



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

Scuola di Scienze  
Matematiche, Fisiche e Naturali

corso di laurea triennale

**Diagnostica e  
materiali per la conservazione e il restauro**

corso di laurea magistrale

**Scienze e materiali  
per la conservazione e il restauro**

## **Prof. Emiliano Carretti Prof. Luigi Dei**

Dipartimento di Chimica «UGO SCHIFF» & CSGI, Università di Firenze

**TIROCINIAMOCI**

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Tel: 0554573046

email: [emiliano.carretti@unifi.it](mailto:emiliano.carretti@unifi.it)

web: <http://www.csgi.unifi.it>

<https://www.unifi.it/p-doc2-0-0-A-3f2b3a30322f2e.html>



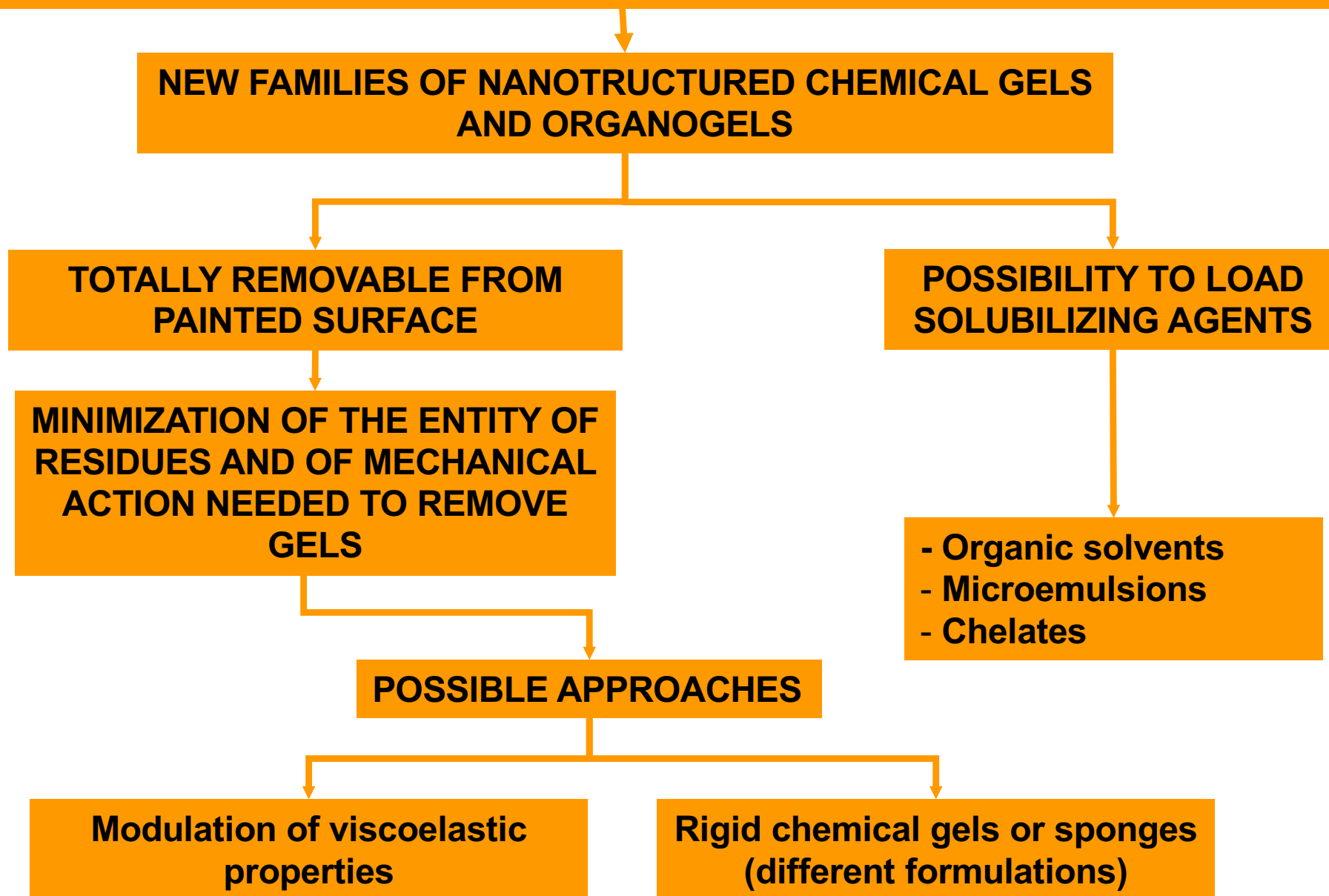
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Dipartimento di  
Chimica "Ugo Schiff"



CSGI

# SELECTIVE CLEANING OF PAINTED SURFACES OF HISTORICAL AND ARTISTICAL INTEREST



Activity @ DICUS/CSGI

email: [emiliano.carretti@unifi.it](mailto:emiliano.carretti@unifi.it)

tel: 0554573046

# Innovative GELS for the cleaning of painted surfaces

Francesco Vecellio, San Salvador Church Sacristy, Venice, Italy



## Main techniques:

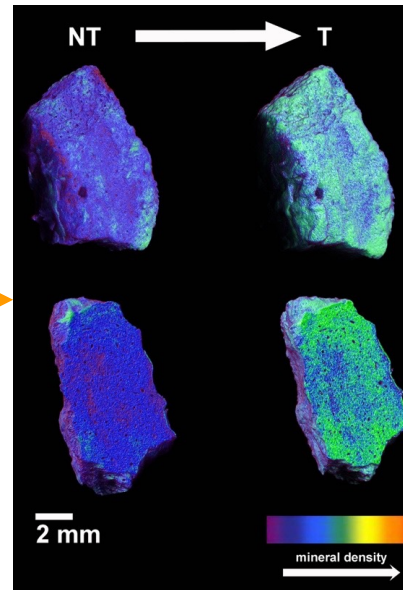
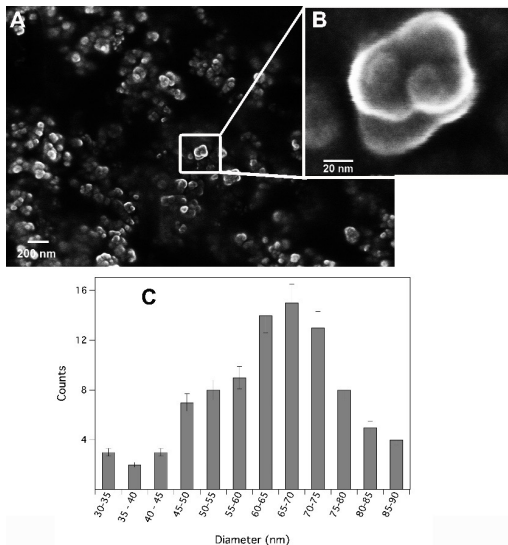


Phase diagram  
SAXS/DLS  
Rheology  
DSC  
SEM  
FTIR  
TOF-SIMS

Collaborations: Prof. R.G. Weiss, Georgetown  
University, Washington, DC, USA  
Conservation institutes (i.e. OPD)

People involved@UNIFI: Prof. L. Dei, Dr. G. Poggi, Dr. F. Porpora

# Innovative nanomaterials for bone remains consolidation: performance evaluation and impact on $^{14}\text{C}$ dating and on palaeogenetic analysis



## Main techniques:

SEM

XRD

FTIR

Light scattering/particle sizing

X-ray tomography

Vickers hardness

Consolidant: Hydroxyapatite nanoparticles developed @ DICUS/CSGI

Impact on

Archaeological DNA

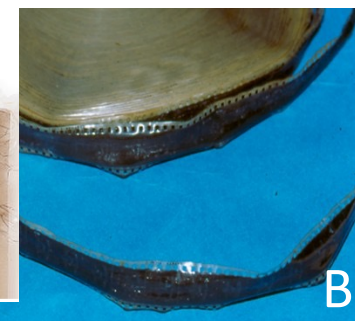
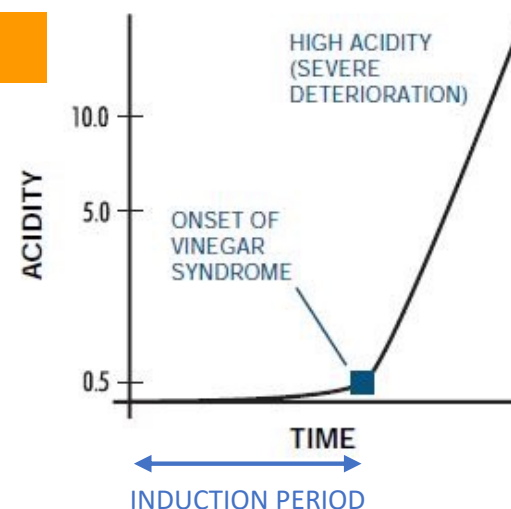
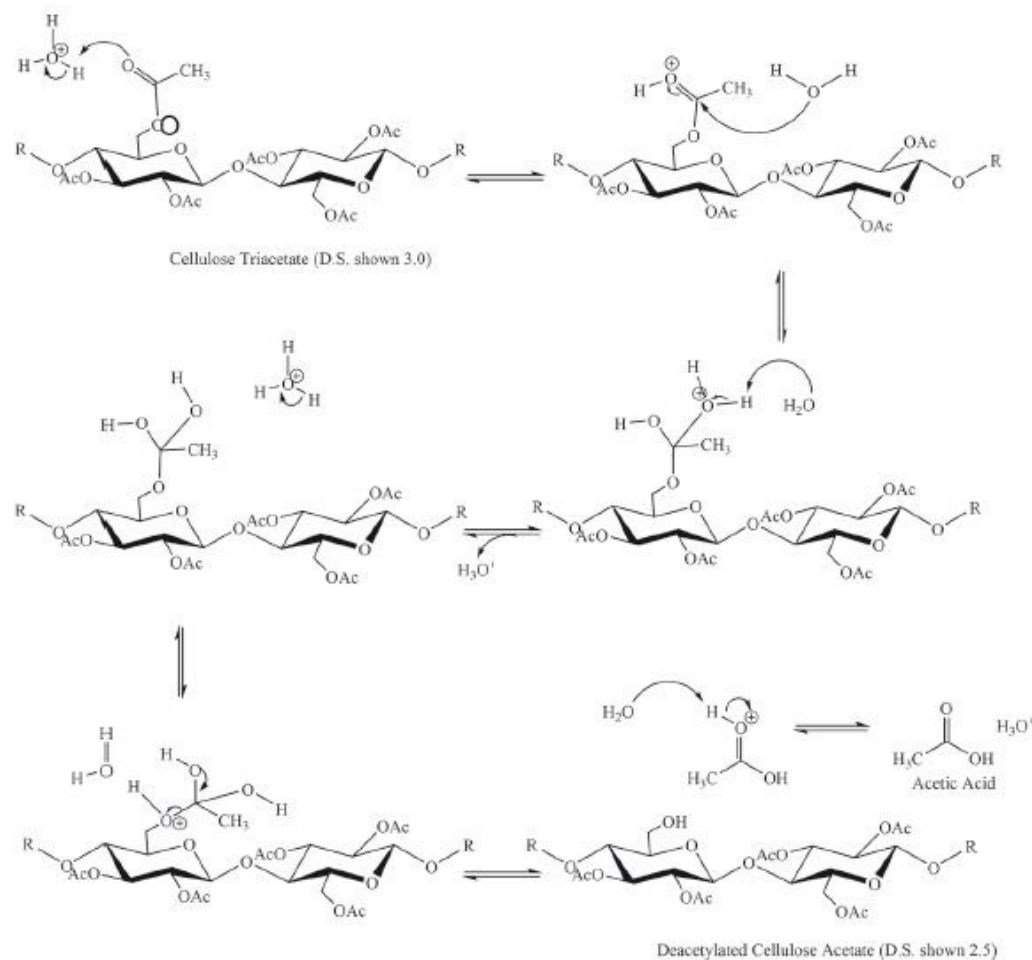
(collaboration with Prof. Lari/Prof. Caramelli,  
Dept. Of Biology, UNIFI)

$^{14}\text{C}$  dating

(collaboration with Dr. Fedi and Dr.  
Liccioli, INFN, Florence)

# Conservation of photographic documents

## «VINEGAR SYNDROME»




## DEGRADATION PHENOMENA OF TRIACETATE-BASED FILMS



## GOALS OF THE PROJECT @ DICUS/CSGI

- The development of a multi-analytical protocol to characterize CTA-based films artifacts and to monitor their conservation status, in order to understand their degradation mechanism better
- To define an effective “chemical” strategy to prevent and/or inhibit the vinegar syndrome, based on the use of nanotechnologies

Main techniques:  FTIR  
DTG  
Titrations  
SEM/OM  
Dynamic Mechanical Analysis

People involved@UNIFI: Dr. G. Poggi, Prof. L. Dei, Dr. F. Porpora

# Conservation of metal artifacts

## Bronze corrosion: artificial ageing and inhibition

### Corrosion

- Key factor: O<sub>2</sub>
- In the absence of oxygen, the corrosion cell stifles itself

#### Main techniques:

SEM

XRD

FTIR/FORS

Contact angle

OCT

Electrochemistry

Possible solutions:

- Traditional coatings

Innovation:

- “Smart coatings”
- Inhibitors and antioxidants

People involved: Prof. R. Fontana@INO; Alice dal Fovo @INO; Dr. D. Porcu@INO/DICUS, Prof. L. Dei@DICUS  
Conservation institutes (i.e. OPD)