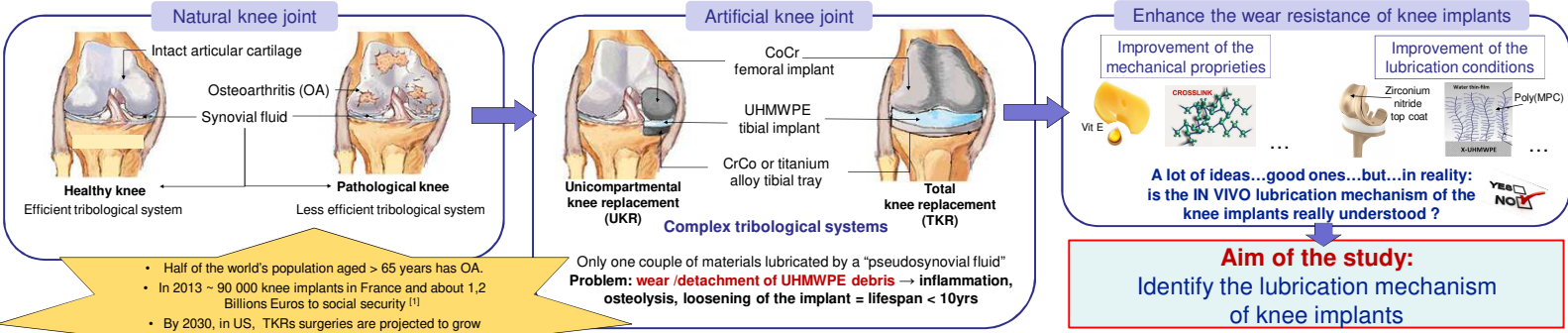


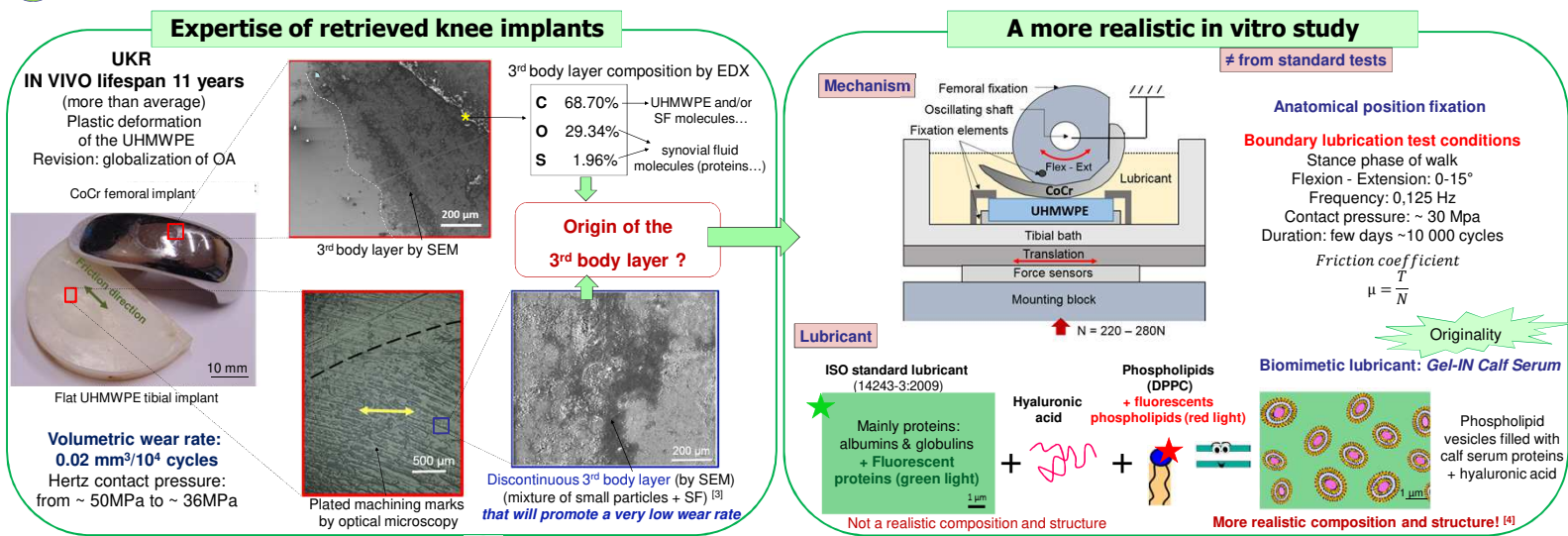
# Towards Understanding The Tribological Behavior Of UHMWPE In Knee Implants: In Vitro Study Using More Realistic Lubricant

M.-M. Sava\*, B. Munteanu, D. Leveque, Y. Berthier, A.-M. Trunfio-Sfarghiu  
 \*Univ Lyon, INSA-Lyon, CNRS UMR5259, LaMCoS, F-69621, France  
 \*mirela-maria.sava@insa-lyon.fr

## Context and purpose



## Tribological approach



## Tribological findings: in vitro study

Implant	Proteins visualization	Phospholipids visualization	Surface characterization by SEM
<b>CoCr femoral implant</b> No visible marks at naked eye			
<b>UHMWPE tibial implant</b> Friction direction, Worn area shape of symbol '∞', Three areas of interest: (1) Edge of worn area I, (2) Center of worn area, (3) Edge of worn area II, μ from 0.09 to 0.05, Volumetric wear rate: 2.96 mm <sup>3</sup> /10 <sup>4</sup> cycles			

## Conclusion

Retrieved implants expertise & in vitro study:  
 → similar tribological behaviors - formation of a 3<sup>rd</sup> body layer, a mixture between the UHMWPE particles and the lubricant molecules (phospholipids and proteins)  
 → the 3<sup>rd</sup> body layer formed during the in vitro test is mostly ejected at the edge of the contact area

**A minimal wear of UHMWPE is necessary because the mixture between the UHMWPE particles + synovial fluid seems to be a GOOD LUBRICANT, improving friction and reducing the wear**

## Perspectives

Lubricant wear particles analysis & Boost the in vitro study to more than 10 000 cycles

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