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Aspirin loaded wafers for buccal and oral GIT delivery for patients with dysphagia to target deep vein thrombosis

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Recent studies have reported that dysphagia is an increasing problem among aging population who are a growing demographic. Therefore, alternative solutions specifically tailored to the special needs of older populations, are required by enhancing the development of novel delivery systems and doses. Lyophilised composite wafers comprising metolose (MET) with carrageenan (CAR) and MET with low molecular weight chitosan (CS) have been developed for potential delivery of low dose aspirin via the oral route and buccal mucosa. SEM was employed to assess the surface morphology of the lyophilised blank (BLK) and drug loaded (DL) wafers and XRD used to investigate the physical form (crystalline or amorphous) of the BL, DL wafers and the starting materials. Functional characterisation [mechanical strength, in vitro mucoadhesion and swelling capacity (in phosphate buffered saline – PBS, and simulated saliva – SS, at pH of 6.8)] were performed in order to select the optimised BLK wafers for drug loading and further characterisation of the DL wafers. In addition, drug dissolution and release, taste masking characterisation and permeations studies to investigate the permeation of aspirin released from wafers using ex-vivo porcine buccal tissue and in-vitro PermeapadTM were performed on the DL wafers. The SEM showed a porous microstructure for the BLK and DL formulations whilst XRD showed the BLK formulations to be amorphous and the DL formulations to be crystalline. The hardness of the BLK wafers containing MET increased significantly ($p < 0.05$), whilst the swelling capacity (%) and the mucoadhesion decreased with increase in MET content. The swelling capacity in SS was lower compared to PBS for both, BLK and DL wafers, which may be due to the difference in ionic strength of the media. Lyophilised DL wafers seems to be a very promising system for the administration of low dose aspirin for older patients with dysphagia.

Speaker Biography

Smirna Farias is a PhD student at the University of Greenwich. She completed her Bachelor of Science with a First Class Honours following an approved degree programme in Pharmaceutical Sciences at the University of Greenwich in 2015.

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