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Dummy molecularly imprinted polymer as a new omeprazole delivery systemt

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Background and Aims: In the present work we tried to prepare new omeprazole delivery systems using dummy molecularly imprinted polymers. Due to instability of omeprazole in different polymerization condition (e.g. heat, light, protic and aprotic solvents), pantoprazole (which is structurally similar to omeprazole) was selected as a dummy template for molecular imprinting process.
Methods: A series of imprinted (MIPs) and non-imprinted (NIPs) polymers were prepared using ethylene glycol dimethacrylate (EGDMA) as a cross-linker monomer, 4-vinyl pyridine (4-VP) as a functional monomer and Pantoprazole as a dummy template molecule. The polymers were synthesized, in chloroform, by UV polymerization at 25°C in 6h. The binding properties of polymers were evaluated in water and water-methanol (70/30, v/v) media. The releasing properties were also studied in NaCl 0.9%- methanol (70/30, v/v) solutions at different pH values.
Results: The results showed that loading capacity of MIP was significantly higher than NIP at all concentrations. The data indicated that the MIP, prepared with a pantoprazole/4-VP molar ratio of 1/4, had a higher affinity for omeprazole, compared to NIP, and a greater ability to control the release of drug in aqueous media.
Conclusions: Our data indicated that choosing a suitable dummy template molecule and a proper polymerization condition had important influences on preparation of selective MIPs for the molecules that are unstable during polymerization.

Keywords: Dummy molecularly imprinted polymer; Drug delivery systems; Controlled release; Omeprazole; Pantoprazole