GEORGE MASON UNIVERSITY

ULTRASOUND RESPONSIVE HYDROGEL BEADS

GMU-24-036

PRECISION DRUG DELIVERY: ULTRASOUND-ACTIVATED MICROCAPSULES FOR ON-DEMAND THERAPEUTICS

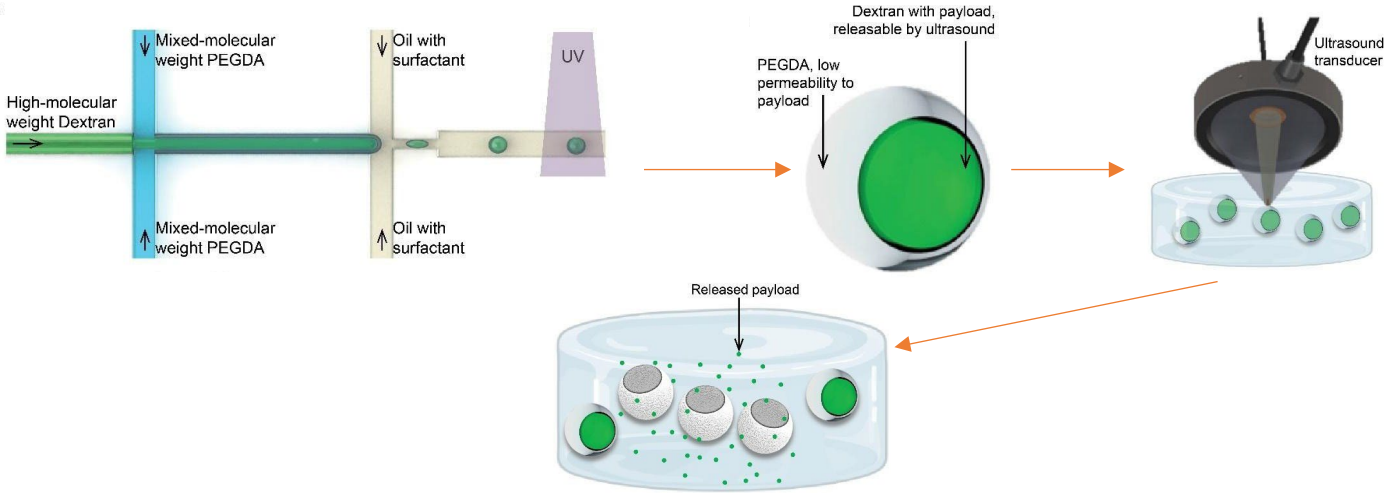
Prototyped drug delivery technology exploits a novel drug delivery system utilizing microcapsules that respond to ultrasound for precise, on-demand release of therapeutic agents.

Key Features

- **Innovative Design:** Creates biocompatible microcapsules through use of a microfluidic aqueous two-phase system capable of encapsulating a wide range of drugs
- **Ultrasound-Triggered Release:** Microcapsules release their payload in response to focused ultrasound (FUS), allowing for controlled and localized drug delivery
- **Minimally Invasive:** System enables non-invasive drug release, reducing the need for surgical intervention
- **Reduced Side Effects:** Limits systemic exposure to drugs, thereby reducing potential side effects and improving patient outcomes

Ideal Applications

- **Targeted Drug Delivery:** Ideal for treating localized conditions, such as tumors or specific organ systems, where precise drug delivery is crucial
- **Personalized Medicine:** Supports patient-specific treatment regimens by adjusting the timing and location of drug release
- **Extended Release:** Offers potential for long-term drug delivery with adjustable release profiles, minimizing dosing frequency



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