



**POLITECNICO**  
MILANO 1863

DIPARTIMENTO DI CHIMICA,  
MATERIALI E INGEGNERIA CHIMICA  
GIULIO NATTA

# CHEMISTRY FOR TECHNOLOGIES

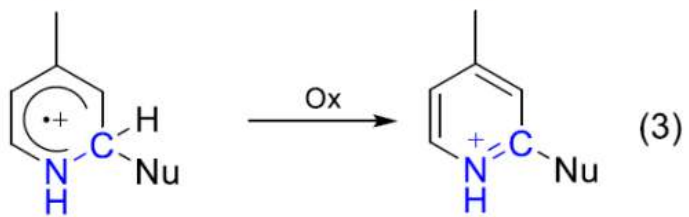
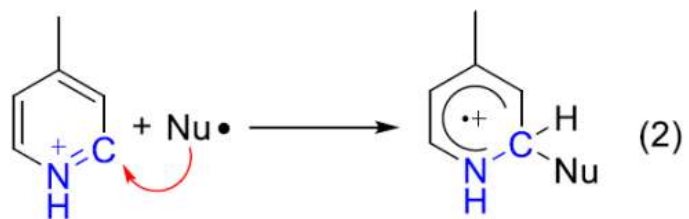
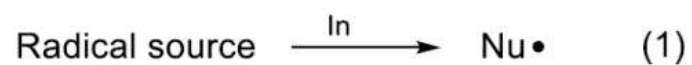
Sezione Chimica

**Carlo Punta**

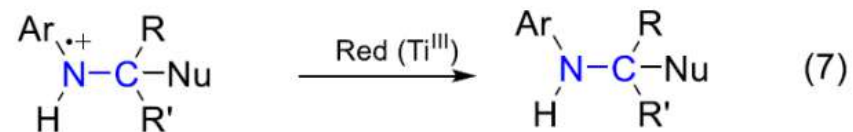
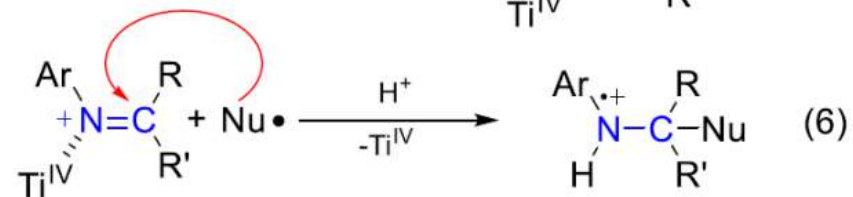
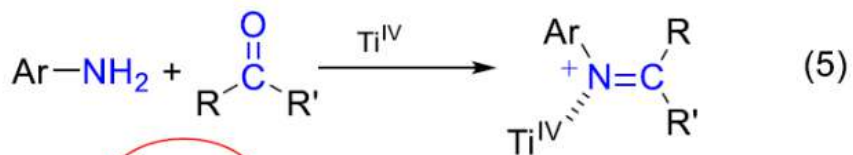
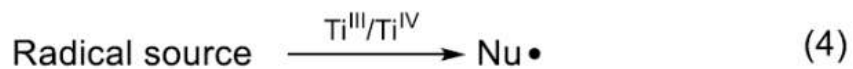
# THE ROOTS

## Radical Chemistry

### Minisci Reaction



### Porta Reaction



*Prof. Francesco Minisci*



*Prof. Ombretta Porta*

# THE TRUNK: THE COMMUNITY

## CMIC Network

### Chemistry Section

Cristian Gambarotti

Andrea Mele

Giuseppina Raffaini

Guido Raos

Ada Truscello

Franca Castiglione

### Other Sections

Luigi De Nardo

Gabriele Candiani

Silvia Faré

Lina Altomare

Andrea Brenna

Fabio Bolzoni

Filippo Rossi

Giovanni Dotelli

Paola Gallo Stampino

## Multidisciplinarity



Organic Synthesis, Catalysis and  
Materials



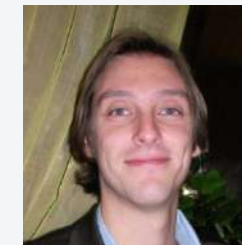
Alessandro Volonterio



Alessandro Sacchetti



Nadia Pastori



Massimo Cametti



Javier Marti Rujas



Arianna Rossetti

# THE LYMPH

## Understanding Chemistry to Design New Products and Processes

### The Principles of

**Green  
Chemistry**

**Green  
Extraction**

**Green  
Engineering**

**Green  
Nanoscience**

### Funding



Fondazione  
Politecnico  
di Milano



Regione Toscana



Regione  
Lombardia

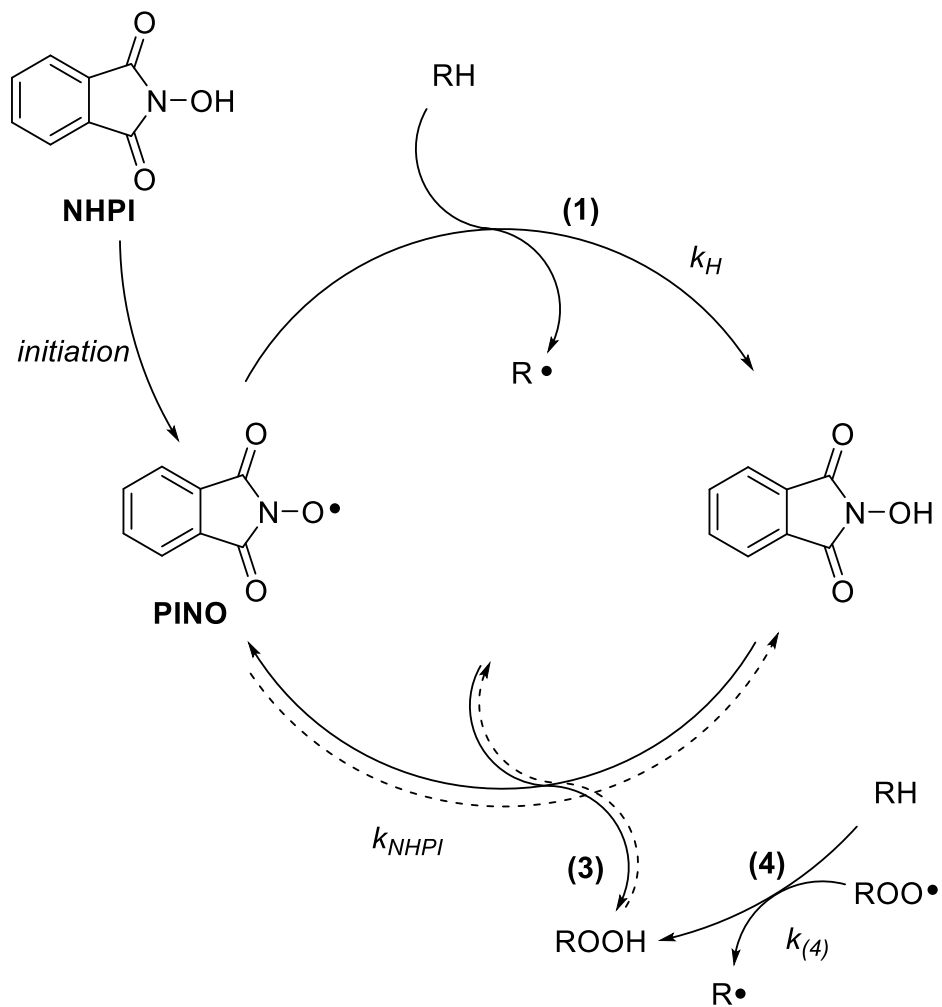
> 10 Private Companies

# THE FLOWERS

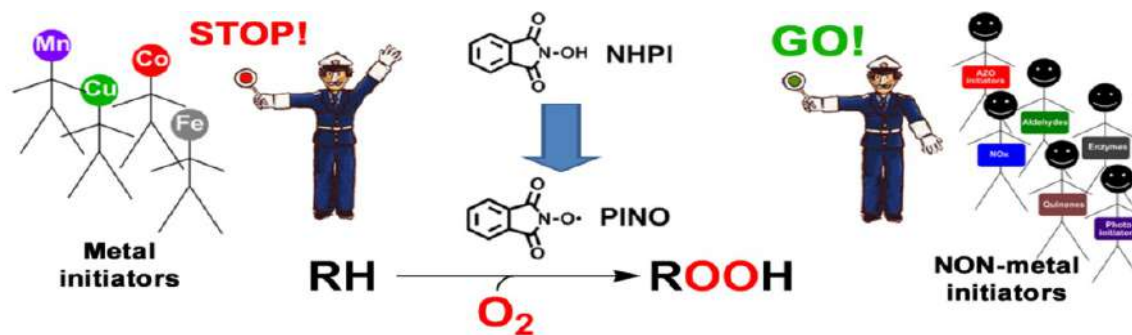


# THE FRUITS:

## Homogeneous Catalysis for Selective Oxidation



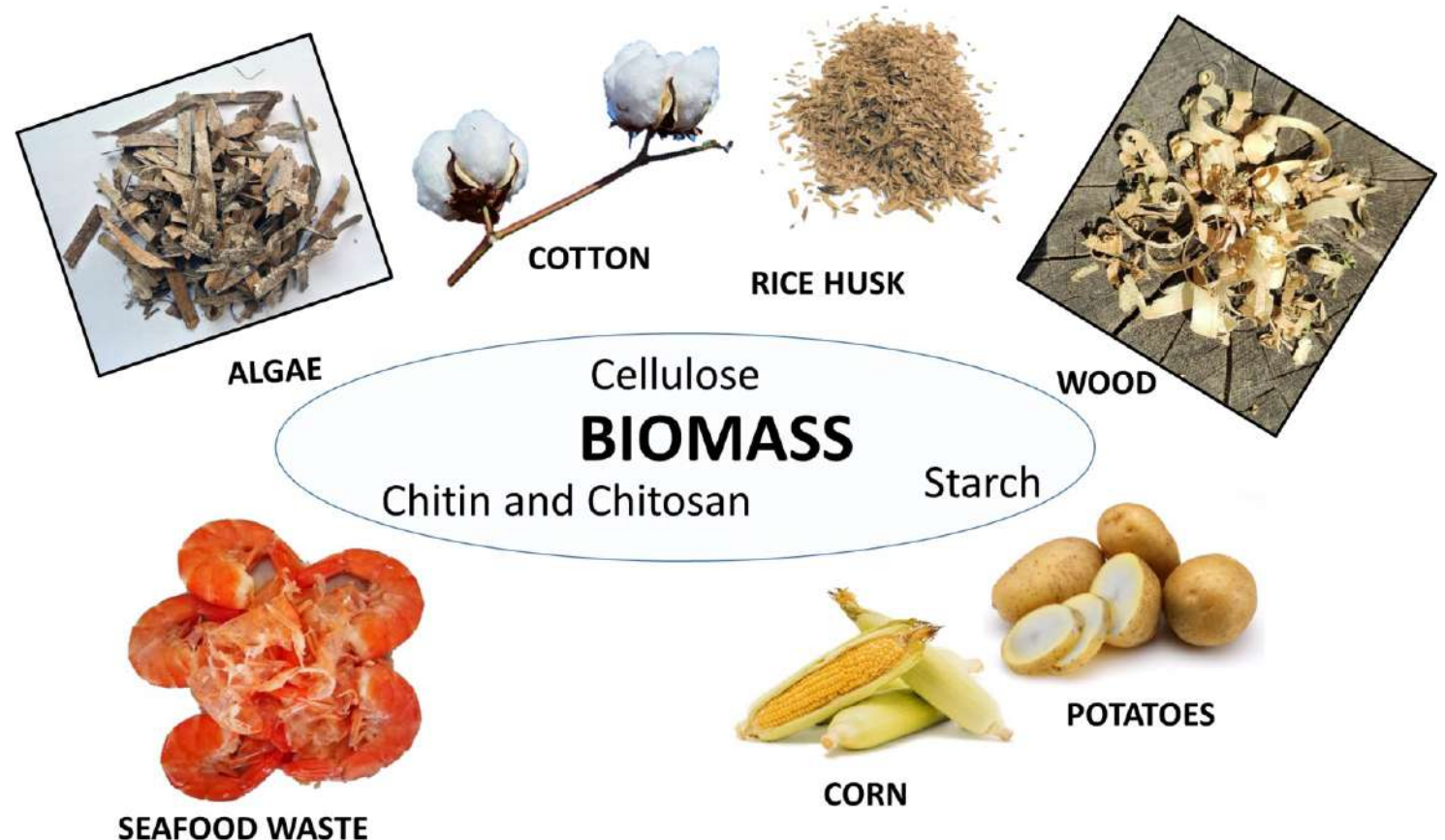
- METAL FREE PROCESSES
- SOLVENT FREE PROCESSES
- CATALYST RECOVERY AND REUSE



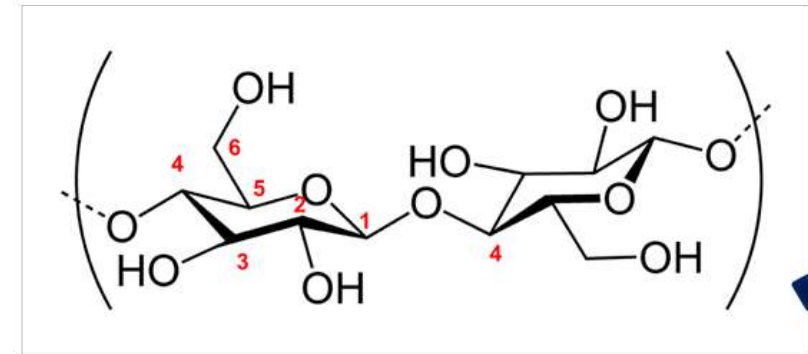
# THE FRUITS:

## Biomass as Source for the Synthesis of Bio-based Products and the Design of Advanced Materials

- RENEWABLE SOURCES
- SUSTAINABILITY
- WASTE VALORIZATION  
(from waste to up-scaled products)
- CIRCULAR ECONOMY
- FROM FARM TO FARM



# THE FRUITS



**CELLULOSE**

1,4-β-D-polyglucose



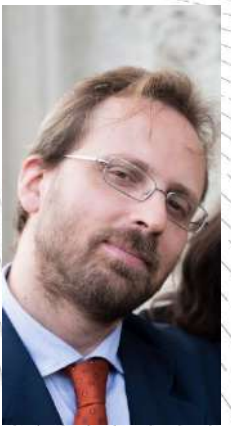
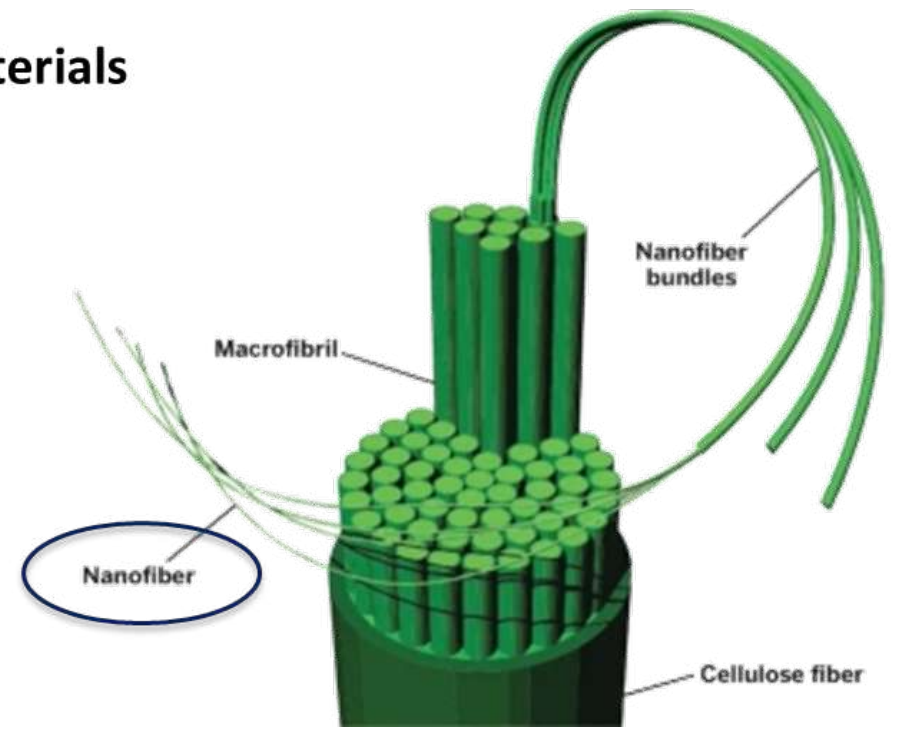
**Advanced materials**

**Biobased products**

**Production**

**Applications**

**NANOCELLULOSE**



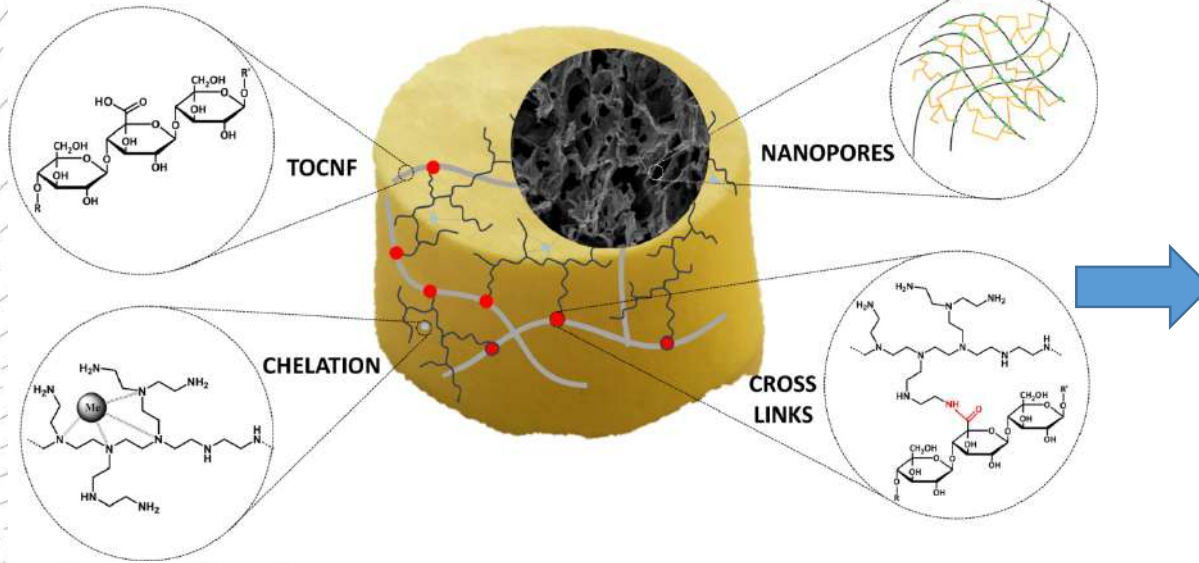
*Prof. Lucio Melone*



# THE SEEDS



Prof. Ilaria Corsi  
Università di Siena



# Nano-structured Materials for Nanoremediation



NATURE NANOTECHNOLOGY  
news & views

news feature

A little knowledge...

Nanotechnology is set to be the next campaign focus for environmental groups. Can scientists avoid the mistakes made over genetically modified food, and secure public trust for their research? Geoff Brumfiel investigates.

They have serious concerns over the safety of nanoparticles such as carbon 'buckyballs'.

Zurutuza & Marinelli, 2014 *Nature Nanotech*

The Economist

A little risky business

The unusual properties of tiny particles contain huge promise. But nobody knows how safe they are. And too few people are trying to find out

# THE SEEDS



Biobased Materials



Fertilizers & Pesticides Delivery



Paper applications



Catalysis

Automotive



Sensing



Biomedical



Nanoremediation



Packaging



Fitodrugs

Cosmetics



Paint industry



Building industry

Antibacterial materials



# THE SEEDS



## Master Students on Nanocellulose

- Material Engineering
- Chemical Engineering
- Environmental Engineering
- Food Engineering
- Biomedical Engineering

## PhD Students on Nanocellulose

- Laura Riva - Innovhub
- Gloria Nicastro – PON Fellowship





**GRAZIE**

**[carlo.punta@polimi.it](mailto:carlo.punta@polimi.it)**

**OSCM Lab web page**

POLITECNICO MILANO 1863