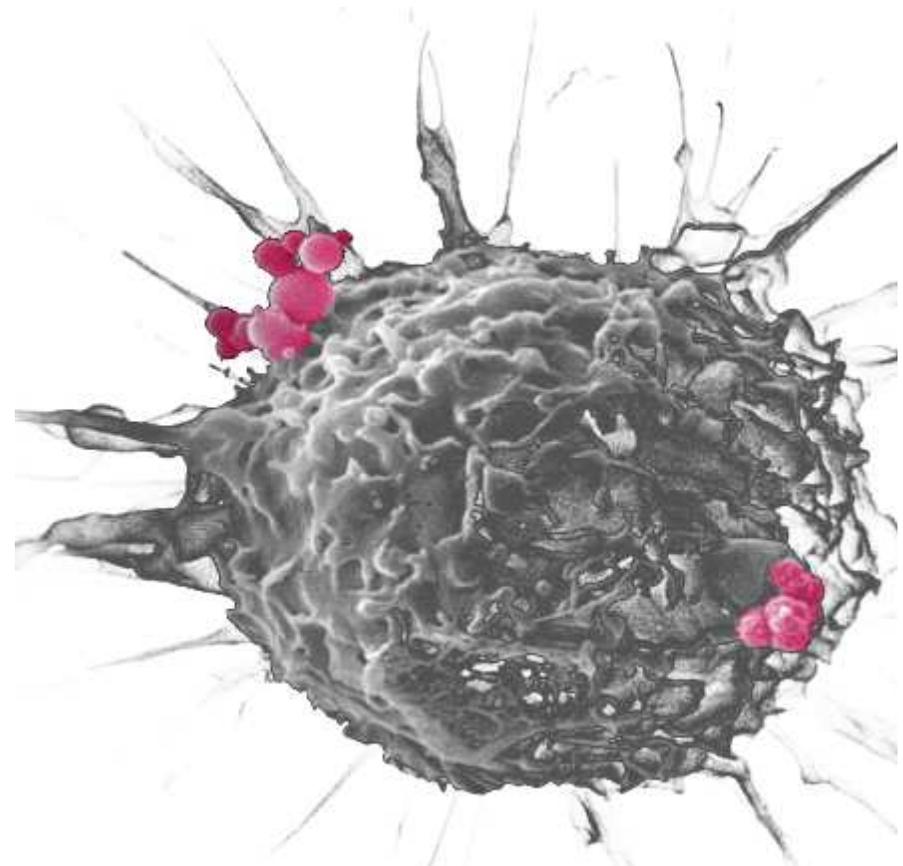
### Empresa

Nanobiología

Funcionalización

Caracterización

Conclusiones



Empresa

# Origen y Reconocimientos

- Reconocida como EBT
- Spin-off Universidad de Zaragoza y Universidad de Vigo

**INSTITUTO NANOCIENCIA  
ARAGÓN**



**CENTRO INVESTIGACIONES  
BIOMÉDICAS**



- Premio Bioemprende.
- Proyecto aceptado como Programa Empresa Concepto 2009.
- Premio "V Concurso UNIEMPRESARIA 2009".
- 2º Premio Empresa Base Tecnológica (IX Concurso Proy. Empr. Innov. USC 2009).
- Premio Cátedra Bancaja 2010.
- NEOTEC. CDTI. 2010

# Empresa Objetivo

## Visión:

Empresa de referencia mundial, en la **Funcionalización** y **Caracterización** de “sistemas nanométricos”

## Misión:

El compromiso de Nanoimmunotech consiste en ofrecer productos y servicios, que cubran de forma integral el mercado de caracterización y funcionalización de nanopartículas, en el sector de la **Biotecnología y la Salud**



 nanoimmunotech

First european company dedicated to the **biological-physico-chemistry characterization** of nanostructures, generation of **monoclonal antibodies and functionalization of nanoparticles** with different elements (antibodies, proteins, sugars...) previous to their use in biomedical applications.  
The company also includes advice in **sterilization and functionalization**.

The company provides support to biomedical, pharmaceutical and biotechnology companies, veterinary and food market, and research groups dedicated to the synthesis of nanoparticles with potential biomedical application **in vivo**.

### Biological characterization of nanoparticles

Biocompatibility  
Toxicity  
Sterility  
Immunogenicity

### Physico-chemical characterization

TEM-EDX    Elemental analysis  
RMN        DLS  
FTIR        Zeta potential  
XPS        Fluorescence spectroscopy  
ICP        UV-visible spectroscopy

### Monoclonal antibody production & functionalization of NPs

Generation of monoclonal antibodies (mAb)  
Conjugation to NPs  
Functionalization with other molecules (carbohydrates, enzymes, nucleic acids, peptides)

**Different applications:**  
MRI/imaging    Drug delivery    Biosensors  
Gene therapy    Interaction studies







## Indice

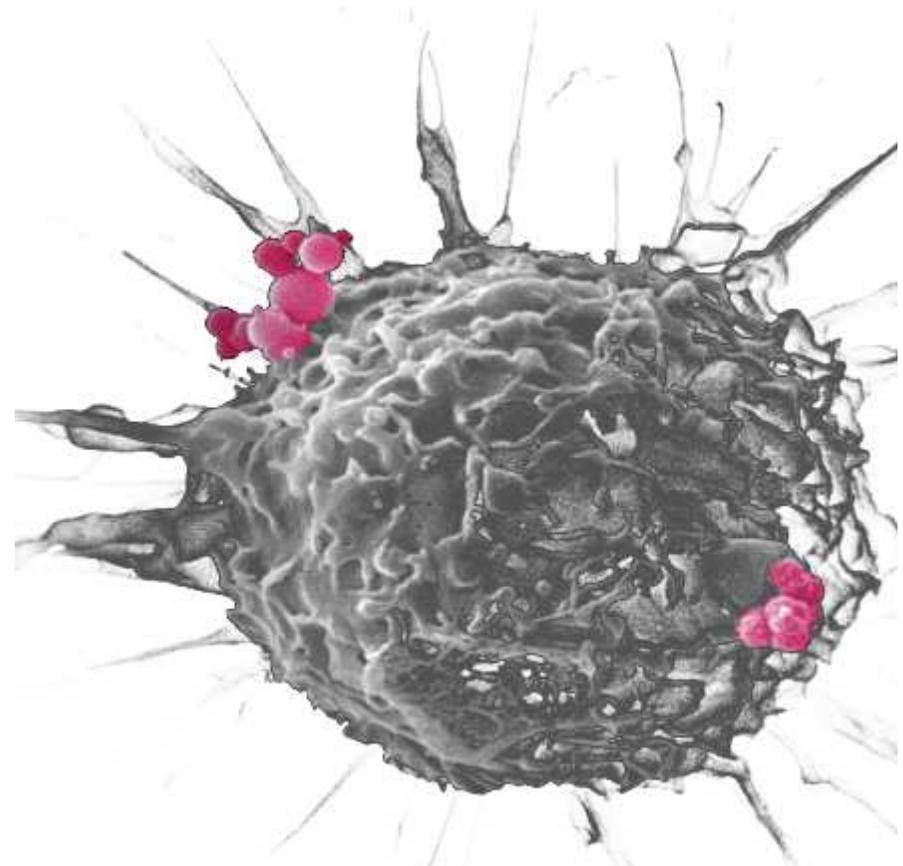
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Nanobiología

Funcionalización

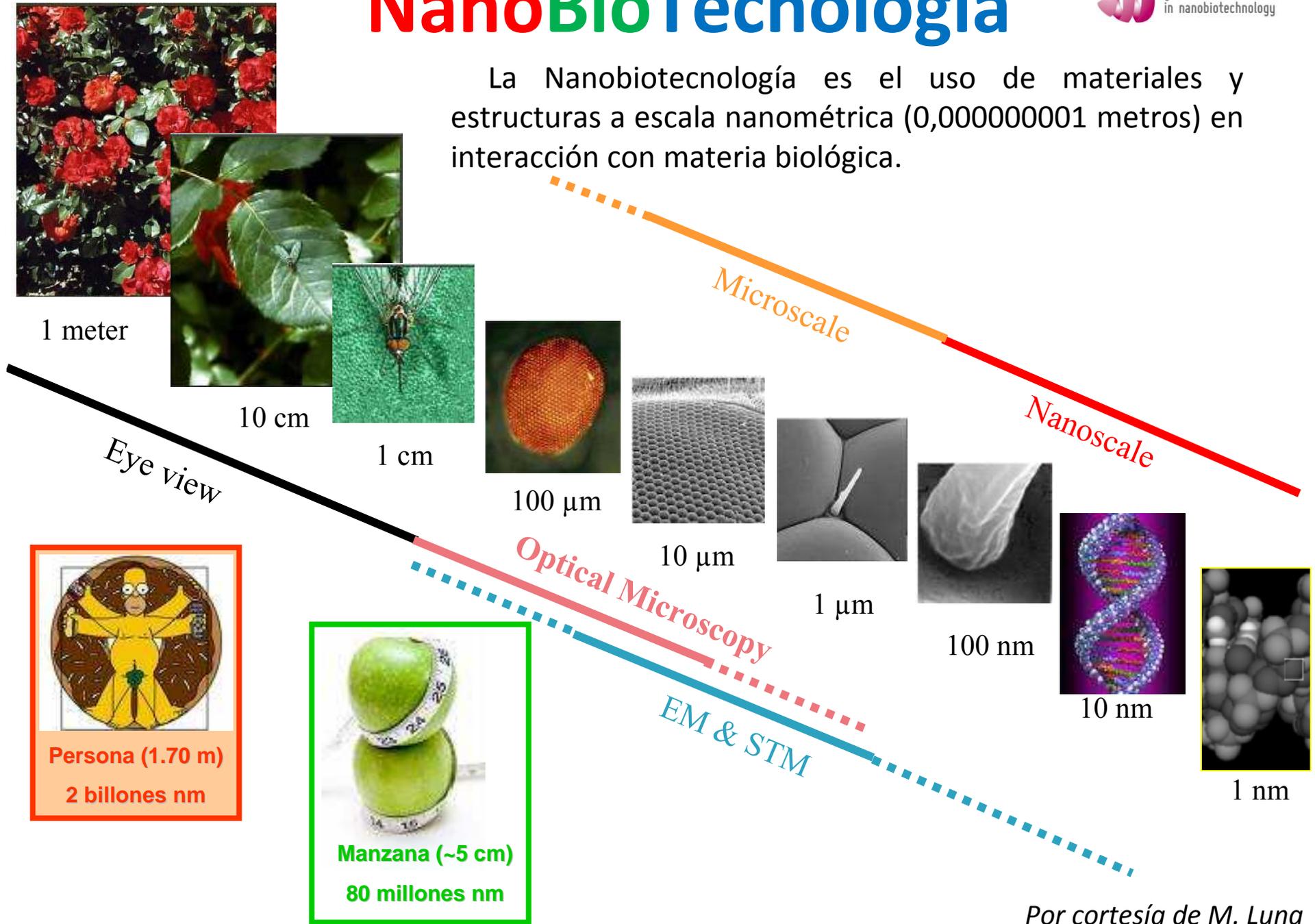
Caracterización

Conclusiones



# NanoBioTecnología

La Nanobiotecnología es el uso de materiales y estructuras a escala nanométrica (0,000000001 metros) en interacción con materia biológica.



Por cortesía de M. Luna

# NanoMedicina

## Aplicación biomédica de la nanotecnología

### VACUNAS

Vías alternativas

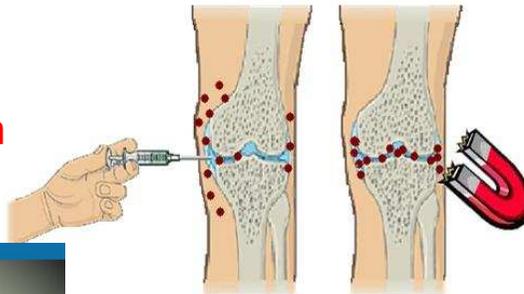


### DISPOSITIVOS

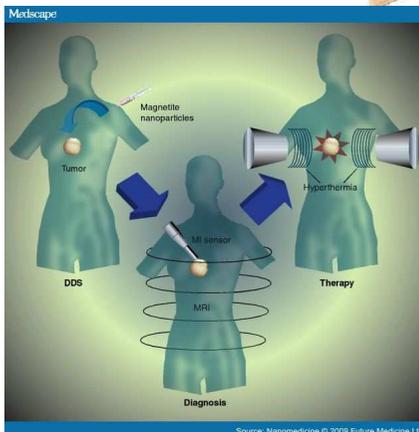
Catéteres NO infecciones  
Dispositivos menor tamaño  
...



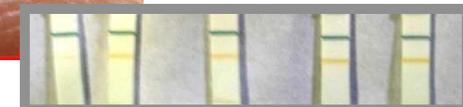
**Hipertermia,  
Fotodinámica  
o localizada**



AGENTES  
DE  
CONTRASTE



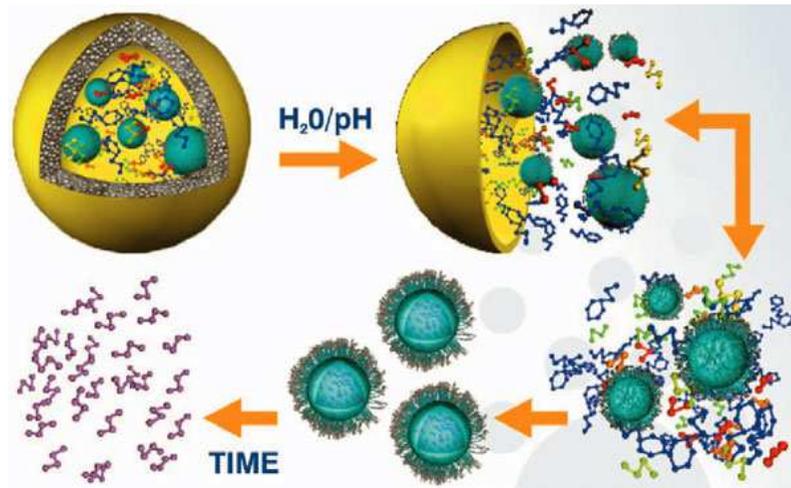
**DIAGNÓSTICO *in vitro***



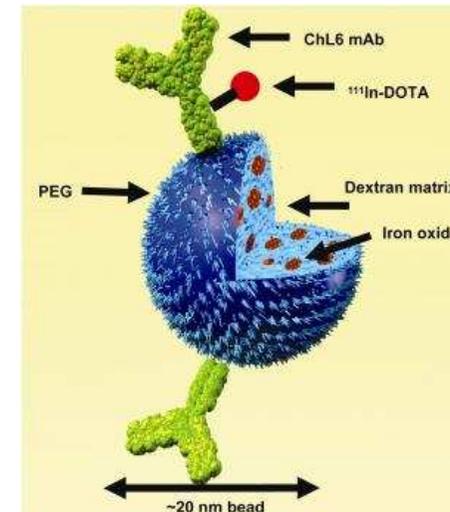
# NanoMedicina

## FÁRMACOS

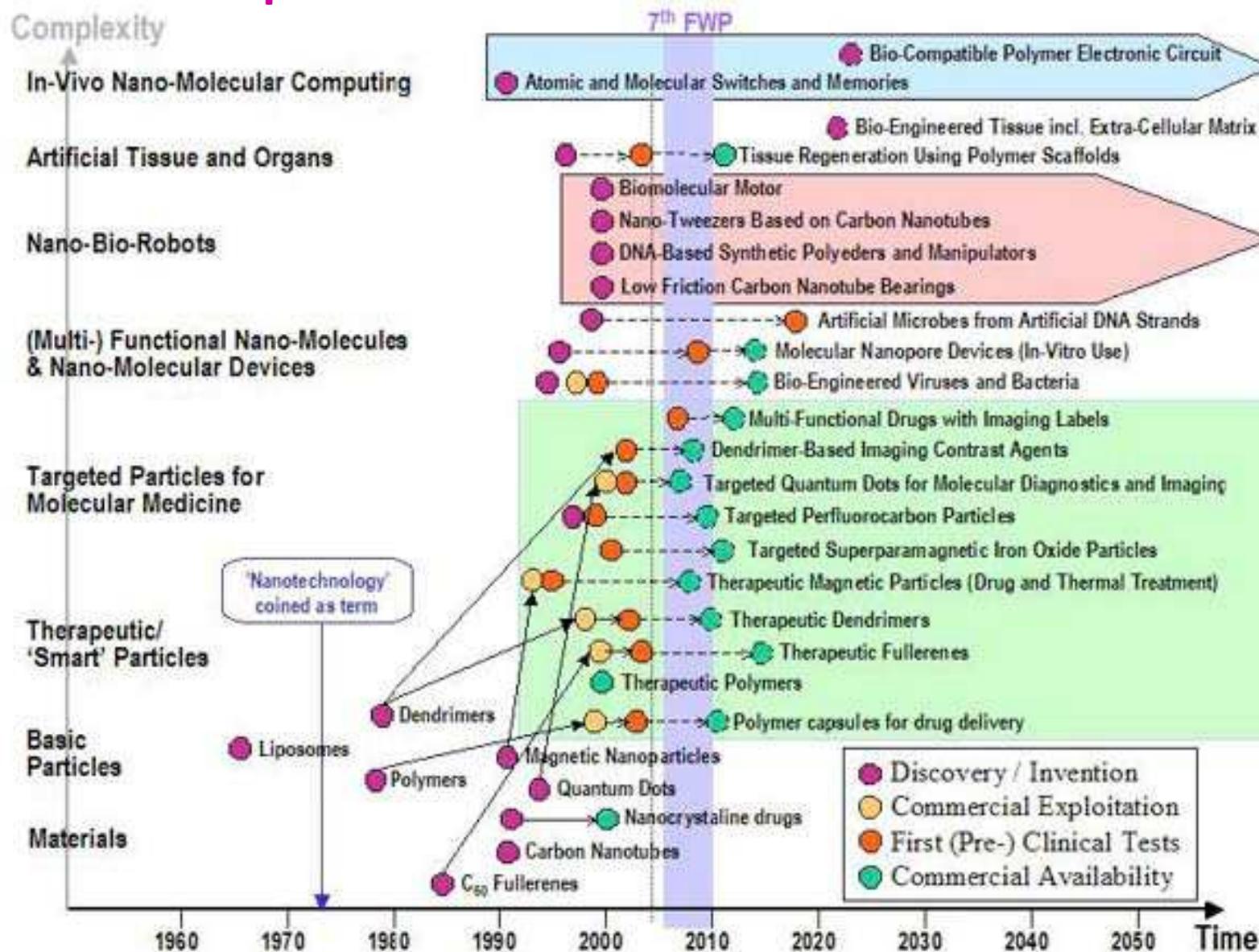
**LIBERACIÓN  
CONTROLADA**



**DIRIGIDOS A LA DIANA  
DE INTERÉS**



# Realidad presente



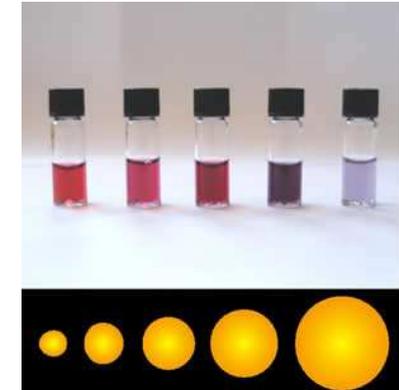
Source: Philips Medical Systems

<http://www.nanowerk.com/spotlight/spotid=3938.php>

## Claves del éxito

### 1.- Características cambian a escala nanométrica

Propiedades ópticas, térmicas



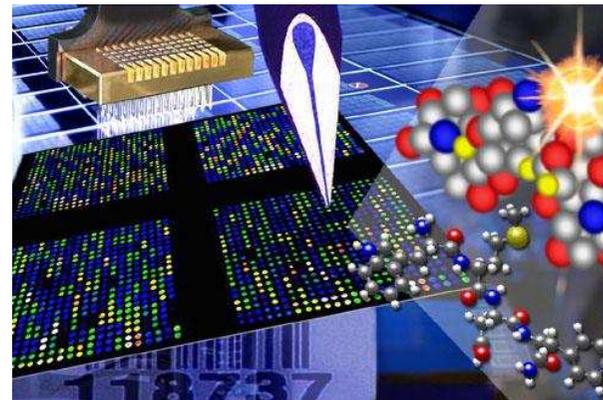
### 2.- Múltiples propiedades

Fluorescentes/ magnéticas/ metálicas.....

### 3.- Tecnología permite ver, medir y producir elementos "NANO"

TEM, SEM, DLS, Confocal, Raman, SEM-TEM, FIB.....

### 4.- ...





## Indice

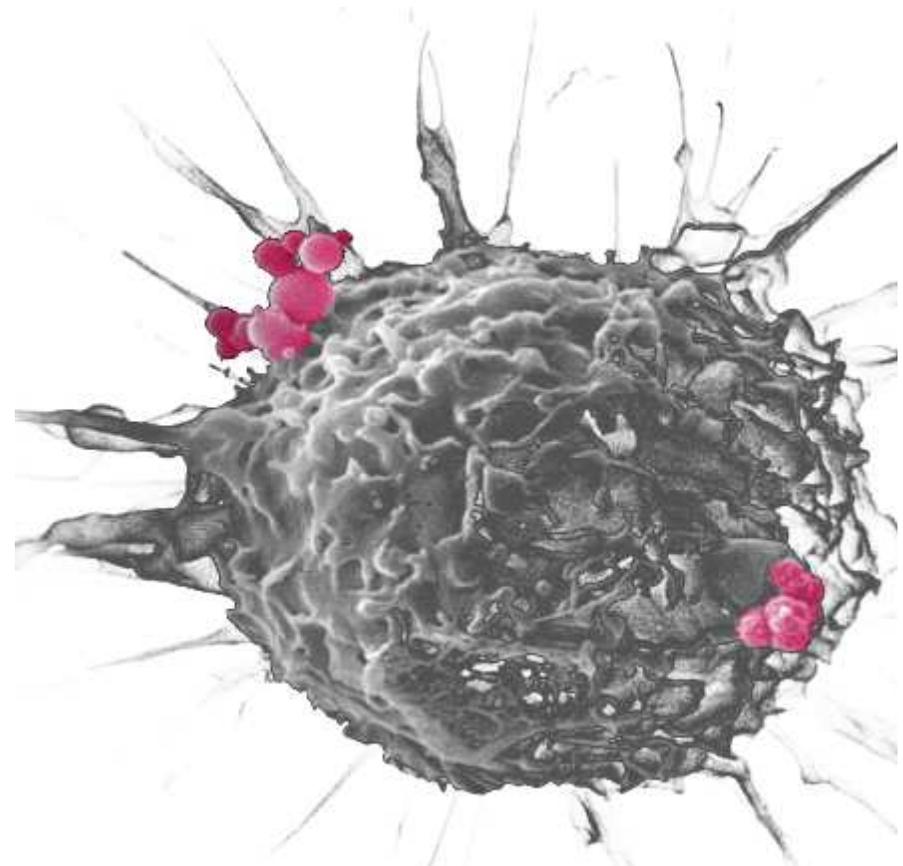
Empresa

Nanobioteología

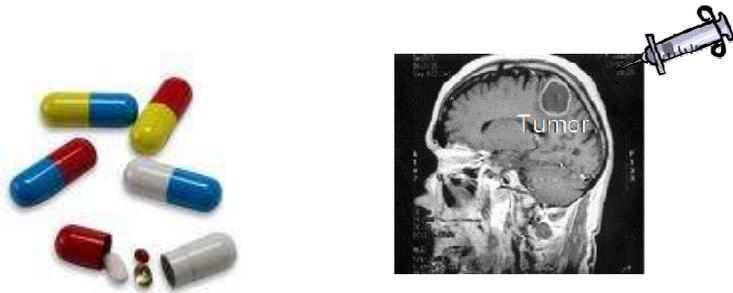
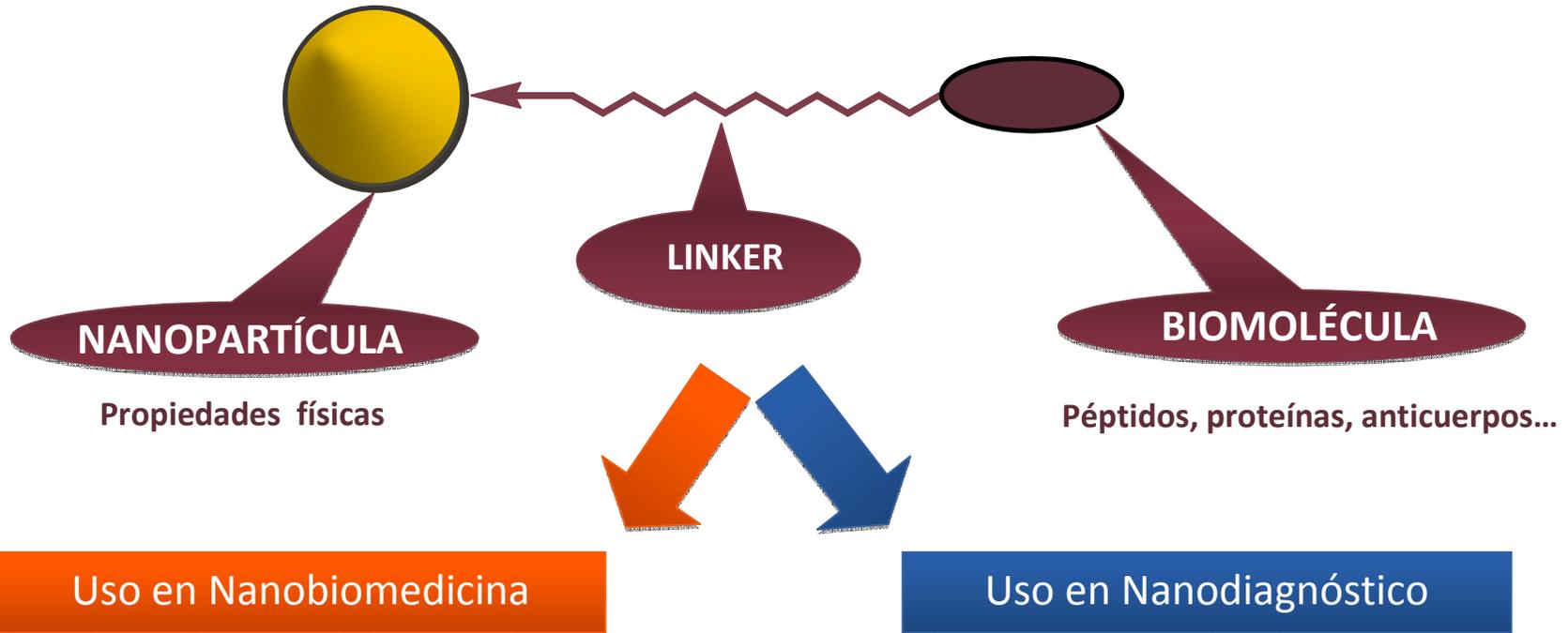
**Funcionalización**

Caracterización

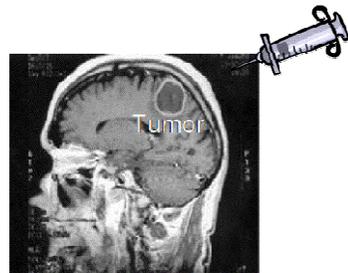
Conclusiones



# Funcionalización



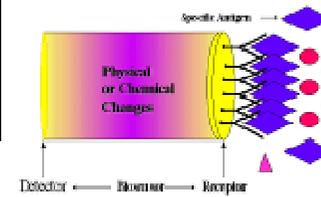
Liberación controlada fármacos



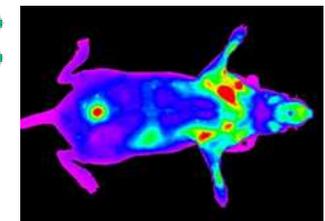
Hipertermia



MRI



Biosensores

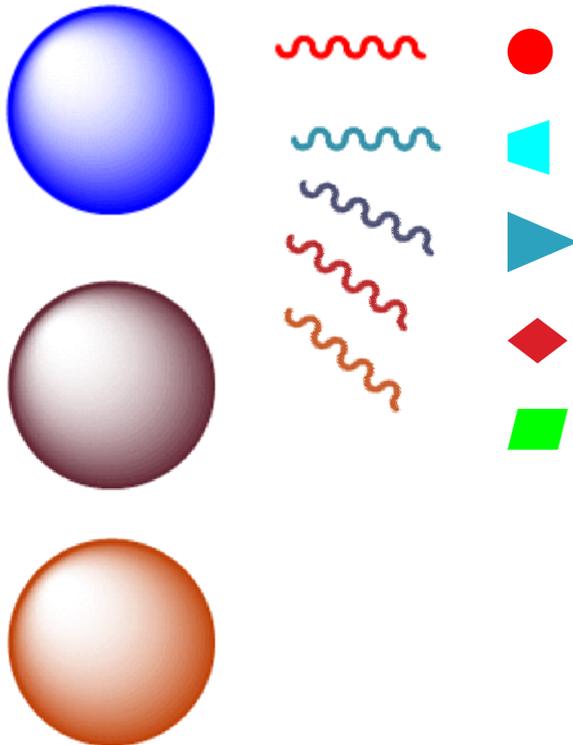


Tomografía fluorescencia

# Funcionalización: Estado del arte

Nanopartículas

Biomoléculas



Monofuncionalización

Proyecto I+D nuevas uniones



# NIT-zipper®

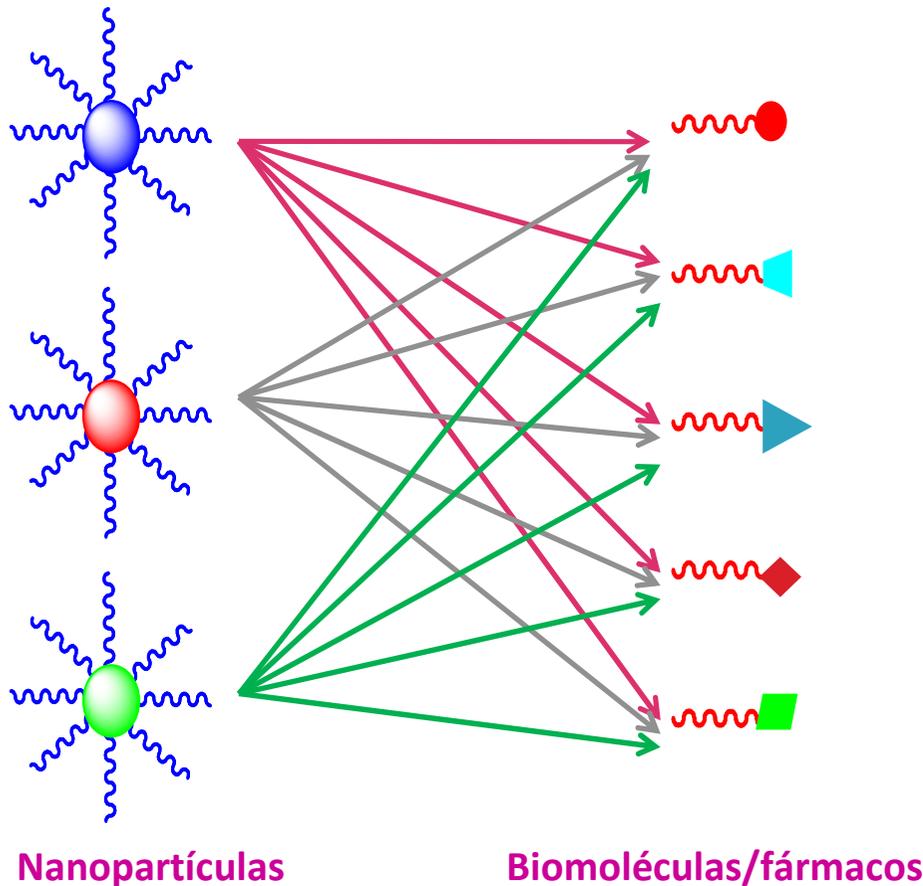
## Estrategia NIT-zipper®

Cualquier NP y cualquier biomolécula

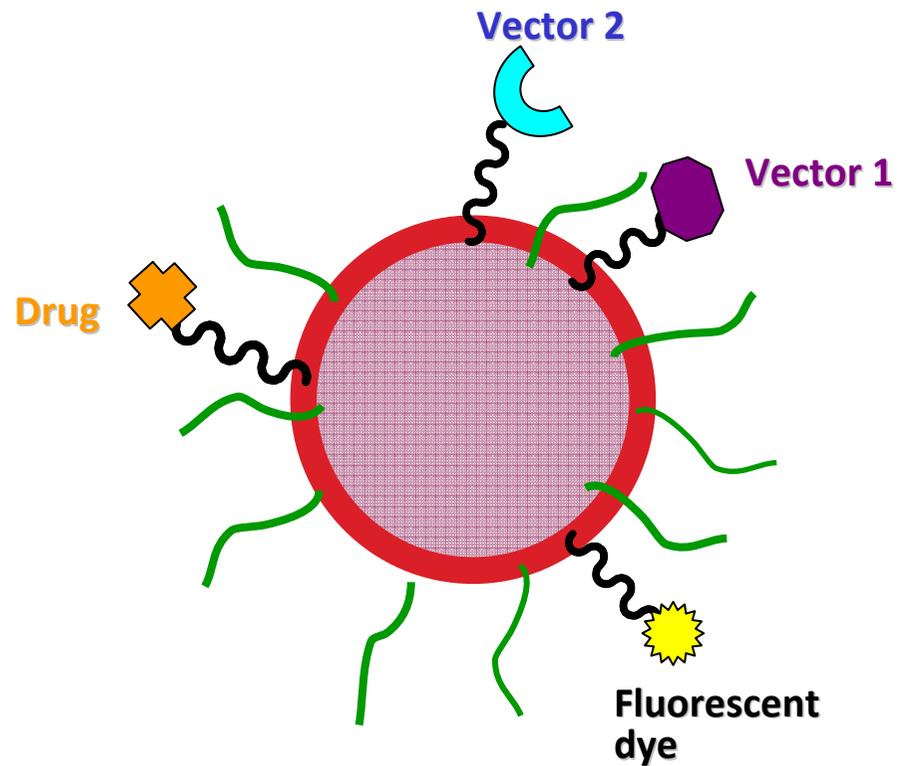
Inmediatez

Multifuncionalización

Patentado

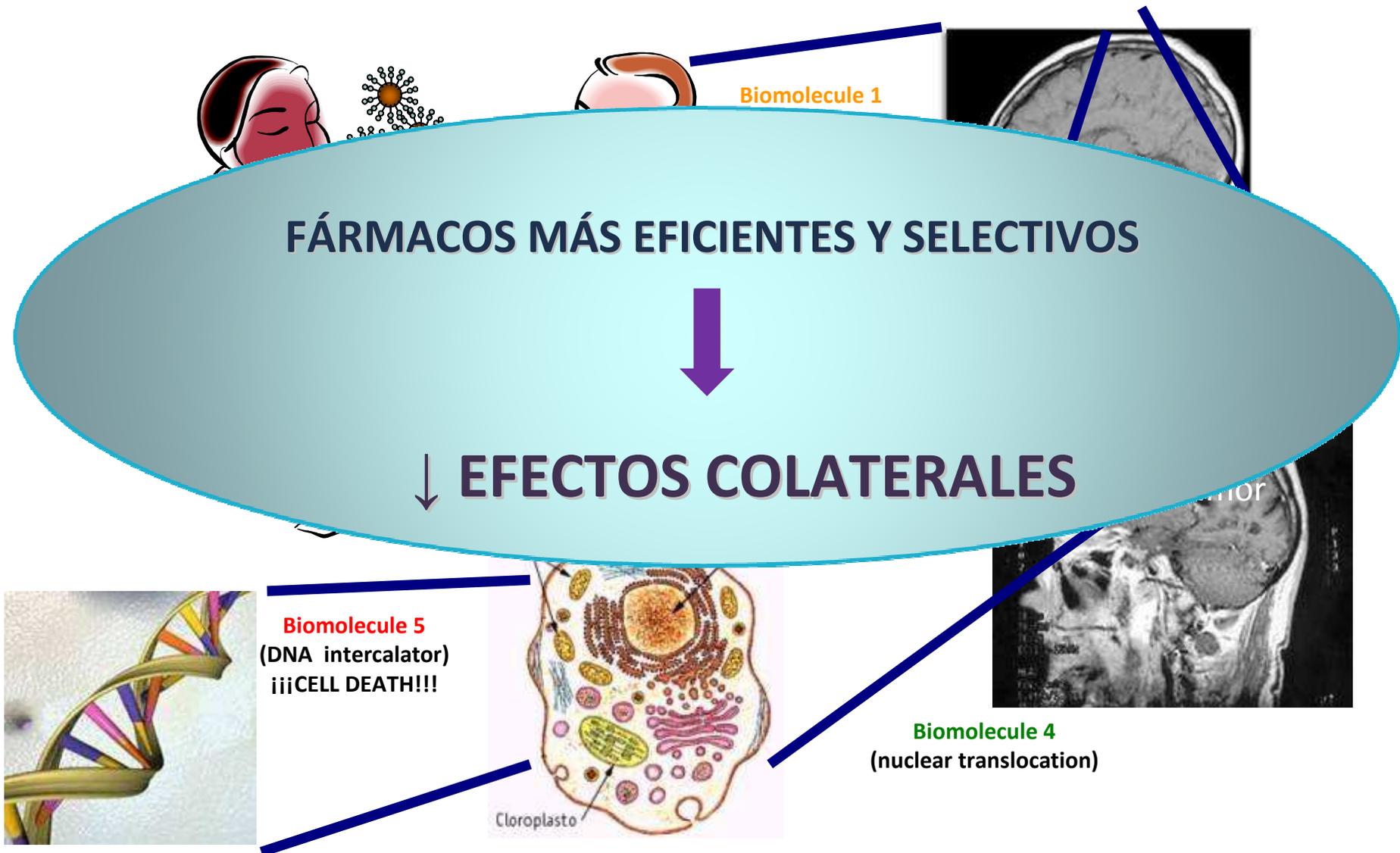


## Multifuncionalización



**NANOSISTEMA**

## Multifuncionalización





## Indice

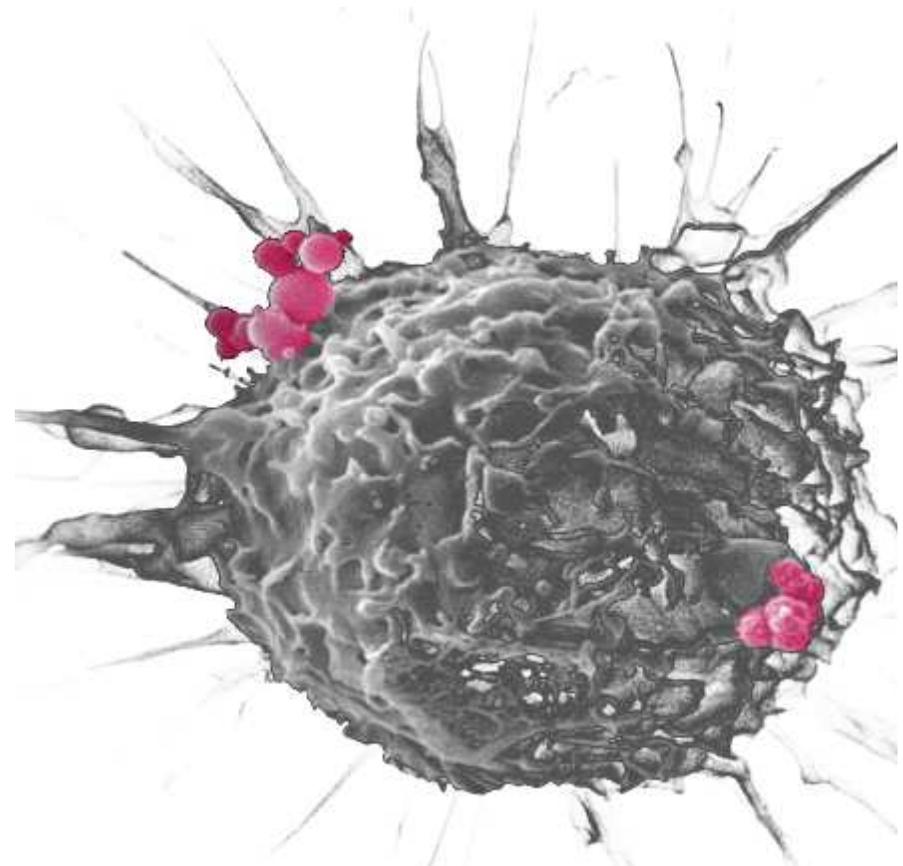
Empresa

Nanobiología

Funcionalización

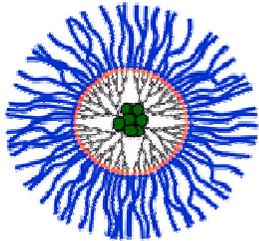
**Caracterización**

Conclusiones

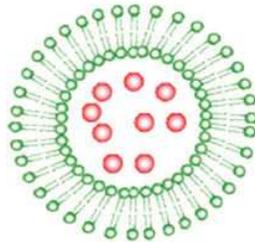


# Nano-estructuras

Dendrimer



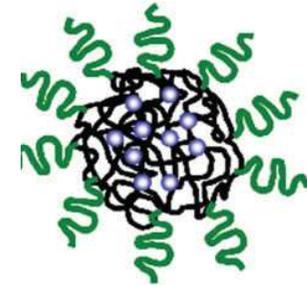
Nanoliposome



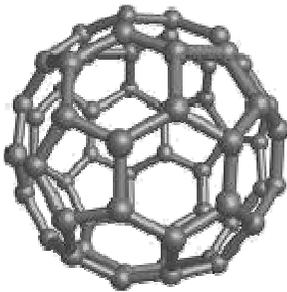
Conjugated  
polimeric



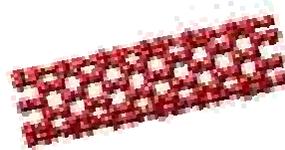
Polimeric Np



Fullerene o  $C_{60}$



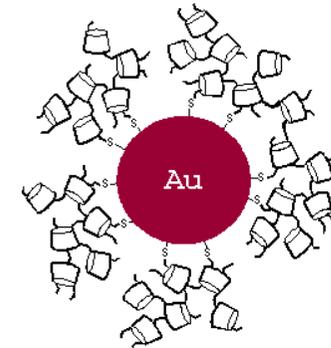
Carbon  
Nanotubes



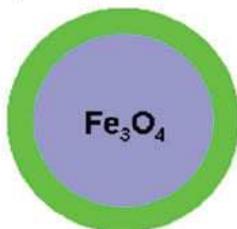
Quantum Dots



Gold Np



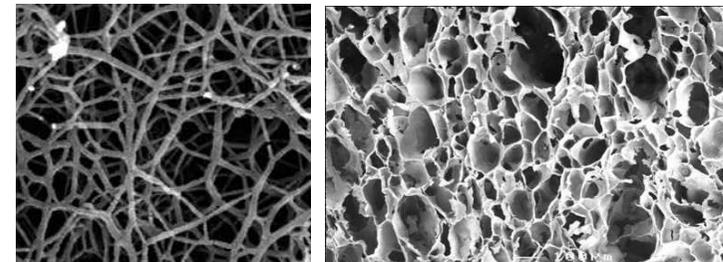
magnetic Np



Nanoshells

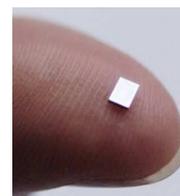
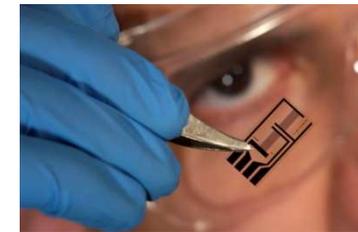
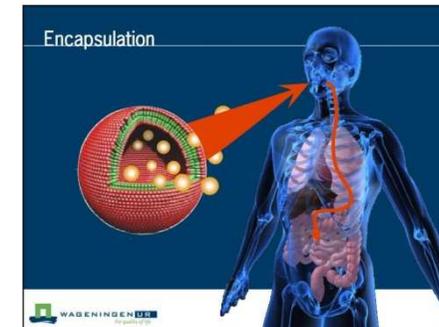
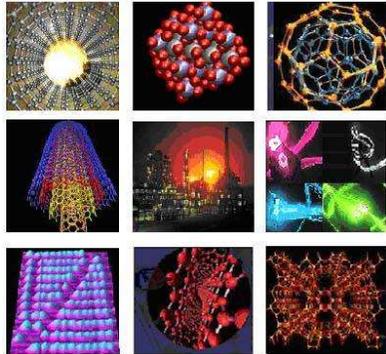


Nanofibres & scaffolds



Caracterización

# Nanomateriales



# Nanomateriales: Alimentación



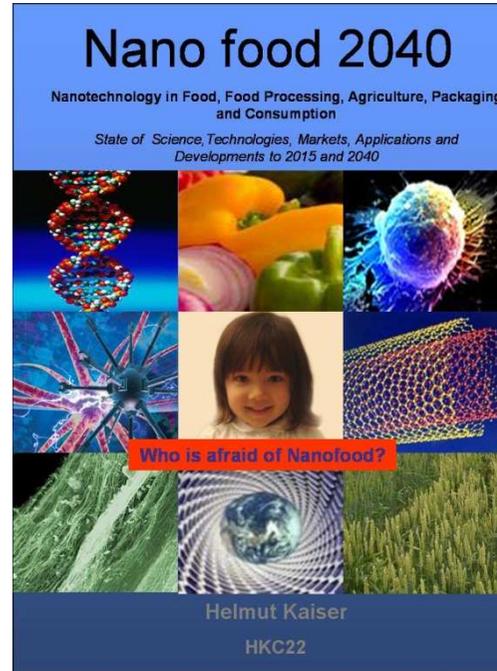
1.- *Alimento*

2.- *Procesamiento*

3.- *Empaquetado / Conserva*

4.- *Transporte*

5.- *Agri-Acui-cultura*



Vias alternativas



Comida interactiva



Seguridad-calidad

# Nanomateriales: Riesgos



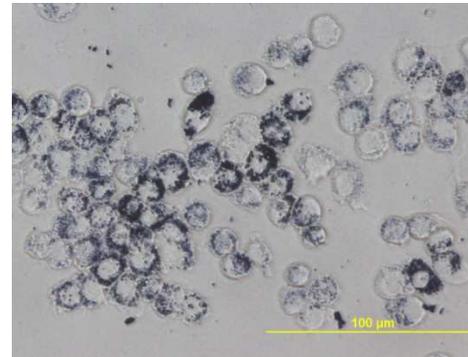
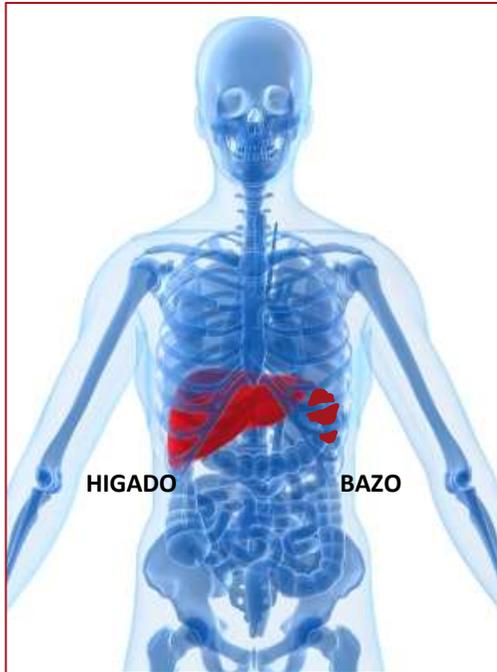
**Medio ambiente: ¿ Materiales de riesgo**

**?**

**Llegada de Nps a ríos / mares/ escala trófica**

**¿ Toxicidad humana ?**

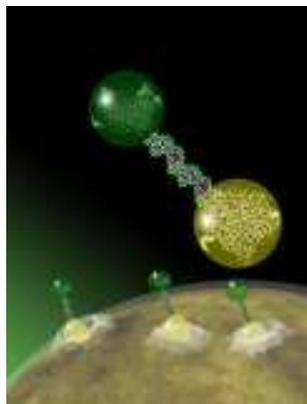
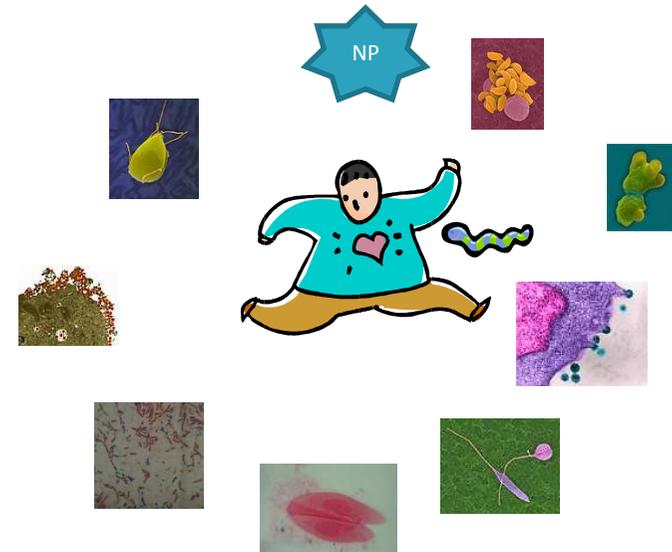
# Nanomateriales: Riesgos



## Entrada de Nps

Intencionada

Accidental



¿ Biocompatibilidad ?

¿ Toxicidad ?

¿ Esterilidad ?

¿ Inmunogenicidad ?

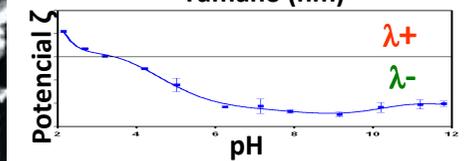
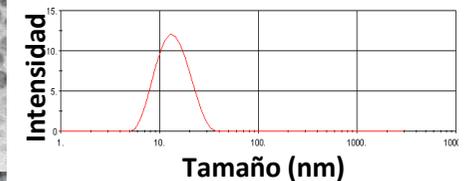
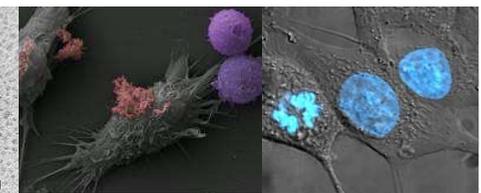
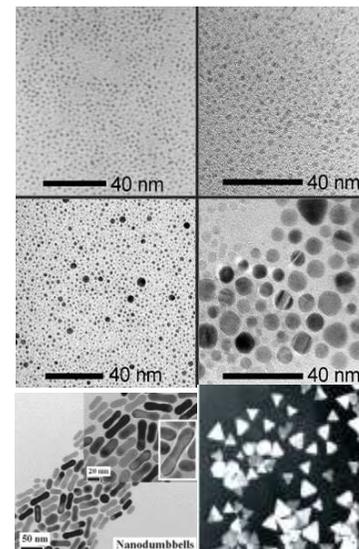
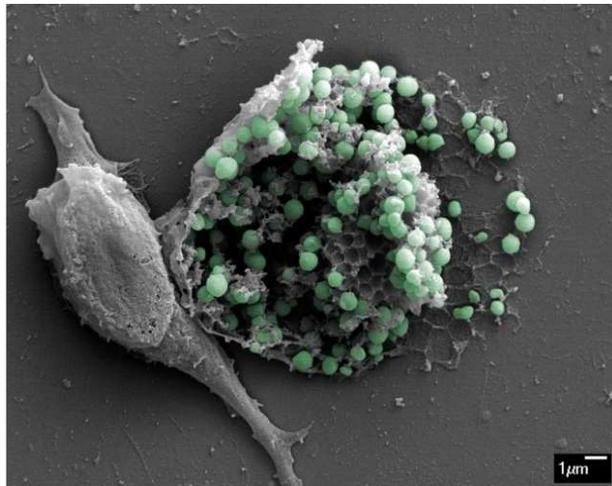
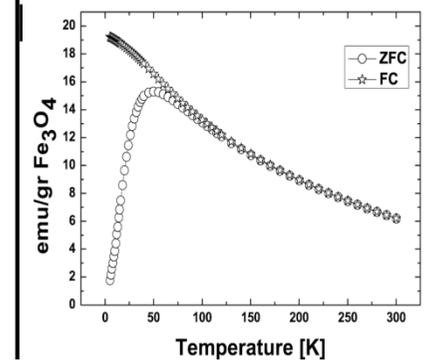
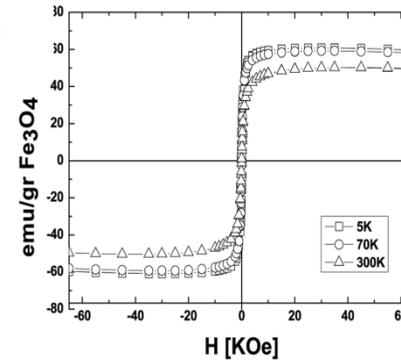
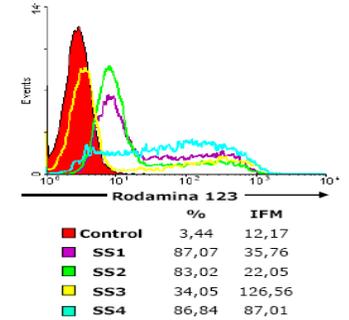
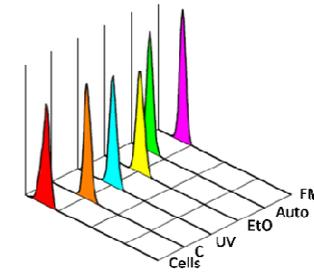
Nanobiotecnología

# Caracterización



Fisico-Química

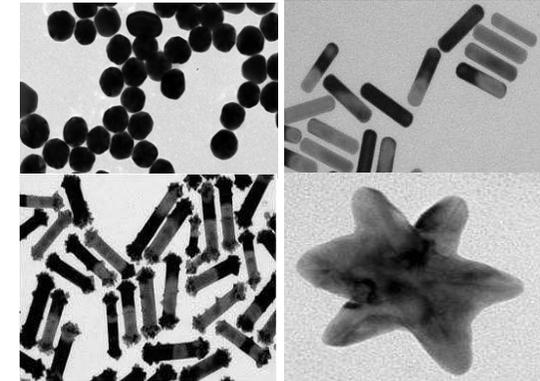
**Biológica** (in vitro / in vivo)



# Caracterización

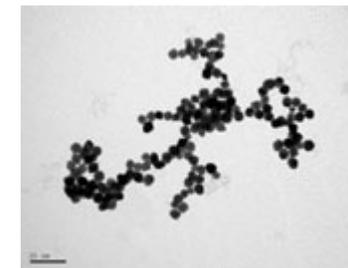
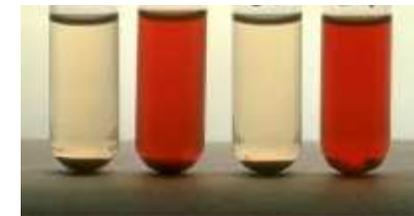
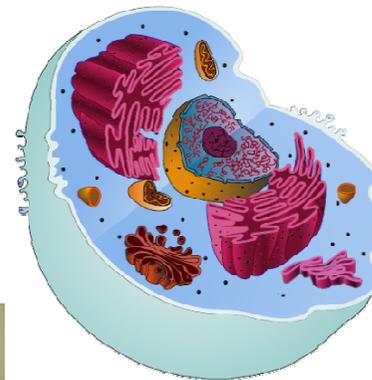
- **Características físico-químicas:**

- Tamaño, composición, carga,
- forma, superficie, estabilidad, ....



- **Características biológicas**

- Agregación
- coagulación / plaquetas
- Toxicidad
- Alergia.....



## Indice

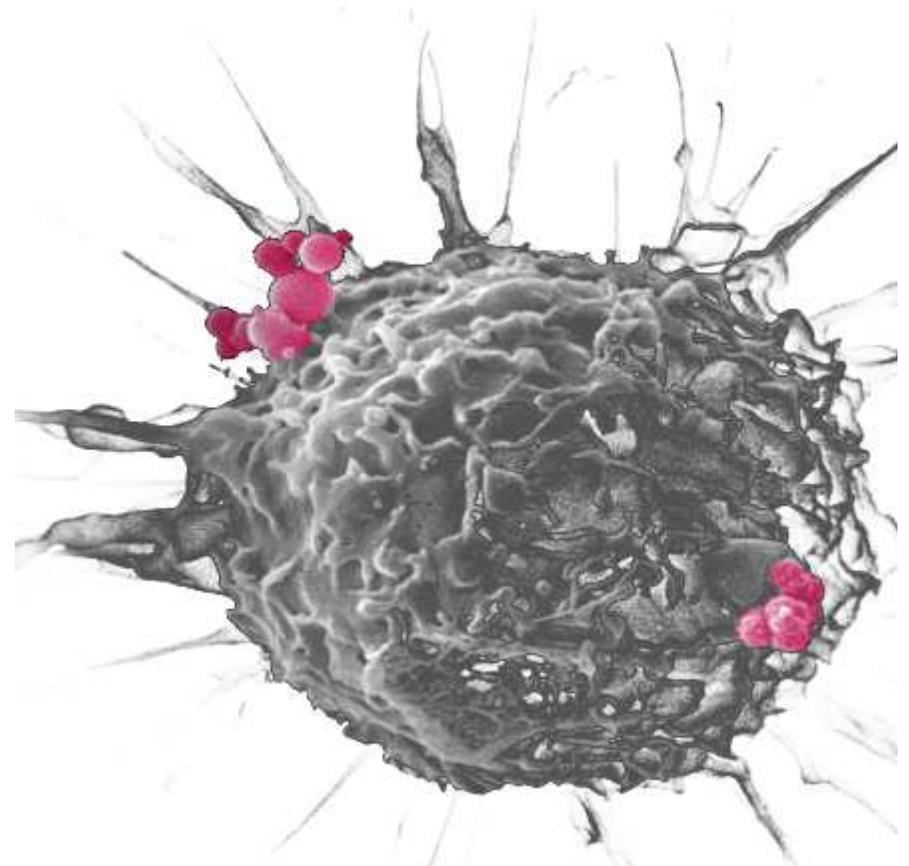
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Caracterización  
Físico-química

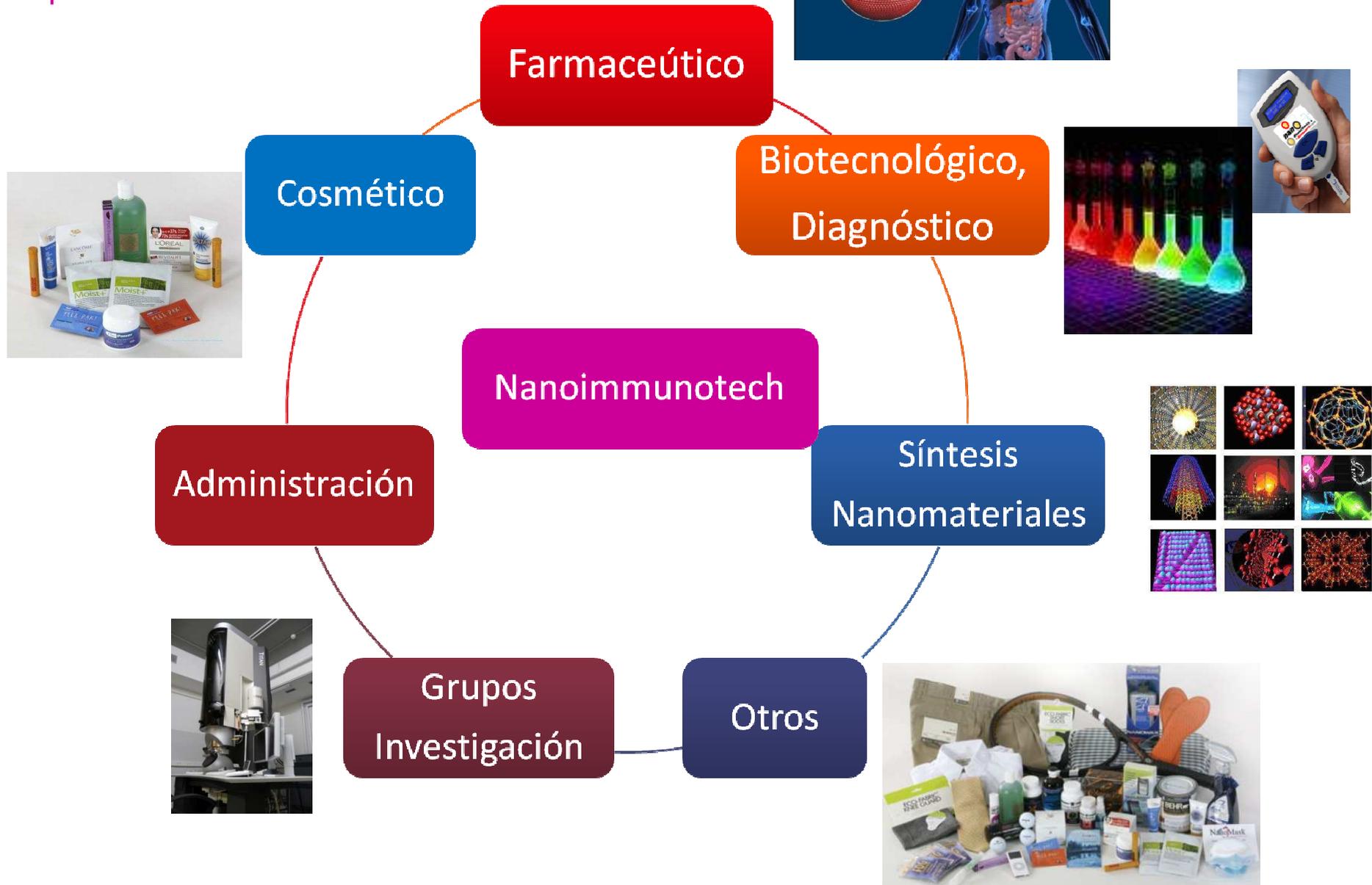
Caracterización  
Biológica

Funcionalización  
Anticuerpos AB

Validación  
Asesoramiento

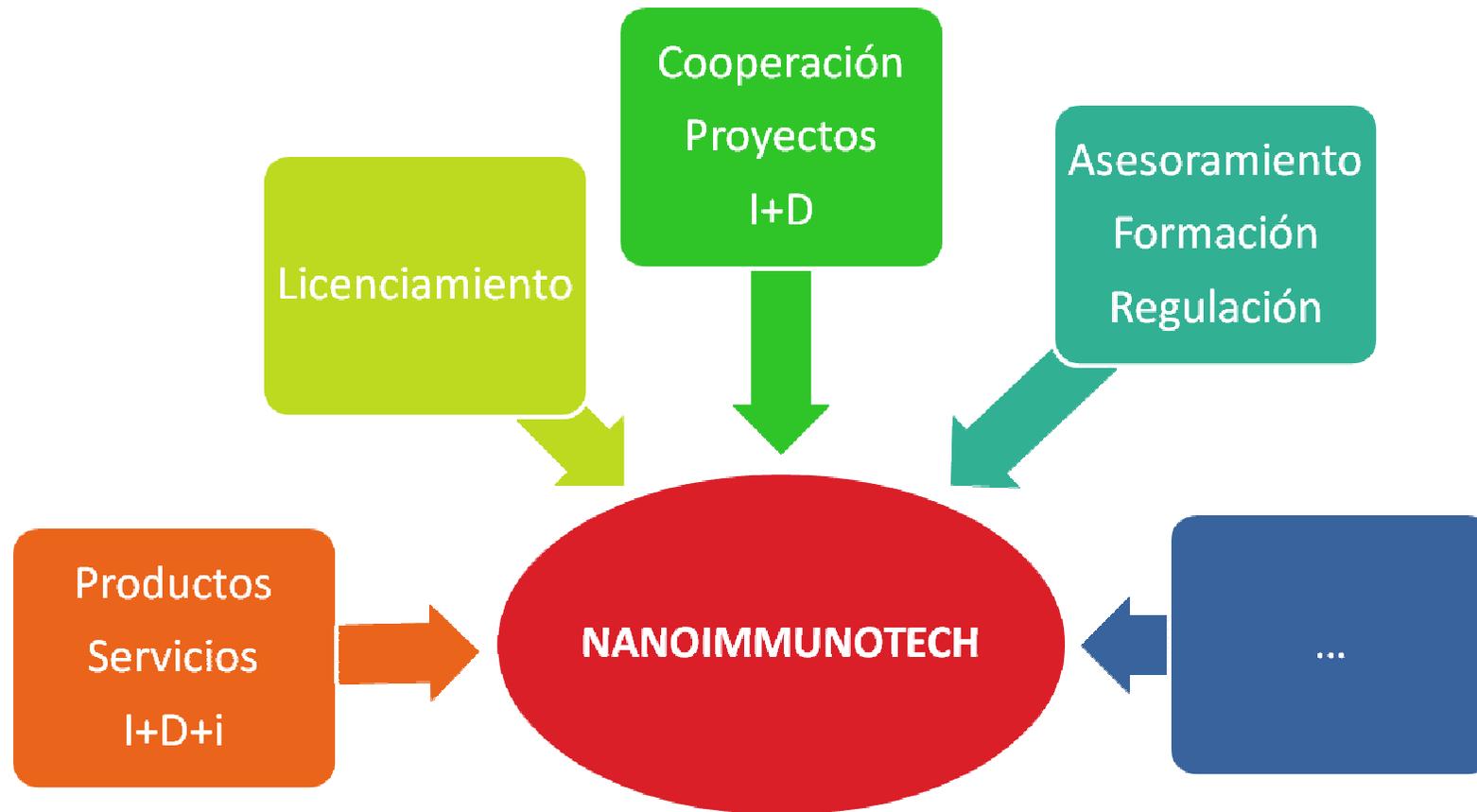


# Productos y Servicios Partners



Productos, Servicios, I+D+i

# Cooperación



[info@nanoimmunotech.es](mailto:info@nanoimmunotech.es)



**nanoimmunotech**  
global solutions  
in nanobiotechnology

[www.nanoimmunotech.es](http://www.nanoimmunotech.es)

