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UNIVERSITÀ DI PARMA

4 QUALITY EDUCATION

SUSTAINABLE DEVELOPMENT GOALS

PARMA NANO-DAY: An International school for young researchers in "nano"

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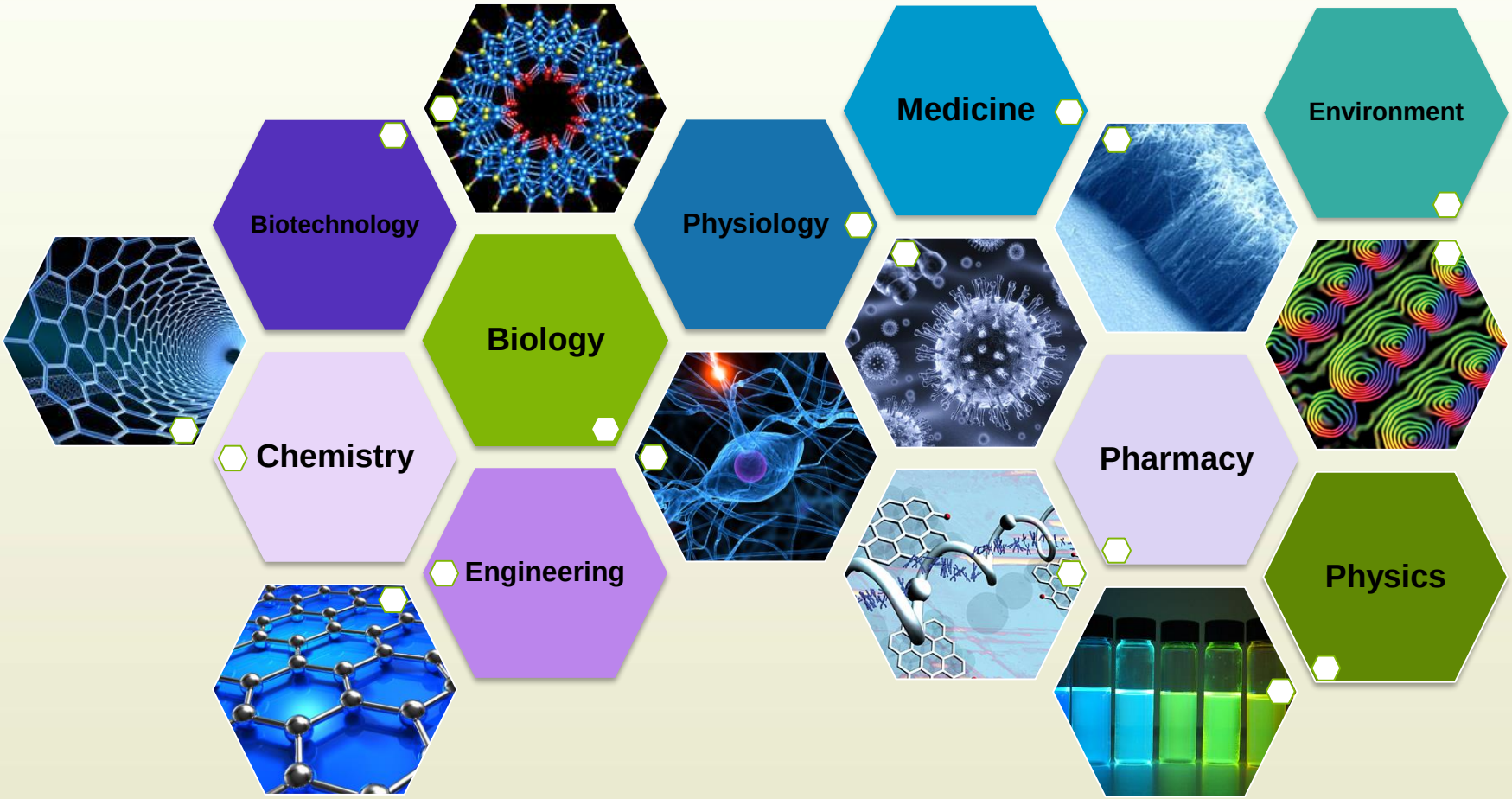
Sustainable Nanotechnology Organization
Research | Education | Responsibility

Starting point – The promise

- The applications of “nano” in our society are showing exciting perspectives
- Discussion among scientists working in different fields is active
- “Nano” can be the future of technology and innovation

What is needed is a more holistic approach

Nanotechnology and nanosciences are multidisciplinary, integrating diverse fields



Perceived risks

However nanotechnologies are not without problems:

- *Environmental risk*

  Increased use of nanomaterials increases the risk of environmental dispersal, with nanomaterial as an environmental contaminant

- *Human health risk*

  The spread in the environment and the increased number of applications expose people to nanomaterials and their possible toxicity

Safe by design – a risk avoidance strategy

- “Safe by design” means that a product or process has been planned by thinking about the safety and health of users, considering all possible hazards and risks
- It is an objective of sustainability, chosen as the common element in education and training activities directed to young researchers

Our contribution: The “PARMA” NANO-DAYs: a positive example of holistic vision

- The series of conferences “PARMA” NANO-DAYs brought together scientists from different scientific disciplines, working in synthesis, application and testing of nanomaterials
- The events are intended as a platform for young scientists, PhD students, postdocs
- It is a moment for multidisciplinary exchange and discussion

The evolution of the NANO-DAY

2014: Local

2015: National

2017: International

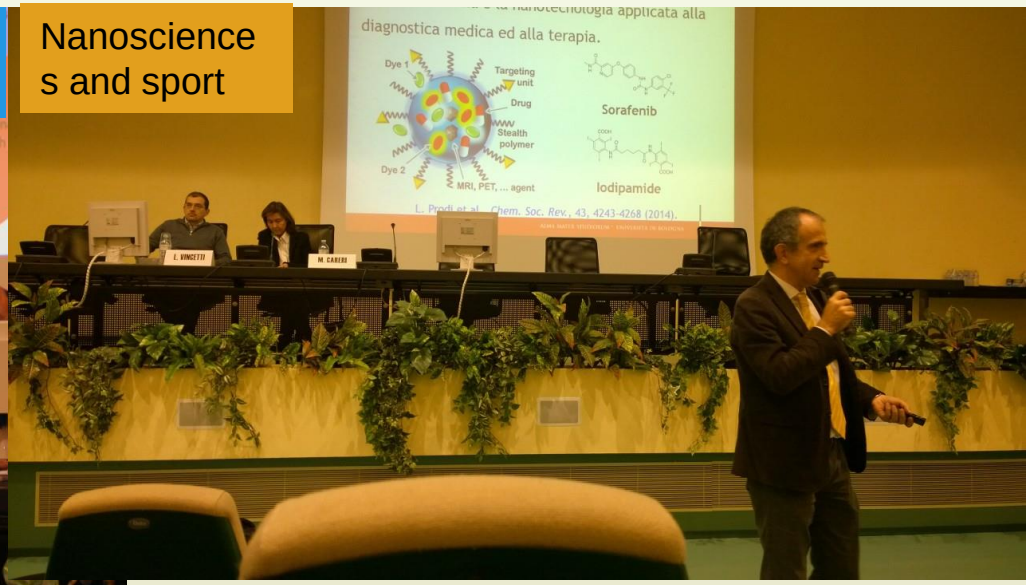
2015 edition

Round Table with stakeholders

Food safety implications

Risks in agriculture

Nanosciences and sport



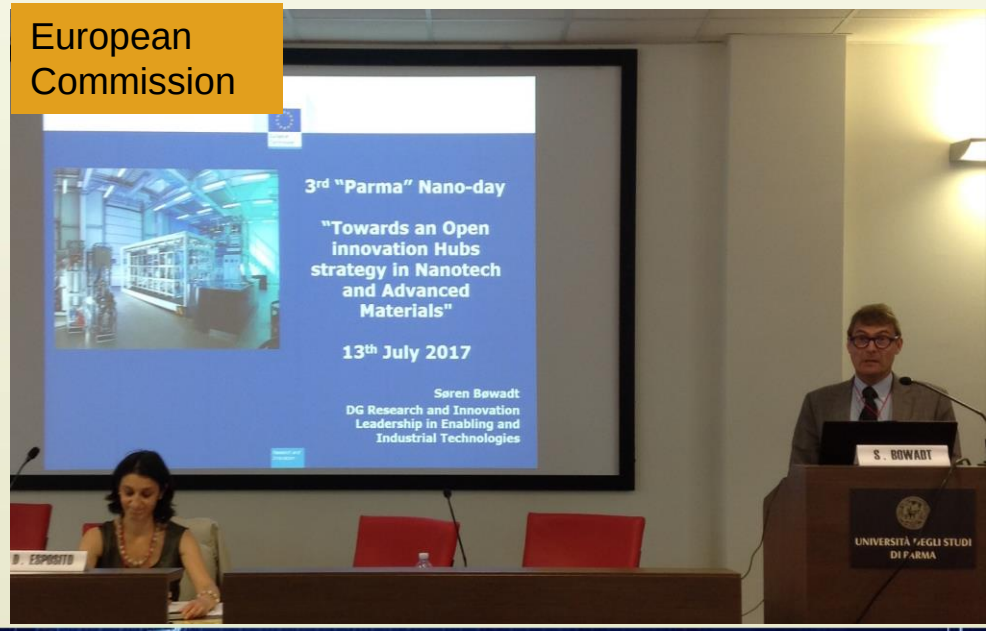
2017 edition

Round Table with stakeholders

Applications to therapy

Local policy and administrators

European Commission



Some numbers of the 2017 edition

- Four sessions:
  - **Technologies and applications**
  - **Regulations and economics**
  - **Agri-Food, Environment and Biotechnologies**
  - **Medicine and Health**
- 29 invited speakers and oral communications
- 49 posters
- Over 200 participants from 7 countries

Structure of the 2017 edition

- **Round table** with stakeholders
- **Job day** “Industries meet students and young researchers”
- Session for presentation of **research projects**
- **Four technical sessions**, each organised in:
  - Plenary lecture
  - Invited speaker for “minplenary” lectures
  - Oral communications selected by the Scientific Committee
- **Three poster sessions** with 3-min pitch presentations
- **Awards** for best presentations and best posters by young researchers

The concept of “Job Day”

- Companies were invited to participate without any expense
- Invitation included a slot for a 10-min presentation and a place for displaying materials and meeting interested people
- The purpose was to establish contacts between companies and young researchers, Master and PhD students
- It included also short presentations about current research projects in the University and research centers

The key messages

NANODAY

- New approaches, methods, applications
- All sciences included
- No topic left out
- Opportunities for discussion
- Dissemination of results
- Actors from the civil society
- Young researchers at the center stage

The way ahead - SWOT

STRENGTHS

New properties

High tech

Diverse applications

Exciting

WEAKNESSES

Safety

Scarce knowledge on effects

Fate in the environment

OPPORTUNITIES

New markets

New applications

Curiosity in the public

Sustainability of productions

THREATS

Uncertainty in legislation

Consumer fears

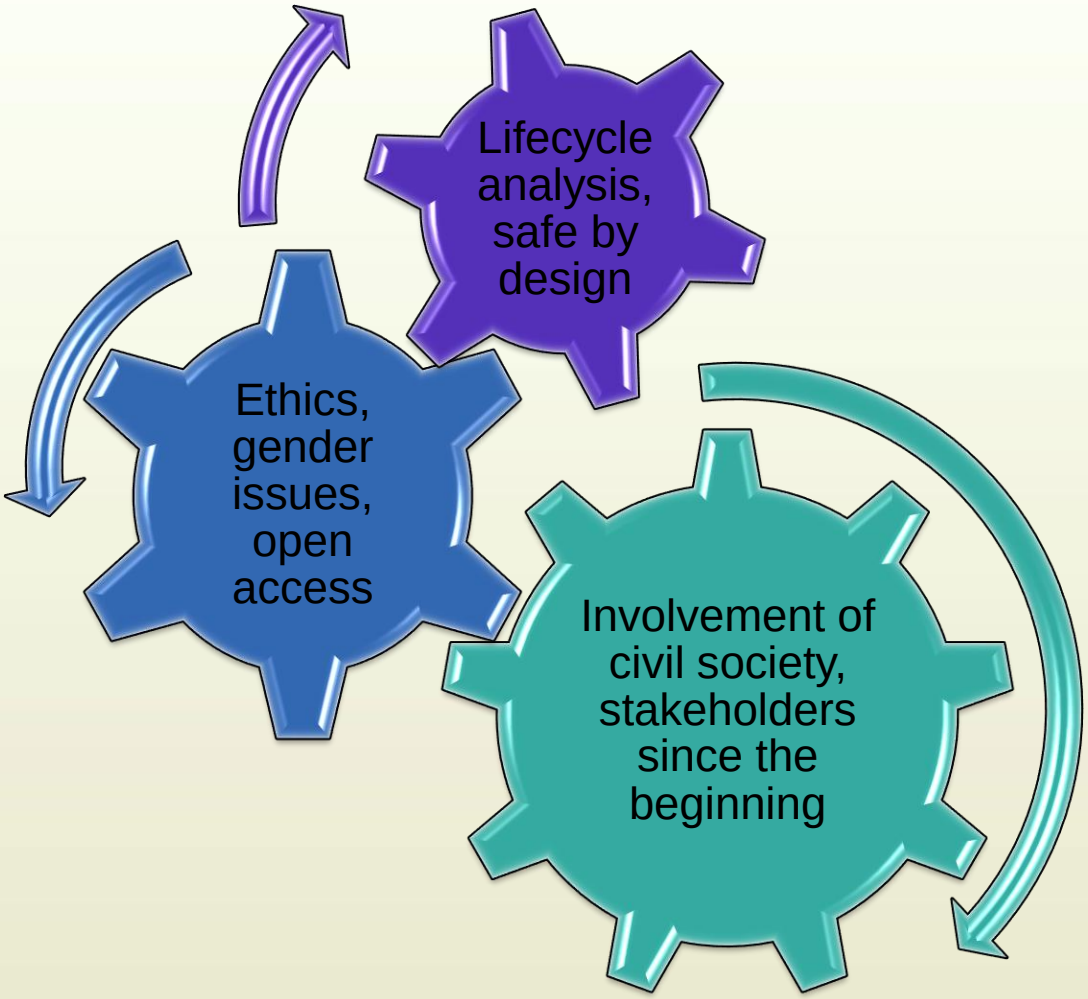
Possibility of rejection

Training in Responsible Research and Innovation

The 3rd “PARMA” NANO-DAY has brought together all actors and stakeholders together with scientists: administrators, regulators, companies, politicians, journalists, students

Our young researchers must be trained to acknowledge that the development of nanotechnologies must consider the requirements of the civil society

The result will be a “safe by design” technology



The relevance of invention and innovation

- Technology transfer from research to market requires both «invention» and «innovation»
- In particular, invention is a process which challenges the relationship between:
  - The needs of researchers
  - The regulation
  - The public acceptance

Invention

- In this process, we have to be extremely careful not to make the mistakes of the past
- Peer reviewed papers are important in evaluating the possibilities of research – but not totally!
- Opinion groups, regulators, policy makers, public acceptance – are all equally important

Innovation

- These additional aspects become particularly important when an invention has to become «innovation»

- **Eventually, the public is the buyer**

The process in progress

- A virtuous flow from «invention» to «innovation» has two simple requirements:
  - Adequate and sound financing
  - The possibility to extend the experimental activities from the laboratory to the field
- We have heard in our meetings that both of these requirements are not sufficiently considered

Final message (1)

- The final take home messages that we want to deliver, on behalf of all the participants of the NANO-DAY conferences, to research and financing agencies, and to the private sector
  - Nanotechnology is the promise for the future in highly industrialised countries
  - Nanotechnology can represent an element for advancement in every country, as an element to sustainability

Final message (2)

- Nanotechnology has a background of young and expert researchers, that can support and expand both research and application
- Nanotechnology requires support and financing for young researchers, to follow their interests and contribute to progress

A new book: accepting contributors

Micro & Nano Technology Books:
Advanced Nanomaterials Series

Series Editor: Ashutosh Tiwari, IFM-Linköping University, Sweden

Please submit your book proposal to books@vbripress.com

- TITLE: Exposure to Engineered Nanomaterials: Fate and Effects on Humans and the Environment
- EDITORS
  - Nelson Marmiroli, University of Parma, Italy
  - Jason C. White, Connecticut Agricultural Experiment Station (USA)
  - Jing Song, Inst. Soil Science, Chinese Academy of Sciences, China

Contents

Nanomaterials and nanotechnologies are tools for progress

Those people who master the use of technologies are better saved of burdens and miseries

Emanuele Severino, Italian philosopher

Acknowledgements

STEERING COMMITTEE

Prof. Elena Maestri – Dept. SCVSA, UniPR
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The key words from the authors