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Cisplatin loaded hybrid aerogel microparticles for cervical and colorectal cancer chemotherapy

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Cervical cancer caused by the Human Papilloma Virus is the most common among gynaecological cancers (Burd, 2003). Cisplatin is usually the primary drug choice in chemotherapeutic treatment of this cancer type, either in a monotherapy or in combination with other antineoplastic agents. However, there are several setbacks in the application of anticancer drugs including poor absorption, poor bioavailability, and side effects such as nausea, alopecia etc.

Biodegradable silica-gelatin hybrid aerogels have been developed as promising drug delivery systems and showed significant cytotoxicity towards cancer cells when loaded with anticancer agents (Nagy et al., 2019).

Our objective is to develop a biodegradable, mucoadhesive drug carrier vehicle using the sol-gel method, functionalization with cisplatin and supercritical drying. The resulting aerogels are mesoporous and contain Cisplatin in coordination bonds. The drug is predicted to be released on a pH responsive profile. We aim to investigate the biocompatibility, bioavailability, and cytotoxicity of this DDS on HeLa and Caco-2 cells using the MTT Assay and the Real Time Cell Analyser techniques. Based on the *in vitro* results, the study furthers on to the formulation of ovulum, suppositories, vaginal creams, vaginal tablets, and other vaginal preparations for the local delivery of cisplatin in the cervical tumour tissue environment, for *in vivo* studies.

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