Innovative Real-Time Magnetic Targeting in the Gastrointestinal Tract for Enhanced Drug Delivery (Case 2023)

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Technology description

Brief Description:

For many orally administered pharmaceuticals, increased residence time in a particular region of the gastrointestinal (GI) tract would greatly improve their therapeutic benefit. Previous studies have used external magnets to improve the bioavailability of orally administered proteins including insulin, narrow absorption window (NAW) therapeutics including acyclovir, and therapeutics for site-specific pathologies including bleomycin for esophageal cancer. In all previous studies, the magnet was applied in a fixed position without monitoring inter-magnetic force or visually verifying the capture of the oral dosage.

Though not previously tractable, localized oral drug delivery would be extremely useful for delivery of therapeutics for inflammatory bowel disease to the colon, of orally administered chemotherapeutics to GI cancers, and of oral vaccines to the ileum. The new invention offered might be the first method for monitoring the force applied by an orally administered magnetic dosage to the GI tissue to ensure safety and efficacy of prolonged retention at a site of therapeutic interest.

The innovative technology describes a novel magnet-based delivery platform including visualization by biplanar videofluoroscopyin vivothat can yield real-time monitoring and control over the duration of residence of magnetic pills in the small intestine. The system can safely and reliably retain drugs for up to 12 hours in any region of the GI with the ability to control the force applied by the orally ingested magnet to the intestinal wall. This unique method of GI retention utilizes a visual confirmation of the anatomical location of the oral dose and constant monitoring and control of the inter-magnetic force to ensure safe capture of the oral dosage in the appropriate region of the GI.

The primary market is pharmaceutical – therapeutic drug delivery for use in optimizing drug delivery in the GI tract for many conditions/diseases in a variety of medical specialties, e.g., infectious disease, cancer, and inflammatory bowel disease, among others.

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