



POLITECNICO
MILANO 1863

DIPARTIMENTO DI CHIMICA,
MATERIALI E INGEGNERIA CHIMICA
GIULIO NATTA

SEZIONE CHIMICA

CHIMICA INDUSTRIALE

Coordinatore

Carlo Punta

CHEMISTRY SECTION: MISSION

Chemistry Section lays its foundations in both **Fundamental Chemical Sciences** and their **technological applications** in the most innovative and interdisciplinary sectors, for the development of materials, products and processes.

Basic research covers Theoretical and Computational Chemistry, Analytical Chemistry, Structural Chemistry, Organic and Bioorganic Chemistry, Supramolecular Chemistry and Polymer Science.

This research finds advanced application in different fields including biology, energy, food, environmental remediation, design of new materials and in nanosciences, supporting the development of sustainable chemical technologies.

CHEMISTRY SECTION IN NUMBERS (last 5 years)

37 Members

8 Research Groups

>500 Publications

>40 International Patents

7 Awards

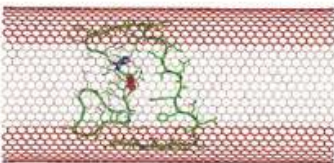
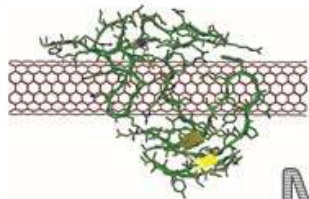
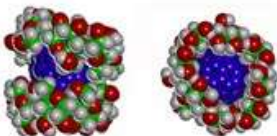
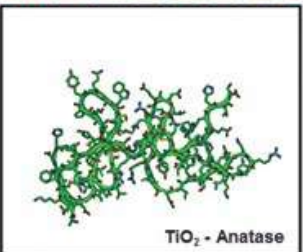
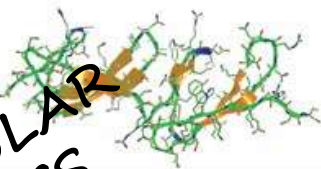
8 Public Funding:
International Projects

18 Public Funding:
Regional and National Projects

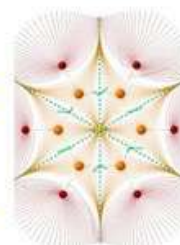
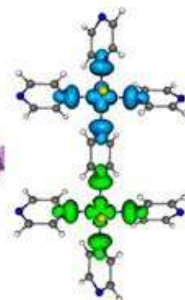
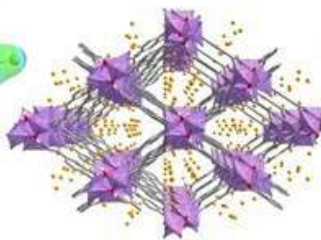
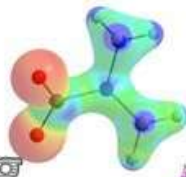
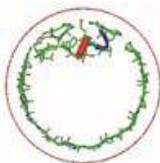
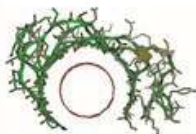
>>> Research & Consulting Contracts

Lab-3MoSt

Materials

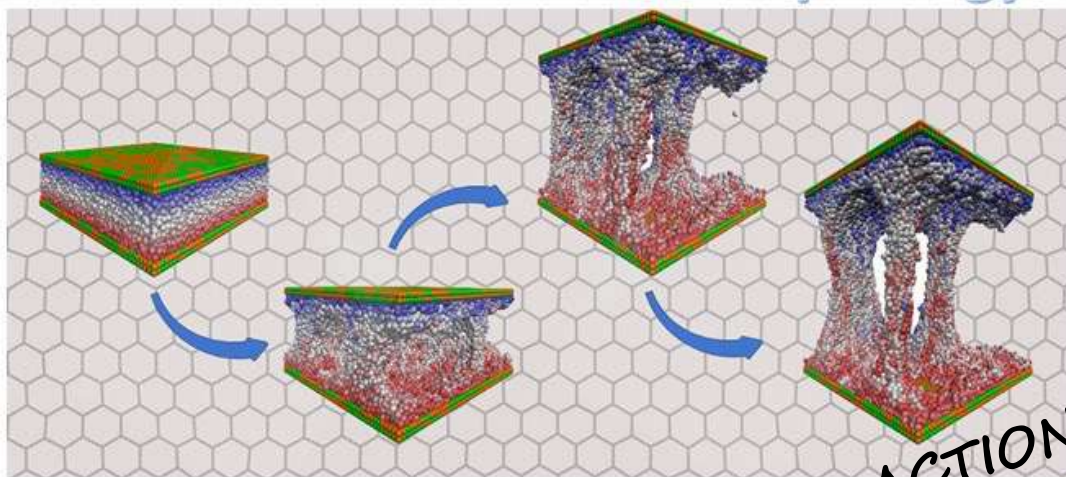


Modelling

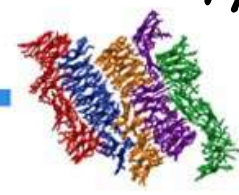
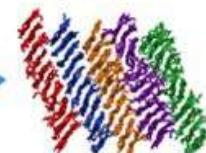
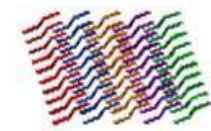


POLYMERS

Morphology



Structure



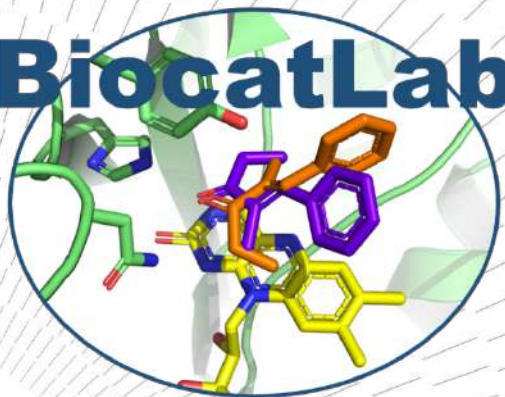
QUANTUM CHEMISTRY

X-RAY DIFFRACTION

CRYSTALLOGRAPHY

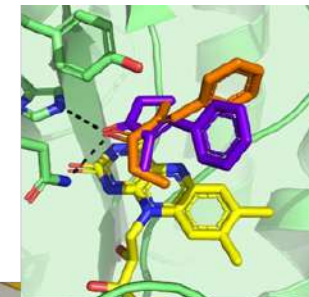
Fabio Ganazzoli, Stefano Valdo Meille, Guido Raos,
Giuseppina Raffaini, Mosè Casalegno, Piero Macchi
<https://3most.chem.polimi.it/>

BiocatLab



Biocatalysis for organic synthesis Laboratory

Elisabetta Brenna, Paola D'Arrigo,
Francesco Gatti, Davide Tessaro,
Fabio Parmeggiani



 @BiocatLabPolimi

- Biocatalysed synthesis of chiral biologically active molecules
- Chemo-enzymatic valorisation of waste (lignin, vegetable seed and olive oil)
- Synthesis and characterization of phospholipids
- SNIF-NMR for the elucidation of the synthetic history of flavors/APIs
- Isolation/synthesis and characterization of pharmaceutical impurities
- Development of enzymatic processes in continuous flow mode

Laboratory of Supramolecular and Bio-Nanomaterials



SupraBioNanoLab where we take inspiration from Nature to engineer the self-assembly and self-organization of **biomimetic supramolecular** and **nanostructured materials** with applications ranging from **crystal engineering** to **nanomedicine**.

<https://www.suprabionano.eu>

Bio-Nanomaterials

Supramolecular Chemistry

Fluorinated Materials

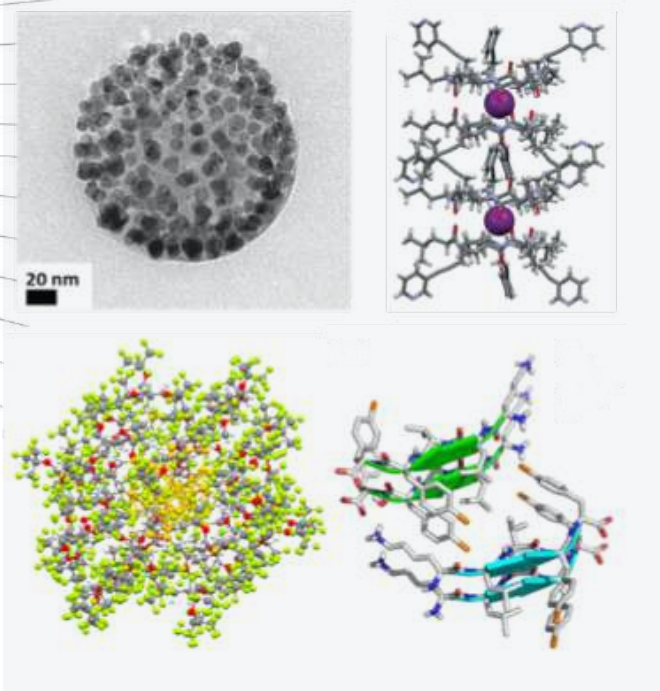
Crystal Engineering

Sustainable Materials

Post-Docs: 2

PhD Students: 7

Master Students: 8



P. Metrangolo



F. Baldelli Bombelli



G. Terraneo



G. Cavallo



V. Dichiarante

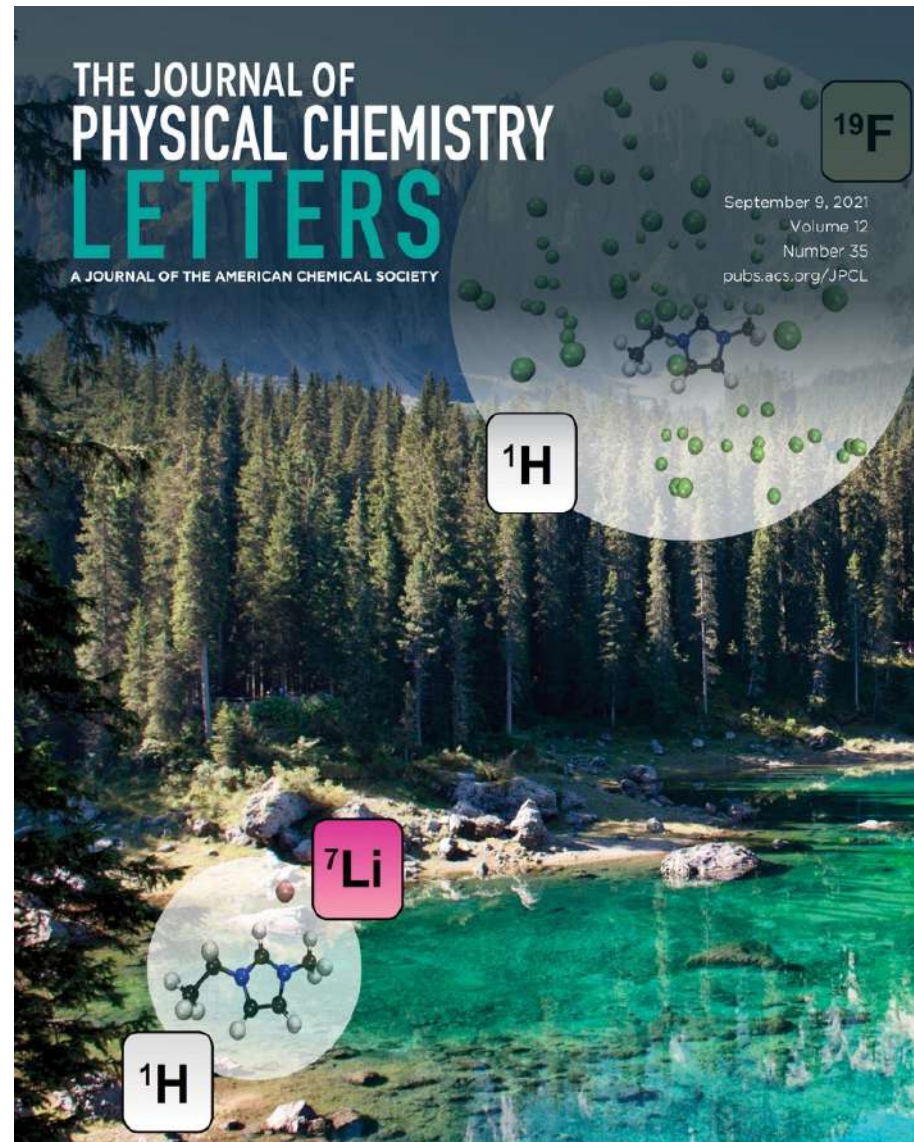


C. Pigliacelli



NMR Spectroscopy
Diffusion
Intermolecular interactions
Ionic liquids/eutectic solvents
Soft matter

Andrea Mele,
Franca Castiglione,
Maria Enrica Di Pietro, Giselle De Araujo Lima E Souza,
Valeria Vanoni, Walter Panzeri



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FuN Mat Lab

The Functional and Nanostructured Materials Lab

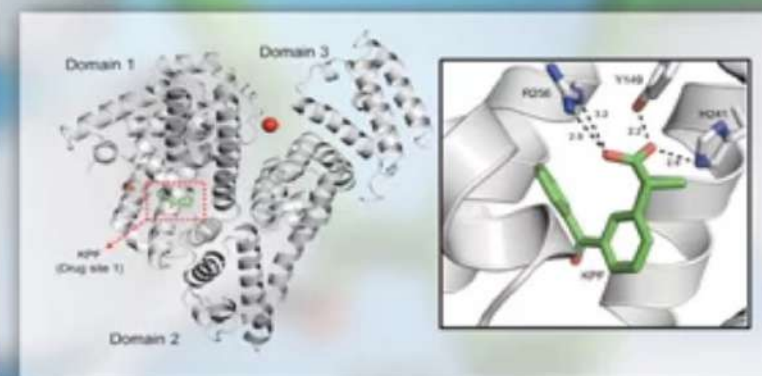


Smart materials
Organic semiconductors
Photochromic materials
Functional polymer nanofibers
Carbon-based and metal nanoparticles

Chiara Bertarelli

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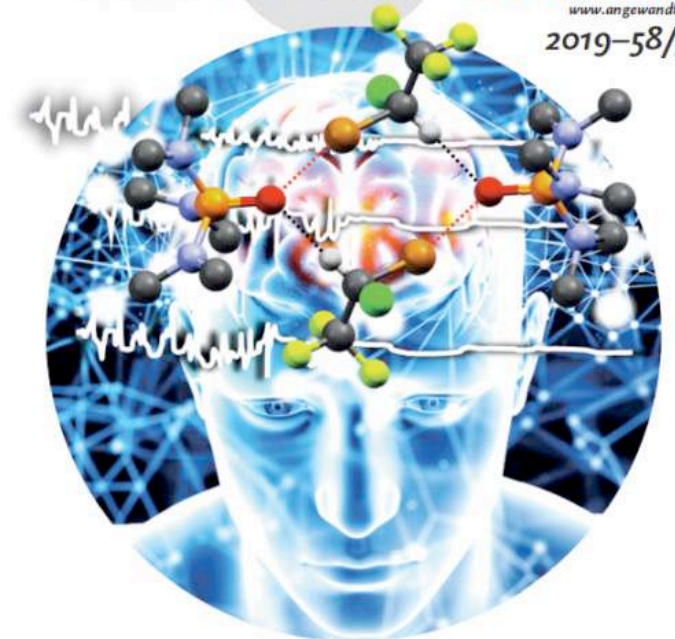
Laboratory of Nanostructured Fluorinated Materials

Supramolecular interactions
Self-assembly
Crystal engineering
Halogen bond
Chalcogen bond

Giuseppe Resnati,
Andrea Pizzi

<http://nfmlab.chem.polimi.it/>

A Journal of the German Chemical Society
Angewandte
GDCh
International Edition **Chemie**
www.angewandte.org
2019–58/36



Halothane, a commonly used anesthetic ...

... can simultaneously function as a hydrogen-bond and a halogen-bond donor in the solid state and in solution, as shown by S. V. Rosokha, G. Resnati, and co-workers in their Communication on page 12456 ff. Both interactions involve moieties commonly present in cell membranes, probable target structures of halothane in the human body. The ability of the agent to act as a polydentate tecton gives a molecular rationale for its eudismic ratio.

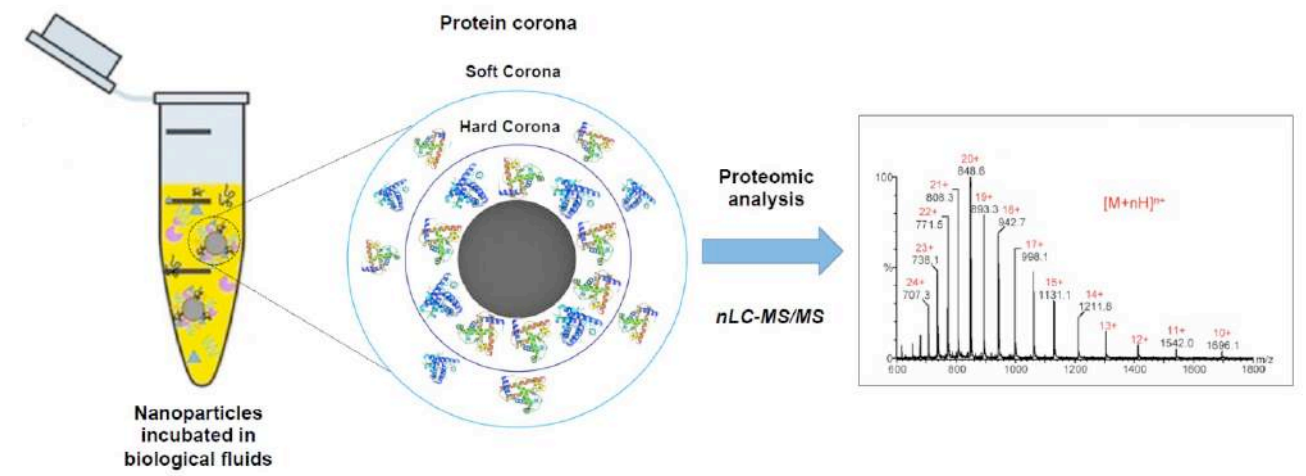
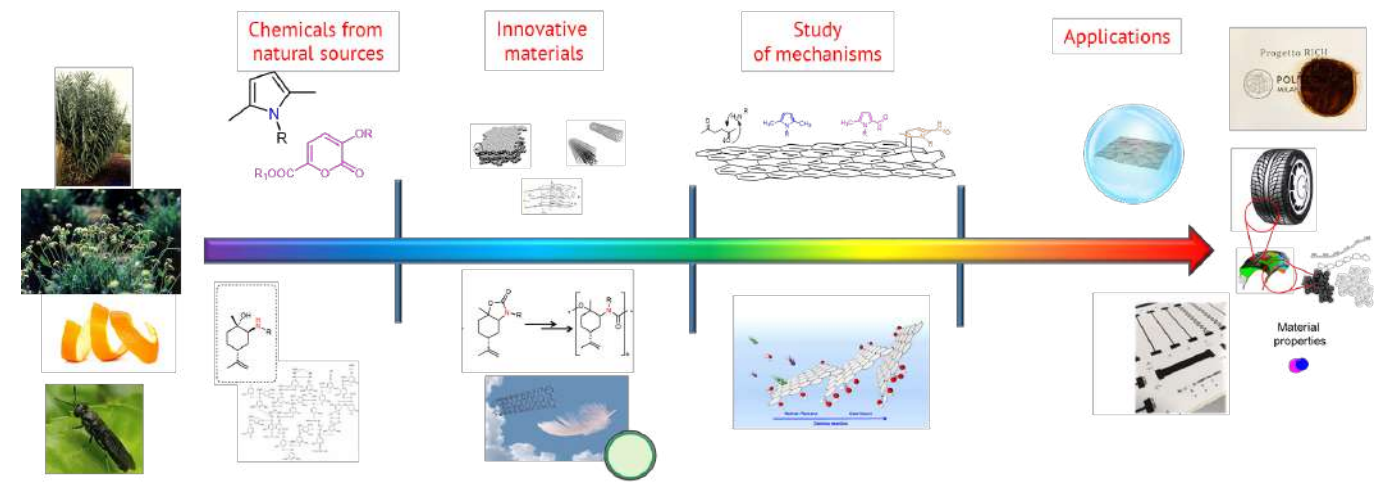
WILEY-VCH



ISCaMaP

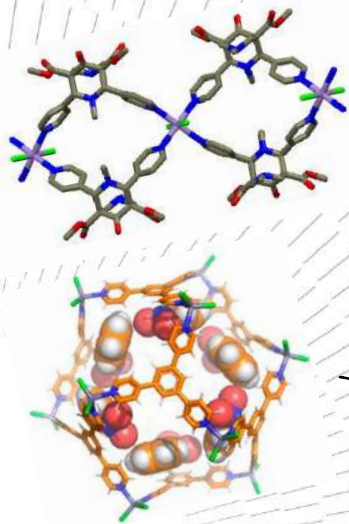
Innovative Sustainable Chemistry and Materials and Proteomics Group

Sustainability
Green Chemistry
Proteomics
Biomass
Materials



Maurizio Galimberti, Elisa Fasoli,
 Ada Truscillo, Cristian Gambarotti,
 Vincenzina Barbera, Roberto Sebastiano, Gabriella
 Leonardi, Antonio Marion, Mirvana Lauria

Organic Synthesis Catalysis and Materials



MOFs

- SENSING
- SELECTIVE ABSORPTION
- CATALYSIS

RENEWABLE SOURCES

- BIOBASED PRODUCTS AND MATERIALS

Massimo Cametti, Nadia Pastori,
Javier Marti Rujas, Carlo Punta,
Arianna Rossetti, Alessandro Sacchetti,
Alessandro Volonterio



HETEROGENOUS CATALYSIS

- CELLULOSE BASED MATERIALS
- PEI BASED MATERIALS
- ORGANIC TRANSFORMATIONS

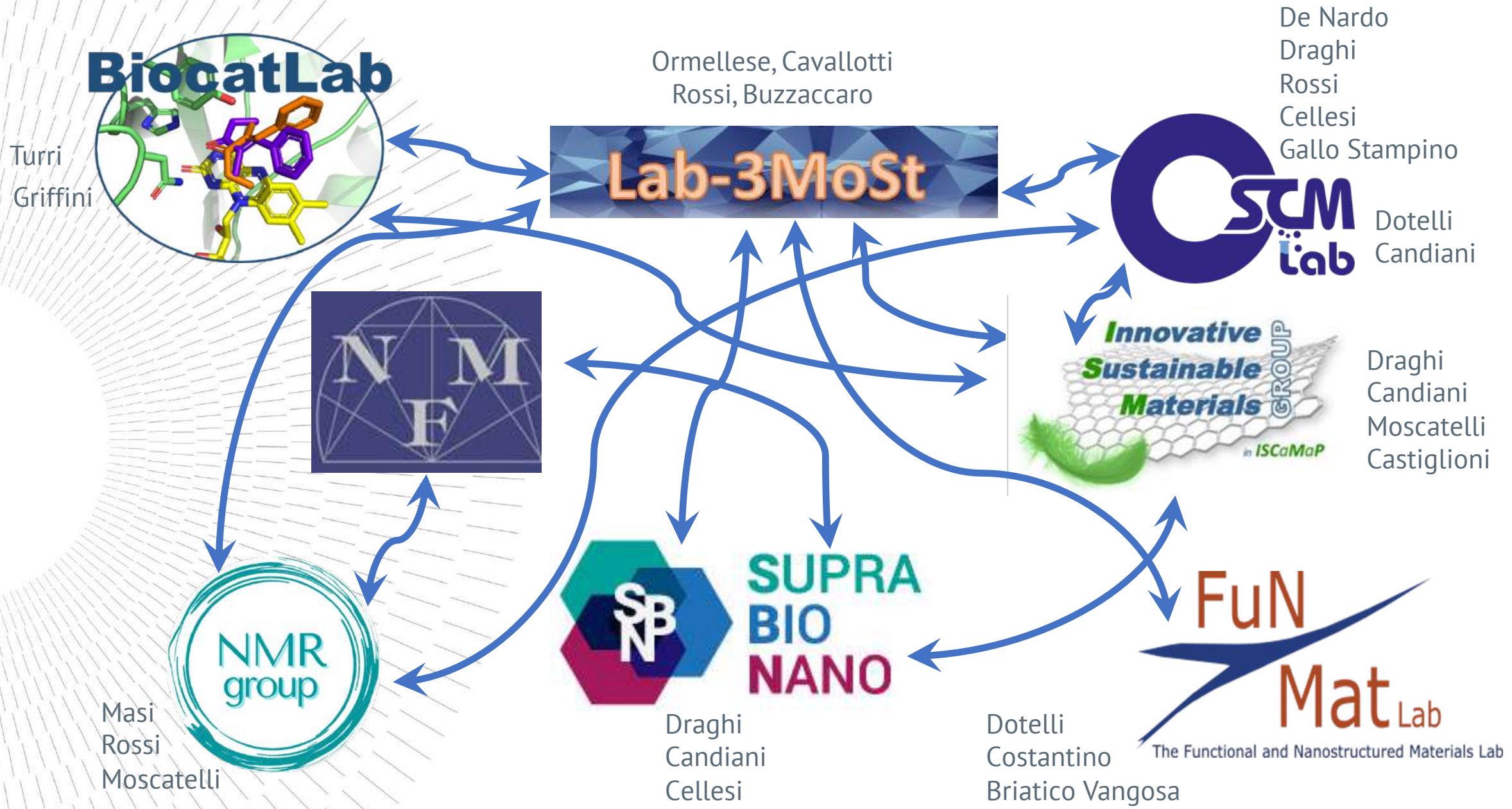
WATER TREATMENT

- REMOVAL OF HEAVY METALS,
ORGANIC DYES, PESTICIDES,
EMERGING CONTAMINANTS



ORGANIC SYNTHESIS

- MULTICOMPONENT REACTIONS
- PEPTIDOMIMETICS CATALYSIS
- GENE DELIVERY





CHIMICA INDUSTRIALE

GRAZIE

carlo.punta@polimi.it

POLITECNICO MILANO 1863