

New oral drug effective treatment for ulcerative colitis, researchers say

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A novel, one-step method to treat ulcerative colitis with an oral drug consisting of microparticles and natural herbal molecules that target the colon shows promise as an effective therapy, according to researchers from the Institute for Biomedical Sciences at Georgia State University and Southwest University in China.

The findings, published in the journal *Colloids and Surfaces B: Biointerfaces* in August, suggest a treatment for [ulcerative colitis](#) that has the properties of pH-sensitivity, controlled [drug](#) release and colon targeting. The curcumin-loaded microparticles show potential as a scalable drug carrier for the efficient clinical treatment of this chronic gastrointestinal disease.

"Orally administered microparticles may offer an efficient drug delivery system because they are characterized by a high drug loading capacity and may target [colitis](#) tissues based on abnormalities," said Didier Merlin, professor in the Institute for Biomedical Sciences at Georgia State.

The researchers used an emulsion-solvent evaporation method to fabricate pH-sensitive microparticles that are composed of a biocompatible polymer and loaded with curcumin, an efficient anti-inflammatory agent that is extracted from a natural herbal source. Studies show that curcumin can weaken inflammation in animals with colitis and reduce the relapse rate of ulcerative colitis in animals in pre-clinical experiments.

The team determined the most effective makeup for the microparticles by altering several factors to improve their loading efficiency and the release of curcumin. They tested the microparticles in mice induced with ulcerative colitis.

Ulcerative colitis, a chronic relapsing disease associated with uncontrolled inflammation in the gastrointestinal tract, is a subtype of inflammatory

bowel disease (IBD) and often affects the innermost mucosa of the intestine. The goal for ulcerative colitis therapy is to control inflammation, heal the mucosa and reduce surgeries and hospitalizations.

Despite advances in drug development, there is an unmet need for a carrier system that is capable of delivering a drug specifically and exclusively to the inflamed region for a prolonged time, Merlin said.

Drug treatments for ulcerative colitis are now administered through intravenous therapy and are dispersed throughout the body, instead of directly targeting the colon, thus requiring much higher doses and causing unwanted side effects, Merlin said.

Until a decade ago, traditional treatments were limited to anti-inflammatory drugs and immune-suppressive medications, which have short and long-term debilitating side effects. In the last decade, several targeted therapeutic approaches have been developed, including inhibitors of inflammatory cytokines (anti-TNF α agents) that induce T-lymphocyte apoptosis, or cell death. Anti-TNF α agents are among the most potent drugs in the treatment of IBD, but their use is limited by serious [side effects](#).

More information: *Colloids and Surfaces B: Biointerfaces* www.sciencedirect.com/science/.../S0927776515301156

Provided by Georgia State University

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