

*Département des Biopolymères Artificiels de  
l'IBMM (IBMM-DBA):*

*Polymères pour la Santé.*

***Benjamin Nottelet***

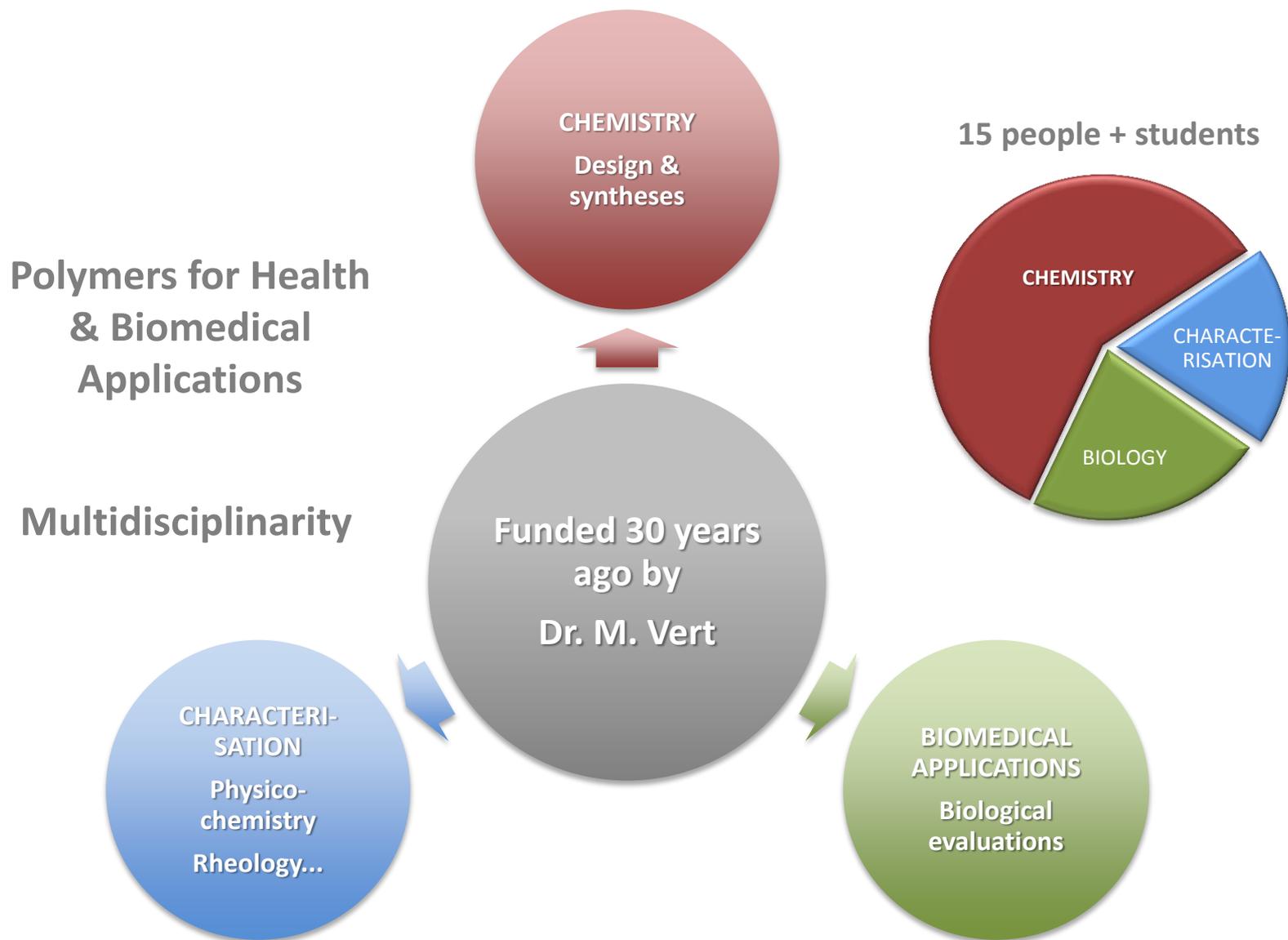
IBMM-DBA UMR 5247

Université Montpellier – ENSCM

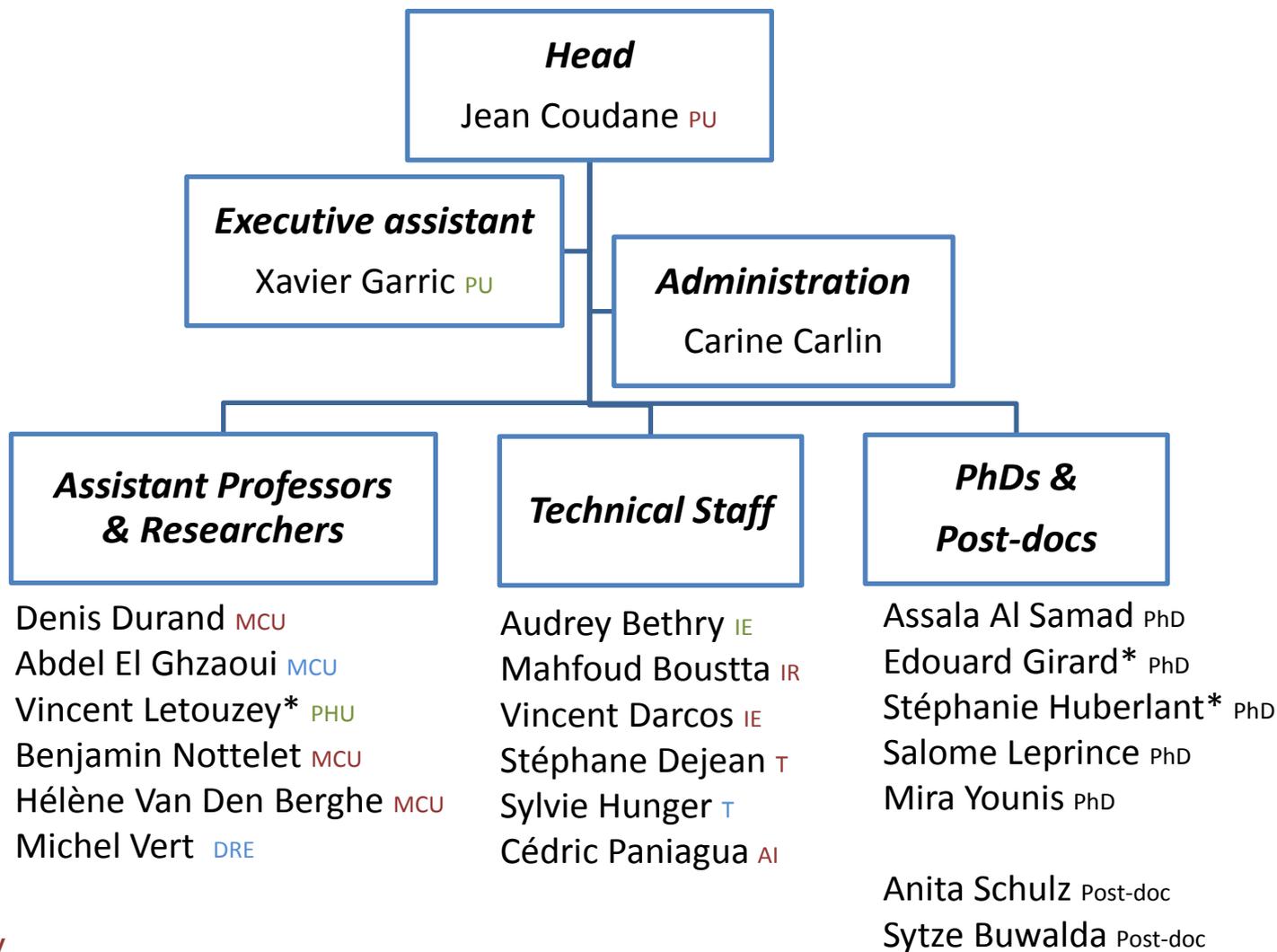
Rencontres Nationales des Jeunes Polyméristes 2015



# About IBMM-DBA

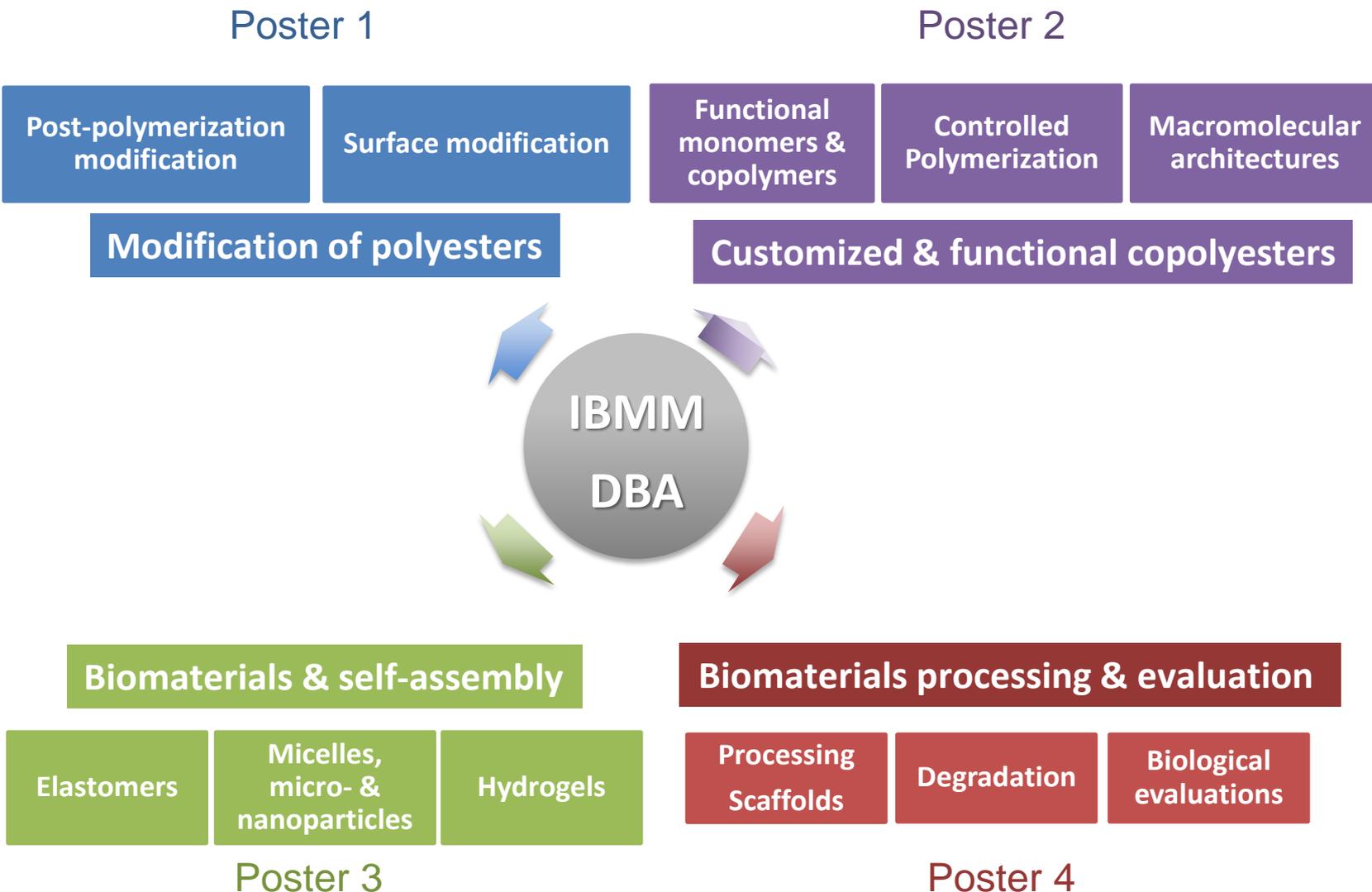


# People at IBMM-DBA



Chemistry  
Physico-chemistry  
Biological Applications

# Expertise & skills at IBMM-DBA

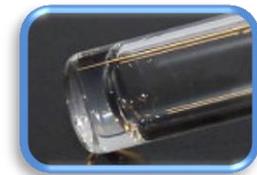
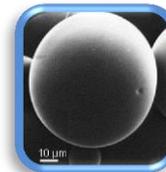
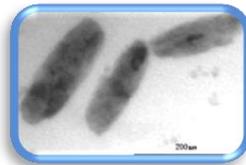


# Topics at IBMM-DBA

## Polymers for Health & Biomedical Applications

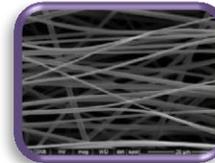
### Drug delivery

*(micelles, nano and microparticules, coatings, hydrogels)*



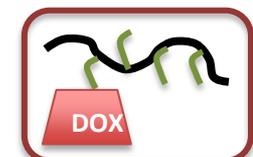
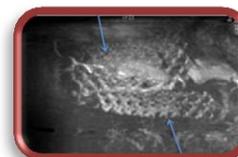
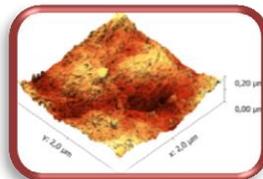
### Implantable medical devices

*(functional prostheses, scaffolds, tissue engineering)*



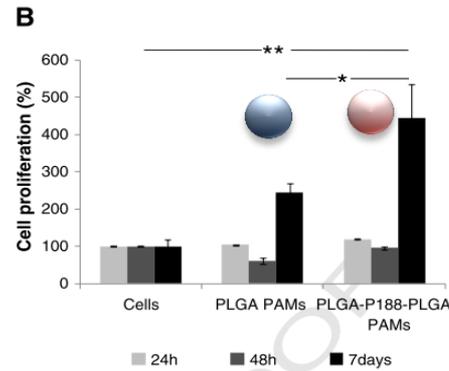
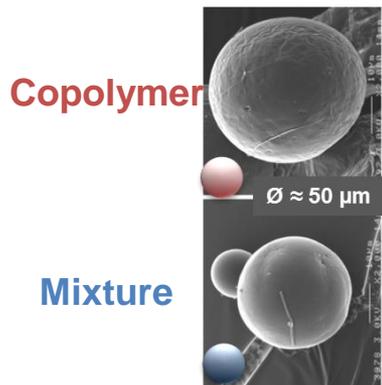
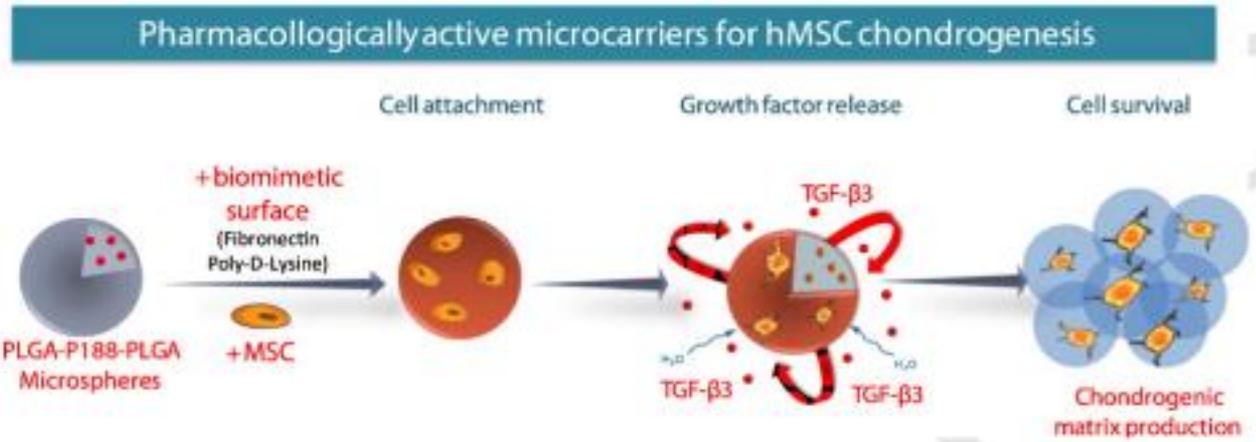
### Biomaterials for advanced applications

*(medical imaging, bioactive surfaces, prodrugs)*

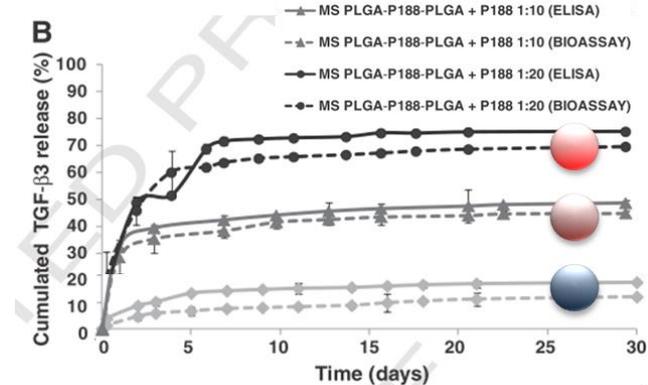


# Topics at IBMM-DBA

## Drug delivery : particles



**Better proliferation of hMSC**



**Protection and controlled release of TGF- $\beta$ 3**



Patent WO2013144341

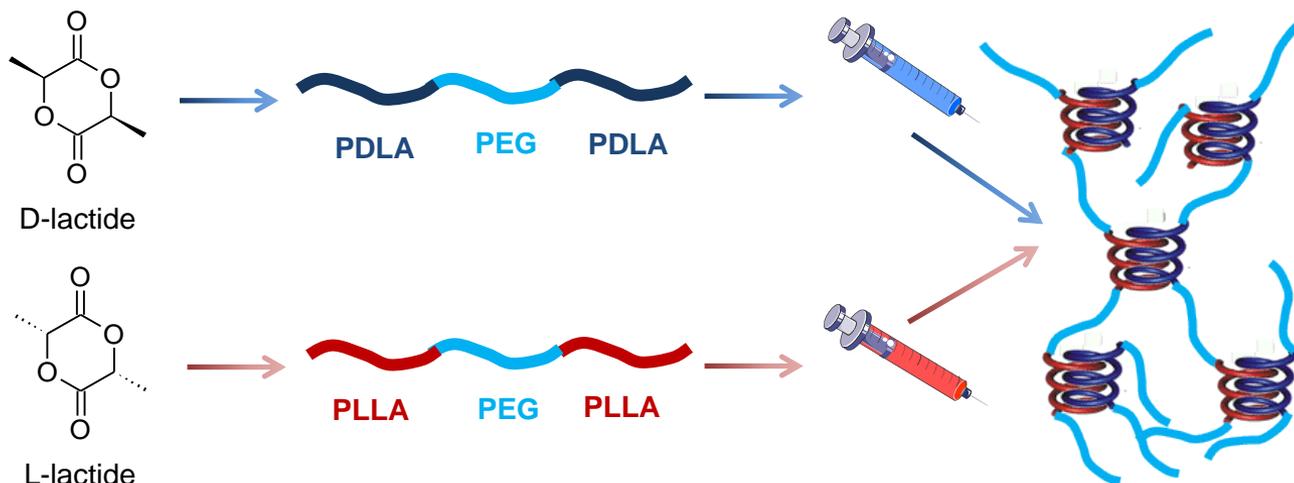
RNJP 2015, La Grande-Motte, 3 juin 2015

Morille M. et al. *J Control Rel* 2013  
 Van-Tranh et al. *Eur J Pharm Sci* 2012



# Topics at IBMM-DBA

## Drug delivery : gels

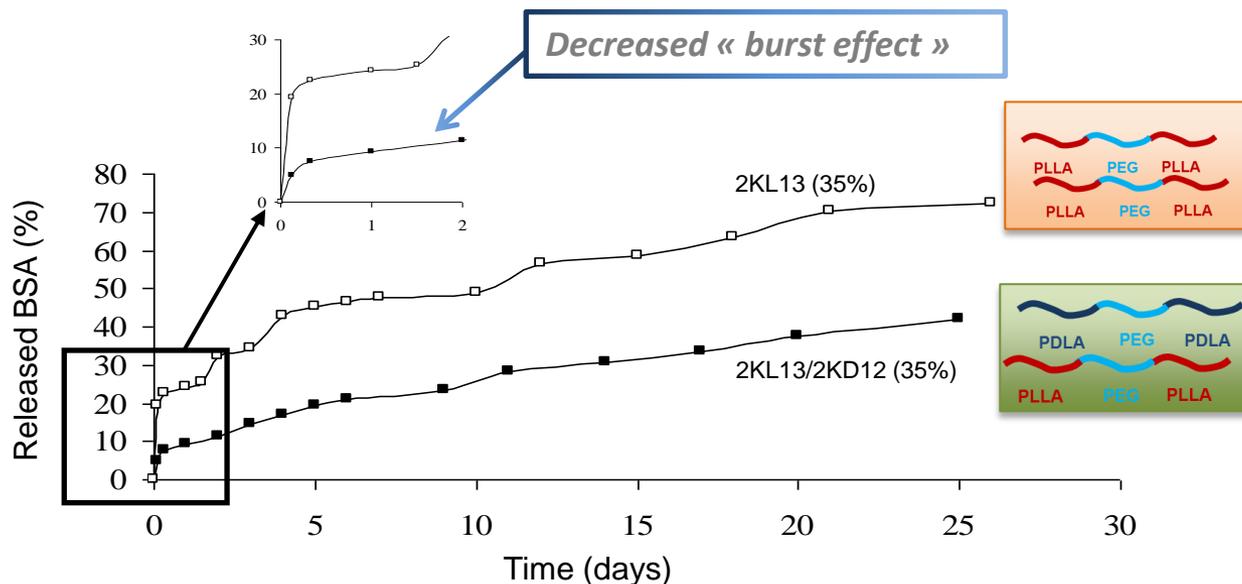


Stereocomplexes



Gel

Improved cristallinity  
& stability

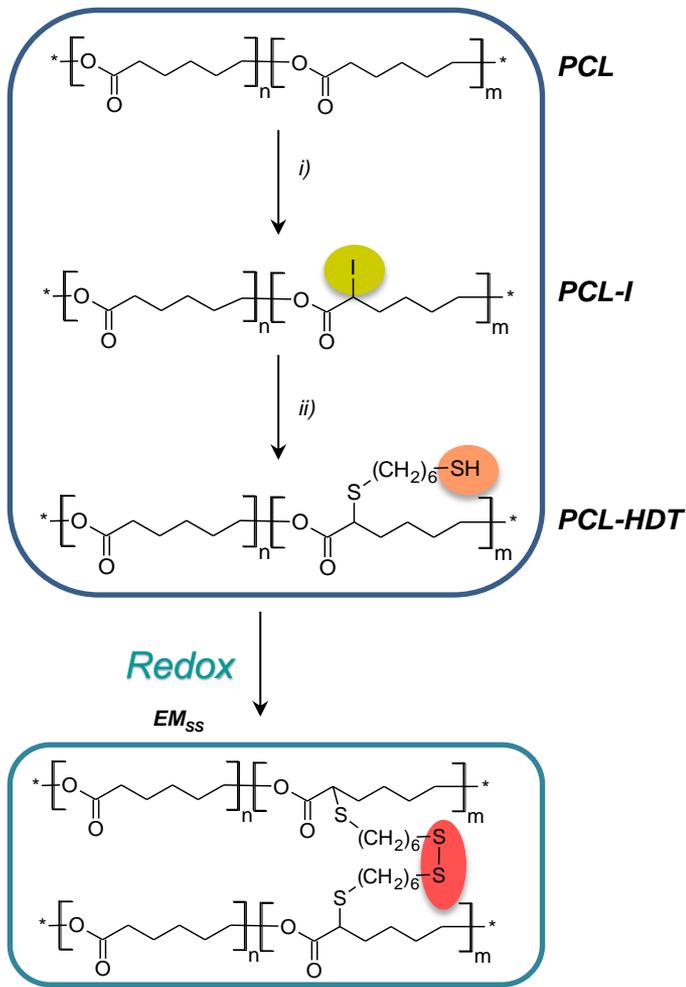


Gel

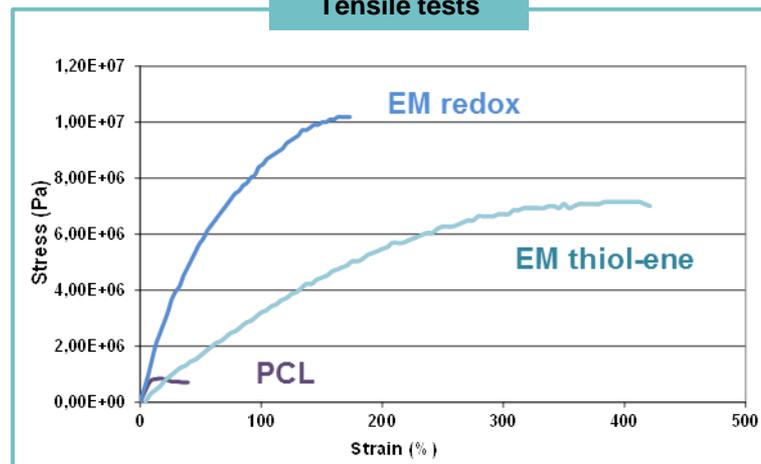
Stereocomplexed  
gel

# Topics at IBMM-DBA

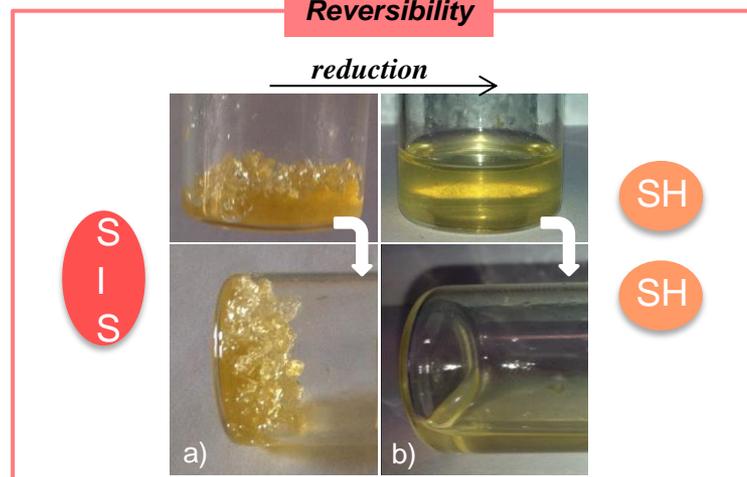
## Implantable medical devices : thermosets



### Tensile tests



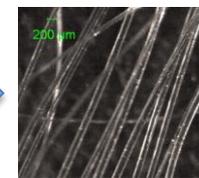
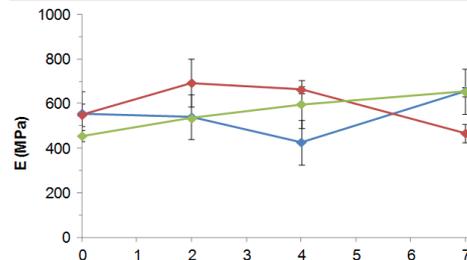
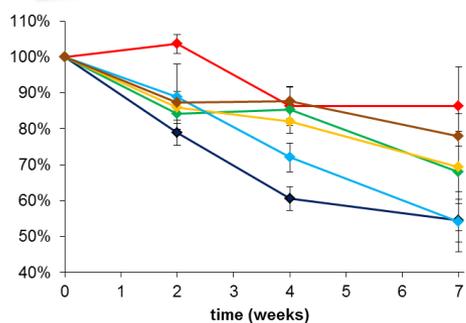
### Reversibility



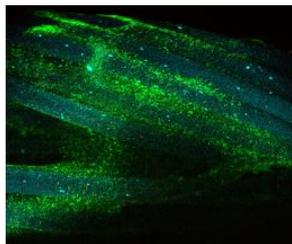
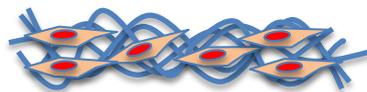
# Topics at IBMM-DBA

## Implantable medical devices : thermoplastics

### Degradable copolymers synthesis, evaluation & selection

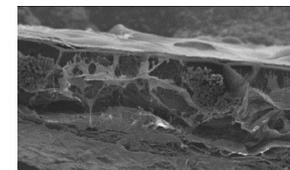


Association with human mesenchymal stem cells



Excellent proliferation onto the scaffold  
Expression of specific proteins (tenascin, tenomodulin...)

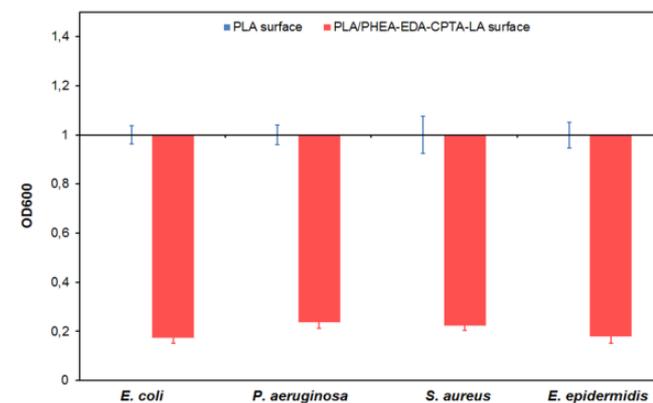
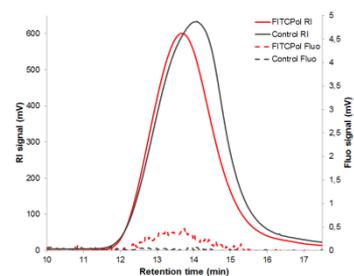
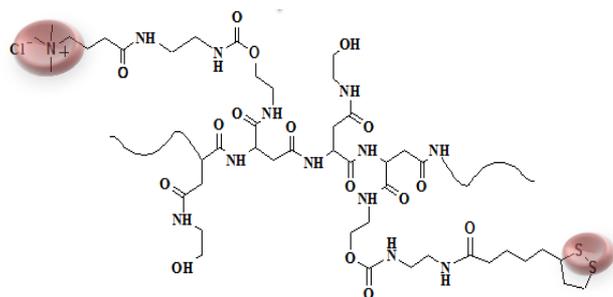
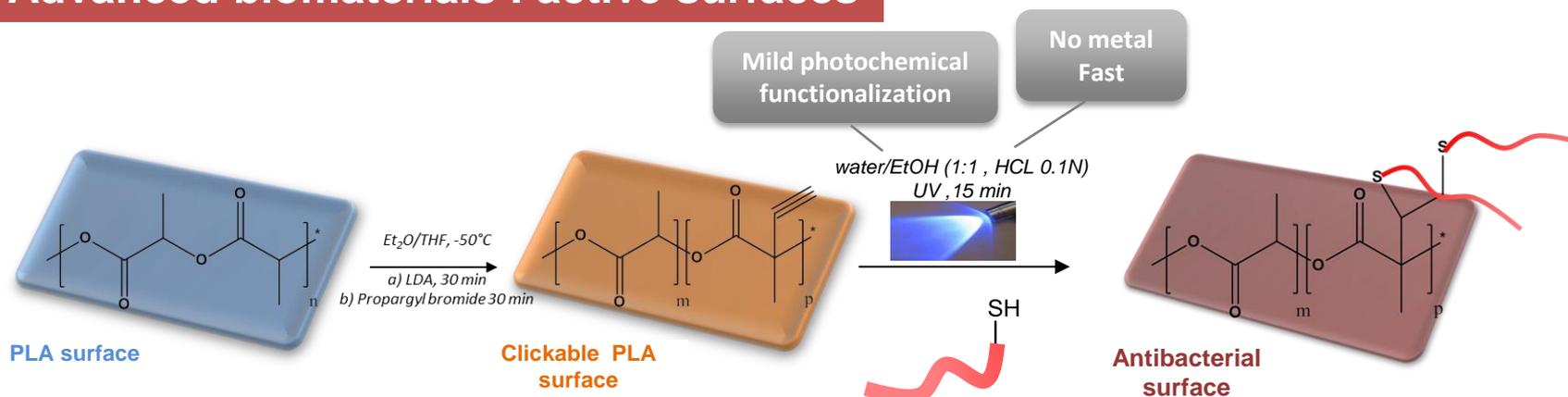
Association with cross-linked bovine collagen



Excellent proliferation of ligamentocytes onto the scaffold  
Development towards a ligament patch

# Topics at IBMM-DBA

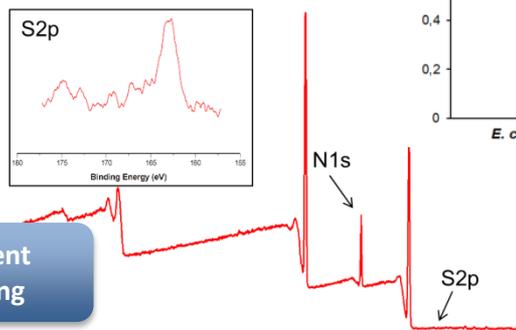
## Advanced biomaterials : active surfaces



**Collaboration Pr.**  
**G.Cavallaro (STEBICEF**  
**Palermo, Italy)**

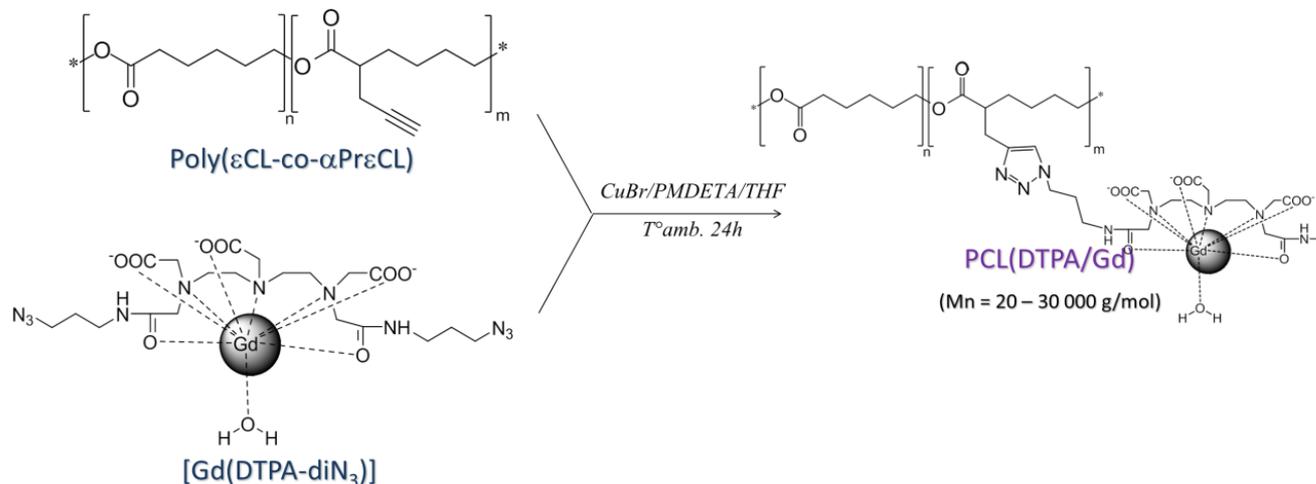
Covalent grafting

80% biofilm decrease

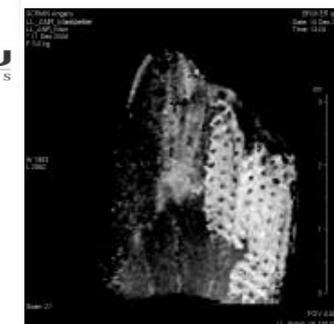
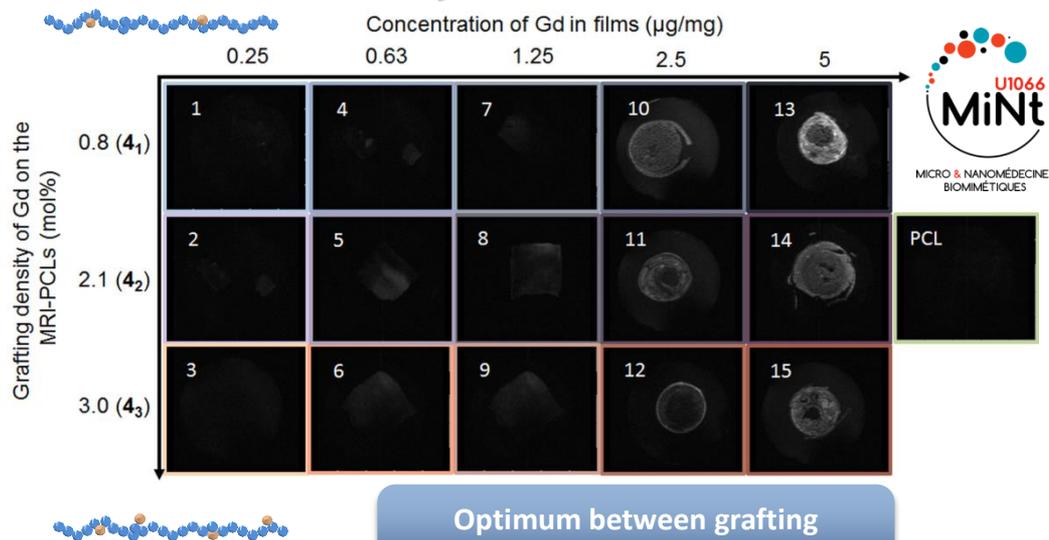


# Topics at IBMM-DBA

## Advanced biomaterials : medical imaging

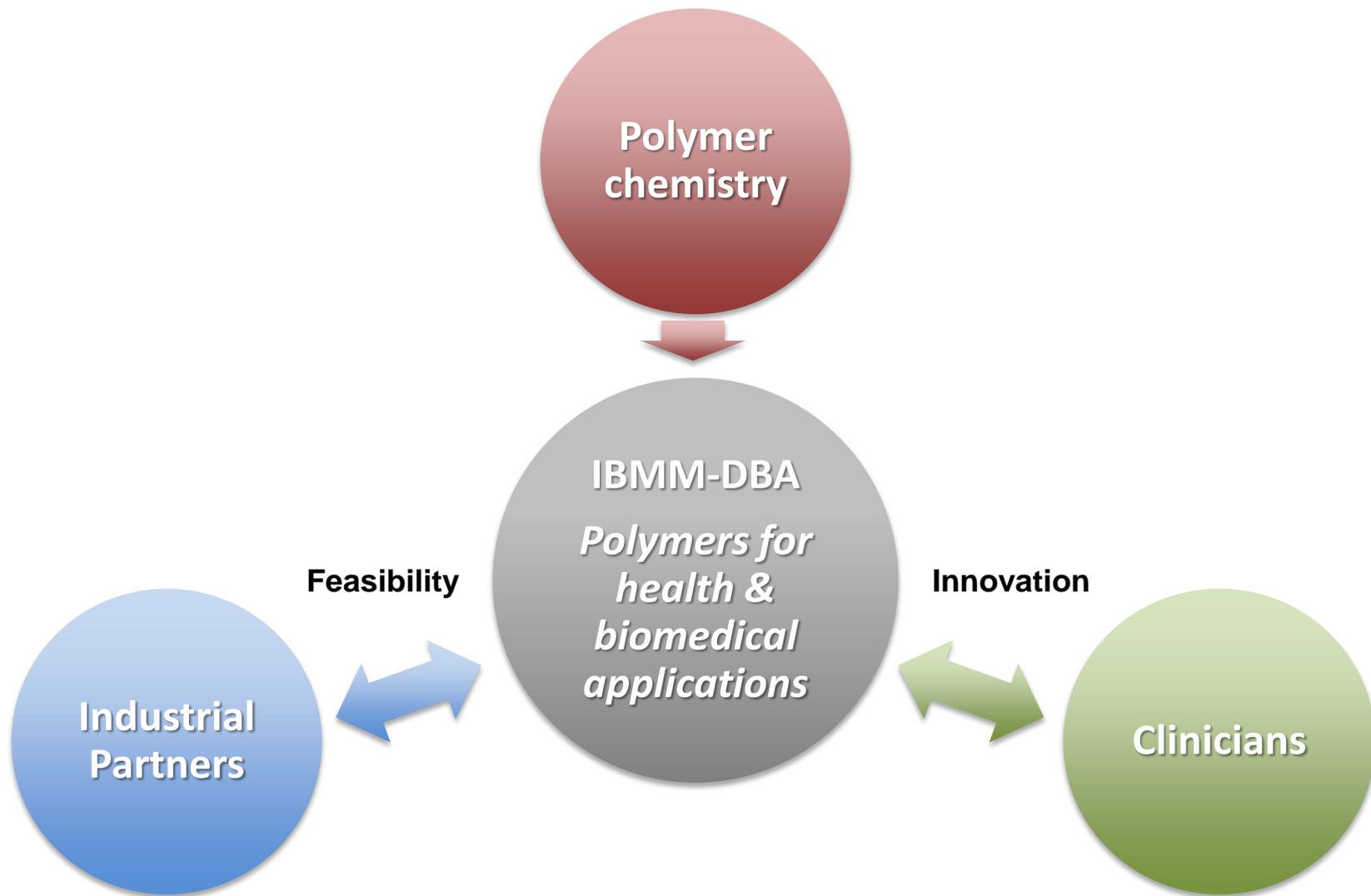


WO2011004332  
WO 2013084204



No need of high Gd<sup>3+</sup> dose

# IBMM-DBA : a summary



# Merci de votre attention

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IBMM-DBA UMR 5247

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