Synthesis and characterization of magnetic nanoparticles covered with molecular imprinted polymer templated with doxorubicin. In vitro drug release.

Pedro Javier Salas Ambrosio, Ma Josefa Bernad-Bernad, **Jesús Gracia Mora**
Facultad de Química, UNAM México
Email: jgracia@unam.mx

It have designed new ways of treating cancer, one of which is use of nanoparticles. When synthesized with a magnetic core and coated with molecular imprinted polymer (MIP), they may function as a system targeted drug delivery. Because of this synthesized magnetic nanoparticles coated with acrylates, using doxorubicin as template (NMSPD). Synthesis of magnetite nanoparticle was performed by the coprecipitation method, coated with silicates by tetraethyl orthosilicate hydrolysis to prevent decomposition, and MIP was built by thermal polimerization. In the characterization of nanoparticles was determined particle size, Z potential, spectroscopy ATR-FTIR, X-ray diffraction powder, absorption and desorption. Results for nanoparticle size were 10±0.02 nm by TEM, Z potential was 1.98±0.06. Infrared analysis showed bands at 3436, 2981, 1616, 1579 and 803 cm-1 by doxorubicin, at 2940, 1729, 1413, 1210, 1113 and 1008 cm-1 by acrilates of MIP, at 1040 and 1151 cm-1 by silicates and 551 cm-1 by magnetite. Diffractogram peaks at 2θ were 30.26°, 35.64°, 43.31°, 53.75°, 57.33° and 62.87°, wich agrees with the caracteristic peaks of magnetite. NMSPD adsorbed 124 mg doxorubicin/g nanoparticles in contrast with no imprinted polymer (NMSP) 109 mg doxorubicin/g nanoparticles and 3.35 times more specific. NMSPD desorbed 56 mg doxorubicin/g nanoparticle at 528 hours in a buffer of phosphates pH=7.4, delivery is kind Fick from a polymer matrix. Conclusions was synthesized and characterizated magnetic nanoparticles and may function as a system targeted drug delivery, because are magnetic and delivery is prolonged