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5-Fluorouracil Delivery Using Smart Carriers

This study focused on creating a novel, one-pot delivery system for FU to treat colorectal cancer using methacrylate derivatives. Increasing patient compliance, lowering dosage requirements, and reducing undesired side effects can all improve the therapeutic outcome of the regimen. Six polymer-based pellets containing FU as a model drug were successfully created utilizing a thermal bulk polymerization process based on the HA and MA monomers. The drug-loaded formulations had a good drug entrapment efficiency of around 90%. The EA concentration greatly enhanced the Young's modulus, glass transition temperature, and tensile strength, but it significantly lowered the tensile elongation at the break value. By raising the crosslinker concentration, the pellets' in vitro swelling behavior was dramatically reduced. Less than 30% cumulative drug release was attained for all formulations after 5 hours of starting the release study. After 24 hours, 70% of a drug's total cumulative release was achieved. The created drug delivery system showed the ability to delay the release of 5-fluorouracil under conditions that mimicked the upper gastrointestinal tract while allowing its release in a regulated manner afterwards, which makes it promising for the prospective administration of 5-fluorouracil to the colon.

Keywords: Sustainability; Smart Carriers; Triggered Delivery; Colorectal Carcinoma

Biography:

Dr. Mohammad F. Bayan, is working as an Assistant Professor of Pharmaceutics at faculty of Pharmacy in Philadelphia University, Amman, Jordan since 2018. The major focus of Dr. Bayan's research involves the development of controlled and triggered drug delivery systems using advanced and novel technologies. His work involves organic synthesis, synthesis and characterization of polymeric smart materials and performing drug release studies. Dr Bayan was awarded a scholarship from the Philadelphia University Jordan during his bachelor's study and a scholarship from Jordan University of Science and Technology (JUST) during his master's study. After finishing the master's degree, Dr. Bayan has worked as a part time lecturer in JUST and Philadelphia University; until he awarded, in 2014, a scholarship from the Philadelphia University Jordan to commence his PhD studies in Queen's University Belfast, UK. He is author of more than 20 publications and received funding from national and international grants (Philadelphia University, Jordan; Project number 511/34/100 PU, King Khalid University, Saudi Arabia; Project number RGP.2/31/43 and Najran University, Saudi Arabia; Project number NU/RG/MRC/12/20). Dr Bayan has presented his work at numerous international and national conferences such as the 10th world meeting on Pharmaceutics, Biopharmaceutics and Pharmaceutical Technology; 6th APS International PharmSci and 38th All Ireland Schools of Pharmacy Research Conference.