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**POLY (DL-LACTIDE-CO-GLYCOLIDE) NANOSPHERES WITH
ENCAPSULATED SELENIUM NANOPARTICLES AS A SYSTEM
WITH THERAPEUTIC FUNCTIONALITY**

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Selenium (Se) is an essential trace element with important physiological functions and extensive pharmacological actions. The role of selenium as a chemopreventive and chemotherapeutic agent has been supported by a large number of epidemiological, preclinical, and clinical trials. Uniform, stable, amorphous selenium nanoparticles (SeNps) have been synthesized and additionally encapsulated within spherical PLGA particles (PLGA/SeNps). The morphology (size and shape) of the particles plays key role in their adhesion and interaction with the cell. Synthesized particles were characterized by FTIR spectroscopy, FESEM, TEM, HRTEM, and Zeta potential measurements. The influence of PLGA/SeNps on cell viability, ROS generation in HepG2 cells, as well as anticancer activity against epithelial tumor cells was investigated. As a part of this study, we have also performed *in vivo* dynamic imaging studies in normal mice, using SPECT imaging and a high resolution gamma camera. The PLGA/SeNps nanoparticles have been radiolabelled with Tc-99m, by applying the direct labeling method. Ex vivo biodistribution measurements, as well as *in vivo* dynamic studies up to 1h p.i. and at 24h were performed, showing increased concentration in liver and spleen.