

## Scientific outcome

*The work aimed to design novel anti-inflammatory coatings with improved biocompatibility and better control of the biological responses after biomaterial implantation. Thus, the well known nonsteroidal anti-inflammatory drug Naproxen that is widely used in clinical settings to treat inflammation was encapsulated in the core of vinyl imidazole shell by free radical copolymerization to produce nanoparticles (NPs) (Biomaterials group, ICTP-CSIC, Madrid). In addition, the application of glycosaminoglycans (GAG) like heparin (Hep) that possess anti-inflammatory potential related to their ability to bind pro-inflammatory cytokines and matrix metalloproteases was performed earlier at the (Biomedical Materials group, MLU of Halle-Wittenberg). Therefore, the Layer-by-Layer (LbL) assembly of polyelectrolytes was used to combine the immediate anti-inflammatory capacity of Hep with the long-term effect of NPs to achieve synergistic effect.*

*In Madrid, coumarin-6- loaded NPs and their hydrodynamic properties were evaluated by Dynamic Light Scattering and Laser Doppler Electrophoresis. UV spectrophotometer illustrated high percentage of dye encapsulation within the NPs. In Halle, LbL systems were prepared and macrophages derived from THP-1 monocytic cell-line were seeded in order to investigate the potential of endocytosis. The flow cytometry indicates the capability of macrophages to uptake the NPs in suspension at higher percentage in comparison to the immobilized ones after 48 h. In addition, Confocal laser microscopy (CLSM) visualized the uptake of NPs by macrophages which confirms the flow cytometry results. Endocytosis up to 15 d would be performed at the last stage to investigate the long term release of NPs.*

## Interdisciplinary and social outcome

*This exchange connected the chemical lab in Madrid with the biomedical material lab in Halle (saale). It was a great opportunity to get the exchange award as it facilitates the chance to learn the synthesis of NPs with corresponding characterization methods. On the other hand, biological reactions were also learned in terms of macrophages behavior towards inflammatory responses.*

*We had the chance to learn different methods in which it added significantly to our research and also helped to understand how collaborations contribute into a wider knowledge.*

*The yESAO exchange award made our aspirations real by the great support of the committee as they showed interest in the research of young scientists.*

*We had a great time exploring the new cities as well as the differences in culture and life style. A lot of nice and warm memories were obtained during the exchange stay. It is one of the best experiences someone can have during the PhD life, we believe. Therefore, we highly recommend everyone to apply to the yESAO exchange award for its unique feature and advantage.*

*Many thanks for the committee to offer us this great chance.*