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Carbon-based nanomedicines as anticancer Trojan Horses

Carbon-based nanomaterials have attracted a lot of attention in recent years because of their unique and extraordinary properties which could be exploited for therapeutic, diagnostic and theranostic purposes. Functionalized Carbon Nanotubes (*f*CNTs) have shown their ability to deliver therapeutic molecules ranging from small anticancer molecules to macromolecules as they are up taken by cells via an energy independent mechanism. While chemotherapy is still the main therapeutic modality in the treatment of cancer, there is always the issue of side effects and relapse after treatment. *f*CNTs can be engineered to specifically target cancer cells, increase the drug payload inside them and reduce multidrug resistance. Carbon nanotubes can therefore act as anticancer Trojan horses. Herein, the discussion is on the state of the art of *f*CNTs as cancer therapeutics and their potential for the delivery of cancer therapeutics in 2D cell monolayers, 3D tumor spheroids and *in vivo* models. The further highlight is on the gaps in the field which needs to be addressed before the translational move of these nanomaterials into the clinic.

Biography

Hanene Ali-Boucetta has completed her Master of Pharmacy degree from UCL School of Pharmacy. He has pursued her PhD at Nanomedicine Laboratory at UCL School of Pharmacy investigating the pharmacokinetics and toxicology of carbon nanotubes and their development into effective nano-vectors for cancer therapeutics under the supervision of Kostas Kostarellos. She was awarded the prestigious C W Maplethorpe Research and Teaching Postdoctoral Fellowship from the University of London. She has joined the School of Pharmacy at University of Birmingham as a Lecturer in Pharmaceutical Nanoscience. She is leading the Nanomedicine and Drug Delivery Laboratory and her team is working on the development of novel nano-delivery systems for the treatment of cancer, neurodegenerative disorders and microbial infections. She has published numerous peer-reviewed articles, reviews and book chapters.

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