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Ultrasonic transformation of tannic acid into biofunctional ellagic acid micro/nanocrystals with distinct morphologies

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A coustic cavitation bubbles can be used to perform miscellaneous reactions due to their reactive surface. A simple ultrasonic approach has been developed for synthesizing crystalline, regularly shaped ellagic acid particles from amorphous tannic acid. Multiple and consecutive reactions have been performed on tannin molecules, including, hydrolysis of an ester linkage, C-C coupling reactions, condensation reaction and crystallization without the addition of any external reagent. The size and shape of these crystals could be finely controlled by choosing appropriate ultrasonic parameters such as sonication time, power and frequency. The formation of ellagic acid was confirmed by absorption spectroscopy, ellagic acid assay, HPLC, mass spectrometry and XRD. The synthesized particles showed blue, green and red emissions, high thermostability, antioxidant properties and a remarkable antiproliferative effect in human breast adenocar-cinoma cells. The particles were also used to load anticancer drugs such as doxorubicin and 80% of drug loading efficiency was observed in 24 h.

Biography

Sukhvir Kaur Bhangu is currently pursuing final year of PhD from University of Melbourne in School of chemistry. She is working on ultarsonically generated nanoparticles from different polyphenols, amino acids and others biomolecules and then to study their biomedical applications.

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