



**Chemistry and Molecular  
Sciences and Technologies  
(CMST)**

#### Participating countries

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SE, SI, SK, TR, UA, UK

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<http://projects.um.edu.mt/cm1101/>

COST Action no. CM1101

# Colloidal Aspects of Nanoscience for Innovative Processes and Materials

2012 | 2016

## Objectives

- To provide a platform for cooperation and coordination in the European colloid science domain directed towards development of innovative materials and processes
- Development of new theoretical approaches and novel analytical methods for interfacial processes.
- Formulation of new theoretical and analytical approaches to the modelling of phenomena at the frontier of quantum, nano- and micro-scales.
- Development of novel, reproducible, economic and up-scalable methods of obtaining various colloidal materials.
- Identification of new routes to designing and characterizing non-equilibrium interfacial processes.
- Application of the acquired knowledge for solving problems in relation to the development of better colloid-based products.
- Engineering of chemical processes and analytical techniques for the design of colloid-based devices at micro and nano-level.

## ■ Main Achievements

- Annual conference, five shared WG meetings;
- Two training schools;
- Twelve STSMs;
- More than 40 publications;



Coalescence of two drops



COST is supported  
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ESF provides the COST  
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## Working Group activities

### Working Group 1

- Interfacial phenomena – fundamentals, modelling and analytical methods

### Working Group 2

- Self-assembly and colloidal interactions: from specific to long-range

### Working Group 3

- Synthesis of nano- and bio-colloidal materials: development and up-scaling.

### Working Group 4

- Kinetic and catalytic aspects of nano-colloids and nano-structured surfaces

### Working Group 5

- Processes and materials for everyday life and biomedical applications

### Working Group 6

- Colloid-based devices: sensors, assays, photonics and micro-fluidics

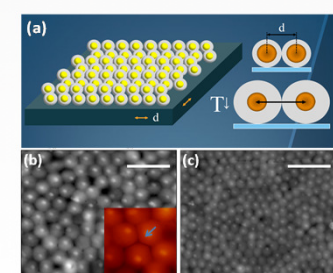
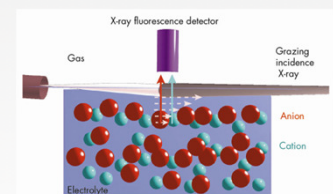
### ■ Main Achievements

- A combination of TRXF with surface tension data allowed for the first time to determine the ionic exchange in the Stern and diffuse parts of electrical double layer, which follows the Hoffmeister Series;
- Carbon based particulate associated with appropriate surfactants has been utilised to stabilise foams used as precursors for the production of carbon based porous materials;
- Encapsulated neuroprotectant MDL 28170 exhibited 40–fold increase of protection efficiency in the oxidative stress *in-vitro* tests.

### Industry participation

#### Unilever

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Top: Total internal X-ray fluorescence investigation of ionic composition of interfacial layer – Hoffmeister Effect;

Bottom: Illustration of the temperature controlled 2D Au@PNIPAM arrays



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