



Characterization and Effect of Engineered Solid and Mesoporous Silica Particle Physical Properties on In Vitro Toxicity

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Time: 12:00 – 12:30 p.m. CST (10:00 – 10:30 a.m. PST)

Location: 1000 MNTL at Illinois (KL 361 at UC Merced)

Abstract:

Mesoporous silica, due to their unique properties, such as high surface area, large pore volume, tunable pore size, narrow pore distribution, and good chemical and thermal stability, are highly suitable for controlled release applications such as drug delivery. Furthermore, they can be functionalized to permit simultaneous diagnostic capabilities such as monitoring of drug delivery and treatment efficacy. However, biocompatibility, toxicity and biodegradation of these particles are not yet completely understood. Here, we tested the biocompatibility of mesoporous silica with THP-1 human derived macrophages *in vitro* and compared these results to solid silica of similar size. A variety of materials parameters were characterized to test correlation with biocompatibility, including size, surface area, agglomeration, surface charge, external surface area, pore volume and integrity. These results show that mesoporous silica is more toxic compared to solid silica on a per mass dose. Also, lipid peroxidation appears to be involved in the toxicity of mesoporous silica.

Seminar Presented by:

