



POLITECNICO  
DI TORINO



Compagnia  
di San Paolo

# Smart tools for caring:

Nanotechnology  
meets medical  
challenges

▼ **Friday, 2 March 2018**  
**Auditorium "Museo Piaggio",**  
**Pontedera (Pisa)**

The exploitation of nanotechnology in the development of biomedical devices allowed the control of interactions among materials and biological entities at previously unreachable levels, down to the single molecule. In this context, nanomaterials, nanostructures, and nanostructured surfaces allowed **"mimicking"** the biological microenvironments, and thus to foster specific cellular functionalities and to fix peculiar pathological mechanisms.

Recently, an increased interest towards **"smart" materials** emerged among the scientific community: these are materials able to actively react upon appropriate environmental stimuli, by changing their functional/structural features and behaving as real **"nanotransducers"** at cellular and sub-cellular level.

This workshop focuses on the investigation and **integration of "smart" nanotechnologies in the field of regenerative medicine**, and more in general towards a real **clinical translation**.

Advanced micro/nanofabrication techniques will be described, for the preparation of new generation scaffolds for regenerative medicine; moreover **"active"** nanovectors able to manipulate/sense biological signals will be approached, also introducing intriguing applications for space medicine.

*Organized by Politecnico di Torino with the support of  
Compagnia di San Paolo*

## PROGRAM

8:15 Registration

9:15 Welcome and Introduction  
Gianni Ciofani (Politecnico di Torino & Istituto Italiano di Tecnologia, Italy)

### ▼ Session I Chair: Giada Genchi

9:30 Abhay Pandit (National University of Ireland, Ireland)  
Being a good guest: Understanding the host implant paradigm

10:00 Elisa Mele (Loughborough University, UK)  
Porous structures for biomedical applications: Electrospinning, phase separation, and 3D printing

10:30 Chiara Tonda-Turo (Politecnico di Torino, Italy)  
Advanced therapies to treat spinal cord injuries

### 11:00 Coffee Break

### ▼ Session II Chair: Chiara Tonda-Turo

11:30 Antonella Bandiera (Università di Trieste, Italy)  
HELP biopolymers: A smart platform for design and production of innovative biomedical devices

12:00 Melis Emanet (Yeditepe University, Turkey)  
Evaluation of boron nitride nanomaterials as nanocarriers for anti-cancer drugs

12:15 Andrea Ancona (Politecnico di Torino, Italy)  
Generation of reactive oxygen species from nanoparticle by external activation

12:30 Özlem Şen (Yeditepe University, Turkey)  
Boron nitride nanotubes-doped gelatin/glucose scaffolds: Potential applications in tissue engineering

### 12:45 Lunch

### ▼ Session III Chair: Valentina Cauda

14:30 Satoshi Arai (Waseda University, Japan)  
An organic dye-based nanoheating system toward medical applications

15:00 Ilker Bayer (Istituto Italiano di Tecnologia, Italy)  
Active scaffolds for controlled drug delivery

15:30 Madoka Suzuki (Osaka University, Japan)  
Optical temperature control and sensing in tiny space for controlling and sensing cellular activities

### 16:00 Coffee Break

### ▼ Session IV Chair: Gianni Ciofani

16:30 Valentina Cauda (Politecnico di Torino, Italy)  
Theranostic use of nanomaterials against cancer: Shielding effect of phospholipidic bilayers on nanocrystals

17:00 Michele Balsamo (Kayser Italia, Italy)  
Bioreactors for nanoparticle-based experimentations in Space, on Earth and beyond

17:30 Giada Genchi (Istituto Italiano di Tecnologia, Italy)  
NANOROS: Smart nanomaterials from Earth to Space

18:00 Gianni Ciofani (Politecnico di Torino & Istituto Italiano di Tecnologia, Italy)  
Concluding remarks