PERSONA CIÈNCIA EMPRESA
UNIVERSITAT RAMON LLULL

SCHOOL OF ENGINEERING

Improvement of targeting selectivity to sialic acid receptors by using borylated polymers

The delivery of nucleic acids into cells requires the use of a vector to cross plasmatic cell membrane. Poly(β-aminoester) polymers (PBAEs) demonstrated their superiority in performing this cellular crossing, however, their delivery is not always selective enough, which could compromise the safety of a future therapy. To overcome this limitation the incorporation of a directing ligand to these vectors can clearly increase the system selectivity.
Of particular interest is to achieve a selective delivery to the highly reluctant cancer stem cells populations, which in many cases present an overexpression of the neuraminic acid (sialic acid).

In this context, recently it has been reported that certain classes of aryl and heteroaryl boronic acids are able to recognize this type of keto-sugar-based receptor with a remarkable affinity. The GEMAT and the GQF group's at IQS have decided to join effort to develop a series of borylated PBAE type polymers, which are hypothesized to selectively target only those type of stem cells.

The aim of this TFM proposal consists on tailoring a better formulation based on boron-modified PBAEs with enhanced targeting selectivity to cancer stem cells.

The selected student will be in charge of:
1) formulating and physiochemically characterize the novel nanoparticles;
2) in vitro test of their biocompatibility; and
3) in vitro test their selective transfection by performing competition studies.

Responsible researchers: Dr. Salvador Borrós, Dr. Cristina Fornaguera, Dr. Ana Belén Cuenca