

Mesoporous Silica Nanoparticles for Nanomedicine

two decades? Chem. Soc. Rev., 2022, 51, 5365-5451

Miguel Manzano,

Dept. Química en Ciencias Farmacéuticas. Facultad de Farmacia. Chemistry in Pharmaceutical Sciences. School of Pharmacy. UNIVERSIDAD COMPLUTENSE DE MADRID, SPAIN.

CIBER de Bioingeniería, Biomateriales y Nanomedicina, CIBER-BBN, C/Monforte de Lemos, 3-5, 28029 Madrid, Spain

mmanzano@ucm.es

In recent years, nanomedicine has emerged at the forefront of nanotechnology, generating great expectations in the biomedical field. Researchers are developing novel nanoparticles for both diagnostic applications using imaging technology and treatment purposes through drug delivery technologies. Among all the available nanoparticles, inorganic mesoporous silica nanoparticles (MSNs) are the newcomers to the field, contributing with their unique and superlative properties. MSNs present well-defined and tunable physicochemical properties, including particle size, pore size, pore volume, surface area, volume area, pore structure, and surface functionality. The porous structure of MSNs provides cavities that can host and release a great variety of biomolecules and therapeutic agents. In fact, the versatility of MSNs in size, morphology, and texture has fuelled their application as controlled drug delivery nanocarriers. MSNs can provide a novel therapeutic armamentarium capable of addressing some of the main pitfalls of conventional medicine, such as the lack of drug specificity, the narrow window of efficacy of some medicines, the possible low drug solubility and/or stability, adverse pharmacokinetic profiles, and some possible side effects.

During this talk, I would try to give an overview of the work that we do regarding the use of Mesoporous Silica Nanoparticles as Nanomedicines, and their potential application for treating certain diseases.

References

- [1] Manzano, M., Vallet-Regí, M., Mesoporous Silica Nanoparticles for Drug Delivery. Adv. Funct. Mater. 2020, 30, 1902634
 - [2] Manzano, M., Vallet-Regí, M., New developments in ordered mesoporous materials for drug delivery, J. Mater. Chem., 2010,20, 5593-5604
 - [3] Vallet-Regí, M, Schüth, F., Lozano, L, Colilla, M, Manzano, M., Engineering mesoporous silica nanoparticles for drug delivery: where are we after
-