

Abstract

RESIDENCE STRUCTURES AND RELATED METHODS

Residence structures, systems, and related methods are generally provided. Certain embodiments comprise administering (e.g., orally) a residence structure to a subject (e.g., a patient) such that the residence structure is retained at a location internal to the subject for a particular amount of time (e.g., at least about 24 hours) before being released. The residence structure may be, in some cases, a gastric residence structure. In some embodiments, the structures and systems described herein comprise one or more materials configured for high levels of active substances (e.g., a therapeutic agent) loading, high active substance and/or structure stability in acidic environments, mechanical flexibility and strength in an internal orifice (e.g., gastric cavity), easy passage through the GI tract until delivery to at a desired internal orifice (e.g., gastric cavity), and/or rapid dissolution/degradation in a physiological environment (e.g., intestinal environment) and/or in response to a chemical stimulant (e.g., ingestion of a solution that induces rapid dissolution/degradation). In certain embodiments, the structure has a modular design, combining a material configured for controlled release of therapeutic, diagnostic, and/or enhancement agents with a structural material necessary for gastric residence but configured for controlled and/or tunable degradation/dissolution to determine the time at which retention shape integrity is lost and the structure passes out of the gastric cavity. For example, in certain embodiments, the residence structure comprises a first elastic component, a second component configured to release an active substance (e.g., a therapeutic agent), and, optionally, a linker. In some such embodiments, the linker may be configured to degrade such that the residence structure breaks apart and is released from the location internally of the subject after a predetermined amount of time.

(Figure 1E)