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Ref: SRES/B.PHARM/ESTT/2021-22/302

DATE: 09/08/2021

# Sun Pharma Science Foundation Research Awards 2021

## Citation (Summary) on the Outstanding Research Work on Which Award Is Claimed

The most frequent malignant tumour that is a life-threatening condition in human health is digestive tract cancer . The major goal of this study was to create and test cost-effective modified release Capecitabine (Anticancer drug) tablets without the use of coating methods. The modified release capecitabine tablet preferably consist of effective concentration of hydroxyl propyl cellulose (HPC) range from 15 to 30 % w/w as a extended release matrix polymer and sodium alginate (SA) range from 20 to 30 % w/w as a release modifying polymer. The $3^2$ full factorial design was used to study the effect of these independent variables on dependent variables, in vitro drug release and swelling index. The physiochemical properties of the drug were analyzed by ultraviolet, fourier transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC) and powder X-ray diffraction (P-XRD). The formulated tablets were evaluated for hardness, thickness, weight variation, content uniformity, swelling index, and in vitro drug release study. The FTIR and DSC investigations revealed that the drug, polymers, and excipients did not interact. The crystalline nature of capecitabine was also unchanged in the optimized formulation tablet, according to DSC and P-XRD tests. In vitro drug release study reveals higher drug release percentage range from 84 to 99; sustained up to 24 hour and kinetic model study shown sustained release of drug up to 24 hours. The modified release tablet withstands to gastric pH and sustained with effective therapeutic concentration for 24 hours with reduced dose frequency and cost effective treatment in colon cancer.

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