MATERIALI VERDI PER UN MONDO PIÙ VERDE

ISTITUTO ITALIANO
DI TECNOLOGIA

Dr. Marco Contardi

Dr. Giacomo Tedeschi

ISTITUTO ITALIANO
DI TECNOLOGIA
SMART MATERIALS

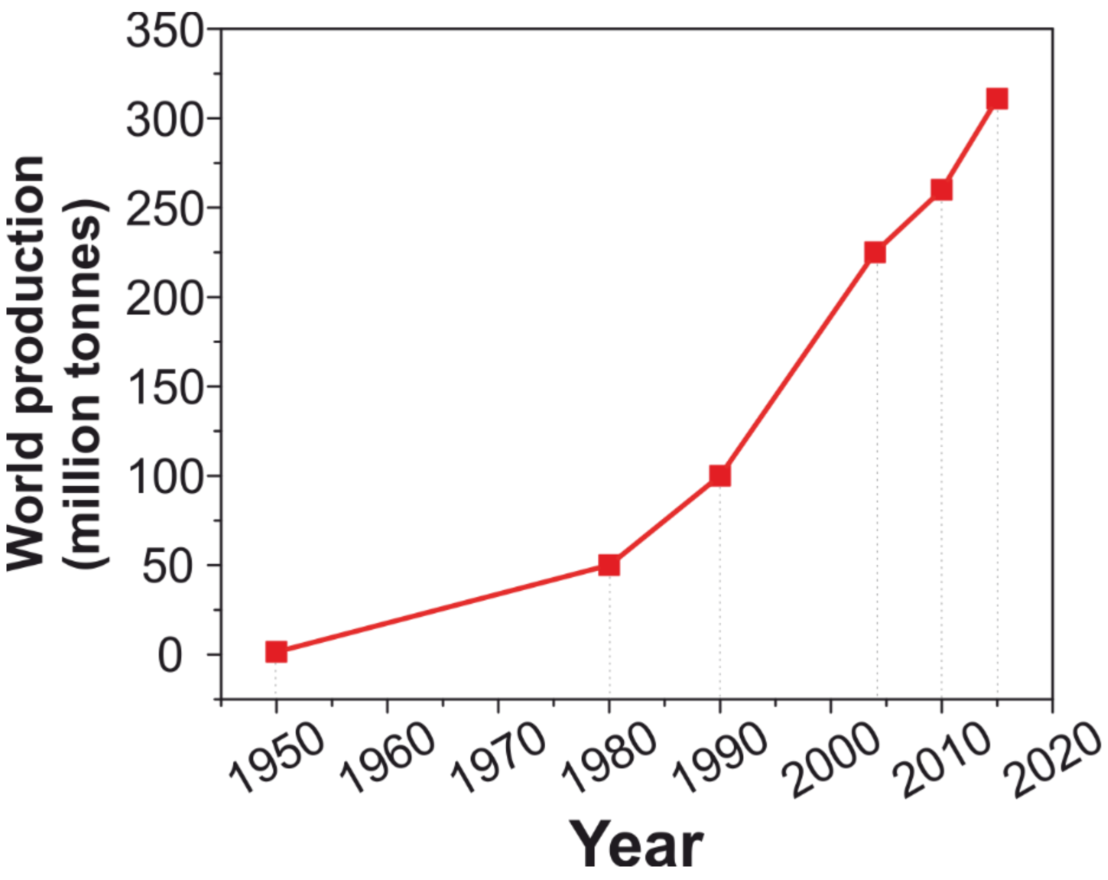
Smart Materials Group

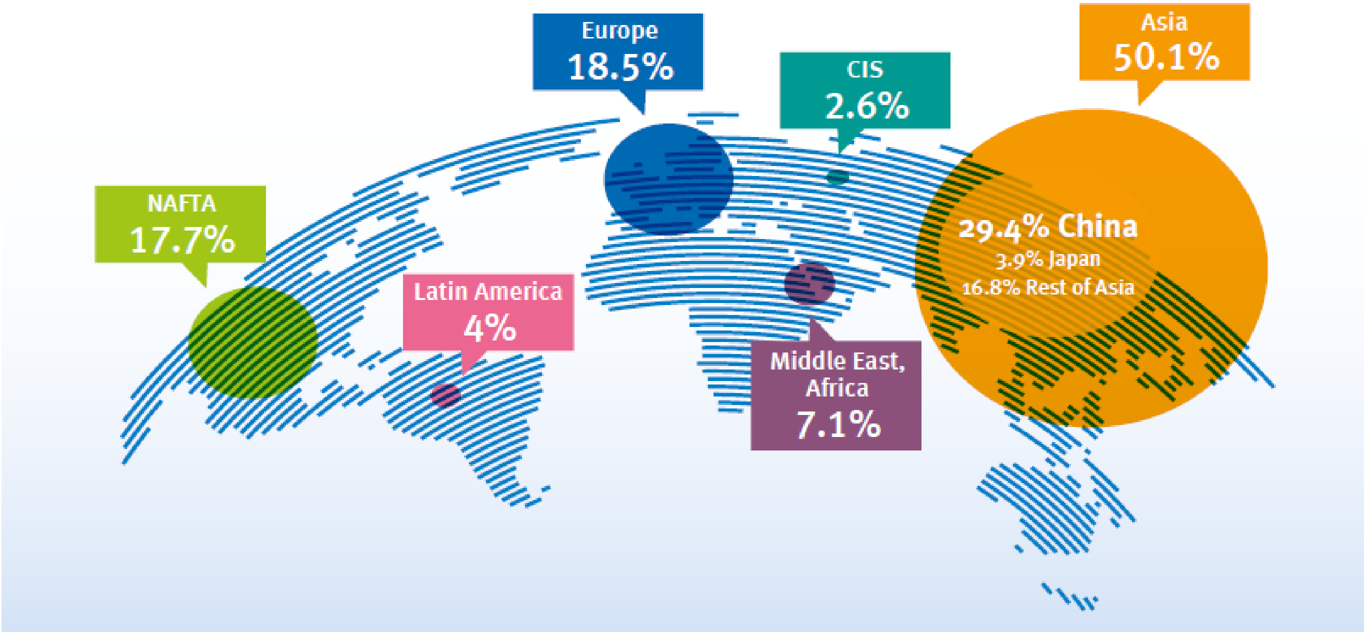
ISTITUTO ITALIANO
DI TECNOLOGIA

Le plastiche sono ovunque…

Tutti i giorni usiamo centinaia di prodotti fatti di plastica.

Produzione mondiale

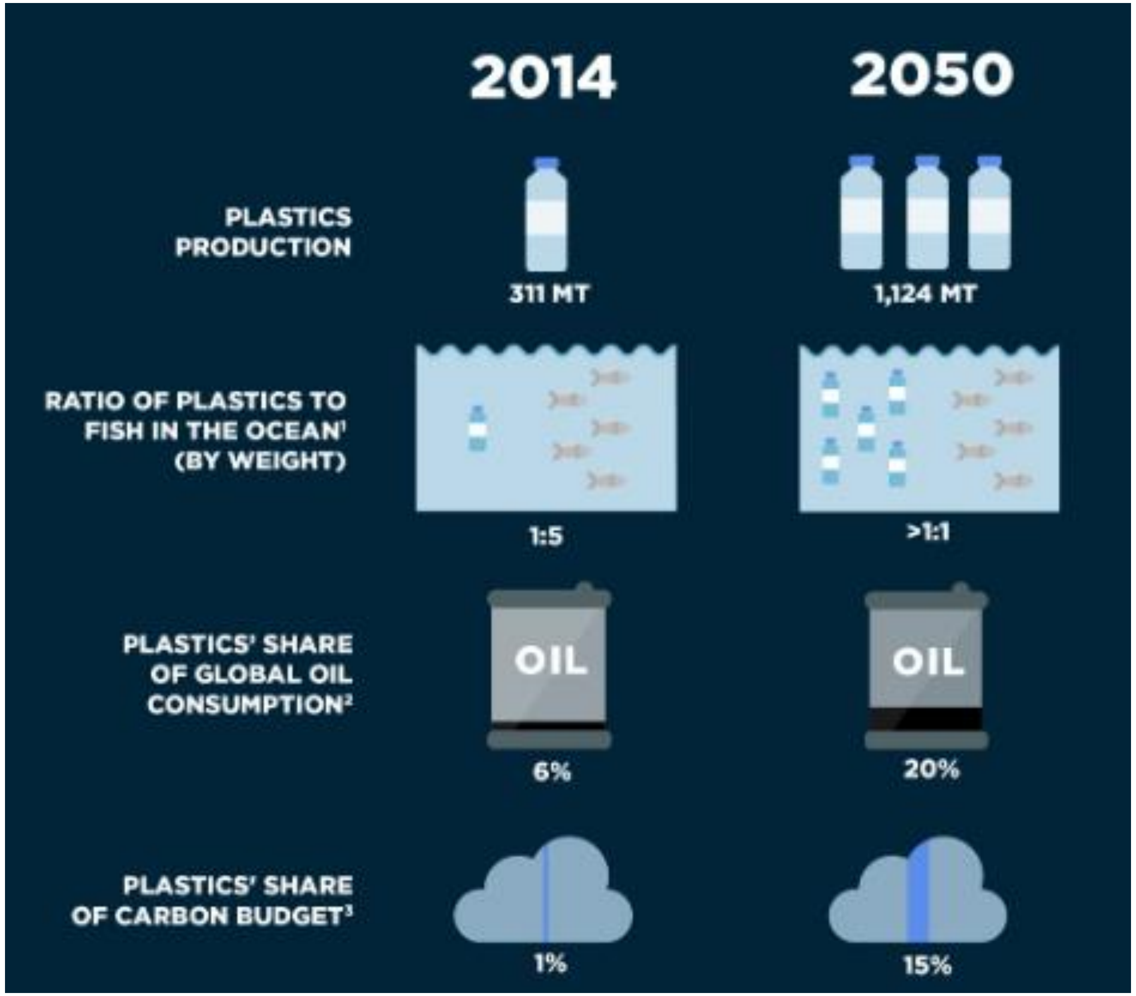


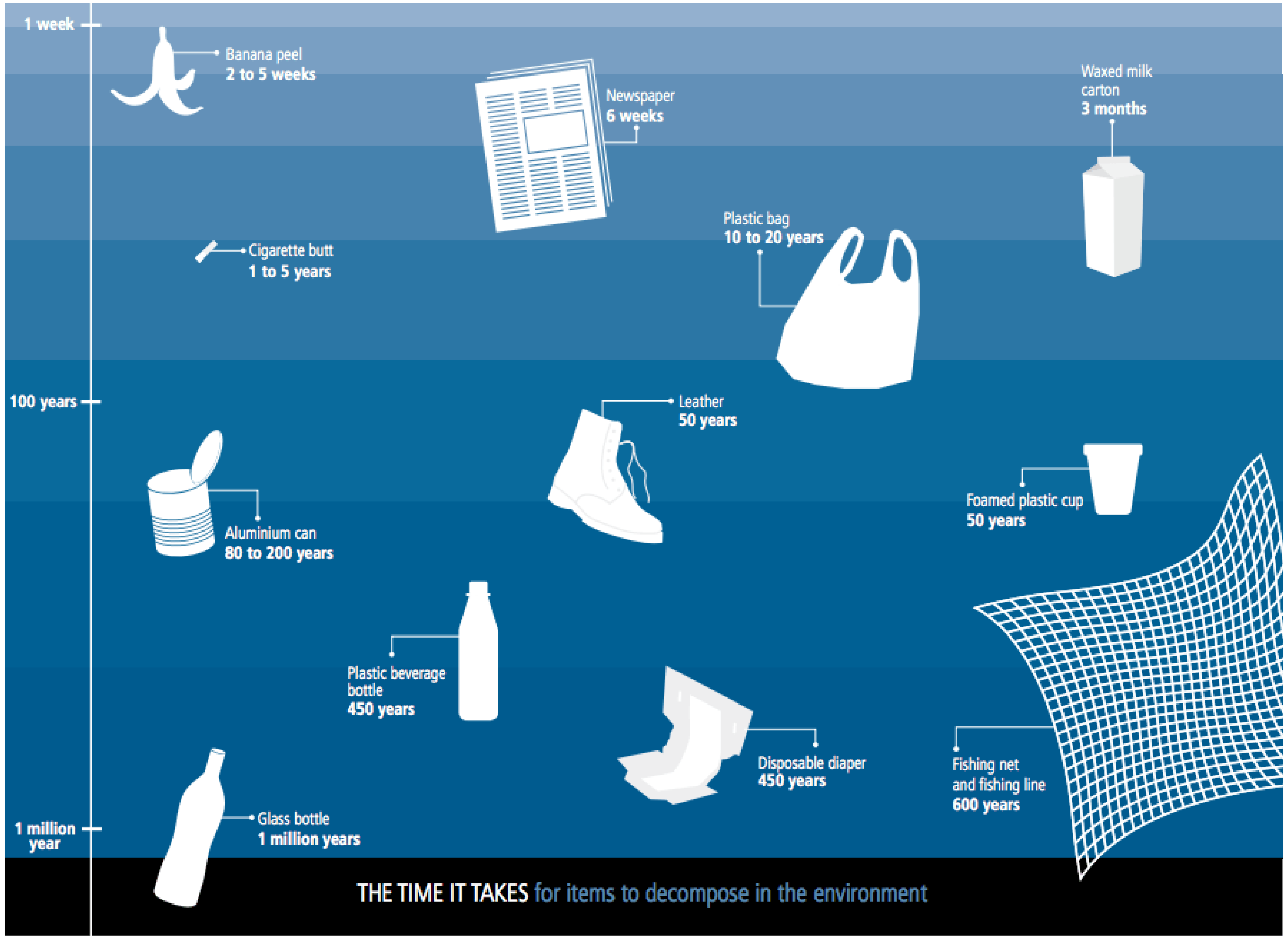


- La produzione mondiale di plastica si è moltiplicata di 20 volte tra il 1964 e il 2016, raggiungendo 348 milioni di tonnellate nel 2017.

Gli usi in Europa

Dove va a finire la plastica?





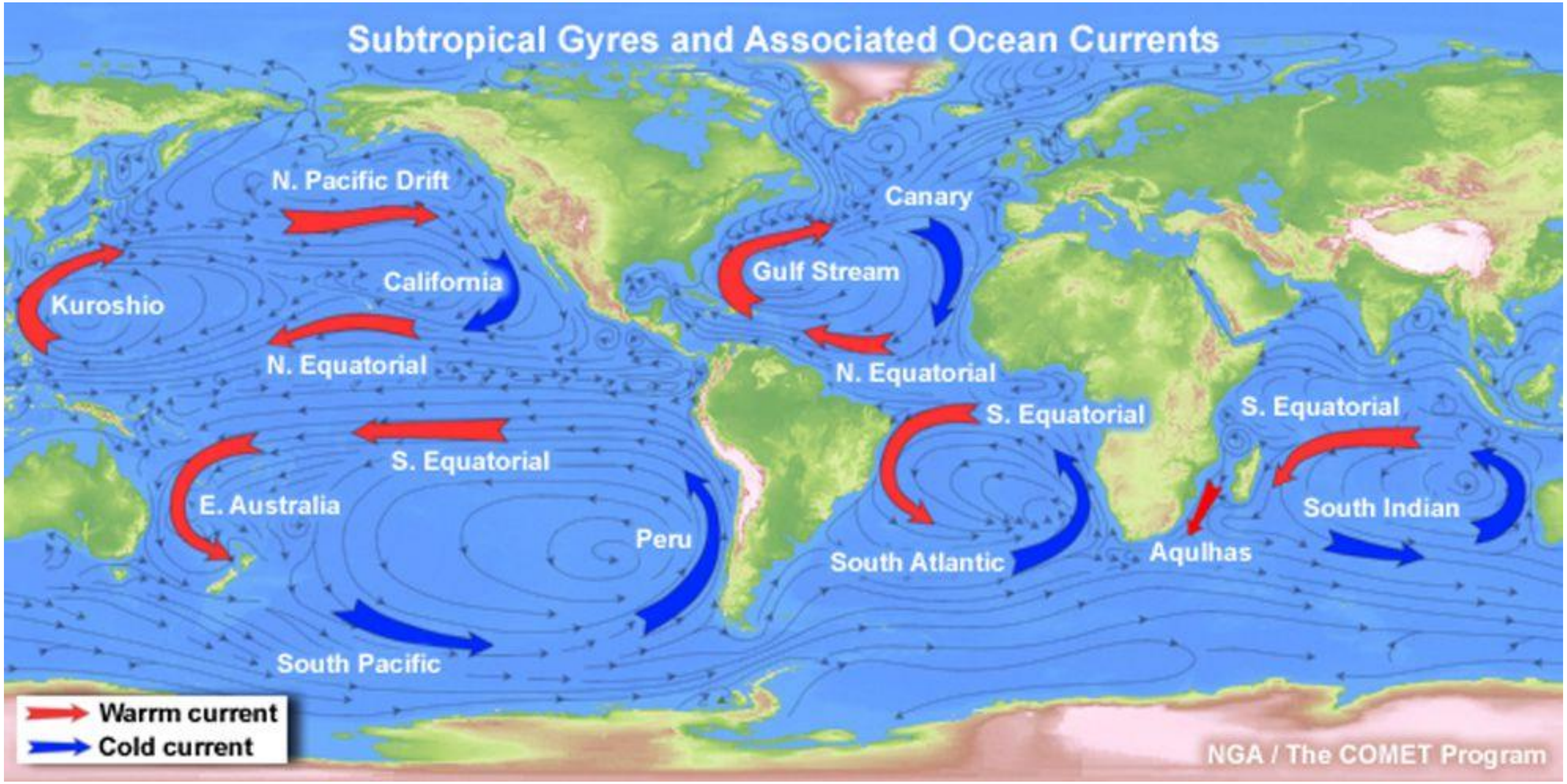
Dove va a finire la plastica?

1955

2019

Dove va a finire la plastica?

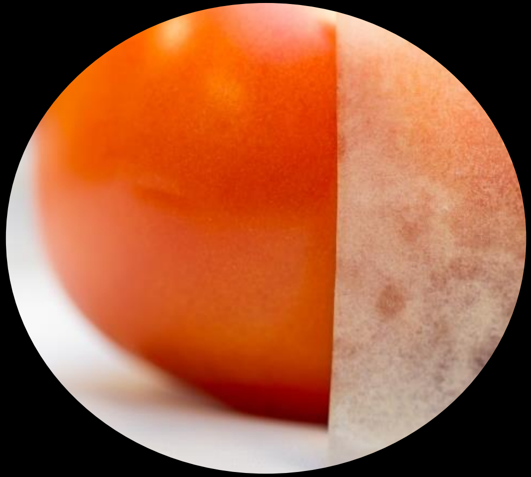
Dove va a finire la plastica?



- La maggior concentrazione di plastica nel mare si trova tra la California e le isole Hawai, un’area di 1.6 milioni di km^2, equivalente a 3 volte la superficie della Francia.

Dove va a finire la plastica?

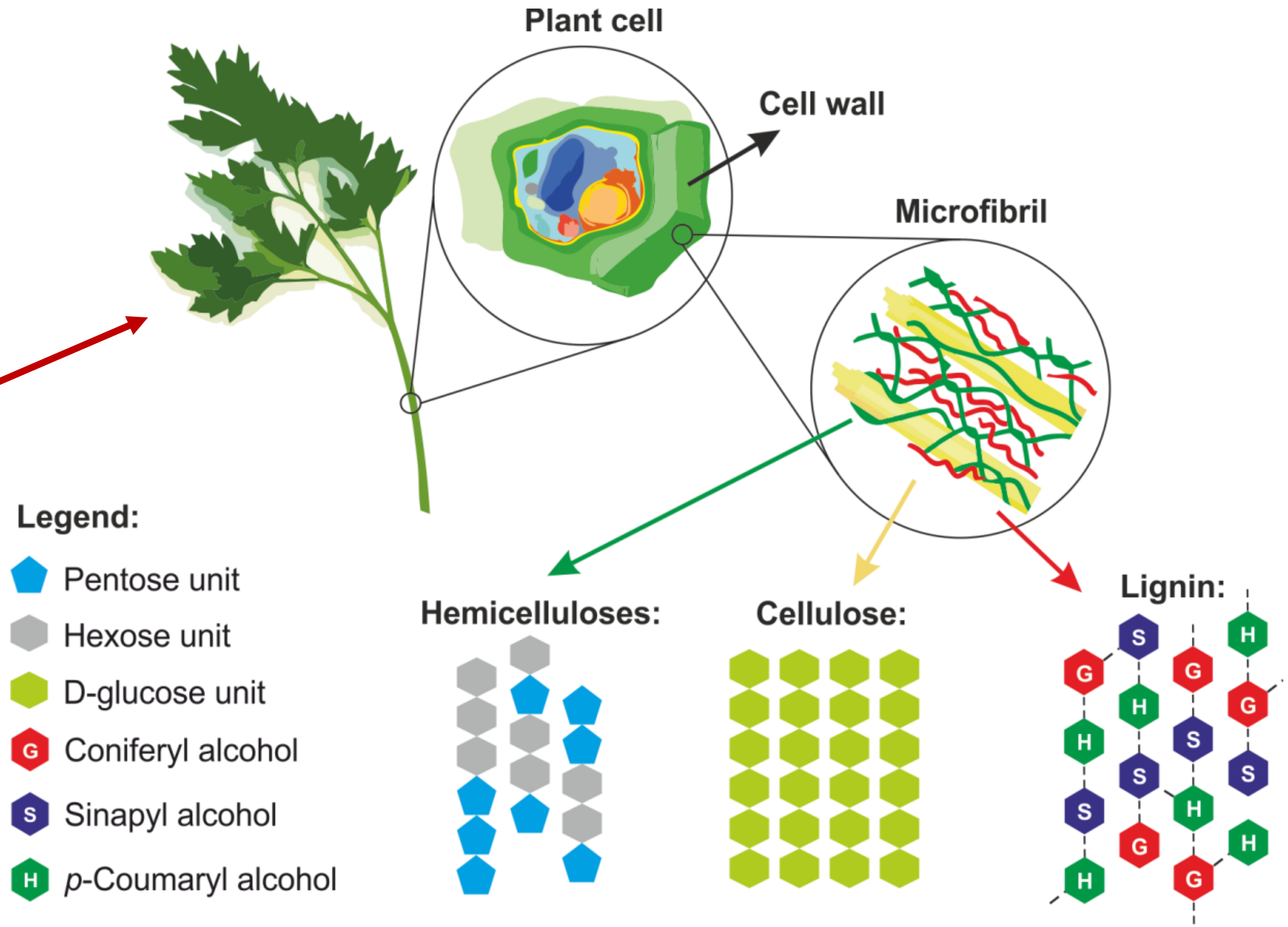
Isola Henderson, Pacifico del sud.



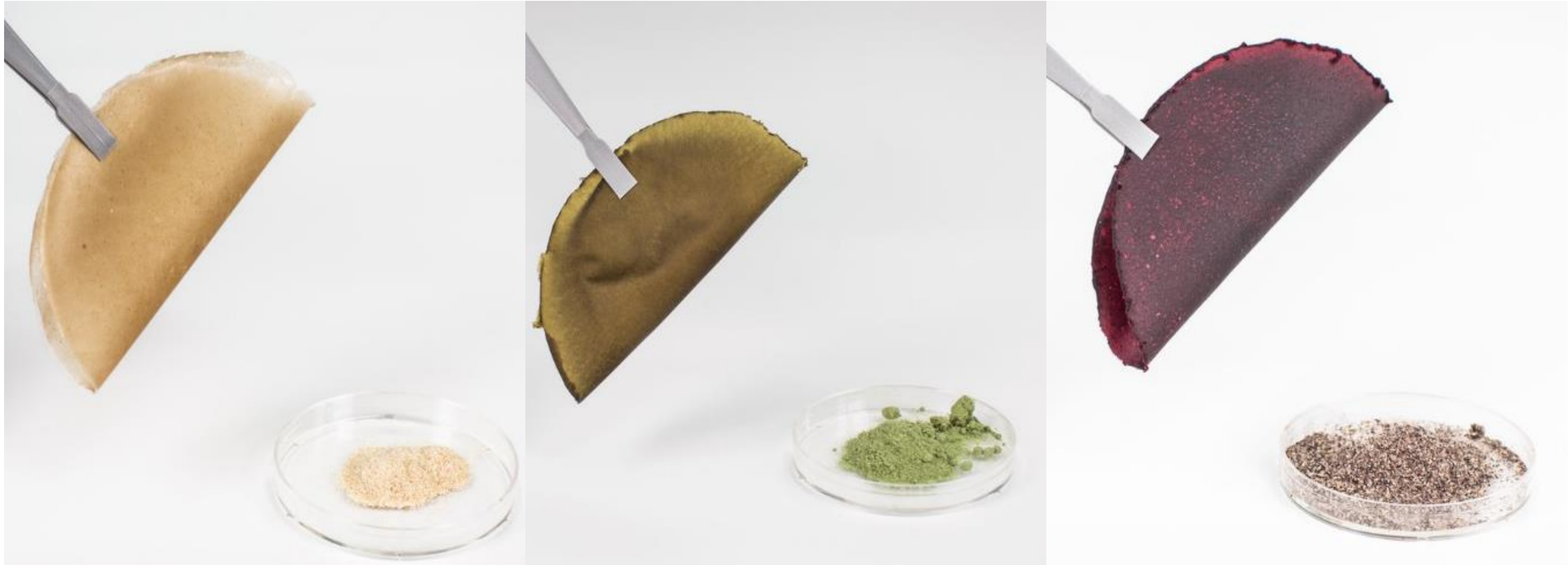
Sustainable biocomposites
from agricultural biomasses

iit SMARTMAT

Le alternative – Bioplastiche da scarti vegetali

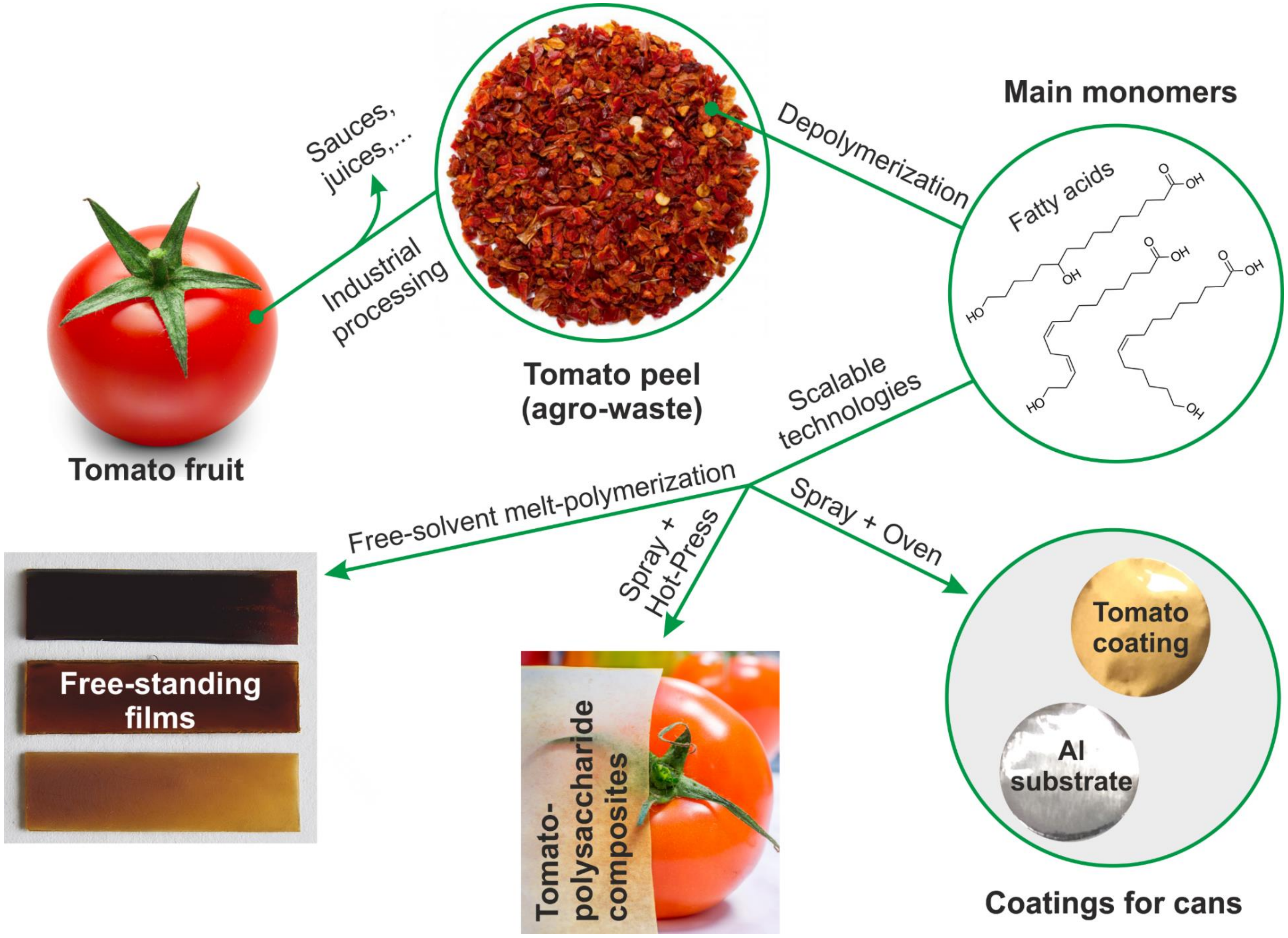


Bioplastiche da scarti vegetali

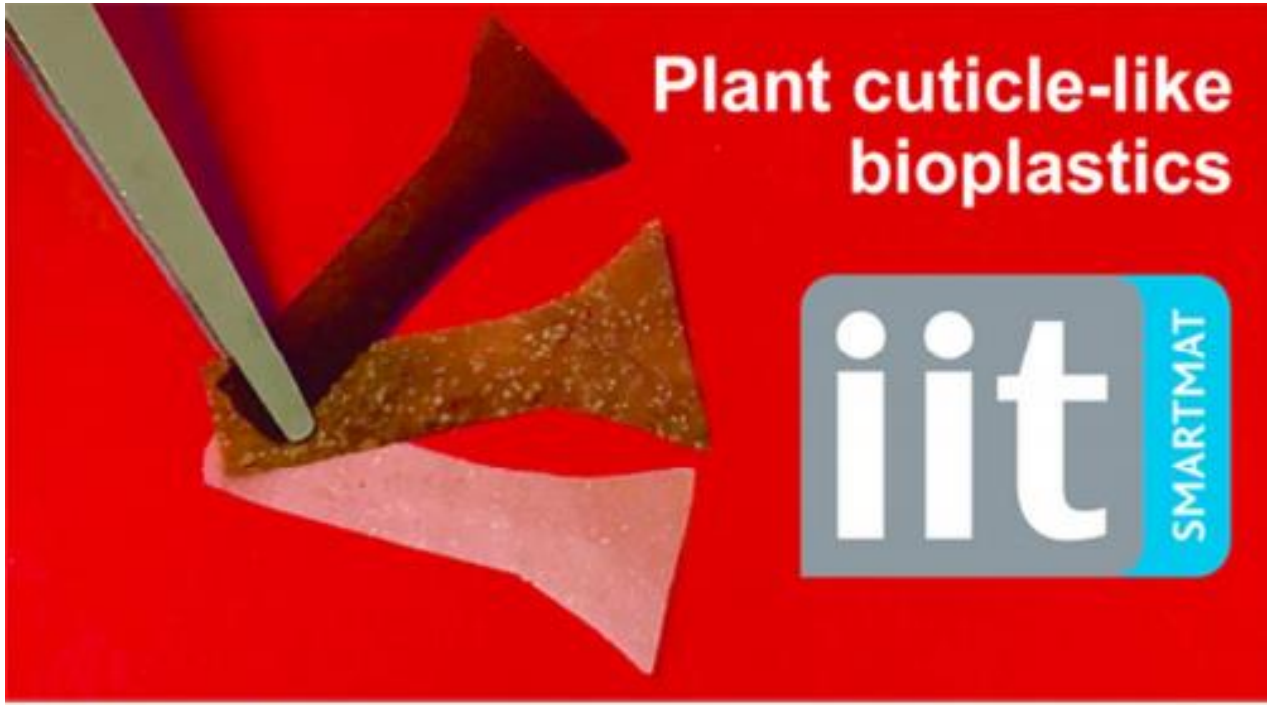


- Possiamo convertire la polvere vegetale in film plastici.
- Nessun sostanza chimica nociva coinvolta.
- Conversione dei rifiuti al 100%.
- Facile da mescolare con altri materiali.
- Caratteristiche interessanti: idrofobicità, proprietà meccaniche, barriera O_2.

Bioplastiche dalla buccia di pomodoro

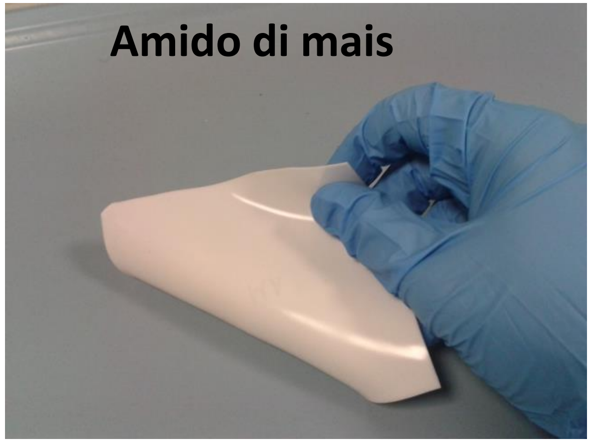


Packaging dalla buccia di pomodoro



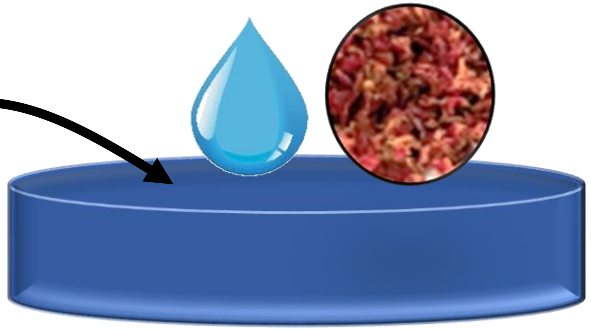
- Questi materiali sono idrorepellenti.
- Aggiungendo cera d'api si possono migliorare sia le proprietà meccaniche sia la permeabilità all'acqua.

Biogomme



Biogomme da scarti vegetali

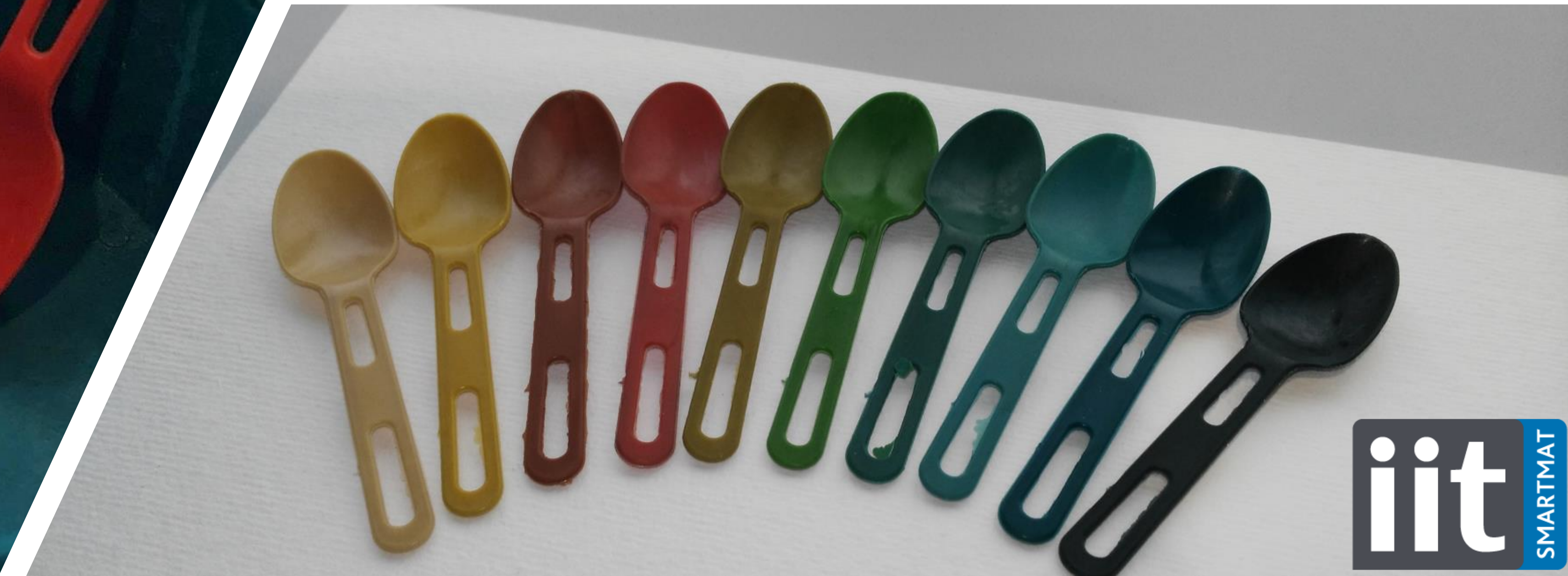
Elastomero di silicone con dei rifiuti



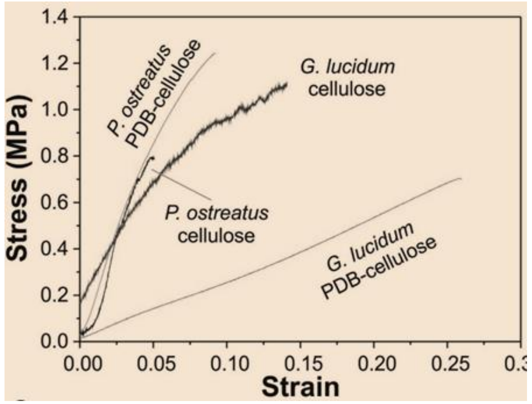
Curing a temperatura ambiente

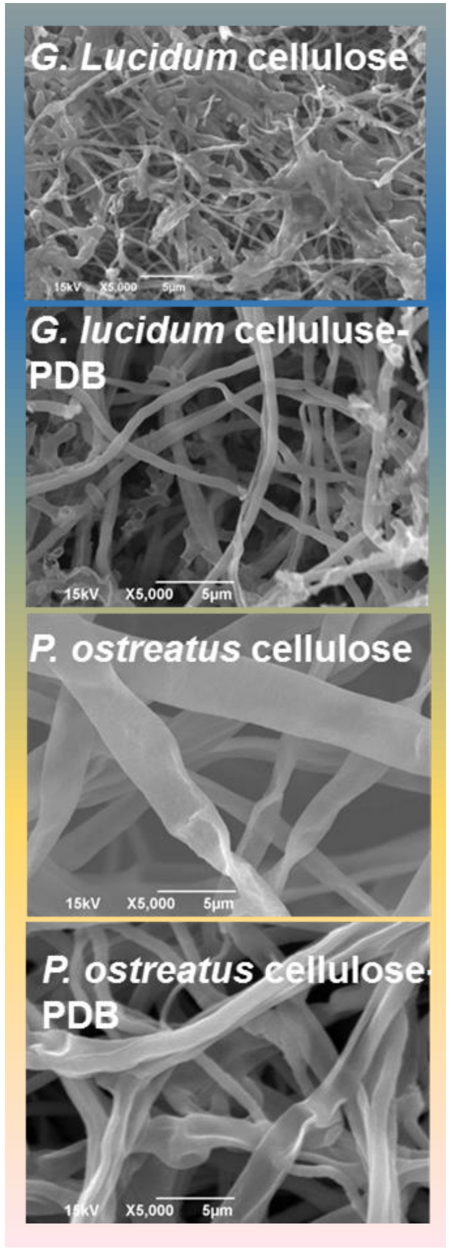

CubePro
scamex
babyplast


novacart


iit
SMARTMAT

Mycelium Self-Growing Materials



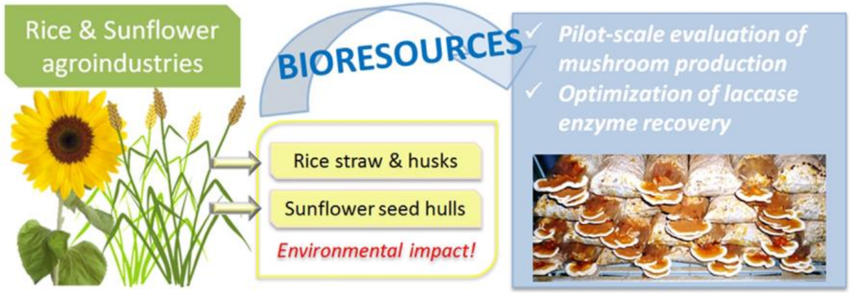


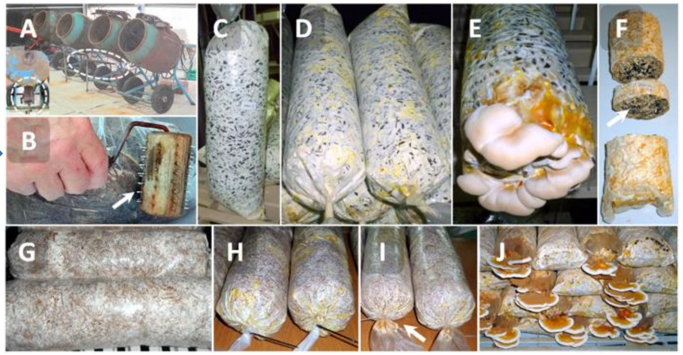
Self-growing, natural composites with properties controlled by their feeding substrate, based on fungal mycelium

TOP 100
- READ ARTICLES -
2017
OFFICIAL AUTHOR
SCIENTIFIC REPORTS

iit SMARTMAT

Circular Economy of Mycelia





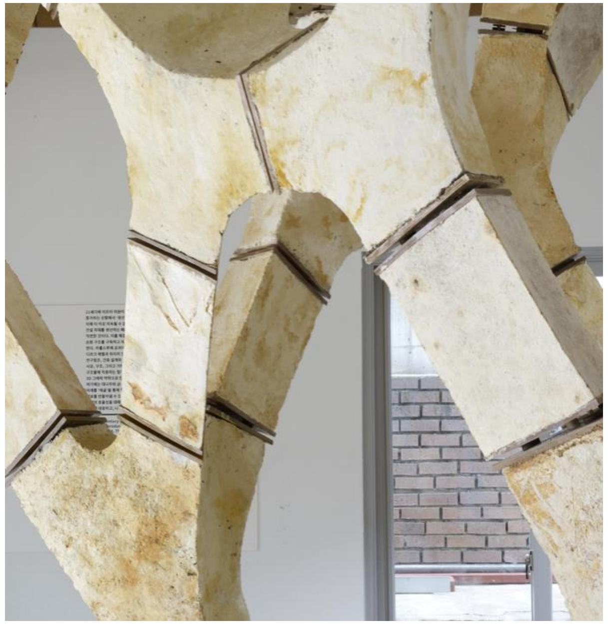
Biomass conversion into medicinal mashrooms

OFFICINA
CORPUSCOLI

ECOVATIVE
DESIGN

- Leather alternatives
- Construction materials
- Vegan alternatives
- Thermal and acoustic isolation

P.D. Postemsky et al., Biores Tech (2017)

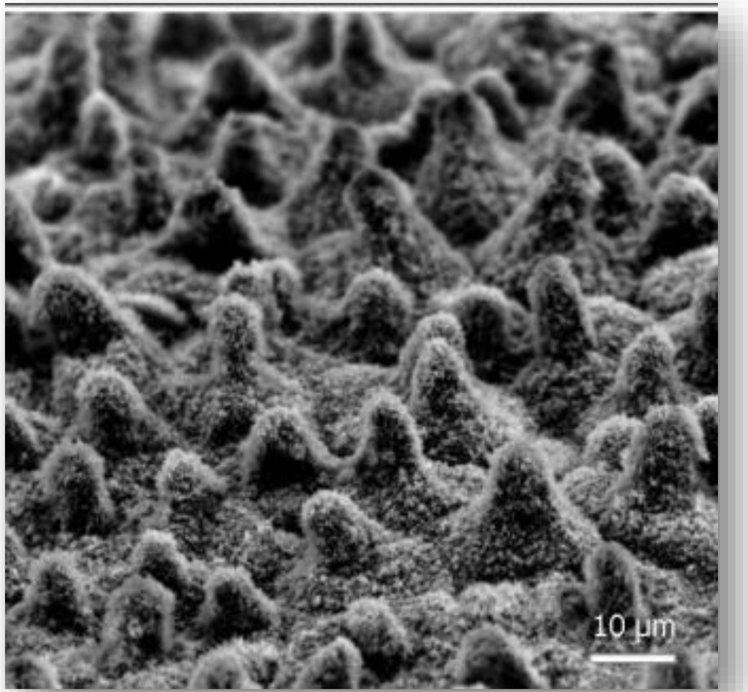


Design at the intersection of technology and biology

Neri Oxman

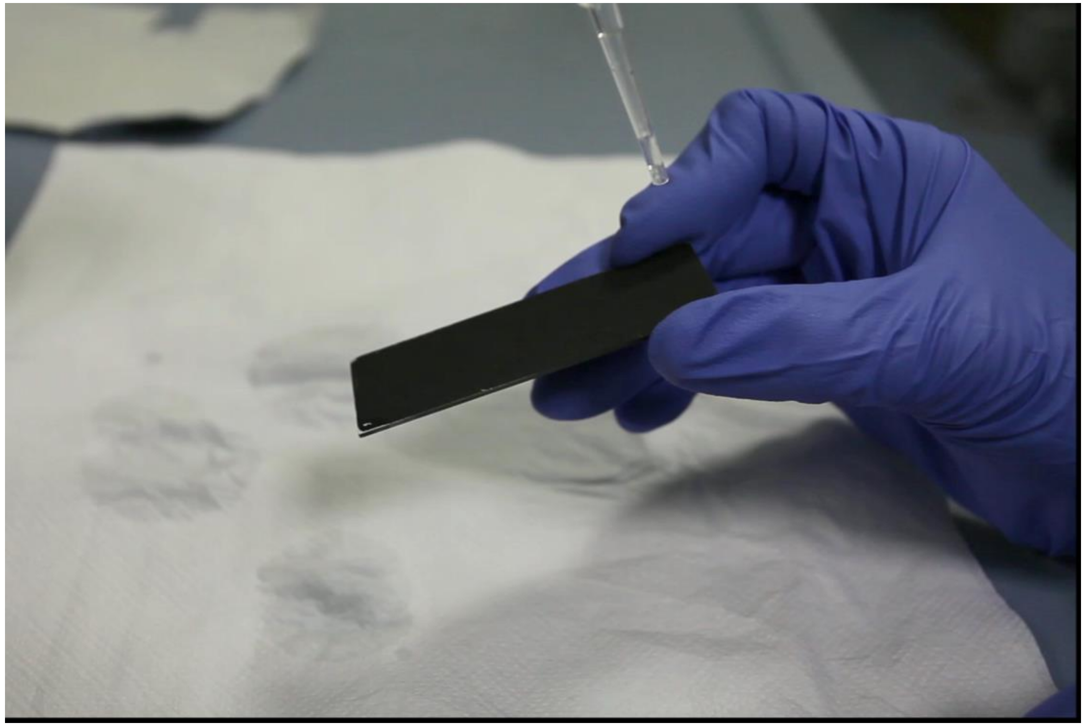
https://www.ted.com/talks/neri_oxman_design_at_the_intersection_of_technology_and_biology/transcript?language=en#t-992887

Superfici superidrofobiche

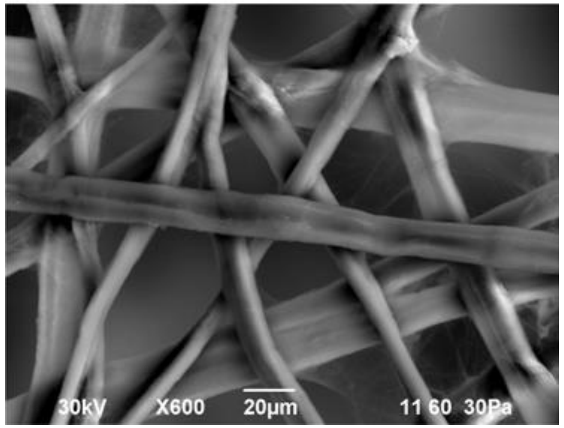


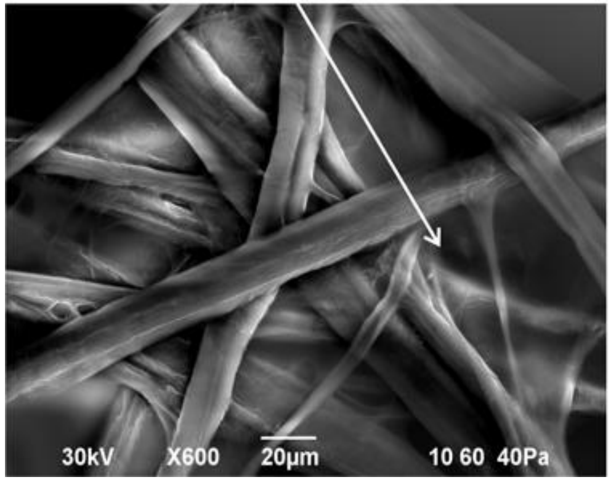
ISTITUTO ITALIANO
DI TECNOLOGIA
SMART MATERIALS

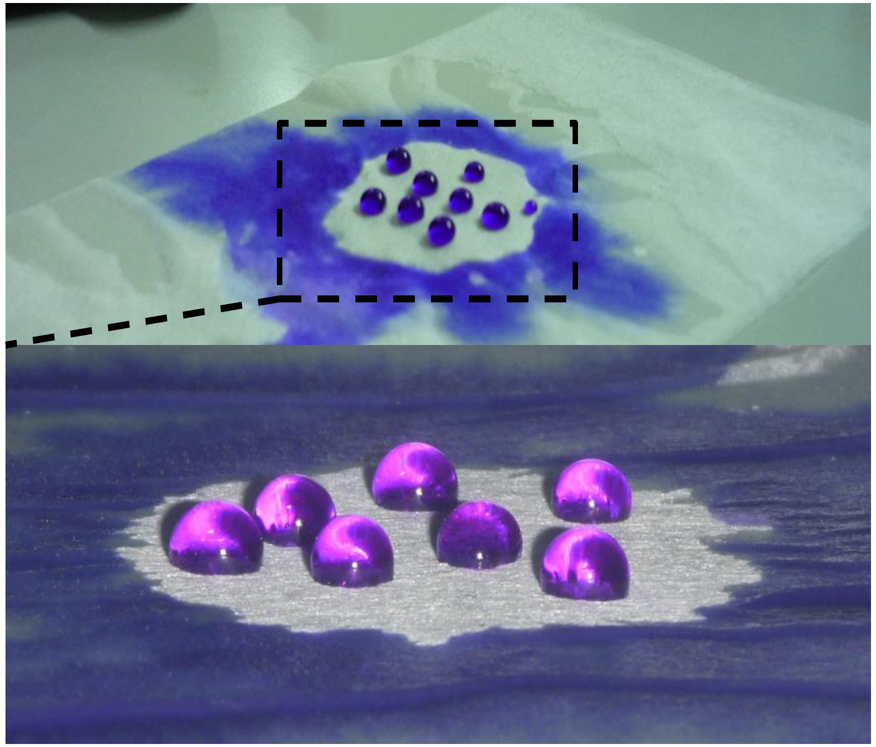
Superfici superidrofobiche

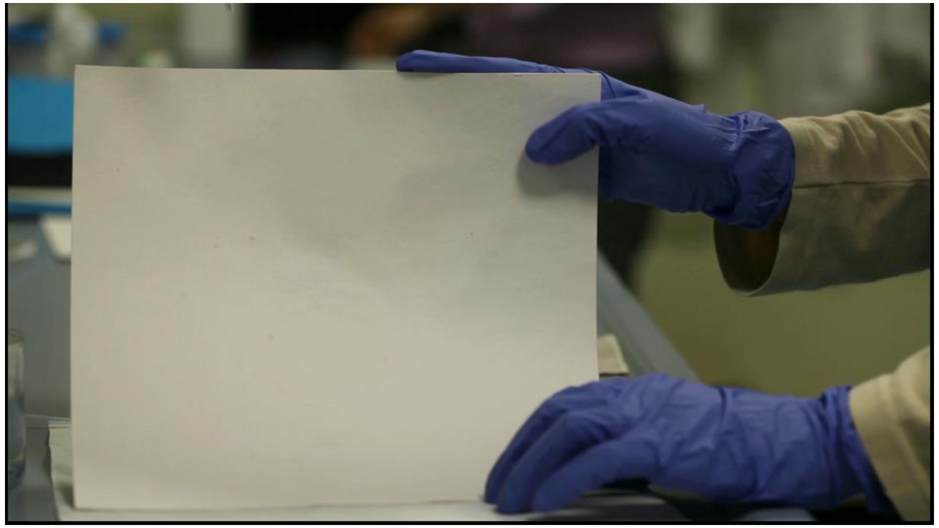


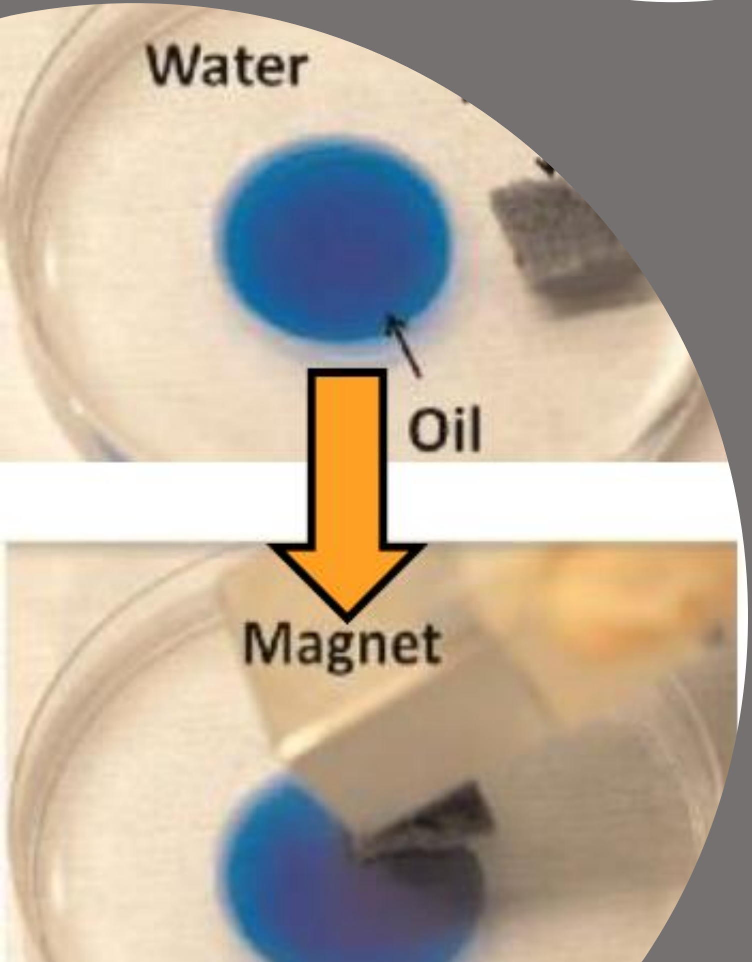
Superfici superidrofobiche

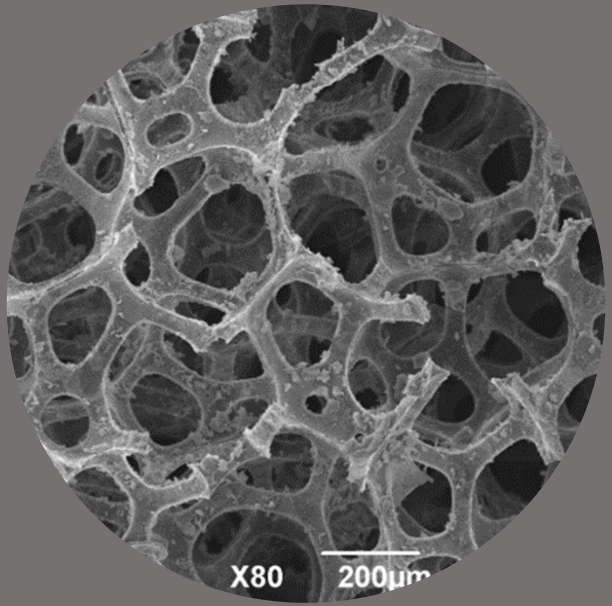


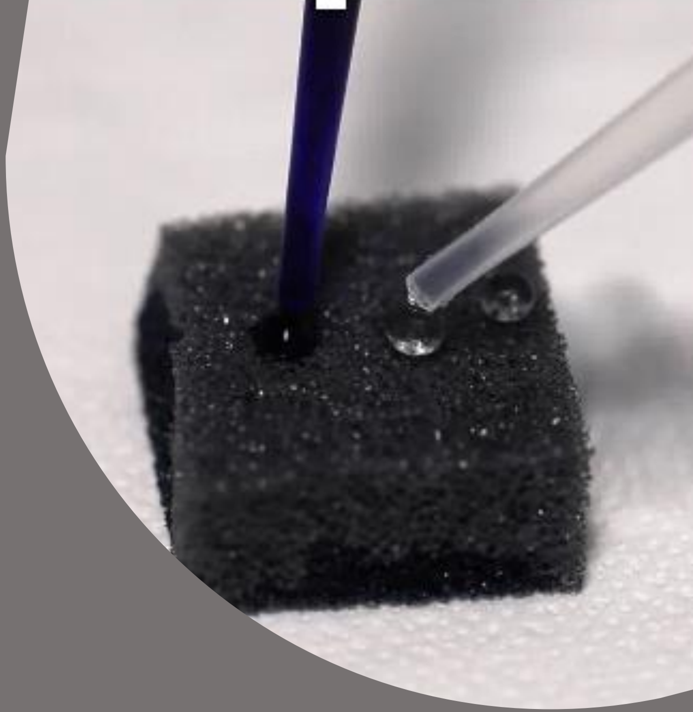




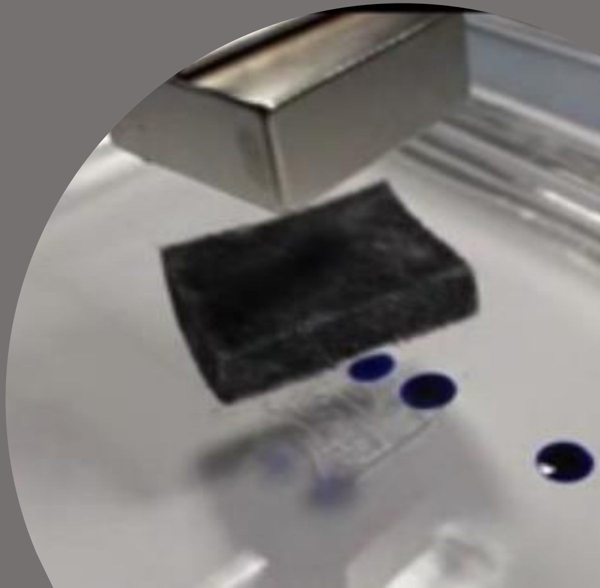








Nanotechnologies for Water Protection & Remediation

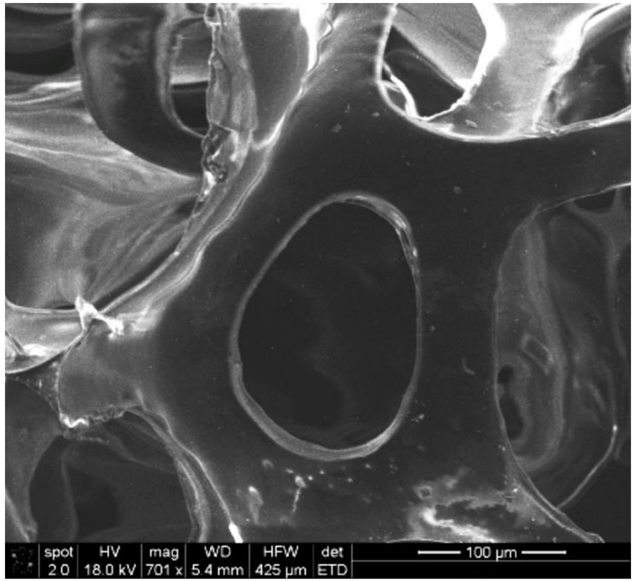


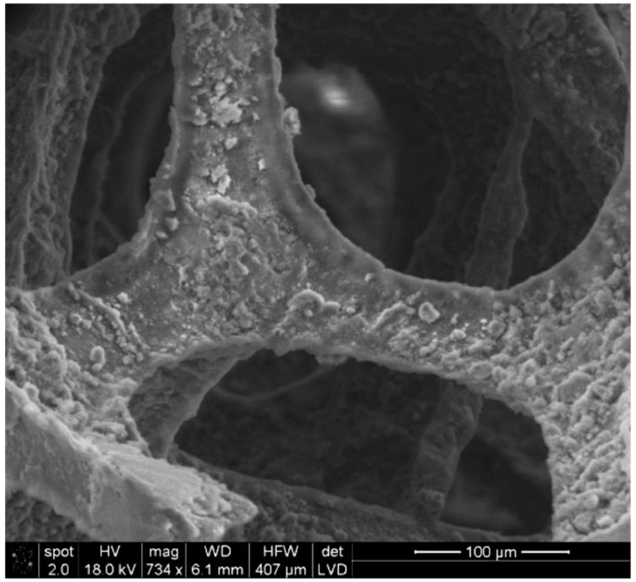
iit SMARTMAT

Inquinamento delle acque

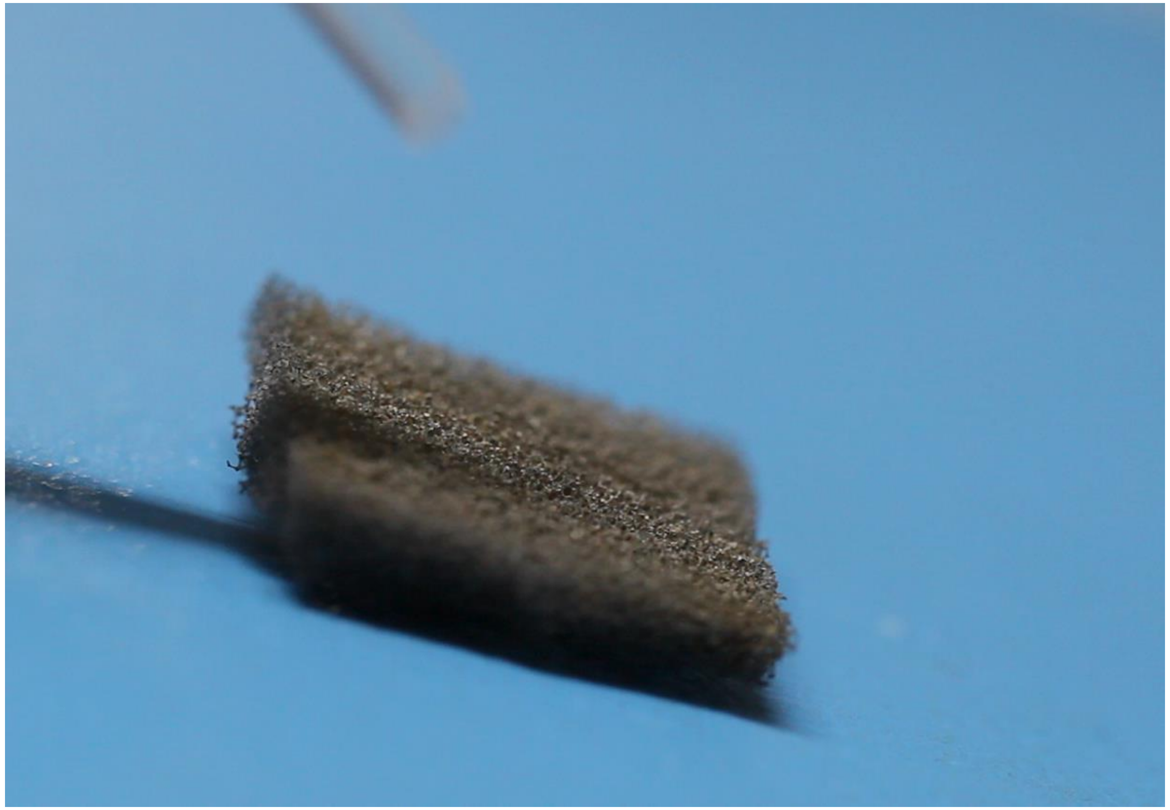
ISTITUTO ITALIANO
DI TECNOLOGIA
SMART MATERIALS

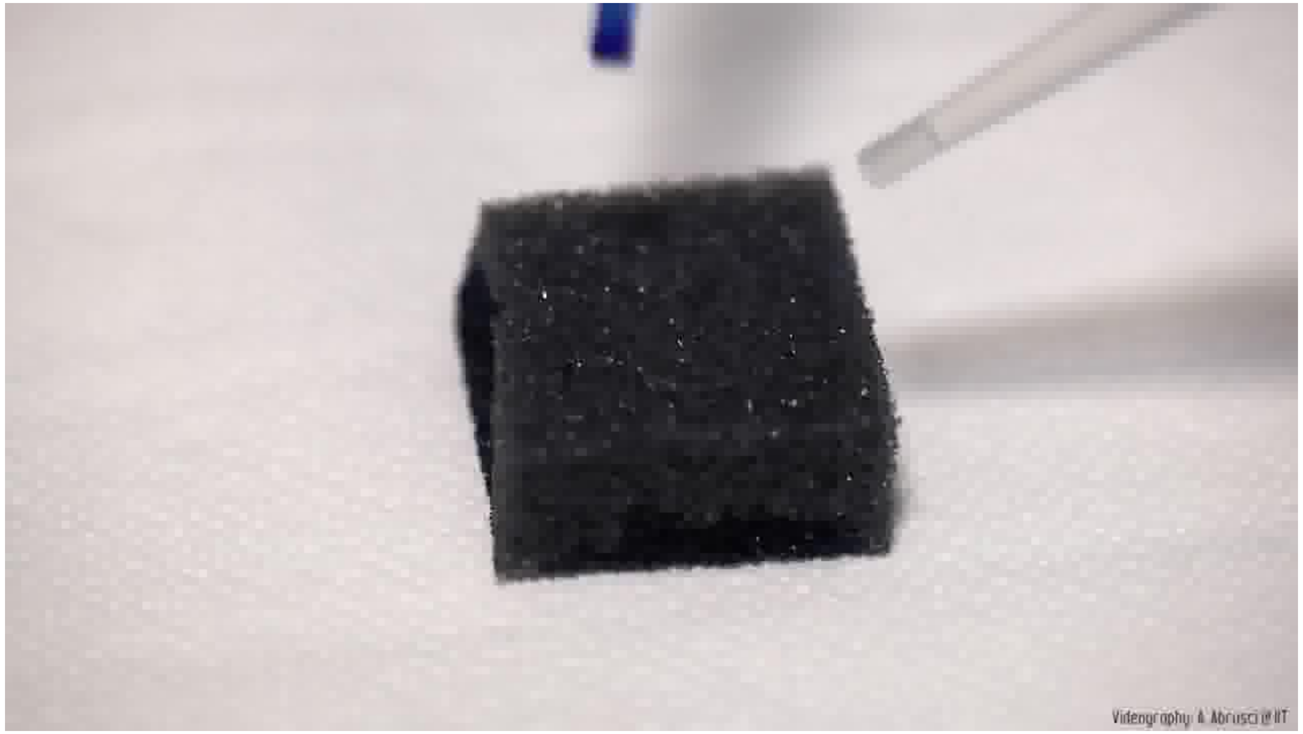
Spugne intelligenti per il trattamento delle acque



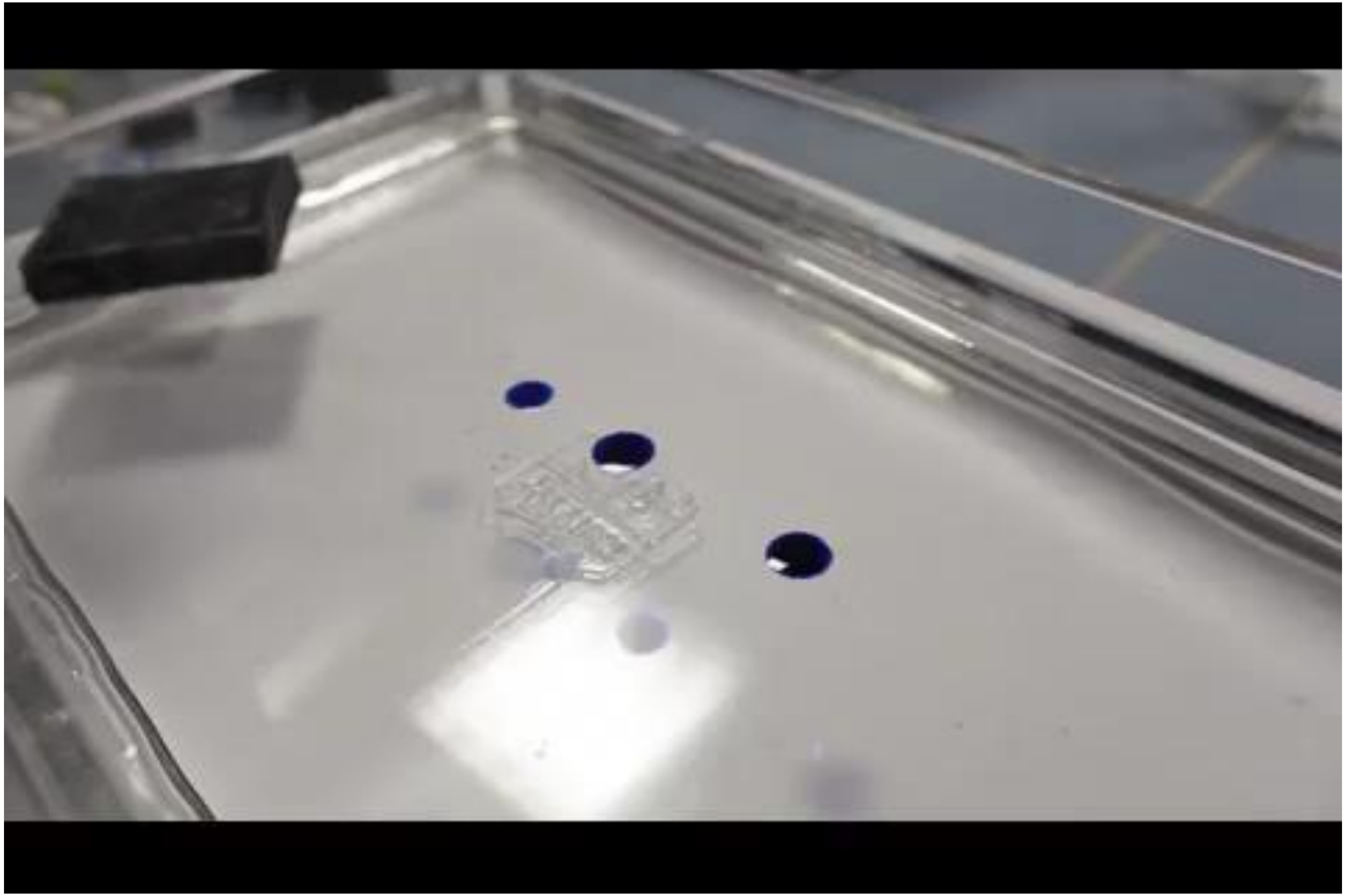


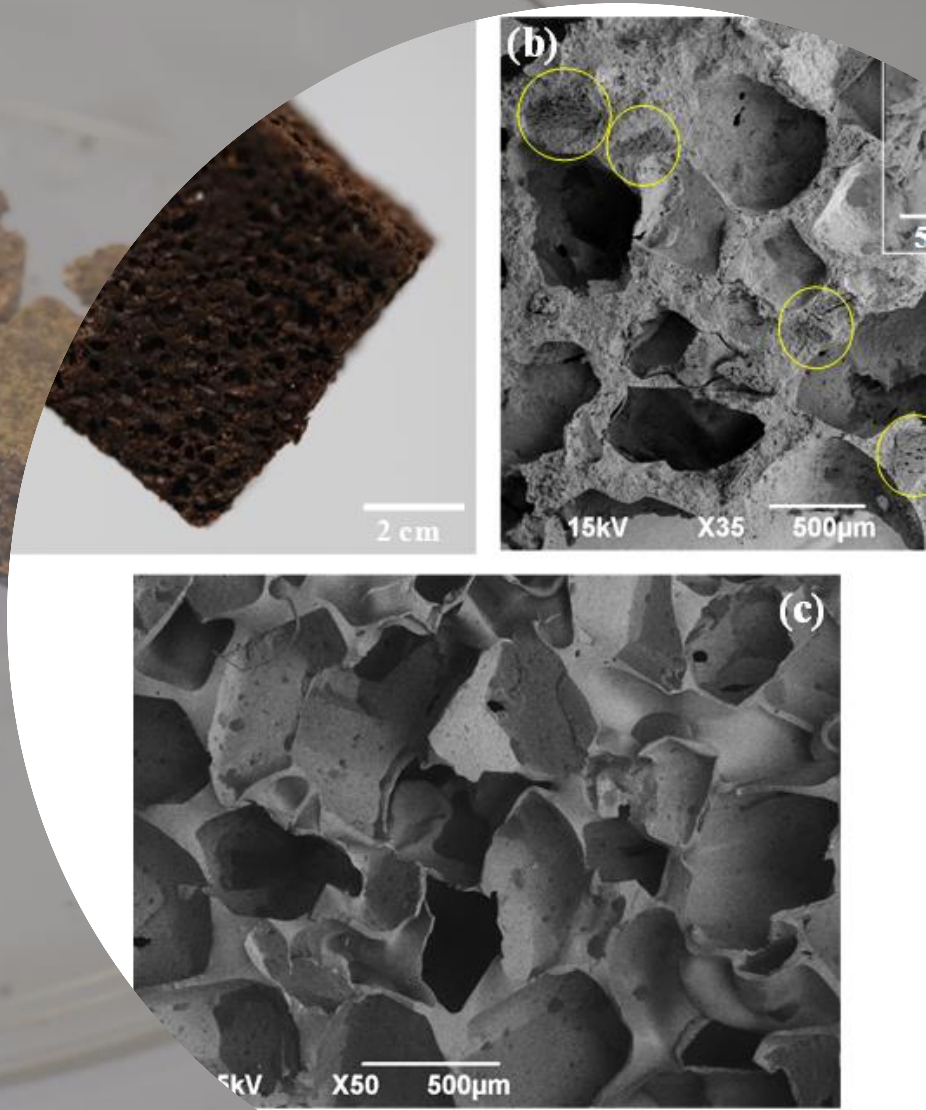
Spugne intelligenti per il trattamento delle acque



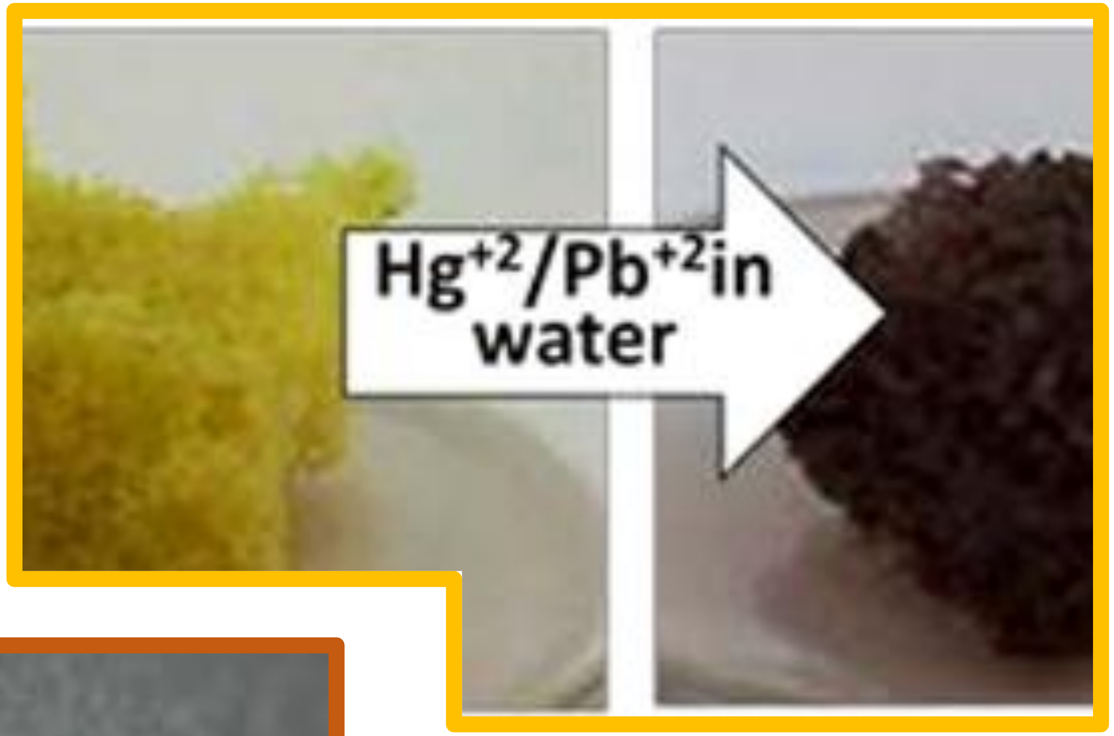


Spugne intelligenti per il trattamento delle acque





Biocomposite foams from agro-industrial wastes for the removal of organic pollutants from water



Silk

Orange peel
waste

Biomateriali da polimeri naturali

Polymers in nature

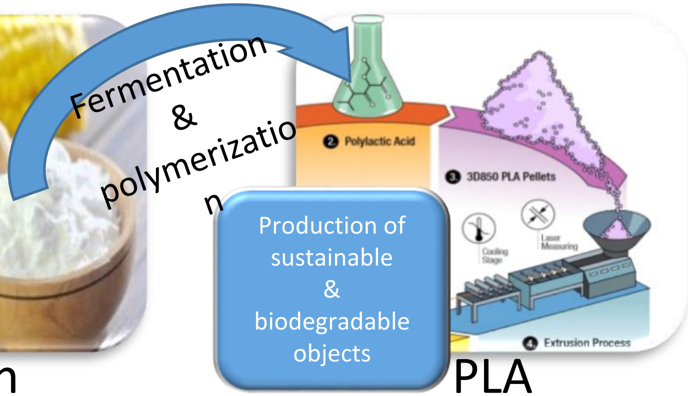
Cellulose/Lignin

Alginate

Fibroin Silk

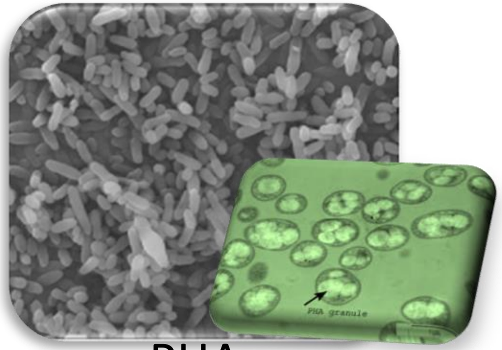
Chitosan

Starch



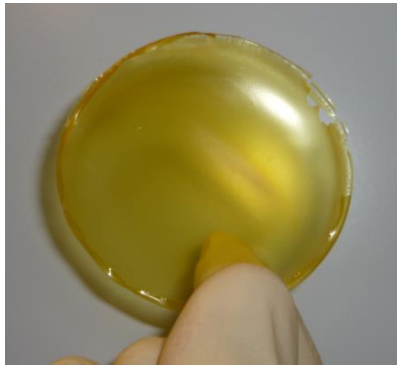
PLA

Keratin

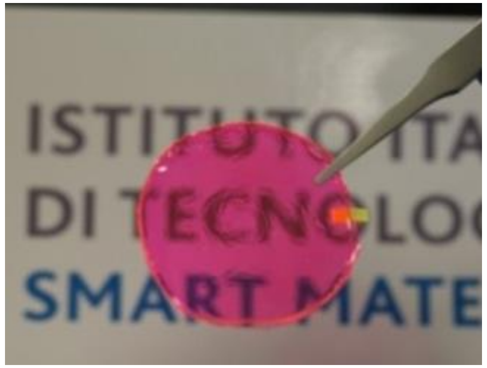


PHAs

Strategies for controlled wound management

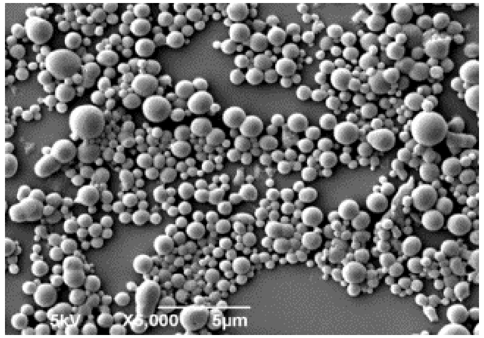


Solid Alginate film with PVPI antibacterial agent



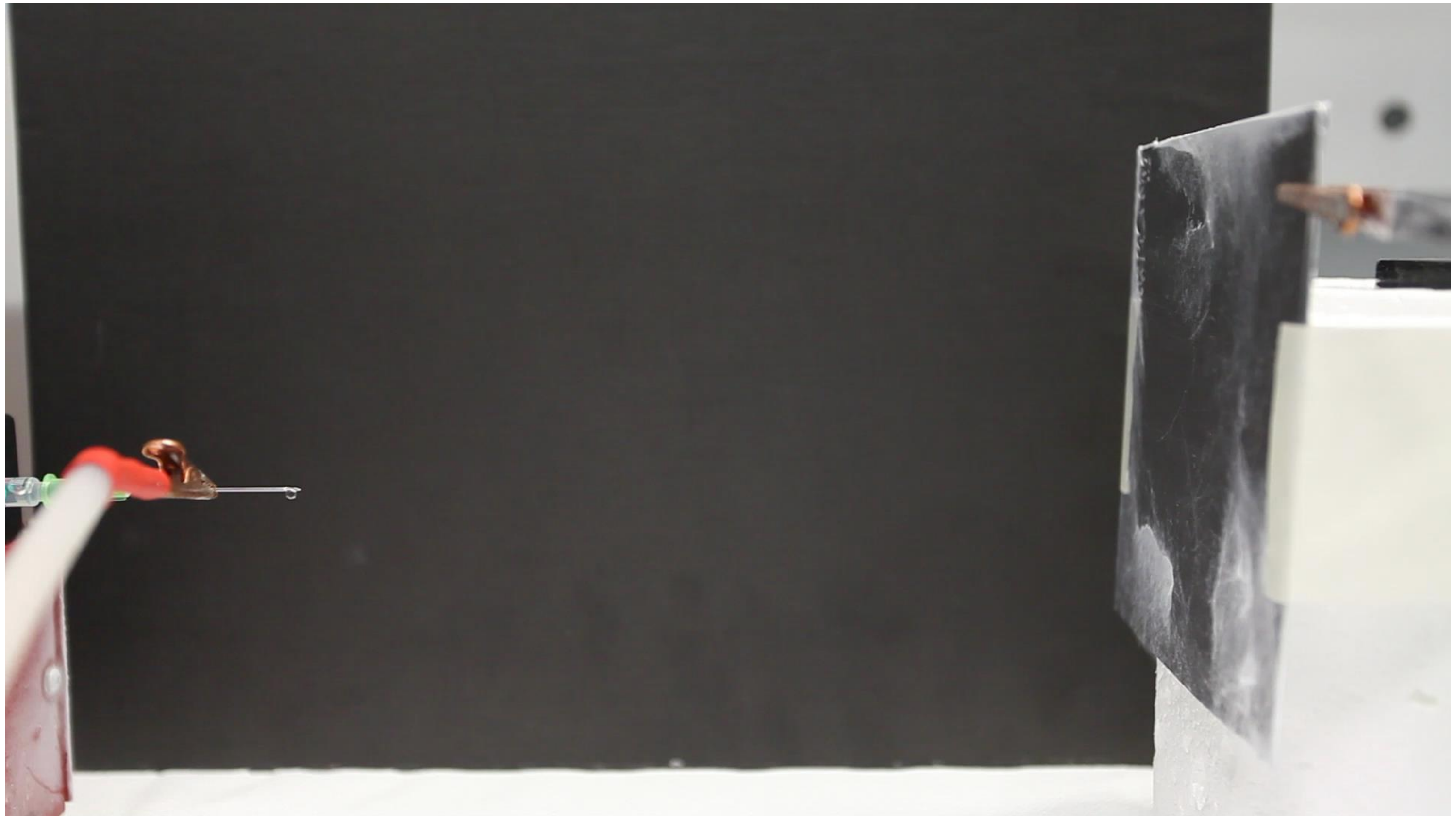
Hyaluronic acid–based multilayer film for sequential-drug release

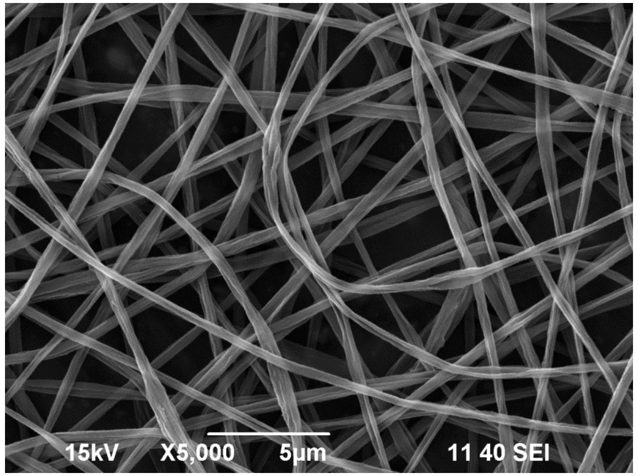
PLA microcapsules with essential oil



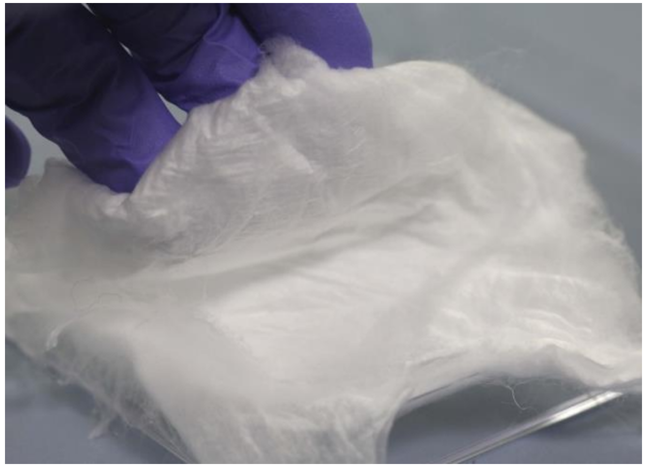
Keratin-based microparticles as drug delivery systems

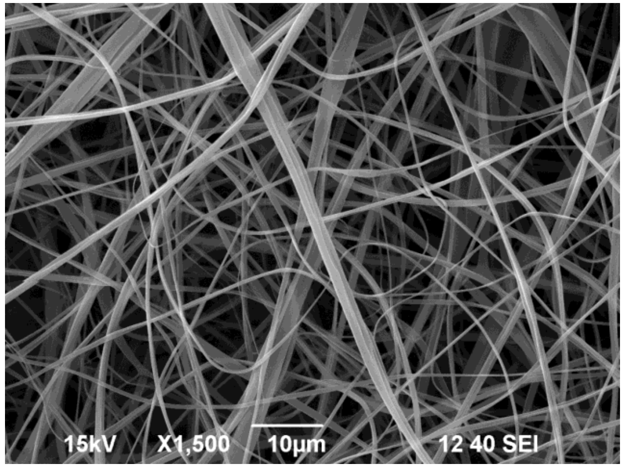
Biomateriali da polimeri naturali



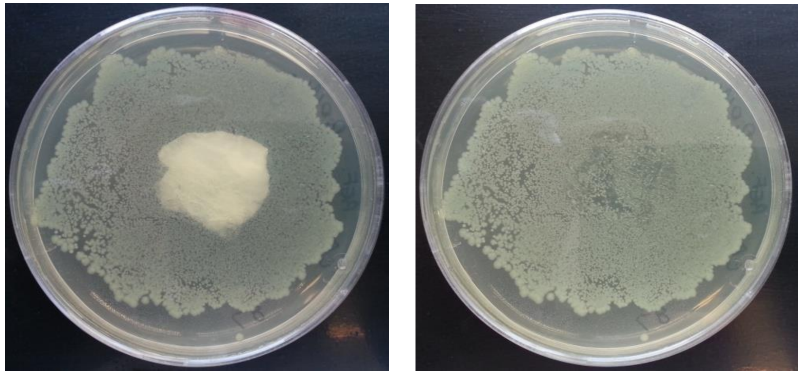


Tessuti intelligenti per il trattamento delle ferite

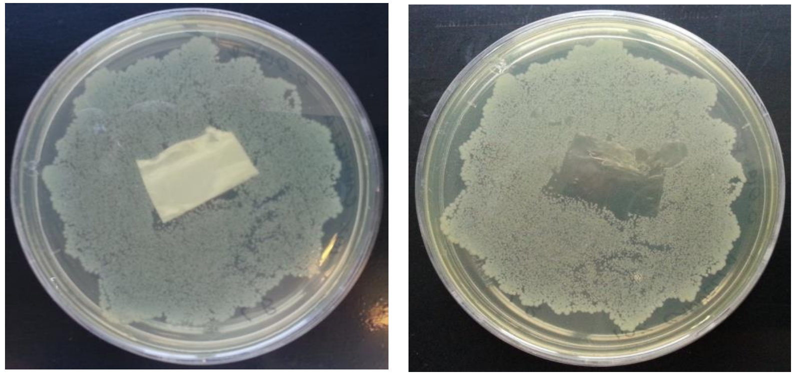




controllo



1% cannella



Cannella

Menta

Citronella

ISTITUTO ITALIANO DI TECNOLOGIA SMART MATERIALS

Elettronica indossabile

iit SMARTMAT

ISTITUTO ITALIANO
DI TECNOLOGIA

Grazie mille per la vostra attenzione

ISTITUTO ITALIANO DI TECNOLOGIA
SMART MATERIALS