

Temperature-Stable Liquid Droplets (Yissum)

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Containment of liquid within a thermostable membrane

Category	Food and Nutrition, Carriers/Encapsulation, Pharmaceuticals, Nutraceuticals, Hydrocolloids
Development Stage	Proof of concept at experimental level
Patent Status	U.S. Patents 6,099,876; 6,680, 184
Market Size	2006 worldwide flavor and fragrance ingredients market - \$6.3 billion; US drug delivery industry - \$54 billion, including capsules

Highlights

- Capsules with liquid-containing core suited to variety of purposes
- encapsulate liquids such as coffee, wine, or juice within droplet core for taste sensations
- include pharmaceutical ingredients for use as medication
- Membrane withstands heat treatment in pasteurization, also withstands cooling treatments
- Thermostability has been proven
- Applications in baking, dairy products, option to texturize fish proteins, extracts and oils for novel products, and medical, and biotechnical uses

Our Innovation

Capsules composed of a liquid core (hydrophilic or hydrophobic fluid, combinations, or emulsions) coated by a hydrocolloid membrane with varying properties, sizes, and compositions. The membrane thickness and thermostability can be controlled. Enzymes and cells can be included within the droplet for slow release and other biotechnological processes.

Key Features

- Thermostable liquid cells withstand high and low temperatures without bursting or leaking
- Flexibility in capsule sizes
- Option to include different types of fluids (fish oils, medications, flavor enhancers) in core

Development Milestones

- Future plans to improve mechanical property of droplets, achieve better thermostability and better control of size and membrane thickness, increase

capacity for fluid containment

- **Confirmation of feasibility in industrial pilot plant**

The Opportunity

- **Flavor enhancement in food industry**
- **Droplets with smaller diameter, a subject under study, will be suitable for medical biotechnology applications**
- **US demand for drug delivery systems growing 9% annually through 2007**

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