conferenceseries.com

5th World Congress on
Materials Science & Engineering
June 13-15, 2016 Alicante, Spain

Synthesis of nanocarbon dots from spicy food and study of their *in-vitro* anticancer potential

Nagamalai Vasimalai, Vânia Vilas-Boas, Begoña Espiña, Lorena Diéguez and **Maria Teresa Fernández-Argüelles**
INL-International Iberian Nanotechnology Laboratory, Portugal

Nanocarbon dots (C-dots) are a new class of nanomaterials that has gained momentum because of their aqueous solubility, chemical inertness, poor photobleaching, low toxicity, biocompatibility etc. Hence, C-dots are used in fields including bioimaging, drug delivery, catalysis, optoelectronics, biosensors etc. Nowadays, there are described multiple routes and carbon sources as alternative for graphite to obtain C-Dots. Among them, foodstuffs have recently attracted considerable attention as starting materials, because they can be used in simple and cost-effective synthetic routes, and are environmental friendly. Besides these advantages, foodstuff-based C-dots present higher fluorescent quantum yield than those obtained with other routes, and some of them have anti-cancer properties, features that strongly depend on the material employed for the synthesis. Black pepper is a well-known spice due to its anti-inflammatory, anti-angiogenic, and anti-arthritic effects, and it has been reported that it is capable to reduce cancer cell proliferation. Therefore, in this work, black pepper was selected as source to perform a one-pot green synthesis of C-dots, and its anticancer potential has been evaluated through *in-vitro* studies. The synthesized C-dots have been deeply characterized (UV-Vis, fluorescence and raman spectroscopy, photostability, quantum yield, FT-IR, XRD, TEM etc.,). They have shown an excellent fluorescence quantum yield and narrow size distribution. Bioimaging studies have been performed to evaluate the *in-vitro* anticancer potential. Localization of the C-dots mainly in the cytoplasm and cell membrane has been observed, and viability studies indicate that the growth of human glioblastoma cells is suppressed up to 75% after 24 h incubation.

Biography

Nagamalai Vasimalai obtained his PhD in Chemistry at Gandhigram University, India in 2013. Subsequently, he did a Post-doc in National Cheng Kung University, Taiwan (2014). Since March 2015, he is working in the Nanoparticles for Bioanalytical Applications research group at INL as a Marie Curie Co-Fund Fellow under the supervision of Maria Teresa Fernández-Argüelles. His field of expertise is luminescent nanomaterials for bioanalytical and theraputic applications.

vasi.malai@inl.int

Notes: