

CARBON NANOMATERIALS AS DRUG TRANSPORTER FOR CANCER THERAPY

^{1,2,*}C. A. Che Abdullah and ²R.P.L. Sear.

¹*Department of Physics, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia*

²*Department of Physics and Surrey Materials Institute, University of Surrey, Guildford, Surrey, GU2 7XH, United Kingdom*

**Corresponding Author: azurahanim@gmail.com*

There is a vigorous and growing research effort developing carbon nanotubes (CNTs) for medical applications. It is now known that nanocomposites of Single Wall Nanotubes (SWNTs) can be used to deliver anti-cancer drugs to cells. Also, SWNTs are efficient at converting near infrared (NIR) light to heat, and can do so in a cell, and so cancer cells can be targeted for destruction by NIR radiation, once the cells have taken up SWNTs. SWNTs are highly insoluble in water, but can be functionalized via physical or covalent attachment of solubilizing molecules and drugs of interest. Once this is done, they are readily taken up by cells. We found evidence that our CNT nanocomposites were found to enter cells via endocytosis (the mechanism cells use to take up nutrients); this agrees with earlier work by Dai and coworkers. Herein, we perform systematic study of the internalization, delivery and subcellular localization and possible adverse effects of SWNTs dispersed in culture media and SWNTs wrapped with different fluorescently labelled peptide (FLP-SWNTs) on Chinese hamster ovary (CHO) cells and SWNTs attached with anti-cancer drug on two common cancerous cell lines, human epithelial carcinoma cell line (HeLa) and colorectal cancer cell lines (WiDr).