

**Nano World Cancer Day 2016**  
**February 2<sup>nd</sup>**

***“How is Nanomedicine concretely changing  
Cancer care for patients?”***

**Simultaneous press conferences in 12 European countries:**

**Austria (Vienna), France (Paris), Germany (Frankfort), Greece (Athens), Ireland (Dublin), Italy (Milan), Netherlands (Utrecht), Portugal (Braga), Spain (Barcelona), Switzerland (Zurich), Turkey (Gebze) and United-Kingdom (London)**

[www.nanoworldcancerday.eu](http://www.nanoworldcancerday.eu)

Organizer

Name

E-Mail & phone number

Logo

## TABLE OF CONTENTS

<b>The Nano World Cancer Day</b>	<b>3</b>
<b>Speakers</b>	<b>4</b>
<b>Nanomedicine and Cancer</b>	<b>6</b>
<b>ETPN: missions and strategy</b>	<b>12</b>
<b>Coordinators and contacts</b>	<b>15</b>

## THE NANO WORLD CANCER DAY

### ***How is Nanomedicine concretely changing Cancer care for patients?***

Attending the Nano World Cancer Day press conferences, which are organized in the framework of the World Cancer Day, is a chance to discover the major improvements that Nanomedicine is bringing to the field of cancer care, from earlier and more accurate diagnosis to more efficient and less toxic treatments.

During one day, the best Nanomedicine experts across 12 European countries will deliver short speeches illustrating the latest breakthroughs in Nanomedicine and current or on going changes for cancer patients. These invited speakers are clinicians, researchers, entrepreneurs, institutions, etc.

Nanomedicine already impacts cancer care and has the potential to revolutionize it in the coming years, thereby opening new and highly significant opportunities for the benefits of patients.

For the full international program, please visit our website [www.nanoworldcancerday.eu](http://www.nanoworldcancerday.eu).



## SPEAKERS

### Name of the speaker 1

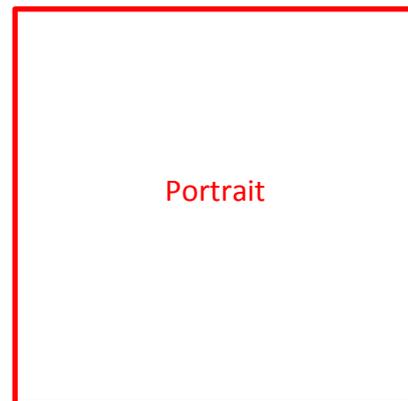
Title of the speaker

Job if relevant

Title or topic of the presentation

Short bio + key facts

Abstract (if needed)

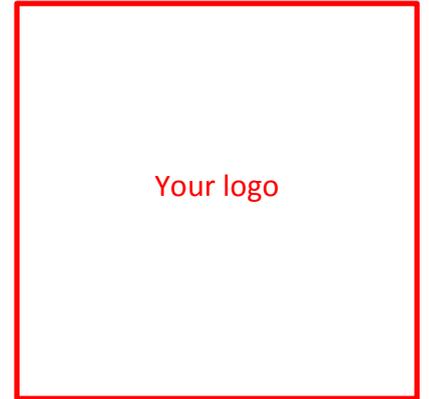


**Duplicate for each please**

## About you (local organizer)

Short presentation

Your website's link



## **NANOMEDICINE AND CANCER**

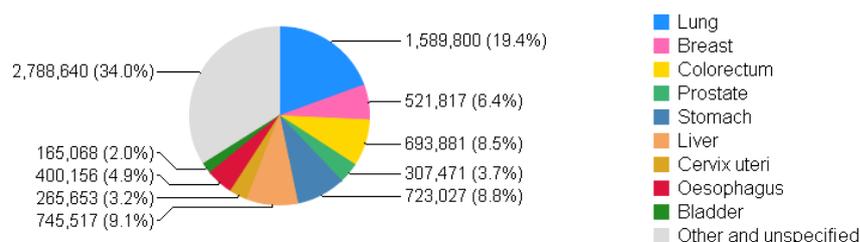
- 1. Cancer Today: key facts and figures**
- 2. What is nanomedicine?**
- 3. Nanomedicine and cancer**

# 1. Cancer Today: key facts and figures

## The global cancer epidemic - Today and future

Cancer is a major cause of morbidity and mortality in the World, and its incidence has been steadily increasing since 1980. Cancer kills more people on a global scale than AIDS, malaria and tuberculosis combined and accounted for 14 million new cases and 8.2 million related deaths in 2012<sup>12</sup>. In the Western World, cancer represents the second leading cause of death after cardio-vascular diseases. Moreover, the impact of cancer in the developing world is growing at an alarming rate. More than 70% of all cancer deaths already occur in low and middle income countries and these regions are projected to account for two thirds of all cases of cancer worldwide by 2050.

**Mortality per type of cancer/year**



Source: [Globocan 2012](#)

There are significant regional differences in cancer prevalence, but the biggest cancer killers worldwide are lung cancer (1.6 million deaths in 2012), liver cancer (745,000 deaths in 2012), stomach cancer (723,000 deaths in 2012), colorectal cancer (693,000 deaths in 2012), and breast cancer (522,000 deaths in 2012)<sup>1</sup>.

The number of cancer cases and related deaths worldwide is estimated to double over the next 20 to 40 years.

In addition to the unfortunate impact on loss of life, the economic impact of cancer is huge. Currently it is estimated that the disease costs of cancer across the world was approximately \$290 billion in 2010 - \$154 billion of which were medical costs<sup>3</sup>.

<sup>1</sup> Globocan 2012- Population Fact sheet. Available from: [http://globocan.iarc.fr/Pages/fact\\_sheets\\_population.aspx](http://globocan.iarc.fr/Pages/fact_sheets_population.aspx)

<sup>2</sup> World Cancer report 2014

<sup>3</sup> WEF report available at: [http://www.world-heart-federation.org/fileadmin/user\\_upload/documents/Advocacy/Resources/Articles\\_Series\\_Reports/WEF\\_Harvard\\_HE\\_GlobalEconomicBurdenNonCommunicableDiseases\\_2011.pdf](http://www.world-heart-federation.org/fileadmin/user_upload/documents/Advocacy/Resources/Articles_Series_Reports/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf) (9 November 2011)

## 2. What is Nanomedicine?

### Small is different

**The nanometer scale,  $10^{-9}$  m: imagine, one millimeter divided into a million parts!**

Nanomedicine is the controlled application of nanotechnology to achieve breakthrough innovations in healthcare.

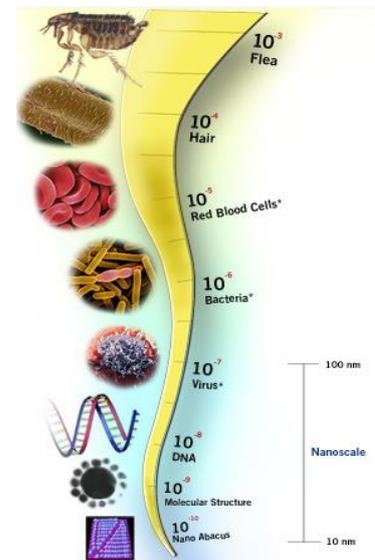
Physical properties of materials change at the nanometer scale. Nanomedicine exploits these specific properties to change healthcare treatment paradigm.

Nanomedicine allows the design of manufactured objects with tunable functions (heating, cutting, etc.) that can interact with the human body at the sub-cellular level.

### Nanomedicine products: already a second generation

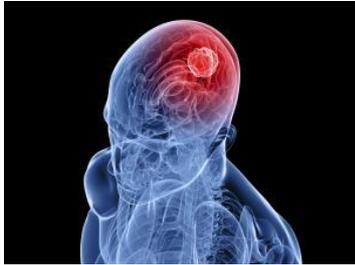
The first generation of nanomedicine products improves efficiency of chemicals and biological based treatments. Nano carriers encapsulate drugs to make them reach with higher accuracy their target the tumor, thus simultaneously improving treatment efficiency and reducing drug related toxicity.

Regarding the second generation of nanomedicine, they do not involve drugs anymore. Since then, the nanoparticles are by themselves, the active principle bringing a therapeutic effect, thanks to physical principles.



### 3. Nanomedicine and Cancer

#### Nanomedicine and diagnosis



Early detection of cancer cells is a major opportunity for an accurate diagnosis and efficient treatment. It drastically improves the chance of survival and recovery of patients.

Nanoparticles can already be used as innovative contrast agents to improve the performances of imaging techniques as Magnetic Resonance Imaging (MRI), Computed Tomography (CT) scan and fluorescence imaging.

Nanoparticles can also be used to enhance the signal and better detect cancer biomarkers. These are molecules indicative of the presence of cancer in the body, whether produced by the tumor itself or by the body as a specific response to the presence of the tumor.

#### Nanomedicine: new paradigm, new treatments

Despite a better prognosis for several tumor locations thanks to major therapeutic improvements over the past several decades, cancer is still a fatal disease in approximately 50% of the diagnosed cases.

Surgery, radiotherapy and chemotherapy are currently the most common treatment options to fight against cancer. Depending on each individual patient's profile of disease, these major therapies are commonly used either alone or in combination.

Nanomedicine products and technologies already improve these therapeutic approaches and have the potential to do much more for patients in the coming years.



Surgery

Live imaging techniques combined with nanoparticles can help the surgeon to localize and resect more precisely tumor tissues and metastases, thus increasing the efficacy and safety of cancer surgery.

Nanomedicine tools for surgery could also impact cancer patient's quality of life, notably by limiting the impact of scars and recovery.



### Radiotherapy

Radiotherapy is a local treatment widely used in most oncology indications: about 60% of cancer patients receive radiotherapy at some point of their treatment.

The second generation of nanoparticles can be a game changer in radiotherapy. How?

Radiotherapy aims at killing cancer cells by delivering energy through X-ray radiations.

It has been proved that nanoparticles once injected into tumor cells, increase the dose of energy delivered and then improve potentially drastically the efficiency of radiotherapy.



### Chemotherapy

The first generation of nanomedicine products can improve chemotherapy. Thus, the encapsulation of a drug into nanoparticles carriers helps to deliver the active molecules directly where it is relevant in the body. Doing so, enhances the efficacy of the treatment by maximizing the drug uptake into cancer cells and lessens the toxicity and side effects.

### Other treatments

Beyond surgery, radiotherapy and chemotherapy, other treatments can be used in combination as immunotherapy or hormonal therapy.

## Nanomedicine for cancer is already a reality

The nanomedicine experts speaking at the Nano World Cancer Day will share with you the latest and the most disruptive innovations in Nanomedicine. Numerous nanomedicine products are already available on the market to treat cancer, and much more are under clinical development.

### Key facts of the Nanomedicine market:

- In 2011, the nanomedicine market was estimated between \$50.1 and \$68 billion and was planned to reach between \$97 and \$129 billion in 2016<sup>6</sup>
- **In 2013, 230 nanomedicine products were identified** on the market or under clinical development for different therapeutics areas including cancer, diabetes, cardiovascular, neurodegenerative, orthoarticular, infectious diseases, etc.<sup>6</sup>
- **Focus on oncology:**
  - Oncology is the leading application area of Nanomedicine products<sup>6</sup>
  - In 2013, 78 products were identified under clinical development or into the market (including first generation of nanomedicine products like Abraxane, Doxil, DaunoXome, Evacet, Lipo-Dox, MyCare Assays, NanoTherm)<sup>6</sup>

## **ETPN: MISSIONS AND STRATEGY**

- 1. What is ETPN?**
- 2. ETPN promotes Nanomedicine internationally**
- 3. A “Hub” to accelerate translation**

## 1. What is ETPN?

The European Technology Platform on Nanomedicine is an industry-led initiative that was created in 2005 as a joint venture between:

- The European Commission
- Healthcare industries as originally Philips, Siemens, UCB,
- SMEs as Nanobiotix, Onxéo
- Academic, research laboratories

Today, 150 members coming from 25 European Member States belong to ETPN, representing all the pillars of Nanomedicine: SMEs, which are the leaders of the Nanomedicine field in Europe, academia, industry, clinicians, and public institutions.

The global ETPN mission is to shape and support the European ecosystem of Nanomedicine in Europe. ETPN defines R&D priorities, promotes Nanomedicine (cf. paragraph 2) and stimulates knowledge transfer to accelerate the translation between innovative projects and the market, for the benefit of patients (cf. paragraph 3).

## 2. ETPN promotes Nanomedicine internationally

The ETPN steadily highlights the resources of the European Nanomedicine community as well as the more innovative concepts, teams, and entrepreneurs in nanomedicine. Doing so, it demonstrates the many new advantages that nanomedicine can bring to patients and accelerates the development of its most promising applications. Here are two concrete examples of ETPN actions to promote nanomedicine internationally.

- The European NanoMed Map<sup>4</sup> introduces on a single chart all the Nanomedicine ecosystem's actors in Europe. This map is available on the ETPN website and displays 1500 European actors in the field of Nanomedicine. Overall, more than 500 industrial players and SMEs having a direct link or activity with the field have been identified.
- The Nanomedicine Award<sup>5</sup> honors the best international nanomedicine innovation projects. It recognizes and promotes the best nanomedicine-based solutions having the potential to bring new diagnostic and therapeutic approaches to address unmet medical needs. Every year, exceptional international projects applied and most of them proposed cancer treatment solutions.

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<sup>4</sup> <http://www.etp-nanomedicine.eu/public/nanomedmap/>

<sup>5</sup> <http://nanomedicine-award.com>

### 3. A “Hub” to accelerate translation

**ETPN published in 2013 a White Paper:** “Nanomedicine Contribution to Horizon 2020” a series of concrete and strategic recommendations<sup>6</sup>.

The pivotal feature of the White Paper is the **Nanomedicine Translation Hub**, which goal is to accelerate the development and the translation of the best Nanomedicine projects and make Europe the leader in Nanomedicine thanks to several instruments, as shown by the following examples:

- The Nanomedicine **Translation Advisory Board (TAB)**: first in class experts provide concrete and invaluable advice, support and mentoring to very strongly selected innovative and ambitious nanomedicine projects (from academia and SMEs).
- The European **Nano-Characterisation Laboratory (EU-NCL)** performing pre-clinical, physical, chemical and biological characterization of nanomaterials to accelerate and facilitate regulatory approval of nanomedicine products.
- Specific **European Pilot lines** for good manufacturing processes (GMPs) of batches for clinical trials, addressing the current developmental and production gap between academic and industrial settings, and facilitating scale-up for clinical trials of nanomaterials.

Nanomedicine has already the potential to achieve breakthrough innovations to diagnose and treat cancer. Many more solutions will arise to answer unmet medical needs in oncology for the benefits of cancer patients in the coming years.

According to Laurent Levy, ETPN vice-chairman and CEO of the nanomedicine SME Nanobiotix: *“A great wave of innovation is coming with a disruptive potential. De-risking projects and developing data becomes essential, and even more key is bringing these programs to a stage where pharma can understand them”*.

*“Five years from now every pharma will have a nano program”*, said Christopher Guiffre, Chief Business Officer at nanotherapeutic developer Cerulean Pharma<sup>7</sup>.

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<sup>6</sup> ETPN White Paper available at: [www.etp-nanomedicine.eu/etpn-white-paper-2013](http://www.etp-nanomedicine.eu/etpn-white-paper-2013)

<sup>7</sup> <http://www.partnering360.com/insight/showroom/id/428>

## COORDINATORS AND CONTACTS

### About ETPN



Created in 2005, the European Technology Platform on Nanomedicine is an initiative led by Industry and set up together with the European Commission to address the applications of nanotechnology to achieve breakthroughs in healthcare. The ETPN is structuring and federating the European Nanomedicine community and leading the communication toward the European Commission and the European Members States.

The ETPN contributed to set up numerous European funded projects providing a first impression of economic environment and the structural requirements for an efficient translation of R&D results into innovative nanomedicine.

For more information visit: [www.etp-nanomedicine.eu](http://www.etp-nanomedicine.eu)

### About ENATRANS



ENATRANS is led by a consortium of 7 partners belonging to the European Technology Platform for Nanomedicine.

It has been built to help the translation of innovative projects related to Nanomedicine to successfully go through the different stages of development from the idea to the patients and also improve global knowledge on Nanomedicine.

The key corner stone of ENATRANS is the Translation Advisory Board (TAB) a new instrument to provide free of charge advice and support to ambitious European Nanomedicine projects. First-in-class recognized experts from industry deliver concrete and invaluable advice to drive selected Nanomedicine projects into innovative products for healthcare.

ENATRANS partners: CEA-LETI (Grenoble, France), Nanobiotix SA (Paris, France), Gesellschaft für Bioanalytik Muenster e.V. (Muenster, Germany), Tel-Aviv University (Tel-Aviv, Israel), Fondazione Don Carlo Gnocchi ONLUS (Milan, Italy), TecMinho (Braga, Portugal) and coordinated by VDI/VDE-IT (Berlin, Germany).

For more information visit: <http://enatrans.eu/public>

