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Silica nanoparticles as promising drug-delivery system for 3-hydroxyquinolin-4(1*H*)-ones with anticancer activity

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3-Hydroxyquinolin-4(1*H*)-ones (3-HQs) are known for their biological properties and anticancer activity. Several derivatives were synthesized and studied in this context, exhibiting very good biological activities in some cases. However, most of these compounds suffer from bad solubility in aqueous medium. Their application in pharmaceutical industry therefore becomes problematic. Drug formulations offer a modern approach to overcome not only poor solubility in aqueous media but also protection of the drug against enzymatic decomposition. Moreover the undesirable toxicity of the drug to the healthy cells is significantly decreased and the bioavailability increased. Sol-gel chemistry combined with microemulsion technique brings elegant methodology for synthesis of silica nanoparticles. This approach comprises the drug solubilization inside the core of the micelles followed by series of hydrolysis-condensation reactions of tetraalkoxysilane. The final shape and size of formed silica material is given by the micelles forming nanosized particles. The reverse technique, when pre-prepared empty nanoparticles are loaded by impregnation is also possible. This poster will present two methodologies for 3-HQs encapsulation inside both normal and reverse micelles. Benefits and drawbacks of both systems will be discussed and anticancer activity of selected 3-HQs will be examplified.

Biography

Kristyna Burglova has completed her PhD in 2012 from Institute of Chemical Technology in Prague and Ecole Nationale Superieure de Chemie de Montpellier. Since then she holds a Postdoctoral position in Palacky University in Olomouc, Czech Republic. Her interests are organic synthesis both in solution and on solid-phase, preparation of organic compounds with biological activity, silica materials and others.

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