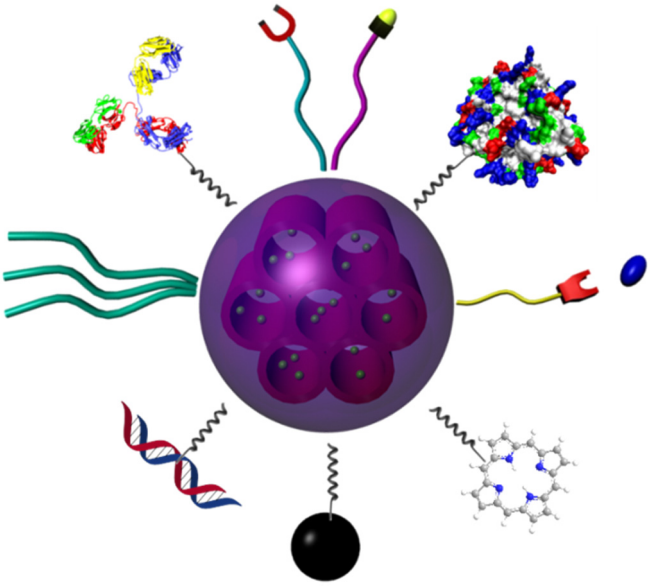
PERSONA CIÈNCIA EMPRESA
UNIVERSITAT RAMON LLULL

RESEARCH PROJECT

Positions offered (2017-2018): 1 Master research project (6-9 month)

Mesoporous Silica Nanoparticles for Sensing applications and Drug Delivery

Despite the encouraging progress in tumor biology and chemotherapy, adequate cancer treatment is far from satisfactory. The therapeutic effect of chemotherapy remains quite poor due to insufficient drug dosage to the diseased regions, rapid blood clearance, severe side effects and drug resistance. One promising strategy to address these drawbacks is the use of multifunctional drug delivery systems (DDS), including micelles, drug conjugates, as well as polymeric and inorganic nanoparticles. In this context, mesoporous silica nanoparticles (MSN) present outstanding properties for drug delivery applications.[1-4] owing to their good biocompatibility, easy chemical modification and high encapsulation capacity. This chemical versatility opens the door to the design of stimuli-responsive DDS, which allow selective release of the payload, by means of smart gates installed at the external surface of the nanoparticle.



All these features endow MSN with ideal properties to design DDS for the co-delivery of anticancer drugs, which is the basis of the so-called combination chemotherapy. The general principle of combination therapy is the administration of more than one drug, with independent mechanism of action, with the aim to enhance the efficiency of the treatment. This approach has been proposed by our group and others for the treatment of aggressive brain tumors such as glioblastoma.

References

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