

MATERIAS[®]
ideas come to life

Prof. Luigi Nicolais

Presidente di Materias s.r.l.



ASSOCIAZIONE
ITALIANA
PER LA RICERCA
INDUSTRIALE



CAMERA DI
COMMERCIO
MILANO
MONZABRIANZA
LODI



OPEN SCIENCE & INNOVATION

CREARE UN PONTE TRA LA RICERCA UNIVERSITARIA E L'IMPRESA: IL CASO MATERIAS

| 25 febbraio 2019 – Palazzo Turati - Milano |

HORIZON EUROPE

THE ARCHITECTURE OF HORIZON EUROPE (2021-2027)

OPEN SCIENCE

bottom-up and excellence focus

OPEN INNOVATION

the European Innovation Council

GLOBAL CHALLENGES AND INDUSTRIAL COMPETITIVENESS

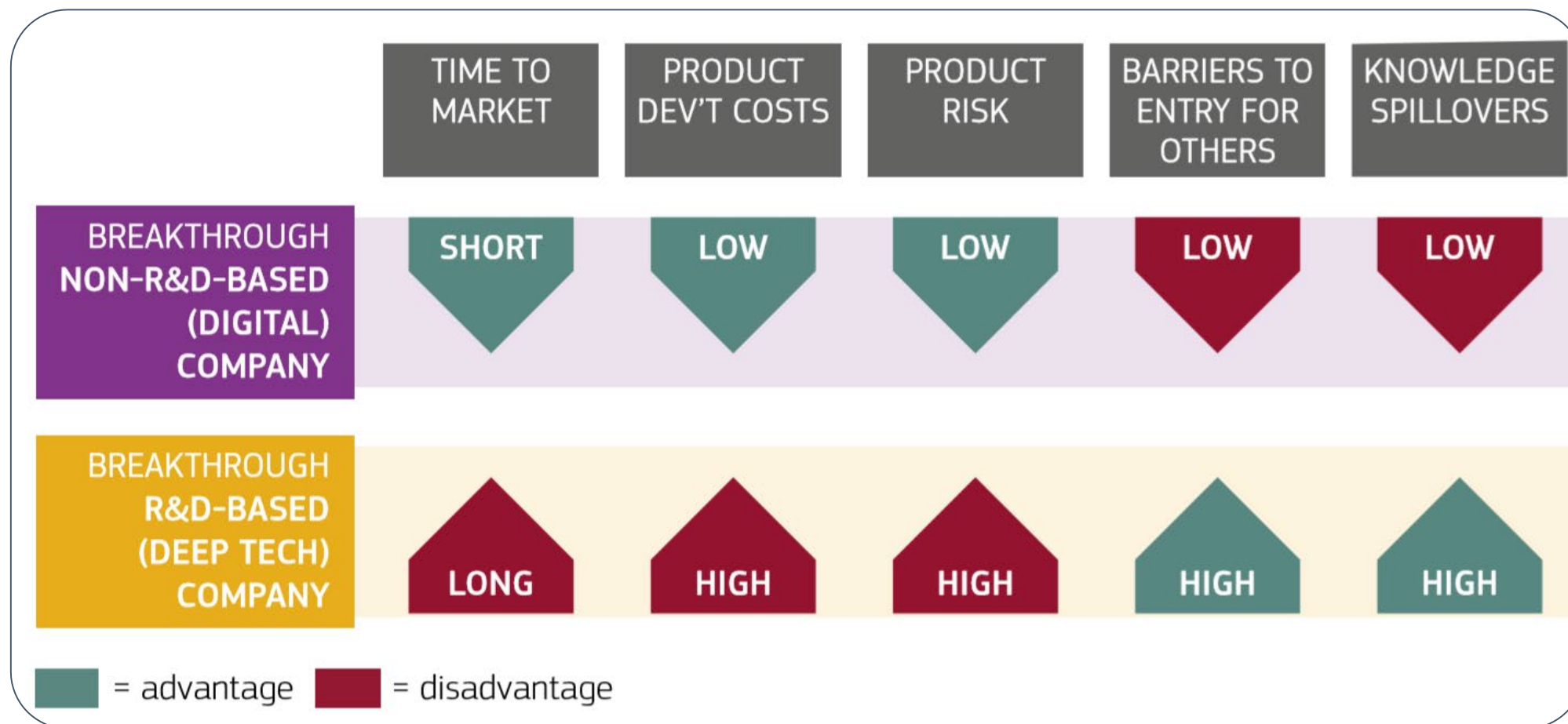
combining the current Societal
Challenges Pillar and elements of the
Industrial Leadership Pillar



The **European Innovation Council** represents the benchmark for **breakthrough and market-creating technologies** and for **innovative companies** (SMEs, start-ups) that have the **potential to rapidly scale the market** at European and global level.

FINANCIAL DIMENSION: 100 Billion of €

BREAKTHROUGH INNOVATIONS IN DIGITAL AND 'DEEP TECH' (R&D BASED)



Source: Europe is back: Accelerating breakthrough innovation, European Commission, Directorate-General for Research and Innovation (2017).

ITALIAN SCIENTIFIC PRODUCTION

Italy is the **#1** country in the world for **number of citations per researcher**.

Number of citations per researcher, top ten countries in the world (1996 – 2016).

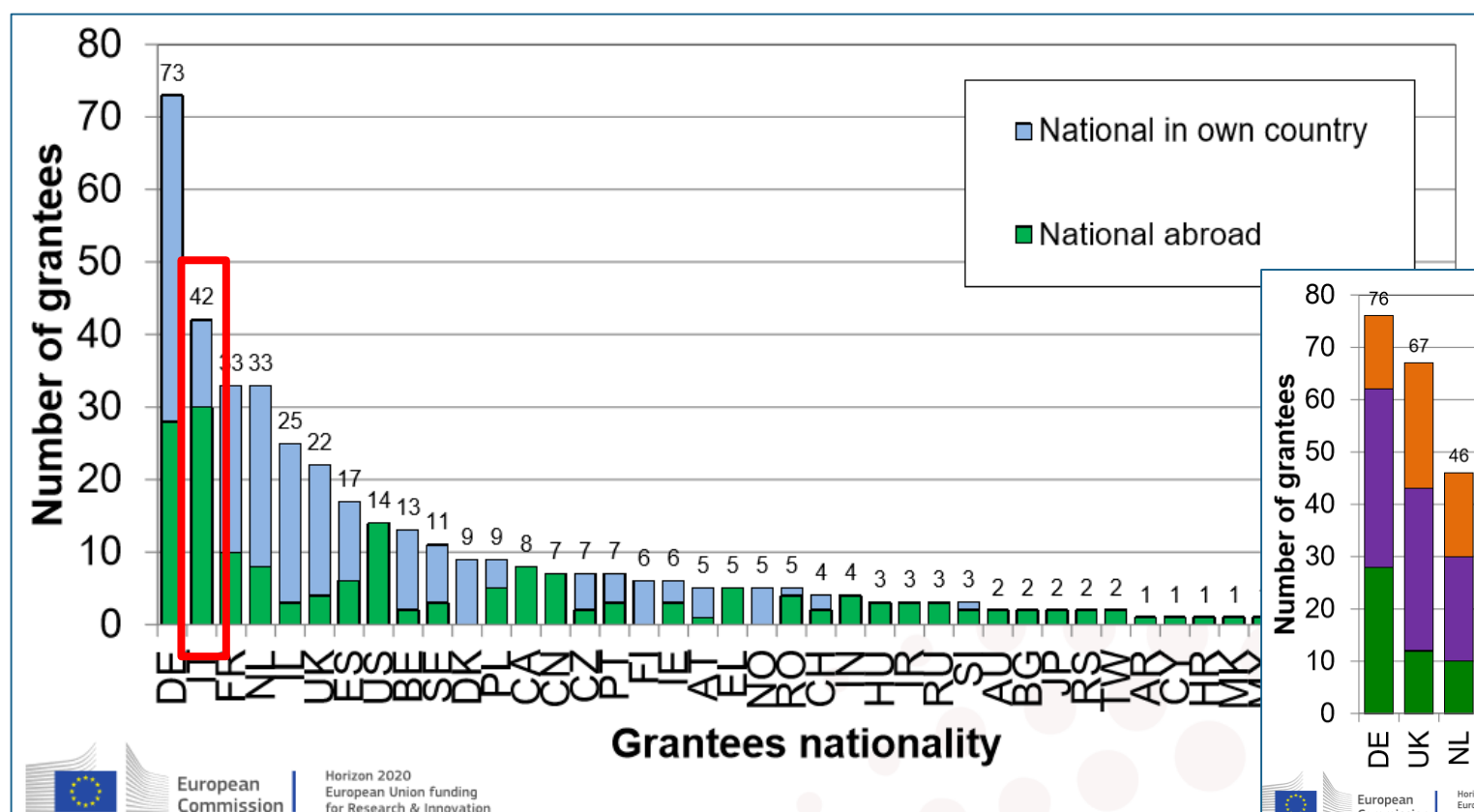


Source: the European House – Ambrosetti on Scimago data and OECD, 2018

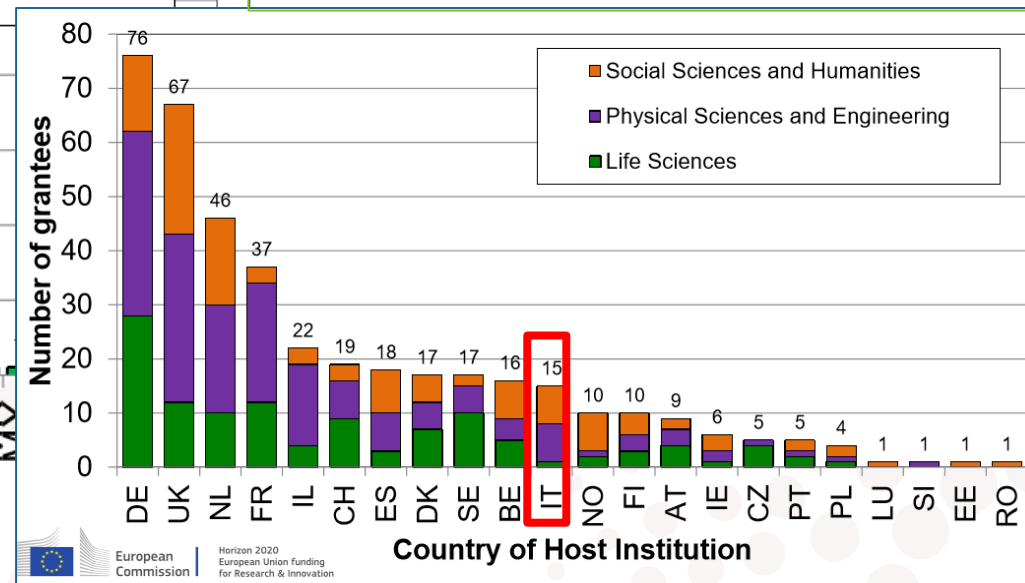
ERC 2018: ITALIAN RESEARCHERS RANK SECOND IN EUROPE BY NUMBER OF GRANTS

The European Research Council (ERC) has announced the awarding of its Starting **Grants 2018** aimed to support young researchers in the early stage of their scientific career.

The statistics of the competition show that **Italian researchers are the second most awarded in Europe** after German researchers with 42 project...

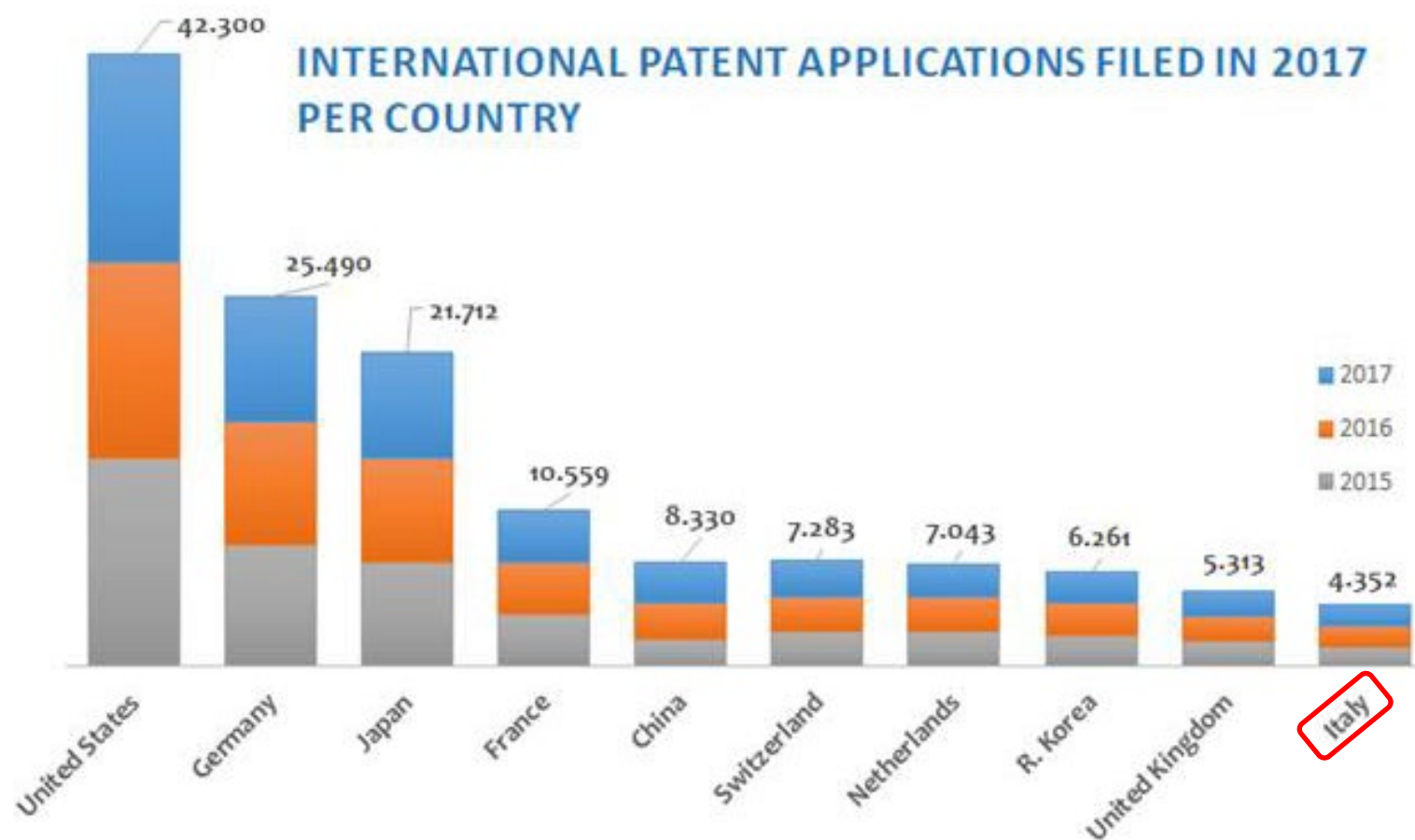


...even if **only 15 of the 42 projects** will be carried out in **Italy**.



Italian researchers receive grants for 42 research projects

PATENT APPLICATIONS



Source: European Patent Office (updated at 22.01.2018). Statistics are based on the first-named applicant.

60	54	42	40	33	28	27	26	26	26

Source: *Ilsole24ore*, 2017

Applications³ per million inhabitants⁴ in 2017

Country of origin ⁵	
1	Switzerland 884
2	Netherlands 412
3	Denmark 377
4	Sweden 374
5	Finland 329
6	Germany 316
7	Austria 253
8	Belgium 188
9	Japan 172
10	Israel 167
11	France 157
12	United States 130
13	Republic of Korea 122
14	Ireland 118
15	Norway 99
16	Puerto Rico 83
17	United Kingdom 82
18	Singapore 77
19	Italy 70
20	Chinese Taipei 69

³ European patent applications include direct European applications and international (PCT) applications that entered the European phase during the reporting period.

⁴ Source of population figures: U.S. Census Bureau, International Data Base.

⁵ The geographic origin is based on the country of residence of the first applicant listed on the application form (first-named applicant principle).

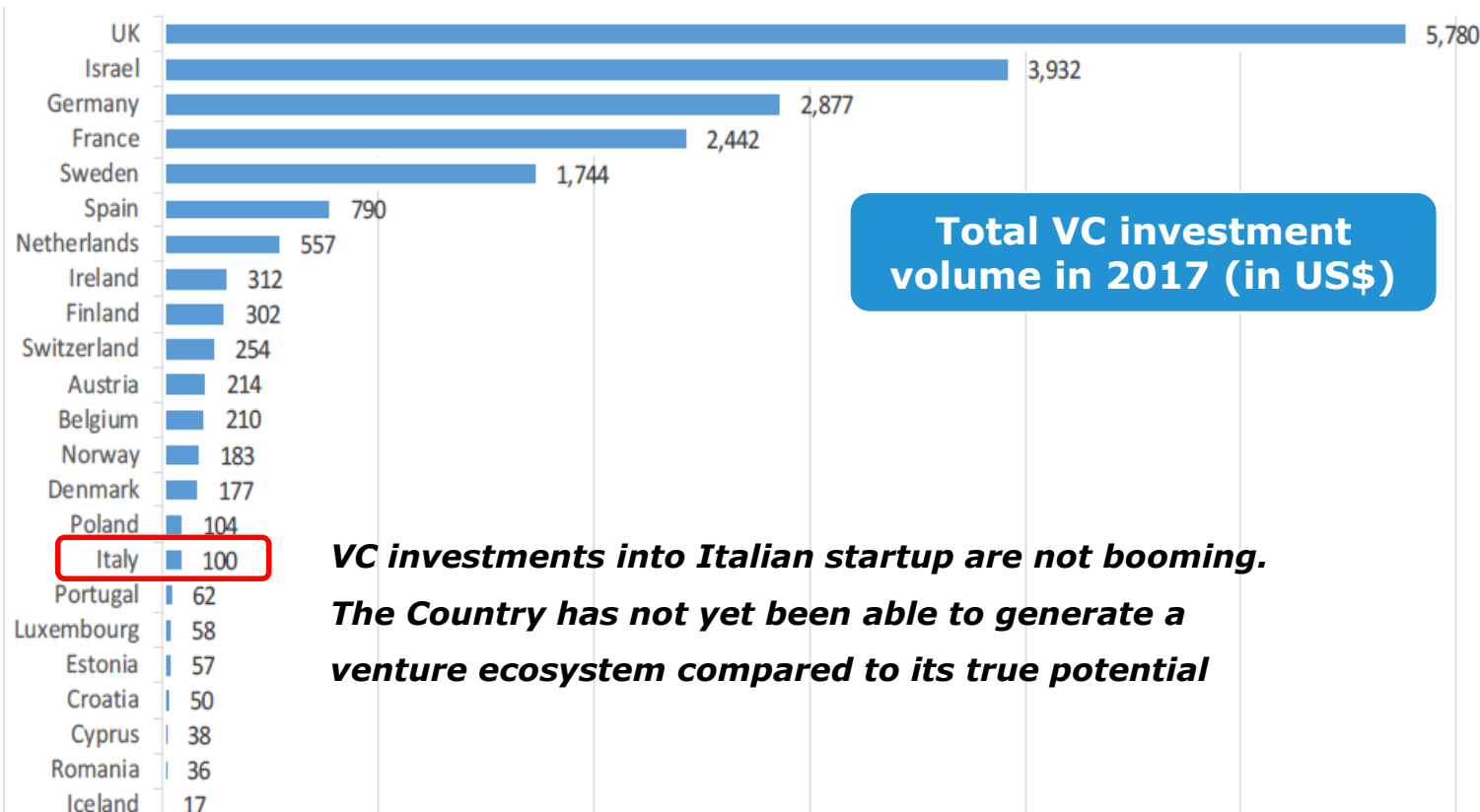
INVESTMENT "VENTURE CAPITAL"

VC investment per person in 2017 (in US\$)



Italy is in the last places of the ranking, with 1.66\$/person

Venture Capital (VC) contributes to the development of the country's economy. Venture Capital investments in innovative start-up promote high-profile employment opportunities for young people and industrial development



Total VC investment volume in 2017 (in US\$)

VC investments into Italian startup are not booming. The Country has not yet been able to generate a venture ecosystem compared to its true potential

Source: Venture Investment Data: 2017, Prepared by Gil Dibner

Good ideas can lead to...



STRENGTHEN RELATIONSHIP BETWEEN ACADEMIA AND INDUSTRY



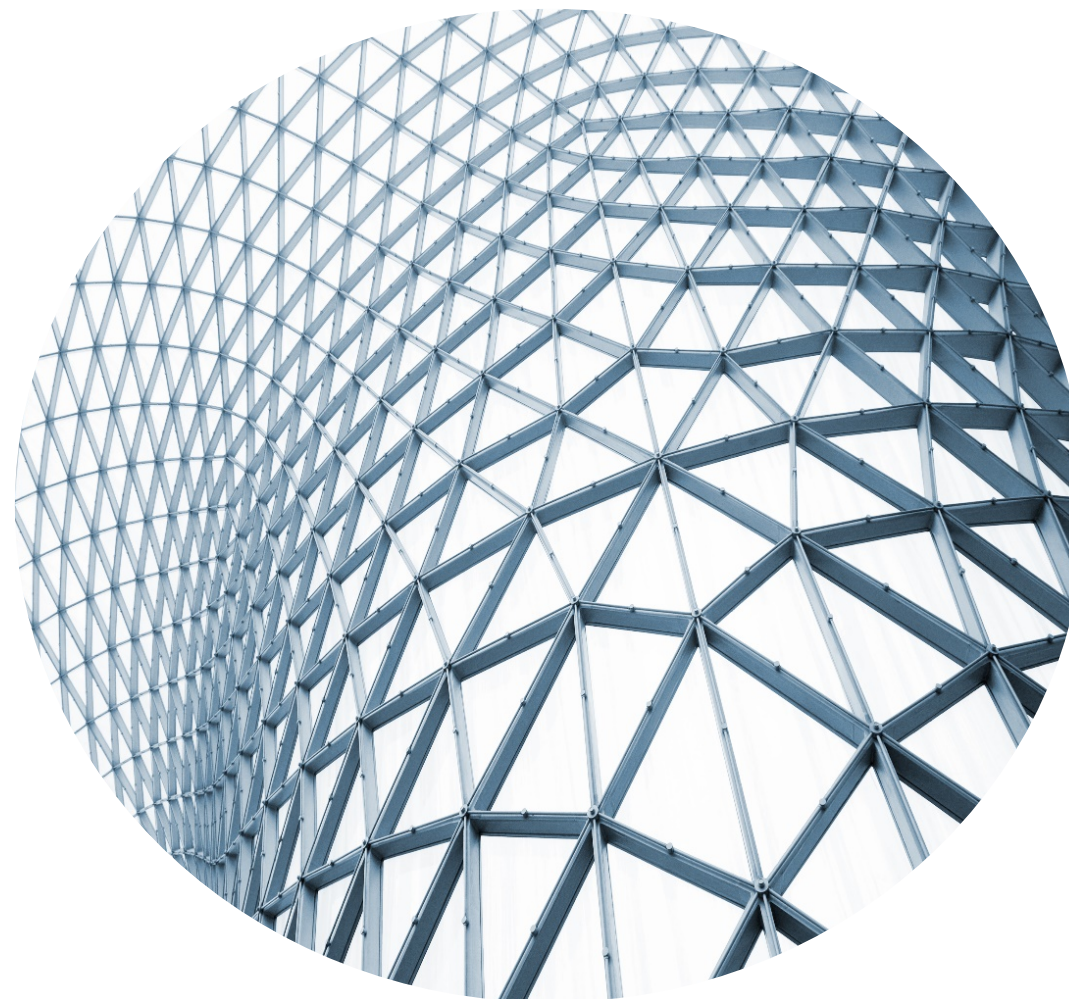
MISSION

MATERIAS[®]

ideas come to life

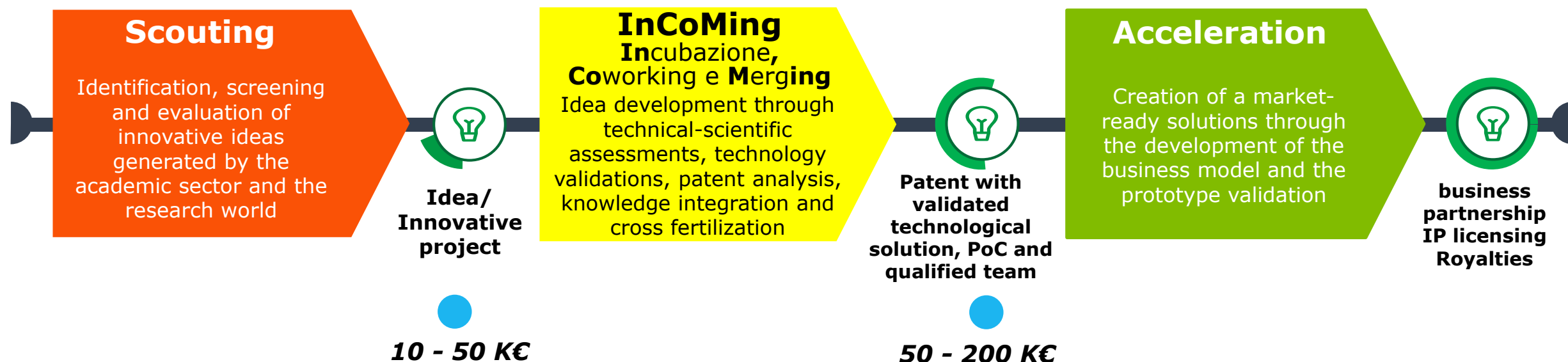
We support ideas become reality

Materias, through the connection of the research world with industrial companies, aims to create new businesses, supporting the development of innovative solutions in the advanced materials sector and accelerating their market entry



A NEW VALUE GENERATION MODEL IN THE ADVANCED MATERIALS SECTOR

Materias

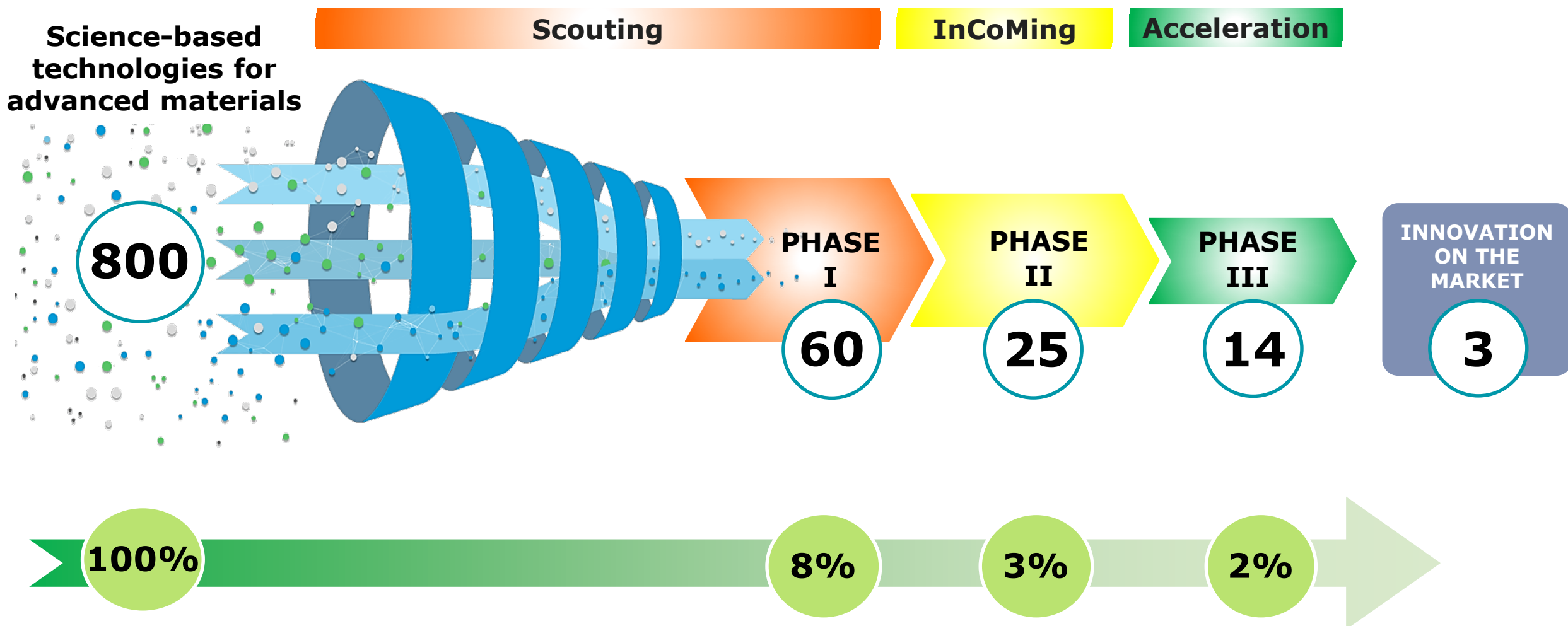


Revenues Streams

- ✓ Continuous scouting service on different technologies
- ✓ Vertical scouting service on specific technologies

- ✓ Startup exit
- ✓ Commercial agreements on proprietary technologies
- ✓ IP Sharing/Licensing
- ✓ IP Royalties
- ✓ Scientific Advising

Materials Scouting Funnel at 30th month



MATERIAS PATENT PORTFOLIO

**9****Italian patent****5****PCT extension****5****Exclusive License**

INNOVATION ECOSYSTEM

The Materias innovation ecosystem consists of institutions belonging to the **research world**, such as **Universities** and **research centers**, and the **industrial corporate network**. Materias cooperates with companies that offer professional **legal** and **business development services** to stand out as the **only technology transfer program** linked to **Advanced Materials** in the national and international landscape



Universities



IRCCS



Research Centers

Partners



World class expertise founders



Institute Biochimique SA

Mpa Development Ltd

Professional Partners

Bio4Dreams

enel

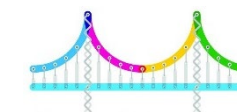
INTESA



SANPAOLO



Italcementi
HEIDELBERGCEMENT Group



Campania NewSteel

INVITALIA



ALTERNATIVE CAPITAL PARTNERS

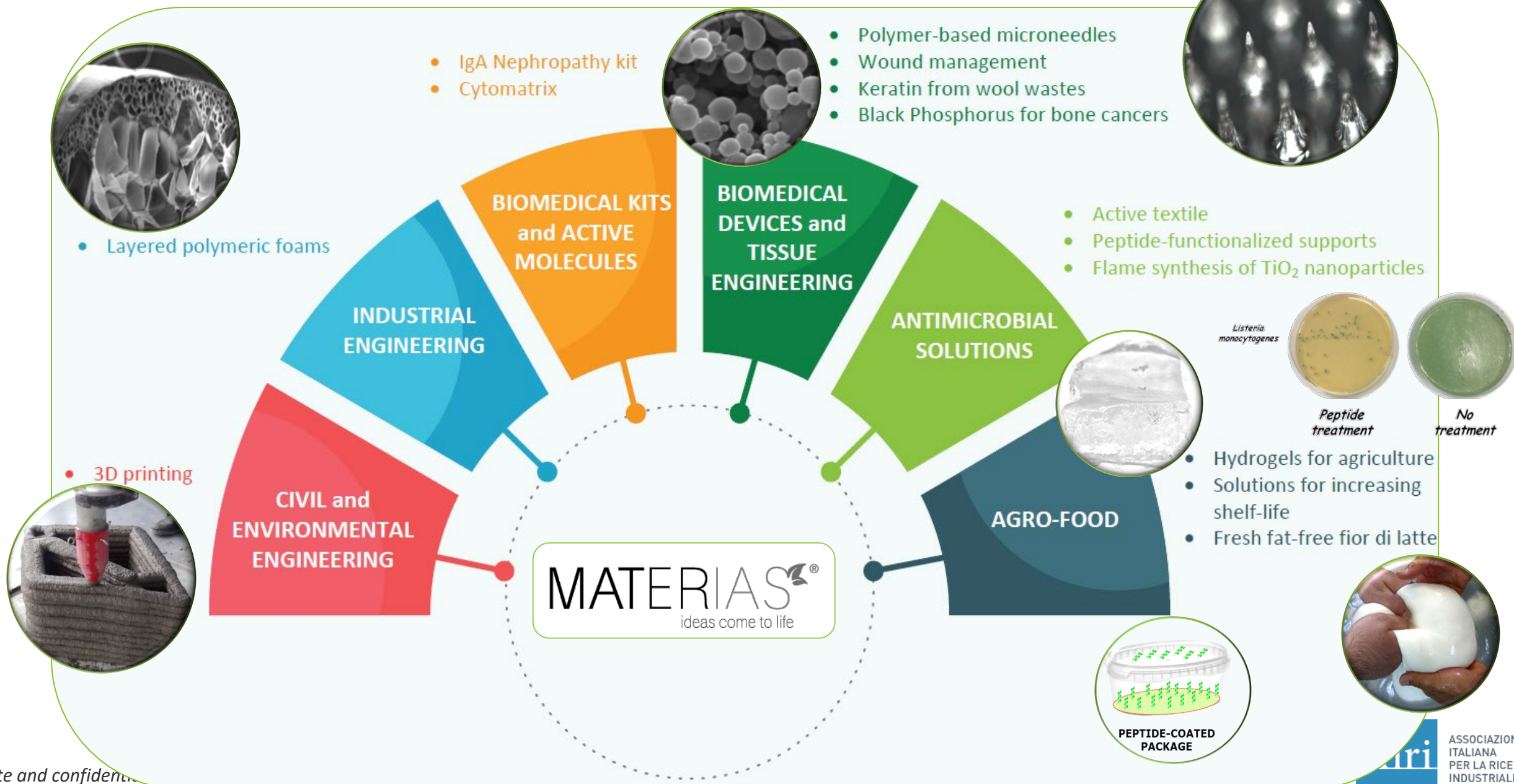
Deloitte.

CASH 国科控股
CAS HOLDINGS

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PER LA RICERCA
INDUSTRIALE

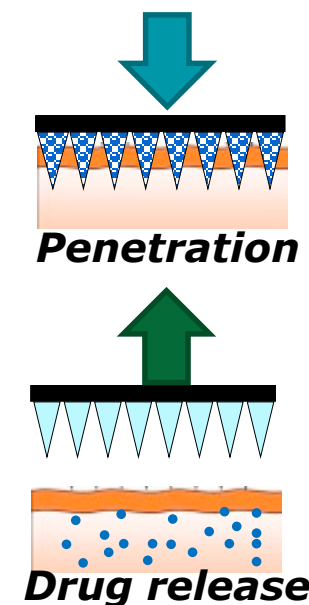
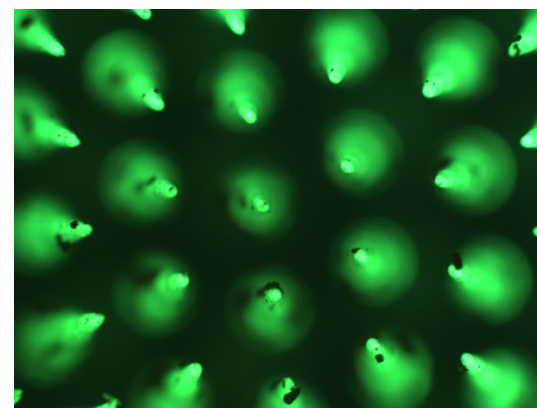
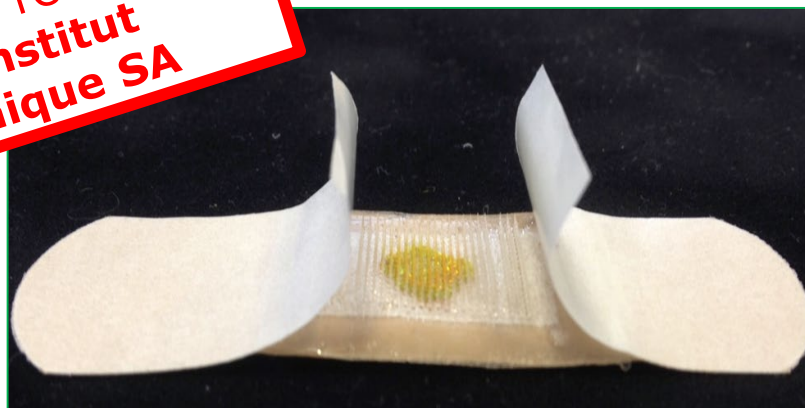
Technological Platforms





Polymer-based microneedles arrays for local drug delivery

**SOLD TO
IBSA Institut
Biochimique SA**



Fabrication of polymeric **microneedles** (MNs) by an **innovative photolithographic approach** that allows fine tuning of geometrical parameters.

Biodegradable and biocompatible microneedles could be used for painless **local drug administration**. These devices are based on a porous silicon free-standing membrane, using, for example, polyethylene glycol and a commercial photo-catalyzer.

The porous silicon multilayer not only increases the storage of a relevant amount of the drug, but also offers a continuous, naked-eye monitoring of the drug delivery process.

International patents filed:



- Italian patent "A device for transdermal delivery of active molecules, uses of the device and methods for producing the device and its components" (IT102017000048421). Applicant Materias, 04/05/2017
- International PCT Extension (PCT/IB2018/052410) 06/04/2018

**SOLD TO
IBSA Institut
Biochimique SA**



Polymer-based microneedles arrays for local drug delivery

- Operational headquarter:


Altergon Italia Srl
Zona Industriale A.S.I.,
Morra De Sanctis - 83040 Avellino

- Objective: development and production of microneedles for drug delivery

- The IP was acquired by agreement



through a patent transfer

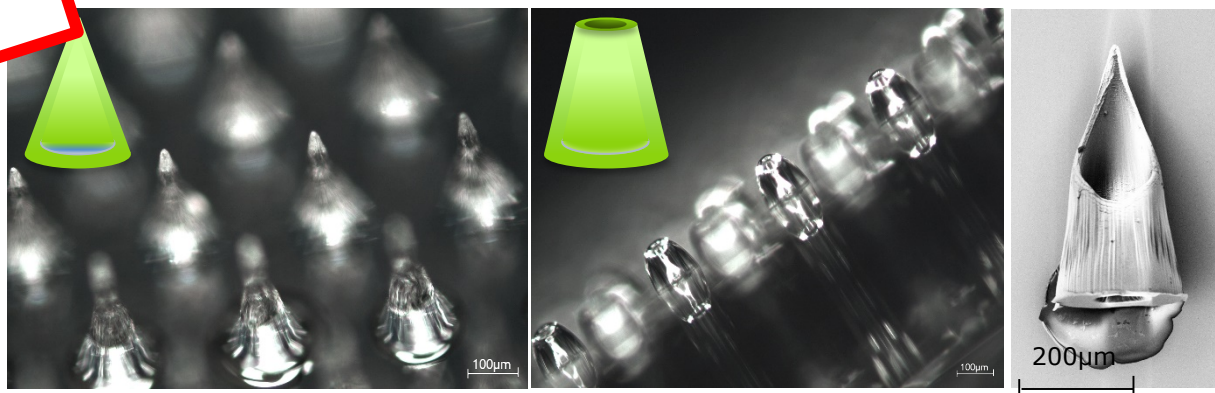
- The technology will be enhanced and developed by  in Campania Region





Hollow polymer-based microneedles for drug delivery into skin

SOLD TO
IBSA Institut
Biochimique SA



The patented technology allows to realize through a simple single-step process biocompatible polymeric hollow microneedles for the **transdermal administration of active molecules and/or for the sampling of biological fluids**.

The microneedles are mechanically strong to penetrate skin, increasing the permeability of encapsulated drug through skin. Moreover, the drug release from microneedles, can be thermally activated, through the variation of the permeability.

The drug diffuses from the drug reservoir (microneedle backplate) via the microneedles into the skin.



Italian patent filed:

Italian patent "Hollow microneedle for transdermal administration of active molecules and/or for sampling organic fluids and methods for producing the device and its components" (IT102018000006526). Applicant Materias, 20/06/2018



3D printing of reinforced concrete elements



Additive manufacturing and 3D printing are having an impact on industrial production in many fields, and provide a new way to fabricate objects and components.

A novel approach to the **fabrication of reinforced concrete (RC) members based on 3D printing technology of concrete** has been developed and patented.

This technology **is expected to save up to the 50% of concrete** and to **facilitate the production of curved elements with variable cross-section**

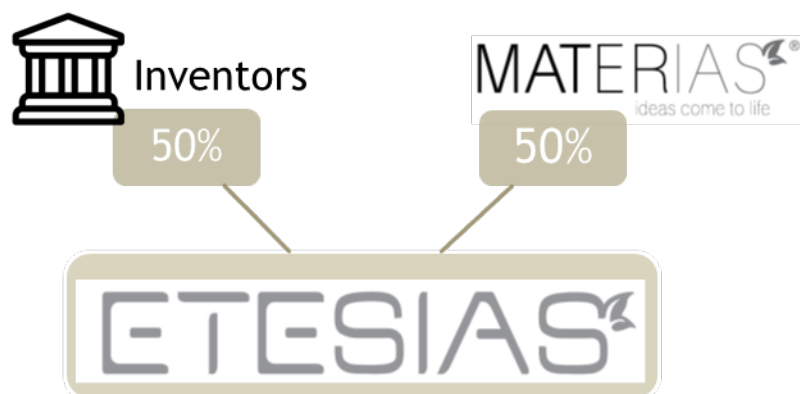
International patents filed:



- “Cementitious composition for three-dimensional printing of reinforced concrete material structures” (MI102016000077435) 22/07/2016.
- “Structure of reinforced cementitious material and process of making the same structure by a three-dimensional printing process” (MI102016000077424) 22/07/2016
- International PCT (PCT/IB2017/054402) 21/07/2017

3D printing of reinforced concrete elements

THE STARTUP



- Objective: full development of the technology in order to create a hub for prototypes and new know-how in collaboration with **Italcementi** HEIDELBERGCEMENT Group

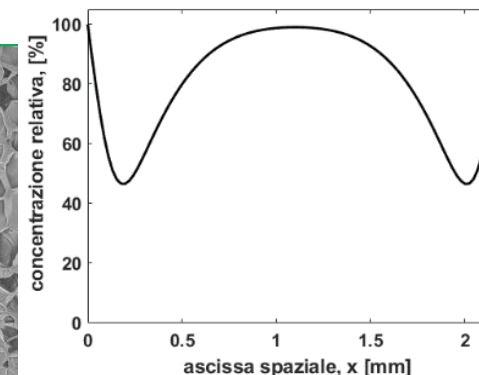
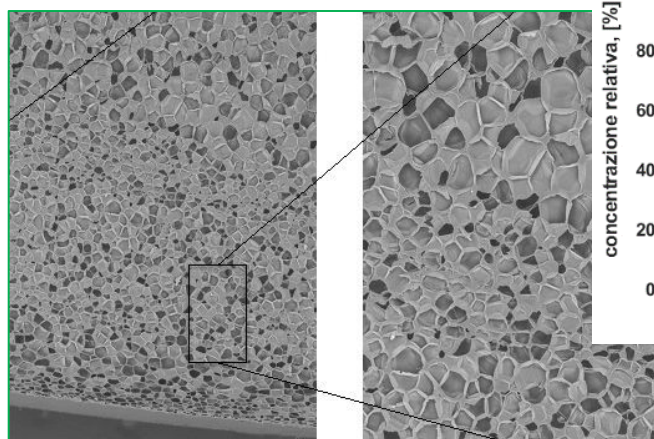
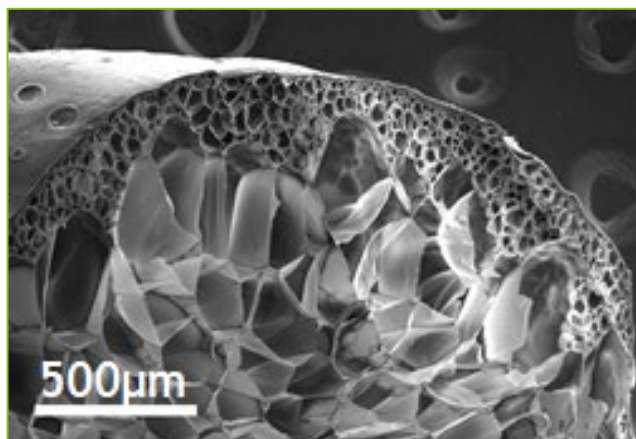
- Operational headquarter:

University of Naples "Federico II",
Campus di San Giovanni a Teduccio,
Corso N. Protopisani, 50 – 80146 Naples





Manufacturing layered polymeric foams for industrial engineering applications



A method for making layered expanded polymeric materials (also called porous solids or foams), both in terms of cell morphology and density. The process is based on a **solubilization procedure of physical expanding agents**, necessary for subsequent expansion, characterized by variable conditions over time. In particular, variable time conditions of the solubilization step generate in the polymer non-uniform profiles of the concentrations of physical blowing agents. Possible applications are: sport equipment (NFL helmets, shin guards, shoe soles), car interiors (sound and thermal insulation), packaging, structural foams.



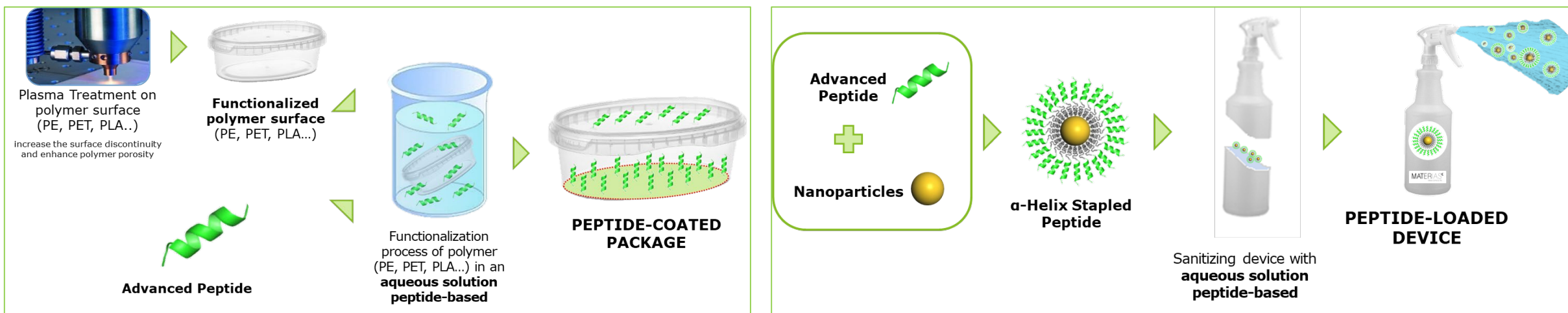
International patents filed:

- Italian patent “A process for preparing layered foamed polymeric materials” (IT102018000004727) Applicant Materias, 19/04/2018
- International PCT Extension (PCT/IB2019/050068) 04/01/2019



Antimicrobial peptide

Food-packaging solutions and Sanitizing products



Antimicrobial peptides can be used as **bactericidal** and **antibiofilm agent** for all Gram+ (especially Listeria) and Gram- bacteria, once **immobilized on organic** (plastics and polymers) or **inorganic** (metals, semiconductors and insulators) **substrates**, for agro-food, biomedical and pharmaceutical applications.

Packaging materials peptide-derivatized were developed to increase the shelf-life of the packaged product and food safety.

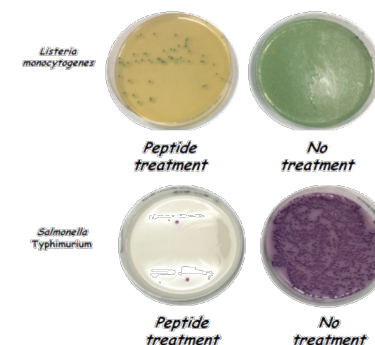
New multifunctional products (medical devices, sanitizing formulations in liquid phase or spray) peptides-derivatized were developed for the sanitation for example of working environment.



International patents filed:

- Italian patent "Antimicrobial peptides" (IT102017000080068) Applicant Materias, 14/07/2017
- International PCT Extension (PCT/IB2018/052567) 13/07/2018

ANTIBACTERIAL ACTIVITY TESTING



THANK YOU

La Luce della Scienza cerco e 'l
beneficio (Leonardo da Vinci)

*I'm looking for the Light of
Science and its benefit*



Leonardo da Vinci
CNR (Rome), Sala Marconi – A. Achilli 1936-
1937

2019 WILL MARK 500 YEARS SINCE LEONARDO DIED!