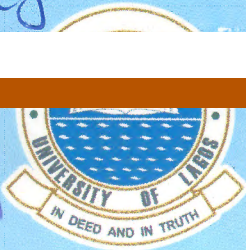


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UNIVERSITY OF LAGOS
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BOOK OF ABSTRACTS

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Synthesis, Characterisation and pH-Responsive Controlled Release Studies of 5-Fluorouracil Drug from Silica Coated $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ Magnetic Nanoparticles

Ehi-Eromosele, C.O.^{1*}, Ita, B.I.^{1&2}, Iweala, E.E.J.³, Ogunniran, K.O.¹, Siyanbola, T.O.¹, Adekoya, J.A.¹, Edobor-Osoh A.¹

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One of the drawbacks of some drug delivery system (DDS) is their inability to release their payloads after reaching the desired site of action. Hence, many DDSs are being evaluated that are able to release their payloads upon action of an external stimulus. $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ MNPs were synthesized by solution combustion synthesis and the optimised MNPs were coated with silica. The synthesized MNPs were characterised by X-ray diffraction (XRD), thermogravimetry-differential thermal analysis (TG-DTA), field emission scanning electron microscope (FE-SEM), energy dispersive absorption spectroscopy (EDAX), fourier transform infra-red spectroscopy (FTIR), vibrating scanning magnetometer (VSM), zeta potential measurements and ultraviolet-visible spectroscopy (UV-Vis). The anticancer drug delivery capability of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ MNPs was carried out. Silica coatings with were utilised for the loading of 5-Fluoro uracil (5-FU) – a well-known anti-cancer drug. The silica surface was functionalised with amino propyl (LSMO-SiO₂-NH₂) to achieve charge reversal of the designed system from negative to positive as pH varied from 7.4 to 5 which was used for the effective release of the cargo at endosomal pH 5. The high 5-FU drug loading and its pH-sensitive release from LSMO-SiO₂-NH₂ suggest that it is a promising material for targeted drug delivery applications.

Keywords: $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$; Magnetic nanoparticles; Silica; cancer therapy; combustion synthesis; 5-Fluoro uracil