



ISTITUTO ITALIANO
DI TECNOLOGIA

The strategic management of the Intellectual Property at IIT

*ERF Workshop on "Technology Transfer and Industrial Relations
in Research Infrastructures", Trieste 6-7th of June 2013*

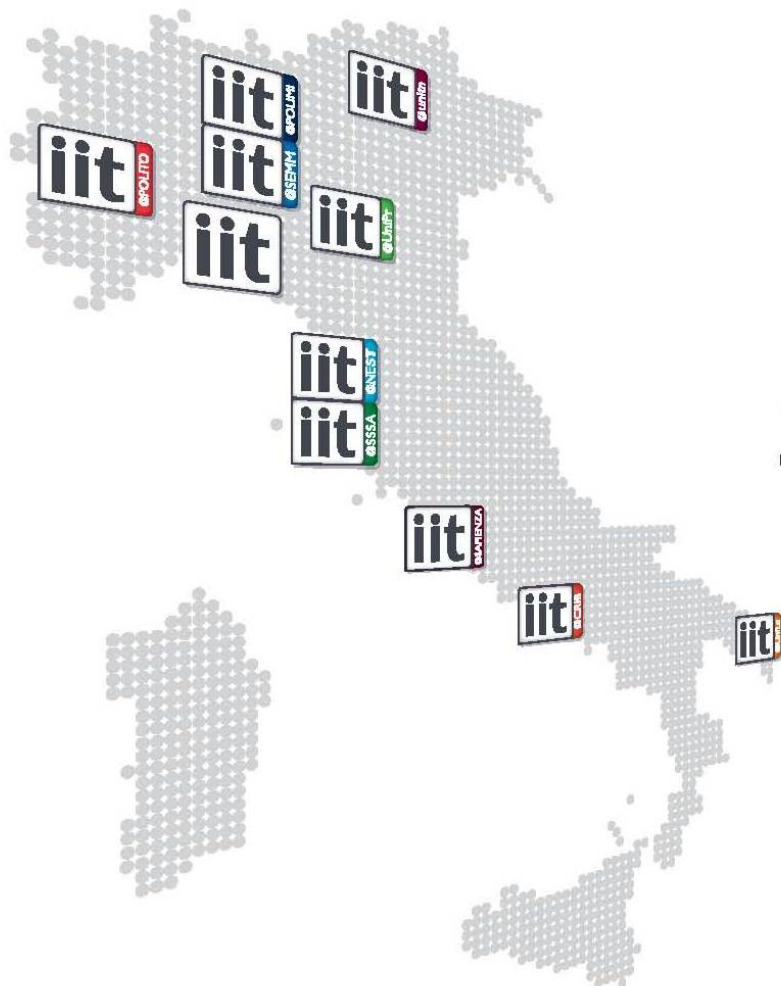
***Lorenzo De Michieli, Ph.D.
Technology Transfer Manager***



Key topics

- *Introduction: IIT in numbers*
- *Sources of Intellectual Property: some examples*
- *IP management at IIT*
- *Benchmarks*

*Istituto Italiano di Tecnologia
promotes excellence in fundamental and applied research,
develops higher education in the area of science and technology and
fosters technological innovation*



Genova Central Research Lab

Advanced Robotics
Drug Discovery and Development
iCub Facility
Nanotechnology
Nanophysics
Nanostructures
Neuroscience and Brain Technologies
Pattern Analysis & Computer Vision
Robotics, Brain and Cognitive Sciences

Research Centers

-  Center for Space Human Robotics
Torino
-  Center for Nano Science and Technology
Milano
-  Center for Genomic Science
Milano
-  Center for Neuroscience and Cognitive Systems
Trento
-  Brain Center for Motor and Social Cognition
Parma
-  Center for Nanotechnology Innovation
Pisa
-  Center for Micro-Biorobotics
Pisa
-  Center for Life Nano Science
Roma
-  Center for Advanced Biomaterials for Health Care
Napoli
-  Center for Biomolecular Nanotechnologies
Lecce





- IIT's scientific program is designed so to be enough **long-term oriented** as to encourage the growth of knowledge, yet fully aware of the world's best practice benchmarks.
- Board members ensure a central role in the global research arena as well as a solid connection with industry leaders.

Comitato Tecnico Scientifico

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Lia Addadi	<i>(Weizmann Institute, Israel)</i>
Adriano Aguzzi	<i>(University Hospital Zürich, Switzerland)</i>
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Takeo Kanade,	<i>(Carnegie Mellon University, USA)</i>
Kenji Doja,	<i>(Okinawa Inst. of Science, Japan)</i>

Consiglio

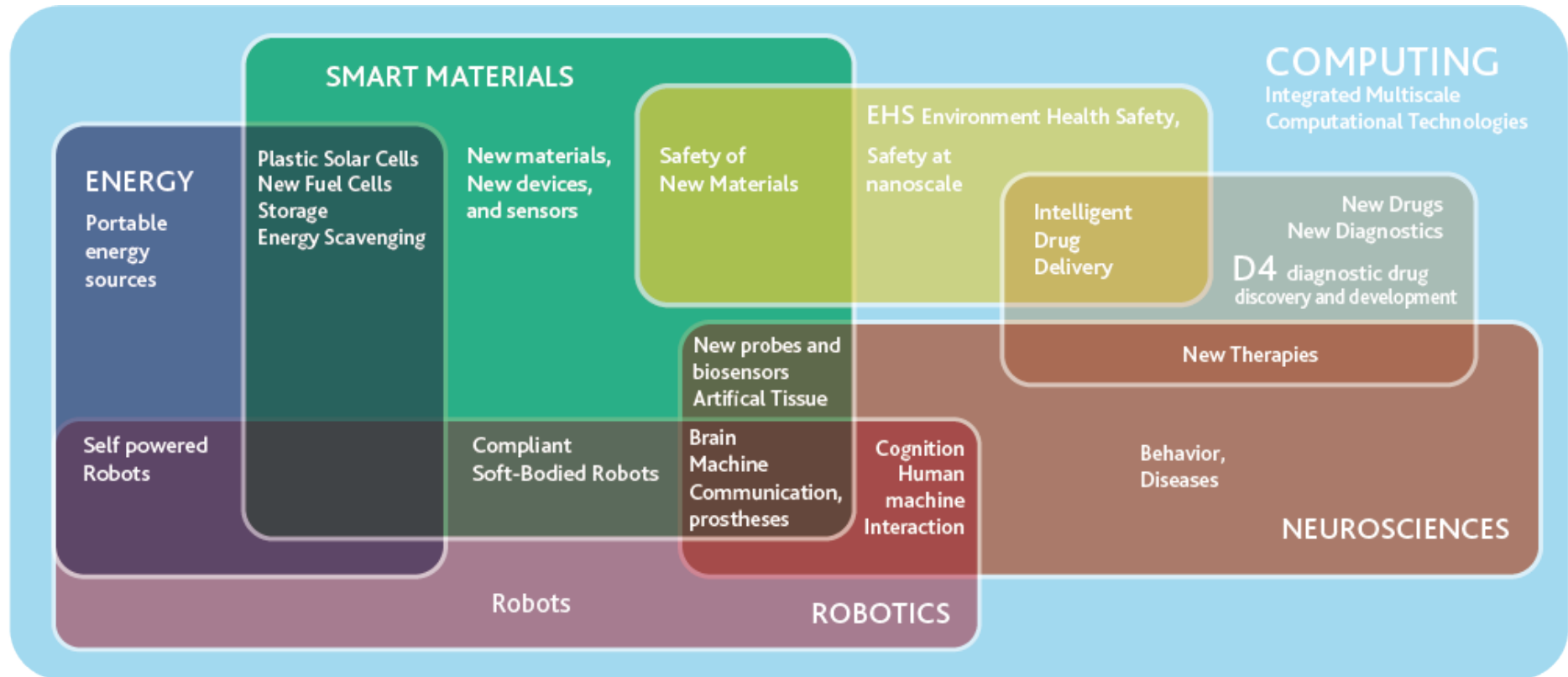
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Pierre J. Magistretti,
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Giuseppe Pericu; Pietro Guindani; Alberto Sangiovanni Vincentelli.



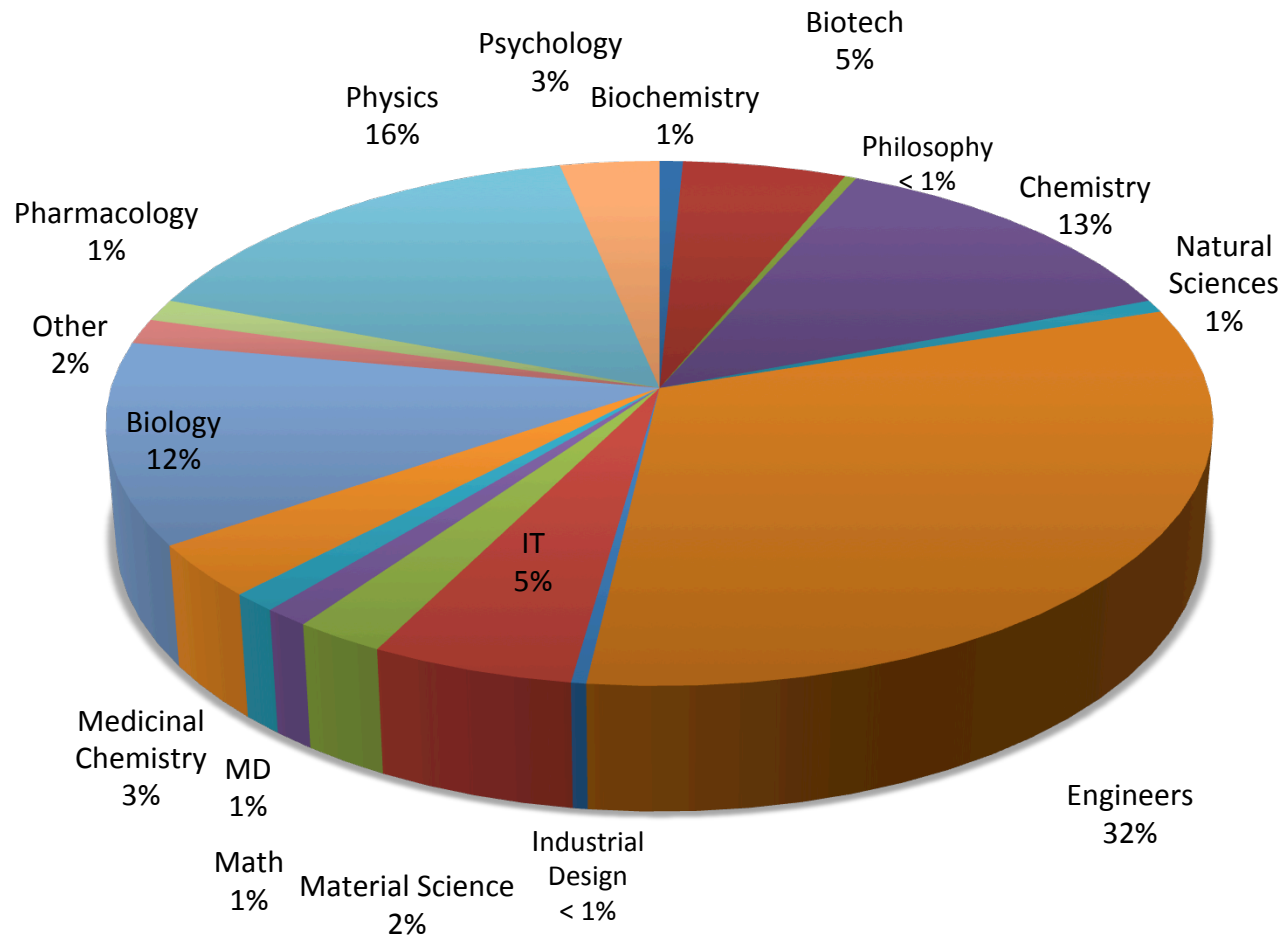
Research Platforms



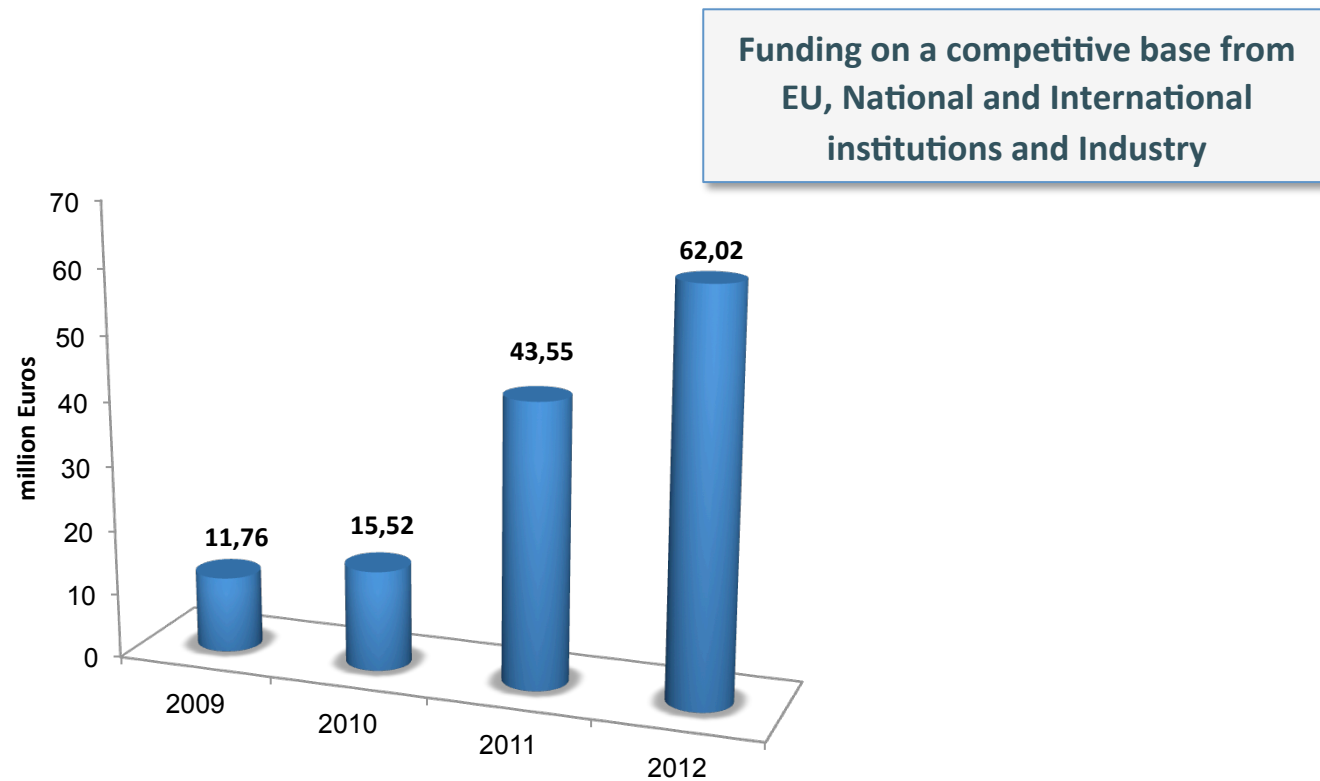


About 50 nationalities represented
Almost 40% of population arrives
from outside Italy

Degree distribution

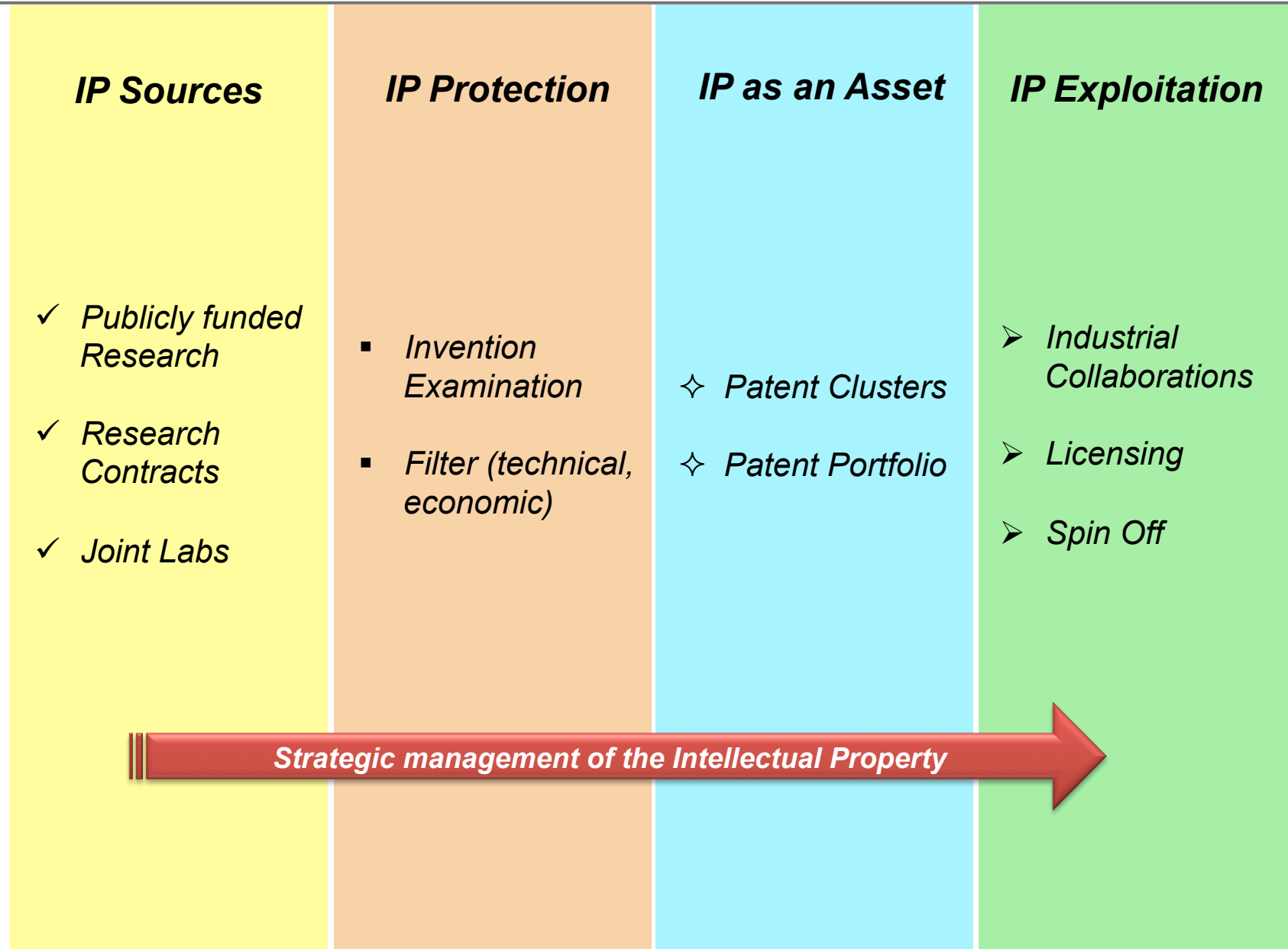


- IIT is funded by the Ministry of the Economic Development of Italy, with **annual budget of €100 million**
- In addition, IIT competes on international level for additional funding, having an acquired project portfolio worth about € 60 million



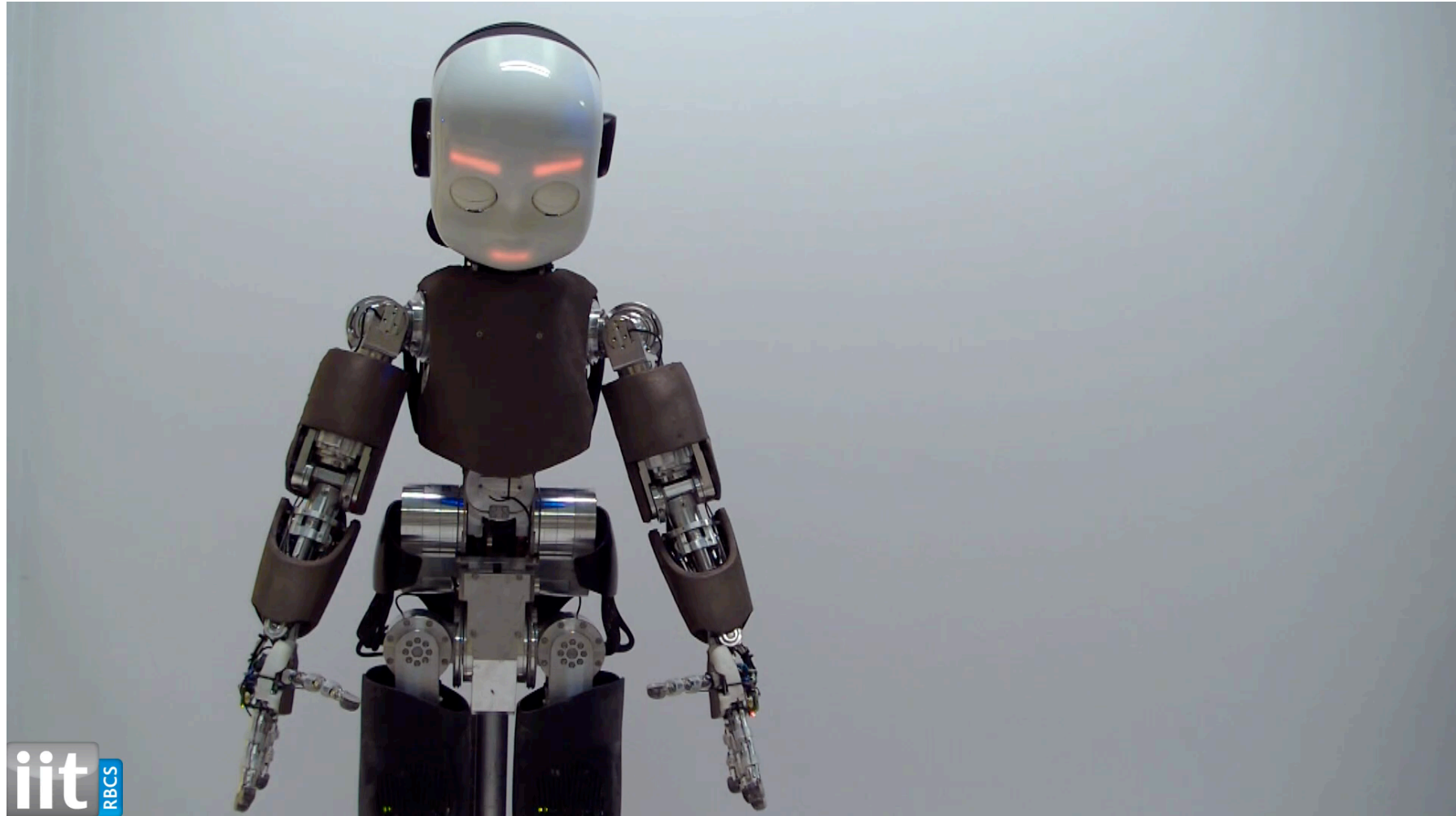


Management of the IP





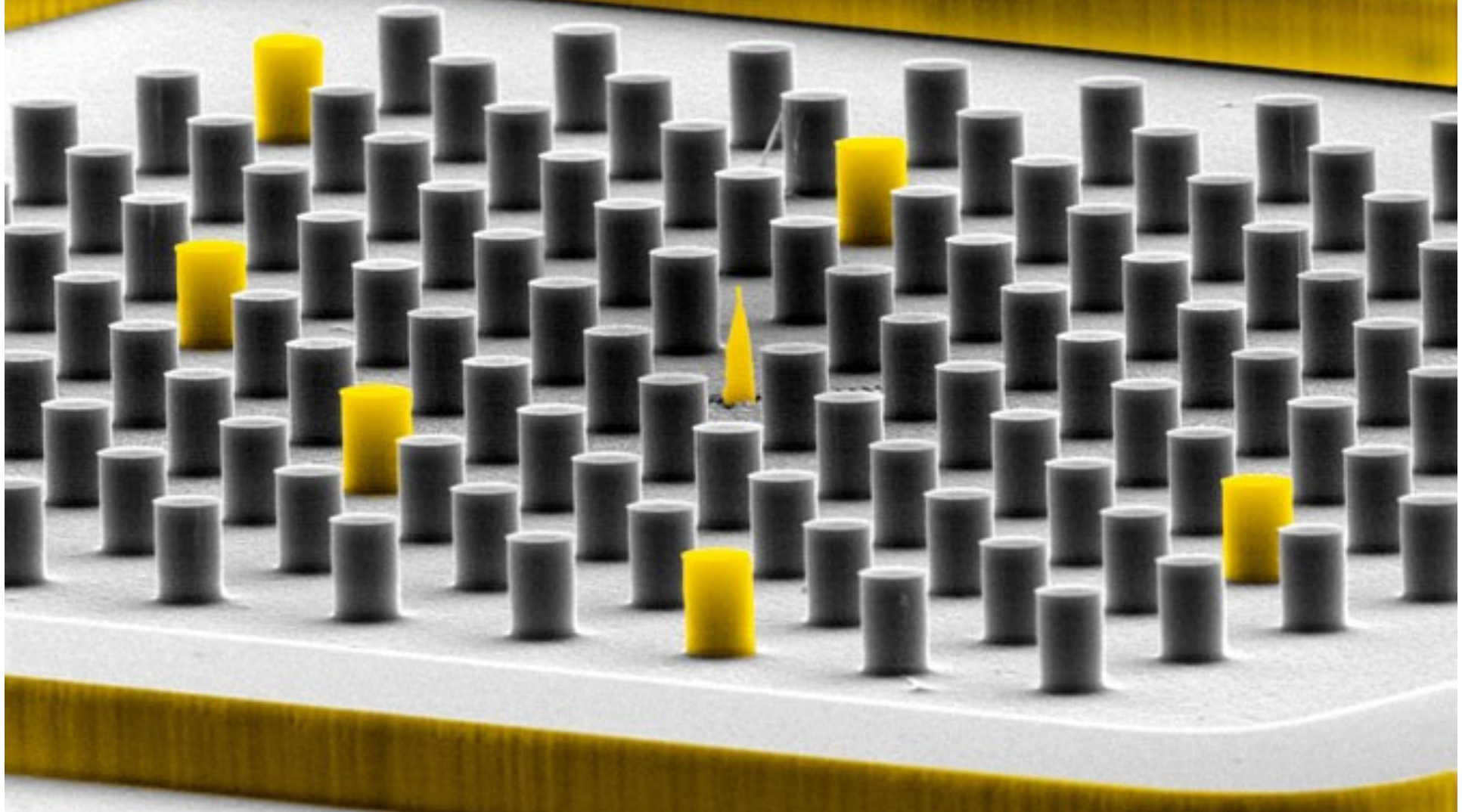
IP Sources: Publicly Funded Research





IP Sources: Publicly Funded Research

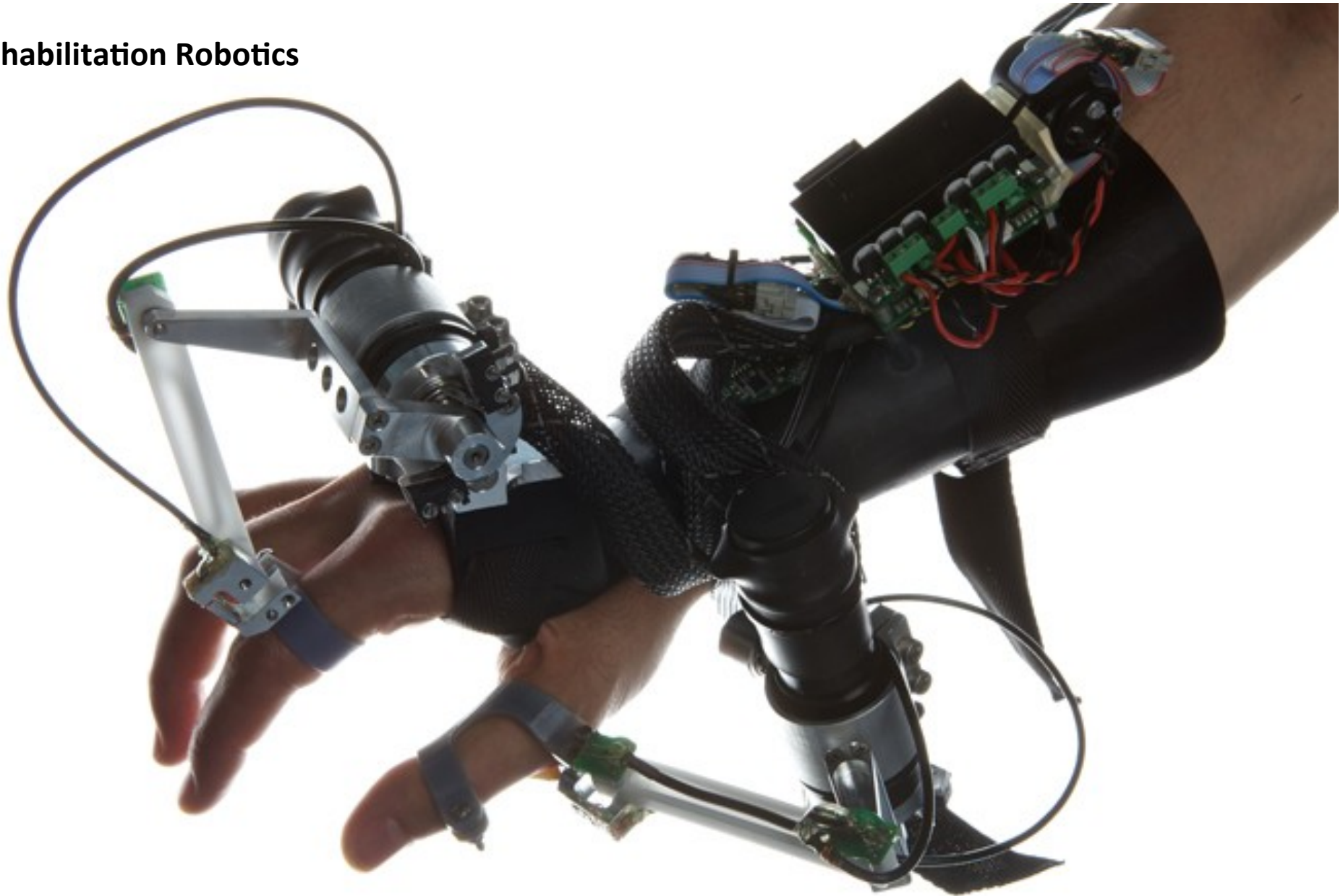
Lab On Chip: Nanostructures for single molecule detection





IP Sources: Research Contracts

Rehabilitation Robotics



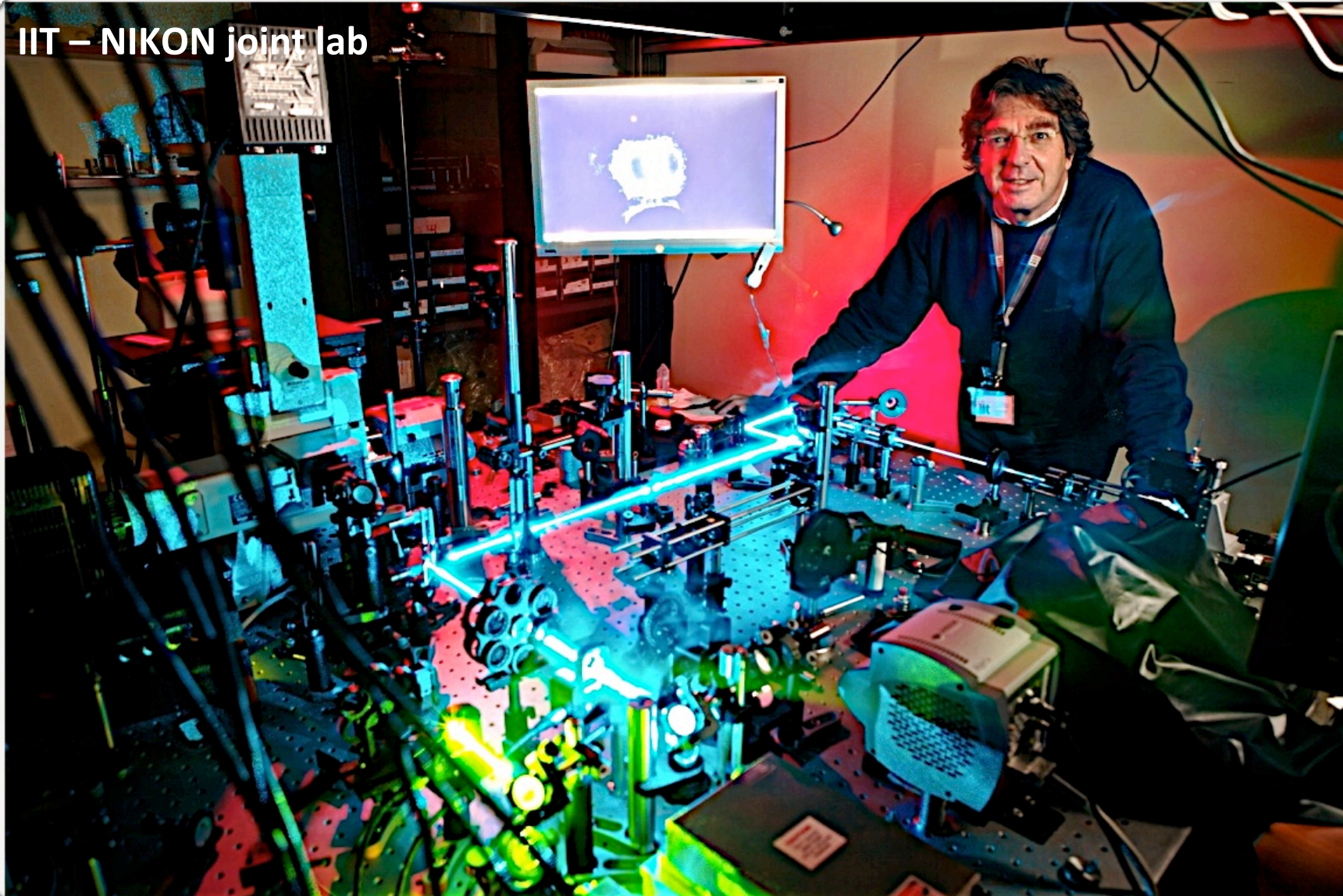


IP Sources: Research Contracts



Drug Discovery: Computational chemistry and lead synthesis

IIT – NIKON joint lab



IIT owns intellectual property generated by employees

- ✓ Compliant with EU-FP requirements
- ✓ Ok for effective negotiation with industry
- ✓ Ok for internal IPR management

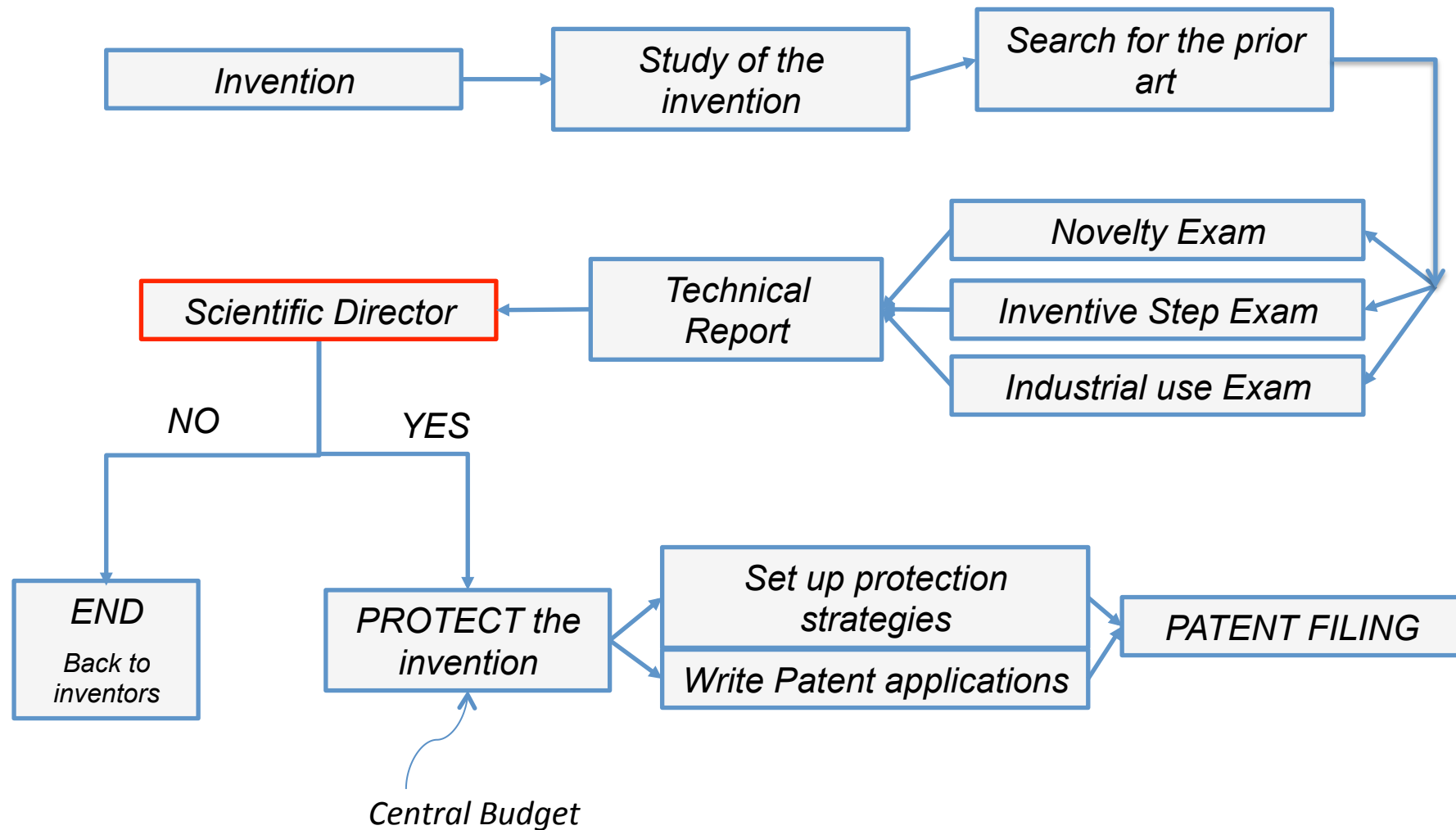
Net Revenues are distributed according to this criteria:

Inventor	1/3
Scientific structure of origin	1/3
IIT	1/3
of which	
General fund	85%
TTO	15%



IP Protection: Examination & Filtering

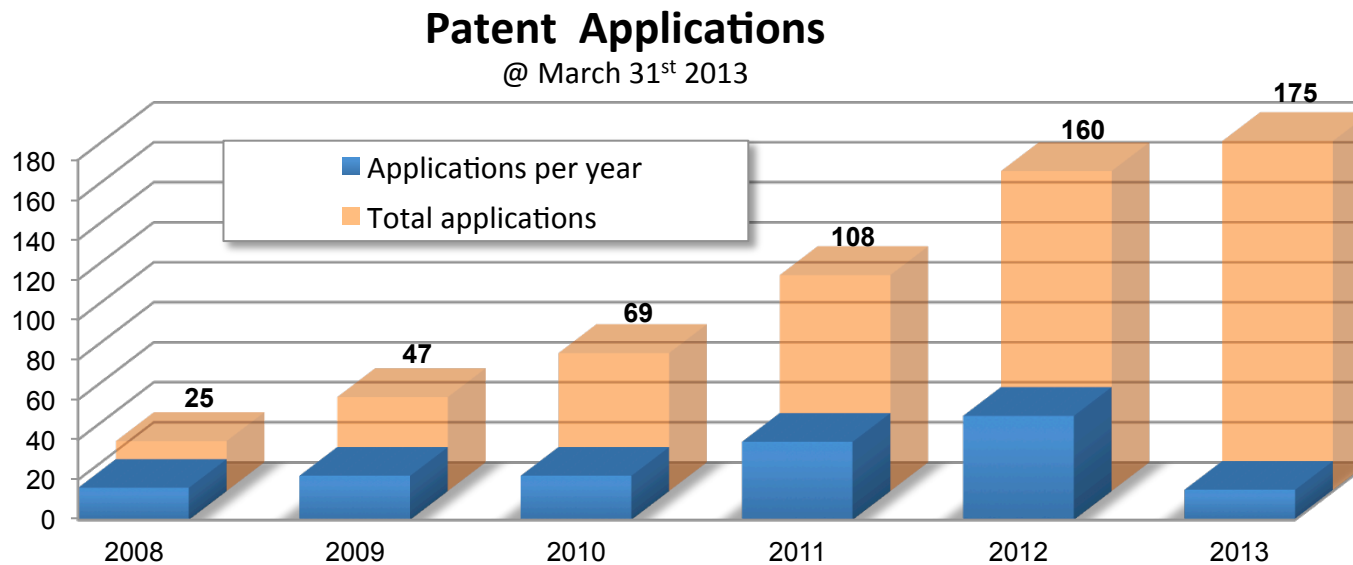
IIT's patent procedure (first filing)





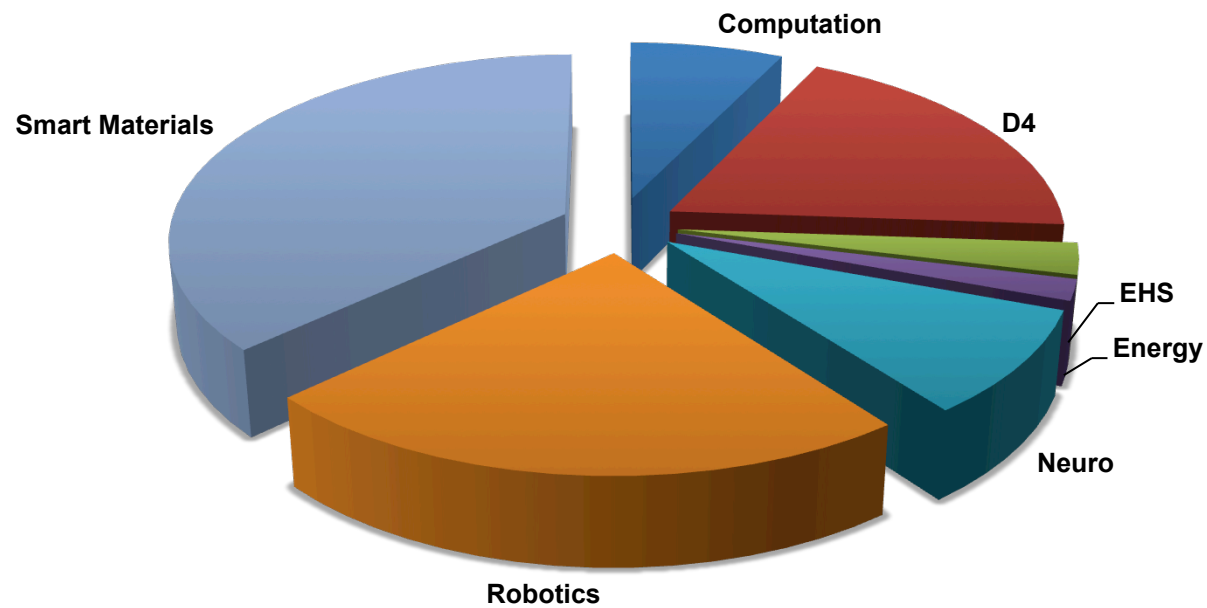
IP as an Asset: Patent Portfolio

- **At present, IIT patent activity shows**
 - 111 inventions produced by IIT overall
 - 175 patent applications
 - 25 patents already granted
 - About € 500.000 spent in 2012 in patent protection, displaying a growing trend.



- Clustering of patents is a key element for technology transfer

Inventions per Platform



Great flexibility, provided that:

- ① The agreement is made only when IIT has a scientific interest in the research
- ② Industry pays only direct and indirect costs: No mark-up on IIT activities
- ③ IIT owns the entire intellectual property rights on all technologies developed using IIT facilities and by IIT personnel
- ④ Technology that is jointly developed by IIT and Industry personnel will be jointly owned



IP Exploitation: Research collaborations

IIT owns the intellectual property



Industry receives an Option to elect a license



Non exclusive license

- ✓ *NO sub license rights*
- ✓ *only in a specific industrial field*
- ✓ *royalty free*
- ✓ *reimburse of patent costs*

Exclusive license

- ✓ *sub license rights*
- ✓ *royalty bearing*
- ✓ *license issue fee*
- ✓ *loose of exclusivity clauses*



IP Exploitation: Spin Off

- ① No Equities for IIT
- ② Exclusive License of the relevant IPR
- ③ Royalties only when commercialization (usually as % of Net Sales of the Start up and sub-licensees)
- ④ Upfront Payments, Minimum Royalties and Milestone payments may occur
- ⑤ Fair and non discriminatory royalty rate



IP Exploitation: Spin Off



MICRO **TURBINE**



open hardware, open software, open mind.



SENSING
ELECTRO
MAGNETIC
PLUS



IP Exploitation: Licensing

- 1) Negotiation of fair and reasonable terms
- 2) Preferably non exclusive license
- 3) Preferably Italian companies, or production of patented products principally in Italy
- 4) Clauses to encourage real use of patented products and technology development
- 5) No license to patent aggregators
- 6) Keep ownership of patents and right to use for research

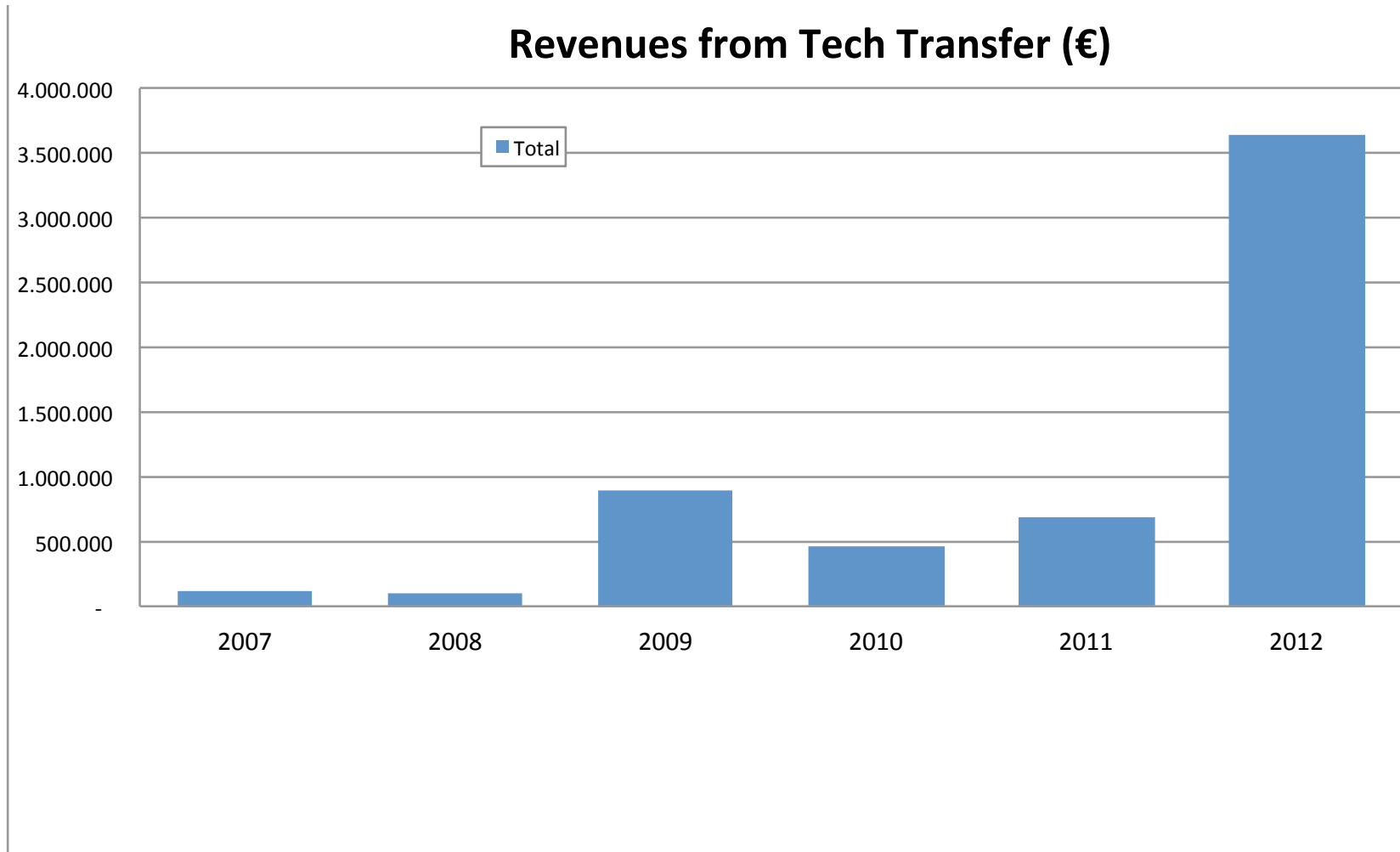


What can we expect from TT?

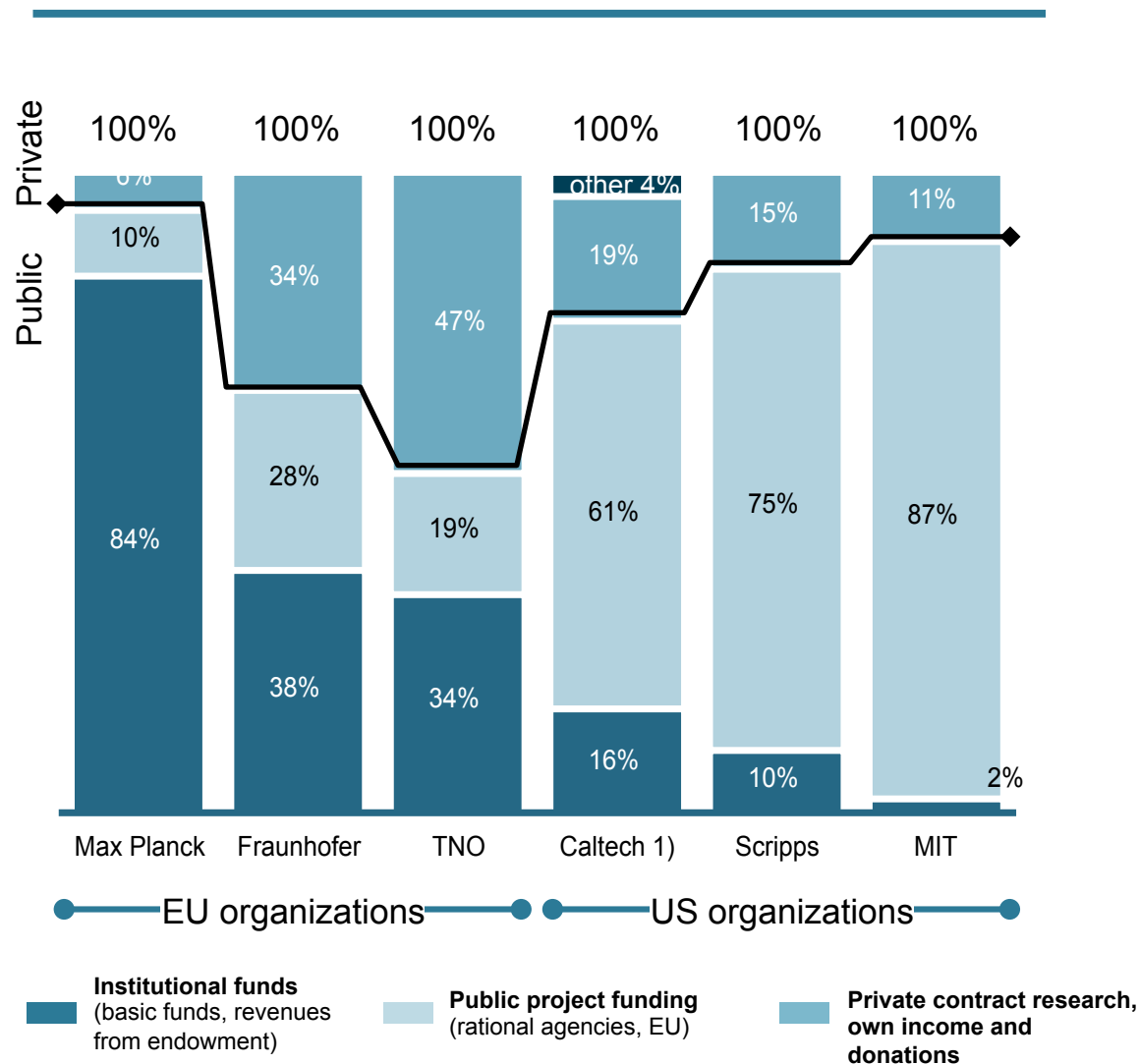
Some
Benchmarks...



IIT: revenues from Tech Transfer

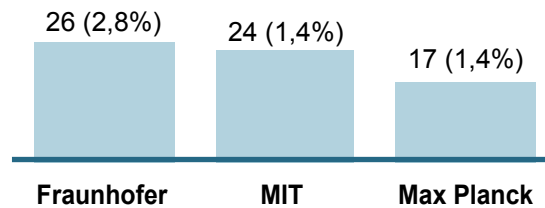


Funding sources: detail by research organization
Public vs. private financing



Technology transfer accounts for a minimum share of total budget...

Revenues (m EUR and % of total budget)

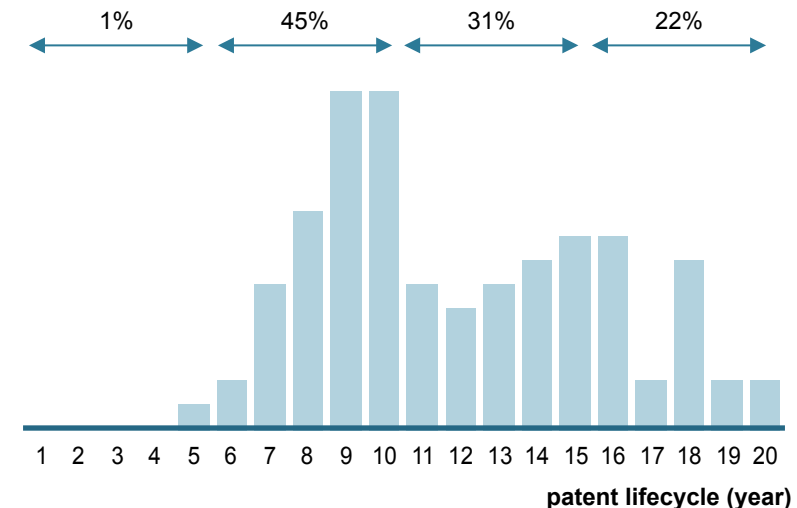


- Technology transfer income accounts for a minimum share of total budget
- In most cases it does not even exceed its costs¹⁾
 - 2.500÷5.500 for provisional application
 - 3.000÷50.000 of additional costs until grant (depending on number of countries)
 - up to 3.000 per year for maintaining patent
- Revenues are highly dependent on few important inventions (e.g. at Fraunhofer 90% comes from the mp3 technology)

1) average costs for patent application at EPO (EUR)

... and produces significant economic results in the long term

Revenues time distribution (% of total revenues)



- Revenues generation is a long term process –first revenues are normally generated after 5÷10 years from invention
- At Max Planck it took 10 years from establishment to become a profitable function



- *Technology transfer has not a significant economic impact and produces returns only in the long term*
- *Nevertheless, technology transfer plays an important role in fulfilling the mission, motivating people, attracting industry and creating new jobs, new companies*
- *IP management is crucial either at policy level, and at strategic and operational level, through the whole value chain*



Thank you!

Lorenzo De Michieli, Ph.D.
Technology Transfer - Manager
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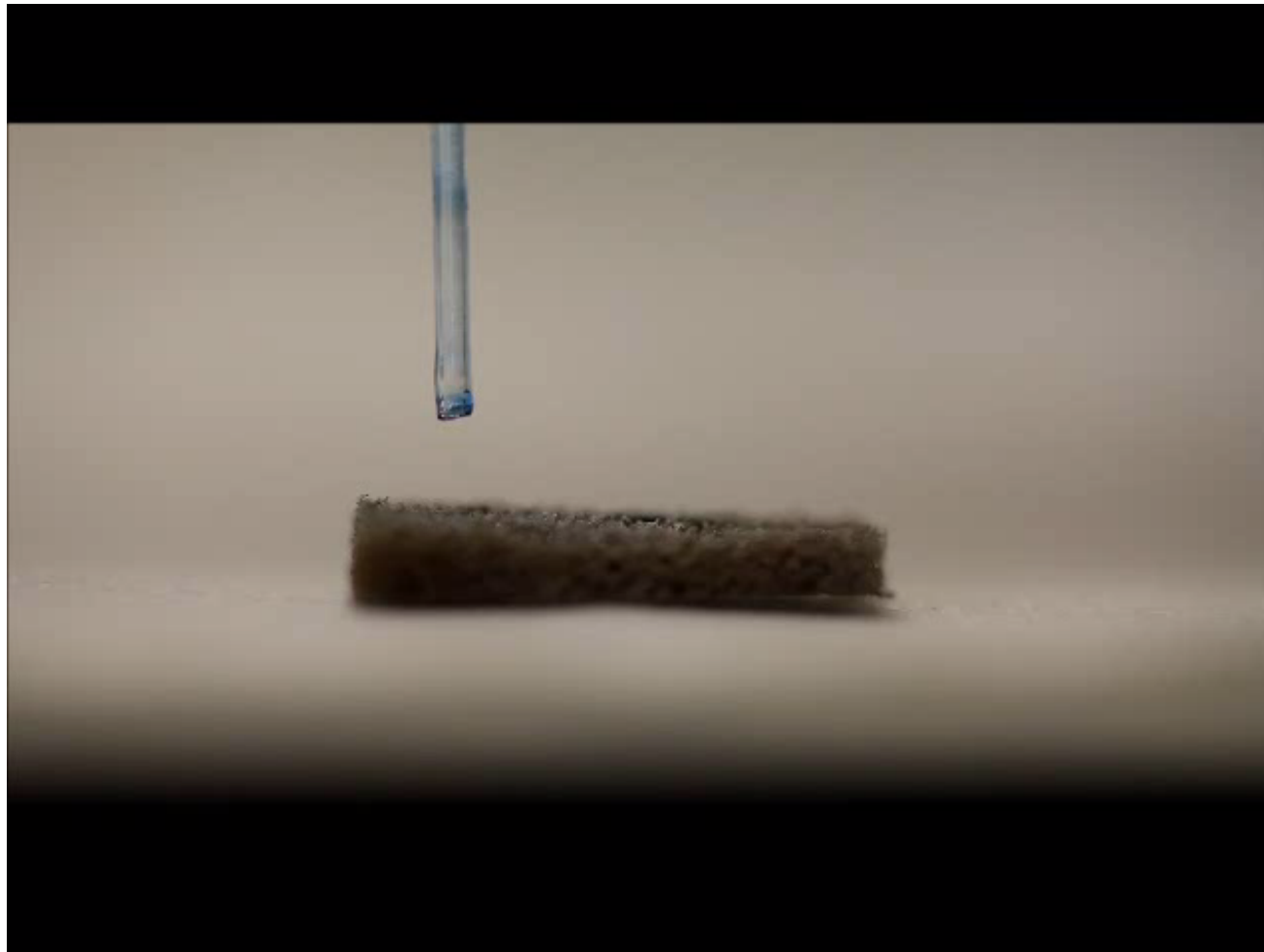
Humanoid Robotic assistant



**Combination of nanoparticles and polymers
allows to change material properties**

**A simple sponge becomes an
OIL-WATER separator**

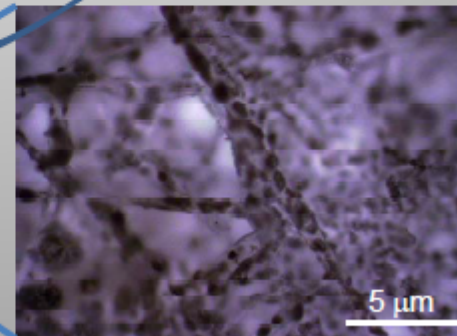
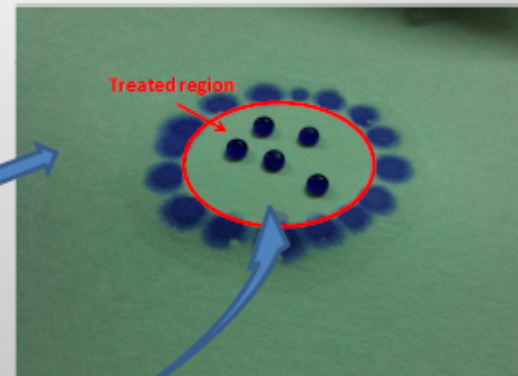
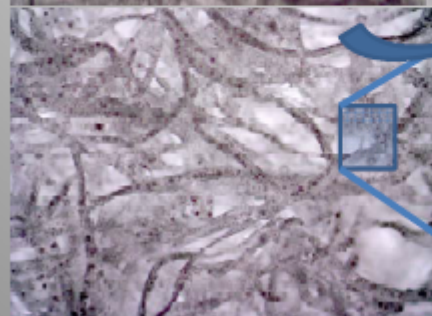
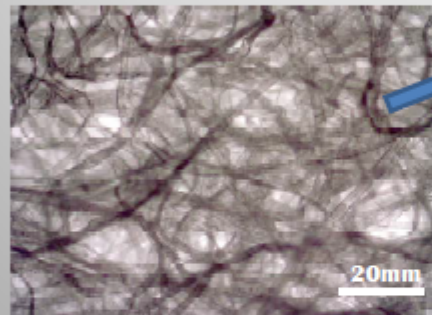
By treating the sponge surface with appropriate nanoparticles it may absorb oil (blue drop) dispersed in water (which remains clean, on the surface)



Cellulose fibers treated with acrylate nanocomposites

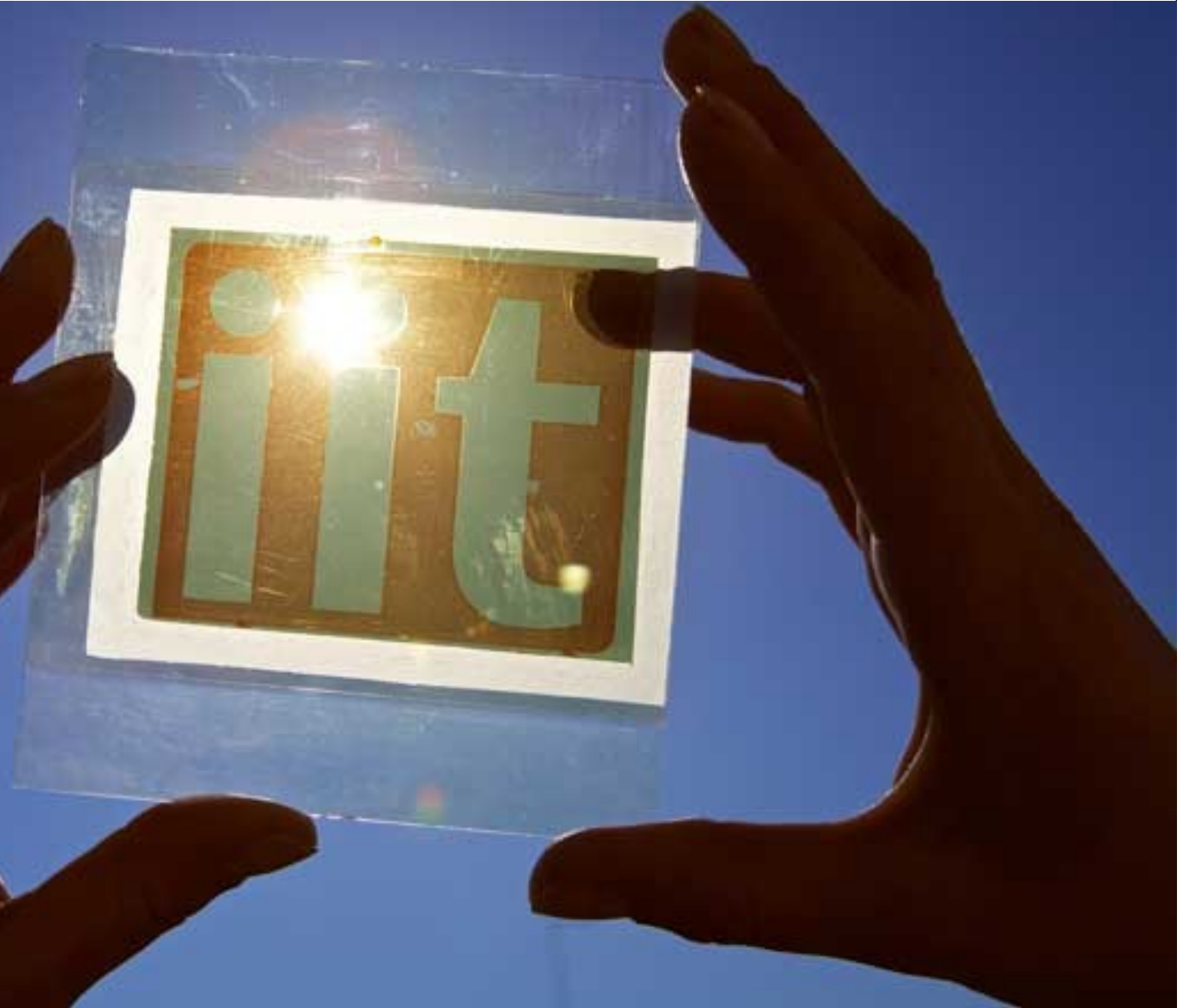
Application of the polymer solution on paper by drop casting or dipping or spraying

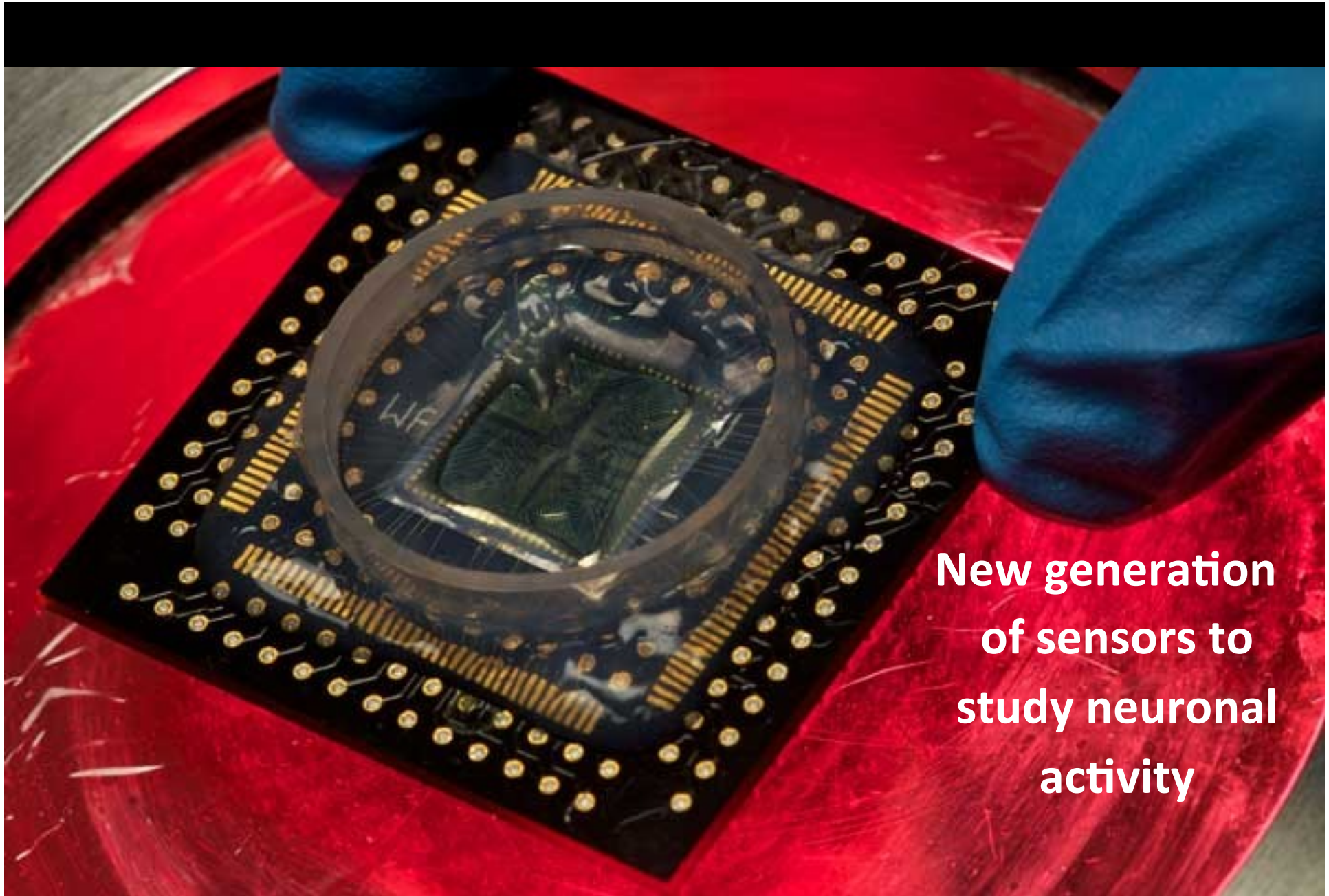
Microscopic Images of Untreated and Treated Cellulose Fibers



Textile &
Paper Industry
Constructions
Cultural Heritage
Counterfeit
Packaging

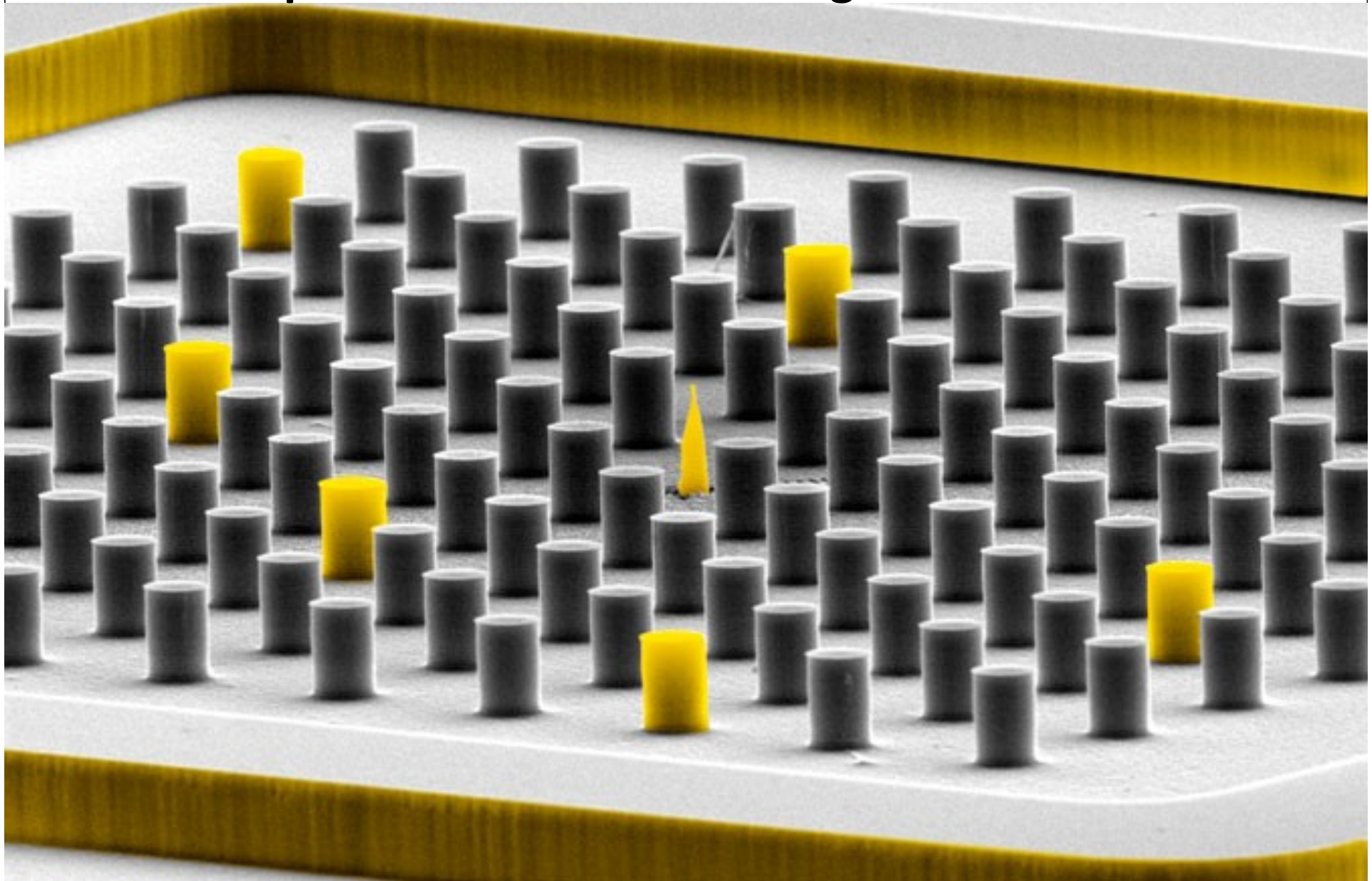
**Photocromatic
polymers for
window
integrated
solar cells**



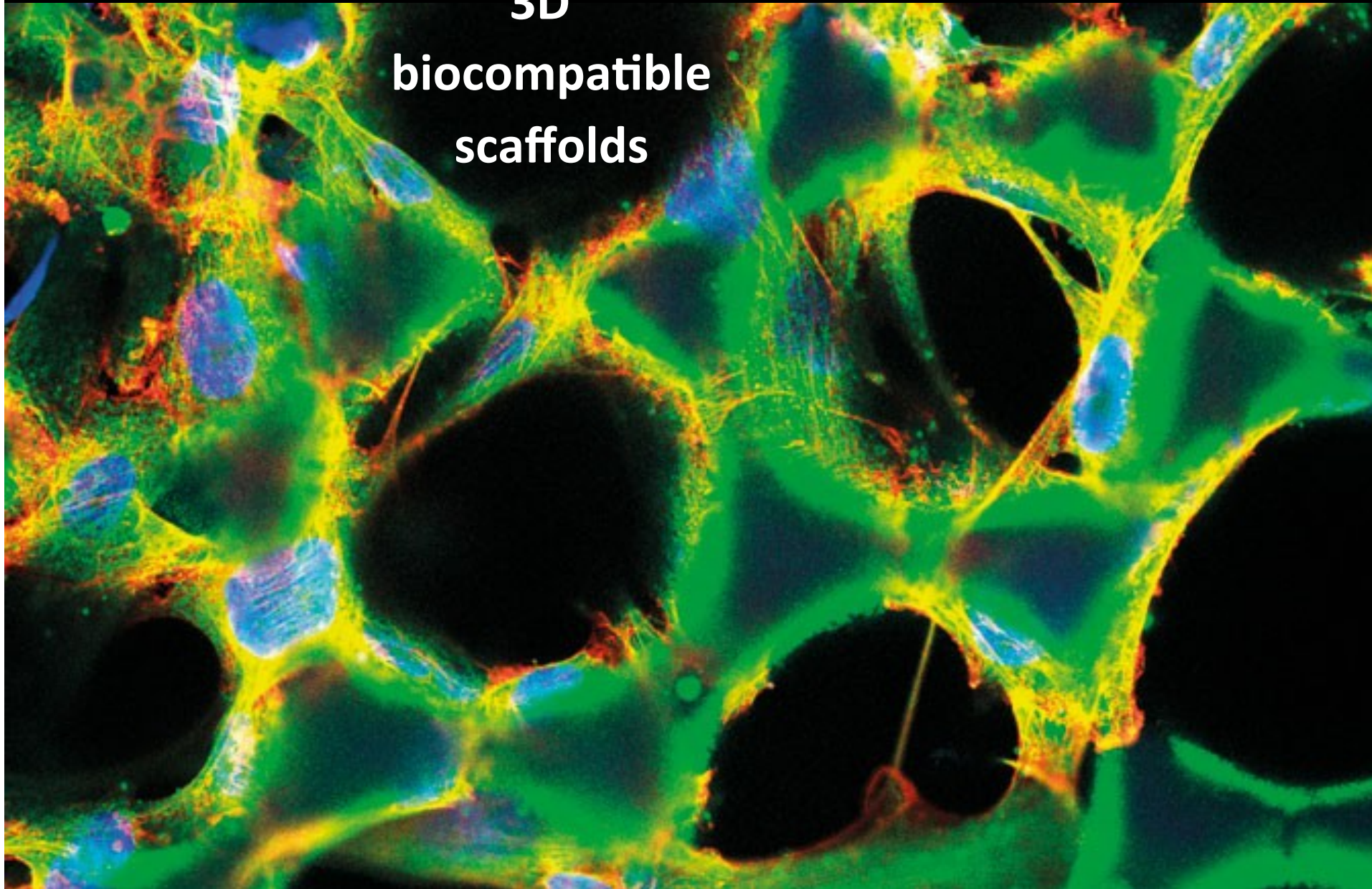


**New generation
of sensors to
study neuronal
activity**

Lab On Chip: Nanostructures for single molecule detection



**3D
biocompatible
scaffolds**

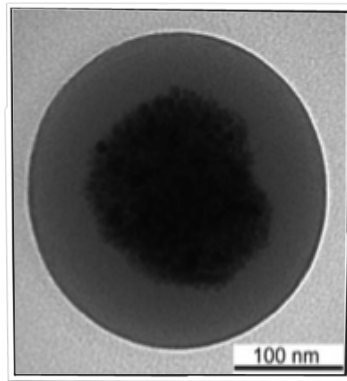


Nanochemistry labs

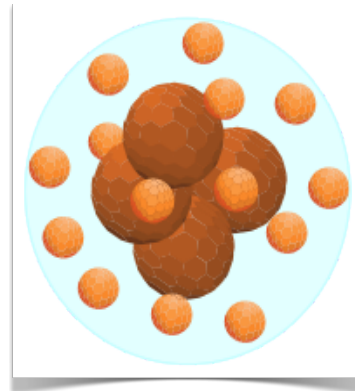


Example of application

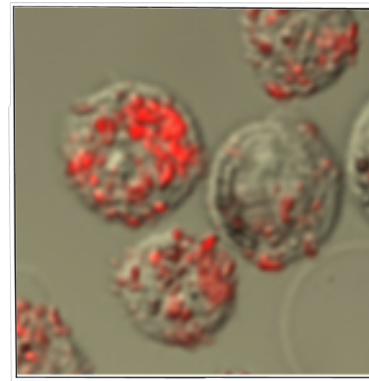
- Fig. 1 and 2 below, show the nano particle core (larger and darker in the picture) which displays magnetic properties, while the external components carry a fluorescent effect.
- Nanoparticles can be used as active markers on target cells: the fluorescent property helps in the screening phase (fig. 3) while the magnetic property allows efficient selection of the target (fig. 4) by using a magnetic field.



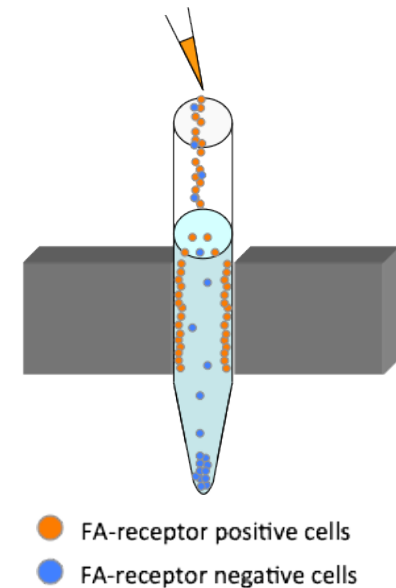
(fig. 1)



(fig. 2)



(fig. 3)



(fig. 4)

Pharmacology facilities



GETTING TO THE
CORE
OF 21ST CENTURY DISEASE



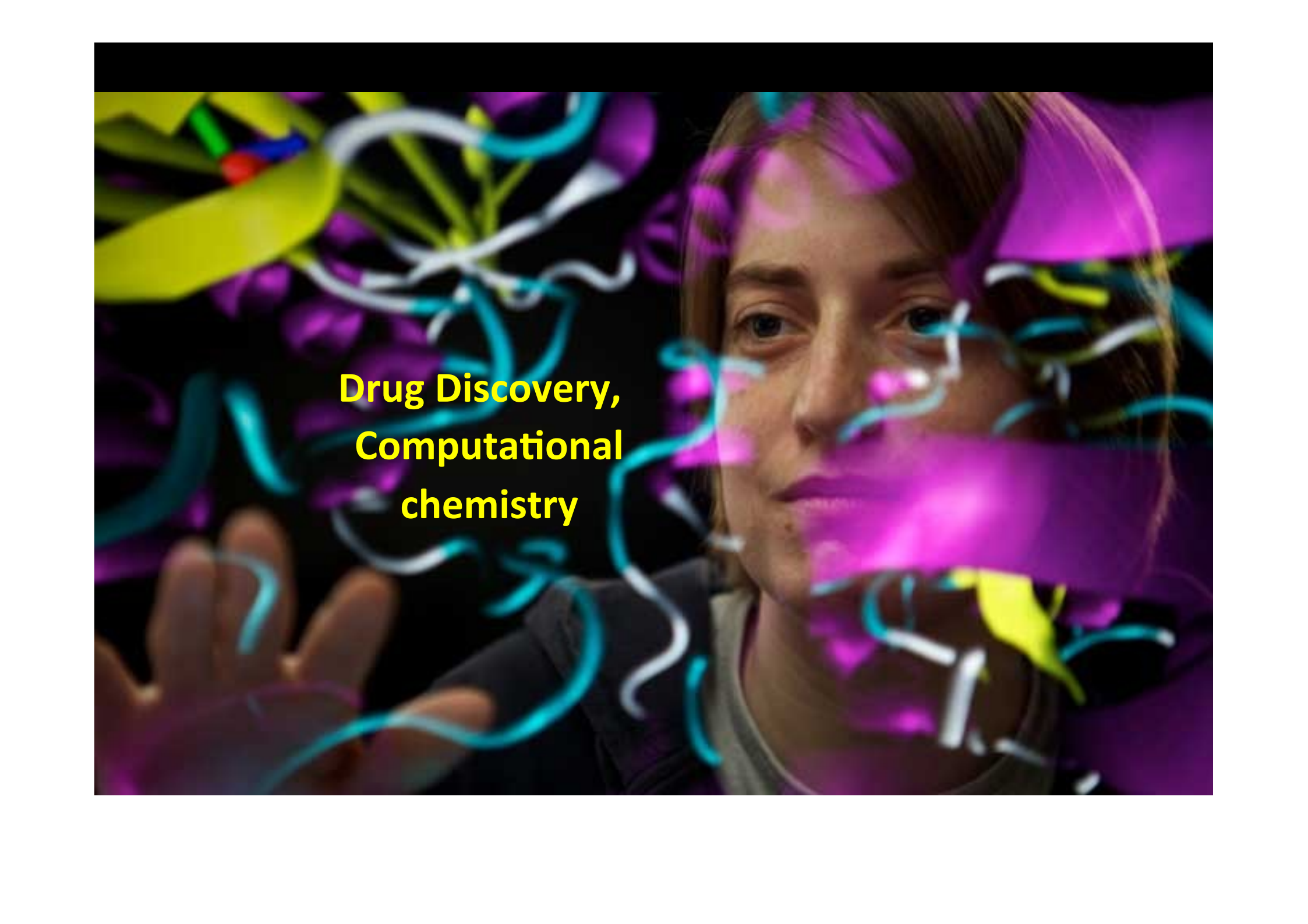
Drug Discovery
The chemistry lab

GETTING TO THE
CORE
OF 21ST CENTURY DISEASE

CompAct

Intrinsically safe
robots for
manufacturing

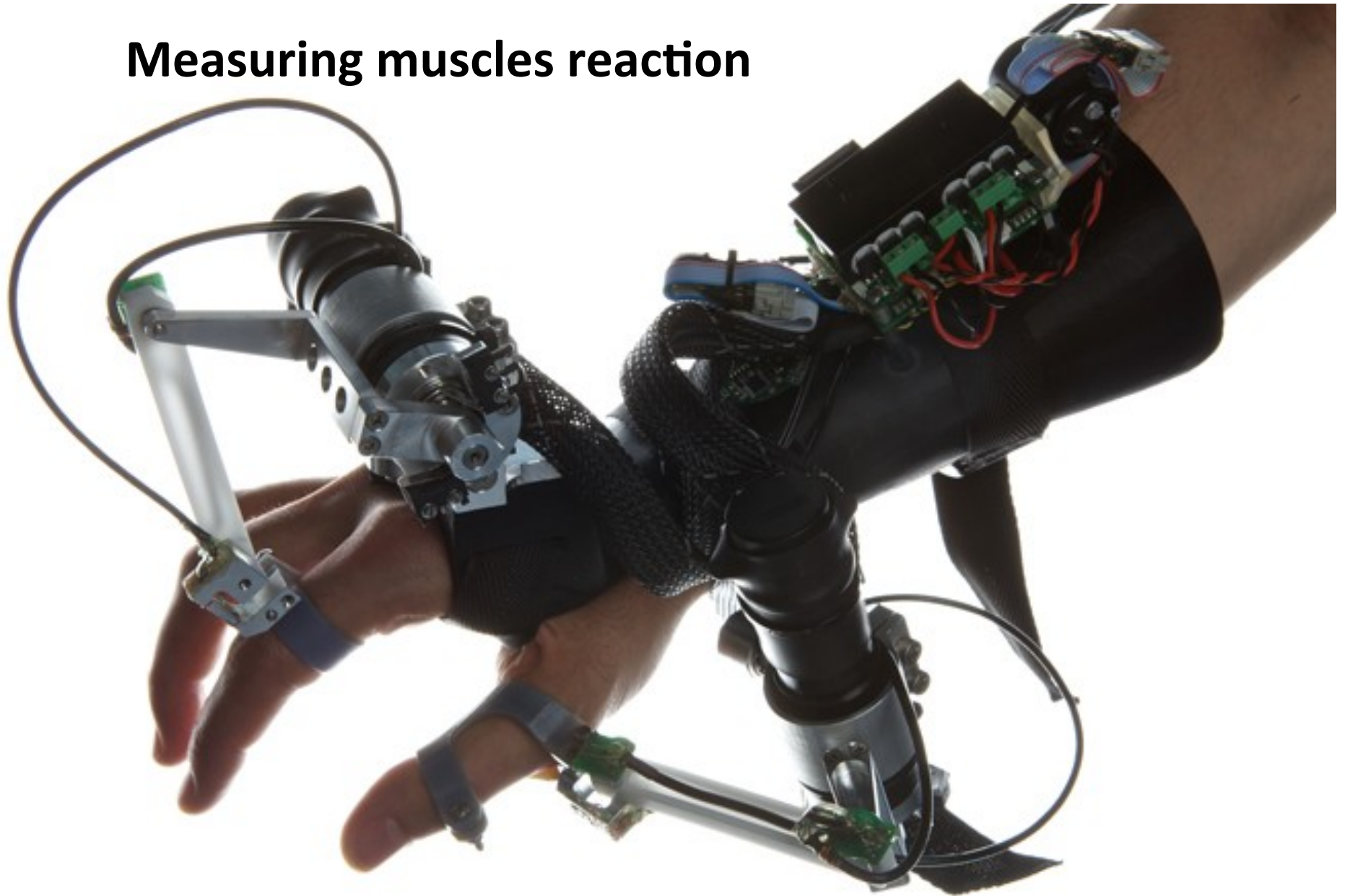


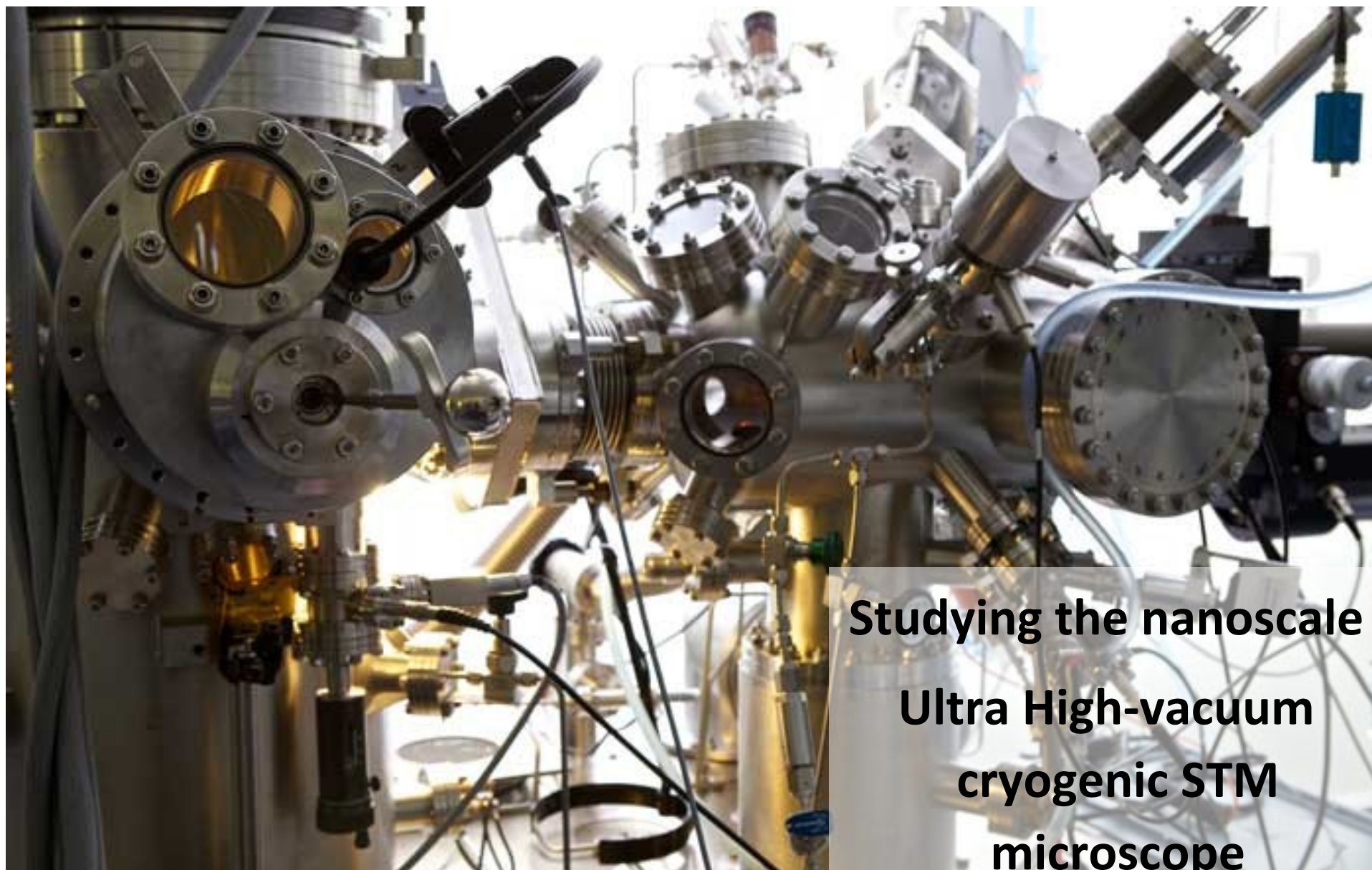
A woman with brown hair is looking towards the camera. Overlaid on her face and the background are various colorful molecular models, including ribbons and spheres in shades of yellow, cyan, magenta, and white. The background is dark, making the models stand out.

**Drug Discovery,
Computational
chemistry**

Rehabilitation Robotics

Measuring muscles reaction





**Studying the nanoscale
Ultra High-vacuum
cryogenic STM
microscope**

- **Scientific Research is one fundamental driver to create long-term competitive advantage**
- **IIT can be a strategic partner to Italian and Chinese companies, acting as technology developer, starting in Italy and reaching out to China**

What we look for...?

- a) **Long-term trustful relationship with highly capable industrial partners**
- b) **Clear and solid rules for Intellectual Property protection**



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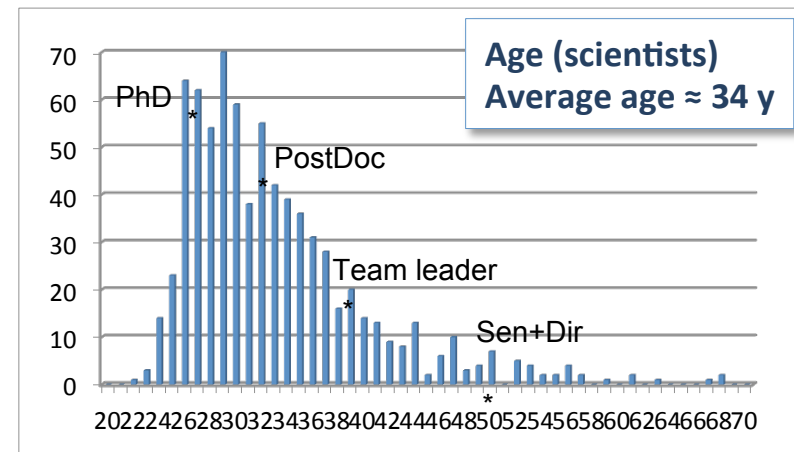
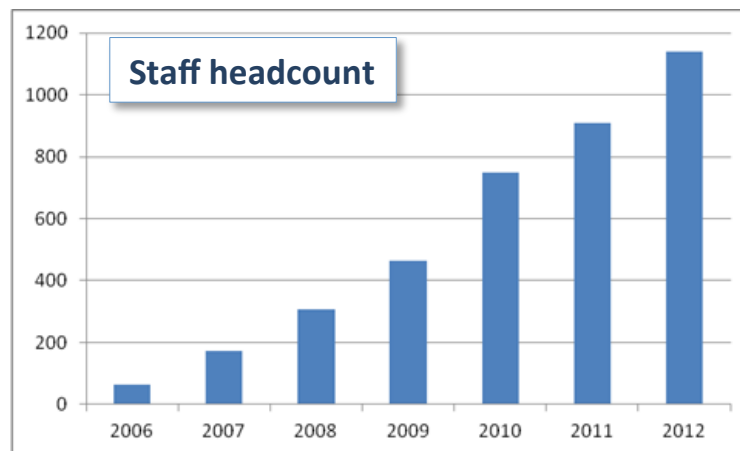
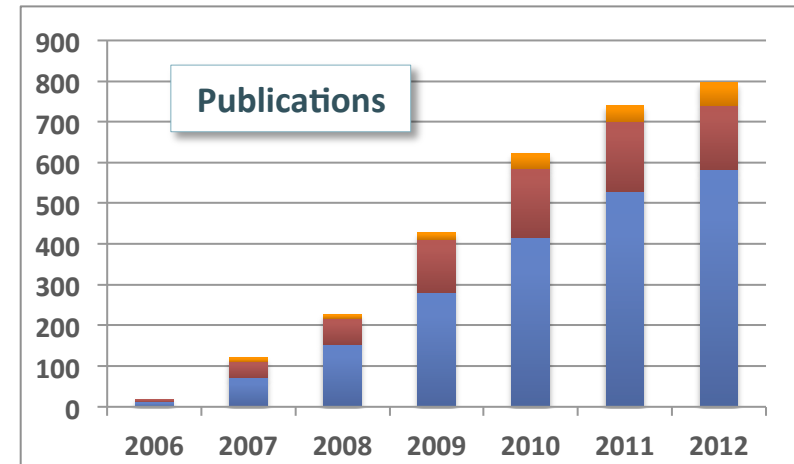
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A fast growing reality

- With a total headcount of 1141 (@Dec. 2012), IIT stands as a very young a motivated community which produces hundreds of scientific works **with a very high impact factor**
- Comparison with other major research institutions places IIT among the top cost/quality performers in EU

	Cost w/wo admin personnel (Keu)	Budget (Meu)
Weizmann (IL)	78/91	> 200
Max Planck (D)	106/156	1.300
Fraunhofer (D)	92/ ?	1.650
CNRS (F)	105/238	2.740
CNR (I)	101/165	900
IIT (I)	85/95	100



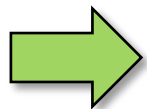
1. **Individual evaluation, on a yearly base, referred to assigned targets**
(Management by Objectives 20% of gross wage)
2. **Departmental evaluation, every three years (6 since 2008)**
Panel made of chairman and selected members of Scientific Committee, plus international independent experts
3. **Global evaluation (3 since 2006):** Evaluation Committee (external scientists and managers)
4. **Evaluation by the Ministry (ANVUR) ...on going**

International Ranking
SIR 2011 (www.scimagoir.com)

**TOP 8%
worldwide
for impact of research**

Based on SCOPUS bibliometry referred to the 2005-2009 period, IIT (while still in the start-up phase) ranked among the top 8% institutions in the world for the impact of its research.

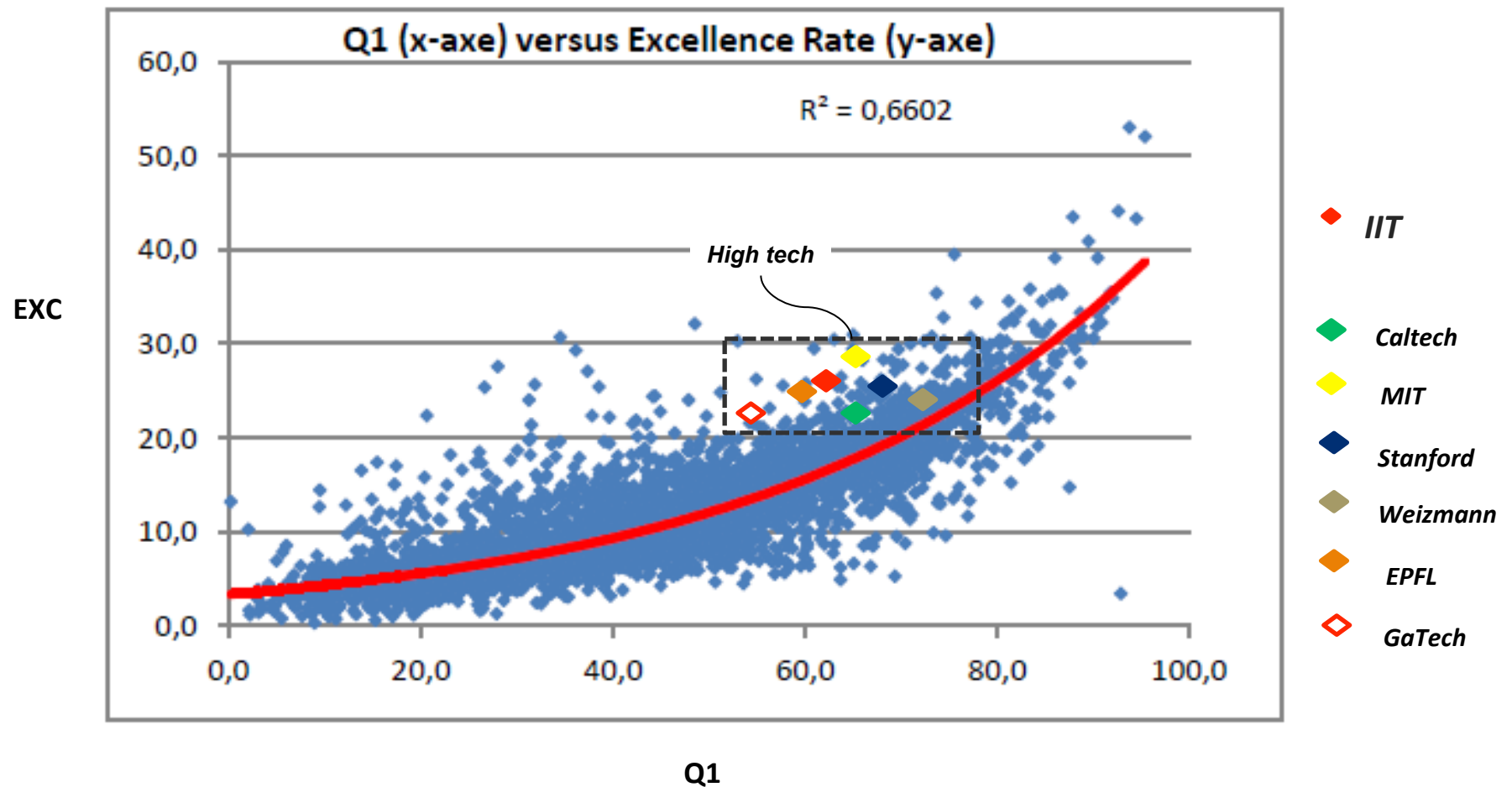
In fact, 2011 rankings placed IIT as 240th out of 3042 research institutions evaluated worldwide, awarding to IIT one of the 402 green labels of quality.

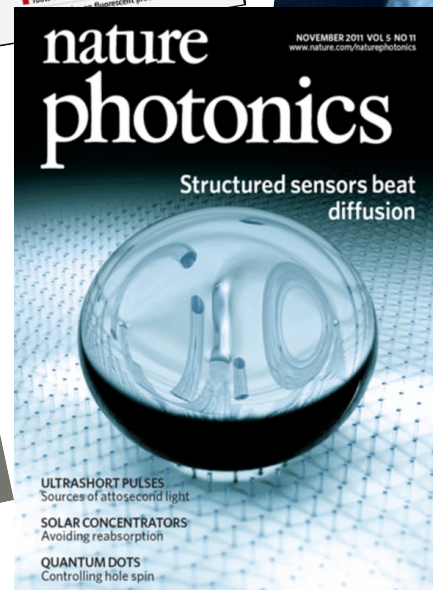


Top 8% worldwide
Top 8% in Europe (85° on 1040)
Top 10% in Italy (13° on 125, only medical organization ranked before IIT in Italy)

- 2012 rankings confirm IIT positioning among the world's excellence of scientific research, evaluating the Foundation performance in the same range of the long established top institutions of the world.

www.scimagoir.com







IP Exploitation: Joint Labs

IIT - Industry Joint Ownership

Both Parties can freely:

- ✓ *Produce, sell and use the technology*
- ✓ *Grant non exclusive licenses*

Parties must agree upon:

- ✓ *Granting of exclusive licenses*
- ✓ *Assignment of patent rights*
- ✓ *Defense of the patent*
- ✓ *Patent extensions*

If Industry requires exclusivity, it can negotiate an exclusive license agreement with IIT





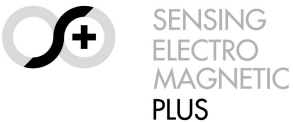







IP Exploitation: Joint Labs

- 1) Tight confidentiality rules for researchers of both parties
- 2) Industry is not requested to cover IIT direct and indirect costs. It is a common investment in research and development.
- 3) IIT owns the entire intellectual property rights, in and to all technologies developed using IIT facilities and by IIT personnel. However, most frequently technology is jointly owned.
- 4) Technology that is jointly developed by IIT and Industry personnel is jointly owned.



Example of Spin-Off projects

Name	Topic
	3Brain Med-Tech & Drug Discovery - company develops, produces and sells Multi Electrode Array (MEA) systems for neuronal activity analysis. It targets the drug discovery process, able to represent a major improvement for in vitro analysis, due to significance of single experiment comparable with a repeated in vivo test.
	Circle Garage Robotics and ICT – A patented solution of multi-sensors/multi-channel networks , reconfigurable and adaptable to sports & outdoor, as well as entertainment applications
	HiQ-Nano Nanoparticles - company produces and distributes top-quality nanoparticles of silica, silver and gold, suitable for research laboratories, medical devices and inks for printed electronics.
	qb Robotics Robotics - a patented solution to deliver innovative Natural Motion™ components for soft robotics applications.
	SEM+ Robotics and ICT - a patented solution for flexible multi-function touch pad.
	Microturbine Clean Energy Harvesting – distribution of patented microturbines for energy harvesting from fluid flows. Ideal for remote locations along pipelines (oil, gas and water), it also displays potential application as harvester of thermal waste from industrial production.
	Biki Tech Drug Discovery - drug discovery tools based on computational approach specialized on the binding kinetics of ligands.
	iCub House Robotics – production and sale of robotic solutions from IIT, paving the way to a diffusion of humanoid-based technologies into the market.
	Rehab Tech Robotics and Healthcare – the initiative promotes commercial exploitation of rehabilitation robotics solutions from IIT. Based on patented products, Rehab Tech solutions are undergoing clinical trials
	CompAct Robotics for Manufacturing - based on IIT patent, CompAct designs and sells robotic solutions to improve efficiency in the manual assembly tasks of industrial clients.



Sources of Intellectual Property

i. Publicly funded research

Project activities funded by UE /Italian Government/foreign agencies

ii. Contract Research

Research agreement between IIT and Company aimed at developing prototypes/technology or knowledge of primary interest to the company.

iii. Joint Labs

Feasibility studies, use of instrumentation to measure materials and goods of specific interest for the company, lab tests.