

BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA



INSTITUTO DE FÍSICA “Luis Rivera Terrazas”



SEMINARIO EXTRAORDINARIO “DR. JESUS REYES CORONA”

“FUNCTIONAL POROUS SILICON BASED COMPOSITES AS NANOSTRUCTURED CARRIERS FOR THE CONTROLLED RELEASE OF THERAPEUTIC DRUGS.”

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Over the past few decades, research breakthroughs made in designing pharmaceutical drugs for various diseases have greatly advanced the knowledge of physicochemical properties of drug molecules as well as mechanisms of cellular uptake leading to numerous effective therapeutic strategies. However, in some cases, the current treatment methods primarily rely on the use of conventional cytotoxic drugs that have adverse side effects and only limited effectiveness. To overcome this hurdle, a widely pursued strategy is to design a target-specific drug delivery systems that can transport an effective dosage of drug molecules to the targeted cells and tissues. The success of this approach hinges upon the ability to construct a biocompatible carrier that allows high loading of drug molecules without any premature release of the cargo before reaching the destination. Among many structurally stable materials that have been investigated for drug delivery, porous silicon microparticles (PSi μ P) have emerged as a potential option for this application. PSi μ P offer the properties needed in terms of non-toxicity, biocompatibility high stability and hydrophilic and porous structure useful for tailoring the encapsulation of drugs and biological molecules. Thus, in this work, we used PSi μ P and biopolymer/PSi μ P composites as scaffolds to deliver in vitro tramadol and theophylline, medicaments used for pain and bronchial asthma. In addition PSi μ P were used as adjuvant and vehicle to deliver a synthetic RAGE peptide, which is known to induce therapeutic effects in Alzheimer's disease. Physico-chemical interaction between the inorganic and organic systems were evaluated by using UV-Vis and zeta potential. The morphological characterization of PSi μ P and composites showed a mesoporous and crosslinked structures, with optimal pore sizes to induce the infiltration of short chain peptides and medicaments. In this talk, the kinetics of release and adsorption properties of hybrid biopolymers and PSi μ P will be presented. Applications of hydrogel composites for the removal of environmental contaminants will be also discussed.

Auditorio-IFUAP

**Jueves 30 de junio de 2016
16:00 Hrs.**