PERSONA CIÈNCIA EMPRESA
UNIVERSITAT RAMON LLULL
SCHOOL OF ENGINEERING

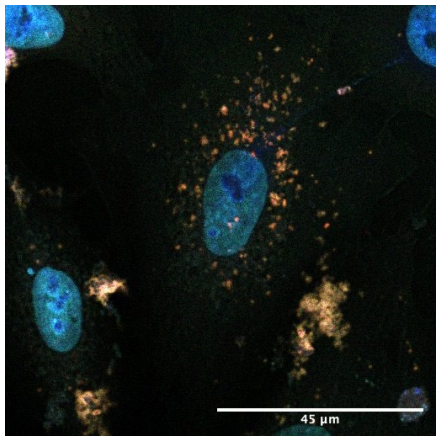
LABORATORY OF BIOCHEMISTRY

Materials Engineering Group
(Biomaterials)

ANIMAL CELLS ENGINEERING FOR THE PRODUCTION OF EXOSOMES

Exosomes have emerged as therapeutic vehicles with promising potential for drug and gene deliver. Currently, one of the main drawbacks in exosome manufacturing and application is the lack of effective tools to distinguish between exosomes and other cellular vesicles, and therefore, their purification.
Based on our prior experience in engineering producing cells by fusing reporter proteins (GFP and mCherry) to different tetraspanins, what allowed exosomes visualization, quantification, and tracking (as shown in the image), we point to go one step beyond. The proposal focuses on engineering the producer cell line with the aim of obtaining labelled exosomes by fusing a TAG sequence (12xTAG, CBP…) to a set of different Trans-membrane proteins (CD63, CD9…) mainly found in exosomes following different approaches.

Initially, a screening study will be performed in order to select the best combination of proteins and TAG sequences, by means of transfecting bicistronic plasmids harbouring the fused proteins. Then the selected combination will be used to edit the cell genome using CRISP Cas9.



Qualitative evaluation of the coexpressionlevels and localization of eGFPCD63+pIRESpuro3 with Ab CD63-PE in A549.

Then, the labelled exosomes will be purified, analysed and characterized by NTA, by flow cytometry, SEM and western blot. The main goal pursued is to be able to purify and quantify exosomes, allowing optimizing dose-efficiency studies. With no doubts it would boost the research for exosome manufacturing and therapeutical applications.

We are looking for a highly-motivated student with a degree in Biotechnology, Biochemistry or related area. The candidate will be integrated in a multidisciplinary group and will be in charge of performing experimental work and actively participate in the group meetings. Commitment and good communication skills are required.

Skills to develop: Molecular Biochemistry, Recombinat DNA technology, nano-particles analysis, Animal cell culture and bioprocessing technologies

Supervisors Team: Martí Lecina, PhD; Pablo Leivar, PhD and Cristina Fornaguera, PhD.

Positions offered (2021-2022): 1 Master research project (6-9 month)

Contact: Martí Lecina, PhD marti.lecina@iqs.url.edu