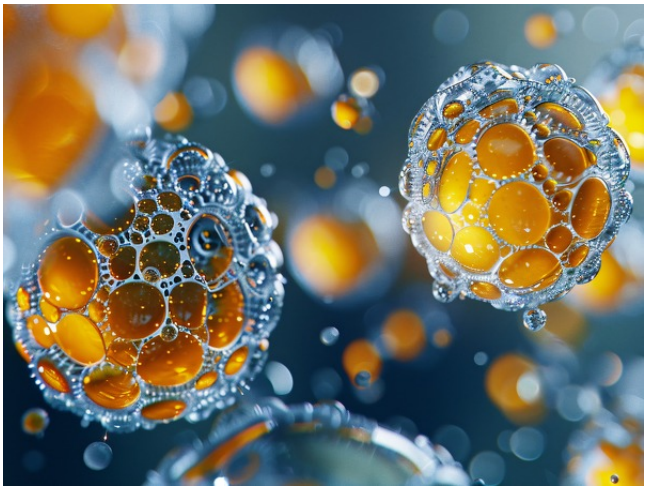
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Fabrication of Bile Salt and Corticosteroid Microparticles for Controlled Release Drug Delivery Applications

TECHNOLOGY NUMBERS: 2019-352, 2021-314



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Category
Therapeutics and Vaccines
Life Sciences
Accelerate Blue Foundry - 2025/Life Sciences

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Accelerate Blue Foundry - 2025 (Life Sciences)

OVERVIEW

Gold-cholate composite microparticles are a newly engineered drug delivery platform—created via a novel chemical process at the oil-water interface—that enables precise control over particle size and geometry, resulting in highly tailored, slow-release delivery of bile salt and steroid-based therapeutics for liver, dermatological, and other medical conditions.

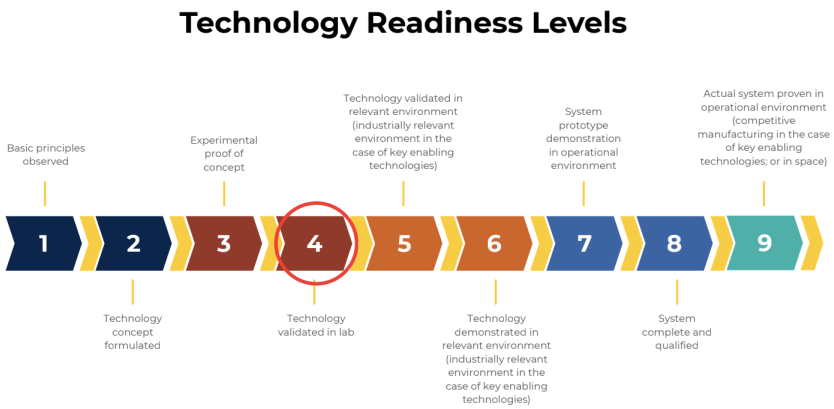
DESCRIPTION

This technology modifies the standard method of drug particle fabrication by introducing gold ions at the boundary between oil and water. This triggers the assembly of solid microparticles composed primarily of bile salt, a material not previously utilized in solid drug carriers. The process uniquely allows for control over both the size and shape of the resulting particles, which is critical for tuning how quickly drugs are released and how they interact with biological tissues. Encapsulated drugs—like water-soluble steroids or bile salts—are gradually released as the particles degrade, enabling tightly regulated dosing. Compared to prior methods, which incorporated gold nanoparticles within the particle matrix, this approach uses gold ions directly to catalyze the formation and structure of the particles, resulting in consistently uniform and customizable geometries.

VALUE PROPOSITION

- First platform to create solid, bile salt-based microparticles with precise, adjustable size and shape for optimized drug delivery and biodistribution.
- Enables slow, controlled drug release ideal for chronic or targeted therapies where dosing and release timing are critical.
- Highly versatile: compatible with a wide range of bile salt-related therapeutics and diseases, including liver disorders, metabolic conditions, and dermatological treatments.

TECHNOLOGY READINESS LEVEL



INTELLECTUAL PROPERTY STATUS

Patent applications pending.

MARKET OPPORTUNITY

There is a strong and unmet need for advanced controlled-release drug delivery systems, particularly in pharmaceuticals for liver disease, dermatologic applications, and metabolic or inflammatory disorders where consistent dosing is vital. This technology's ability to finely control particle size and shape appeals to drug developers seeking precise pharmacokinetics and targeted tissue delivery. Global industry trends show increased demand for customizable, biocompatible carriers, with particle size and geometry emerging as key determinants of efficacy and safety in next-generation injectables and topical formulations.