

## Spheromat and liquid marbles encapsulation

### Development status

#### Phase 2

**Feasibility study.** There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

### IP protection status

CZE patent application filed beginning 2020 for Spheromat. CZE patent granted for application/formulation with 3 model drugs and EU patent application filed in fall 2019

### Partnering strategy

*Collaboration, investment*



### Institution



**University of Chemistry and Technology Prague**

### Challenge

Firstly, the bioavailability is the key parameter how to distinguish efficiency of formulation. Nowadays, 40% market approved active compound are poorly water soluble, therefore they have low bioavailability. Second the food effect is undesired due the problematic drug administration, the incorrect can serve dangerous causes. Therefore, the technology is focused on these compounds to enhance bioavailability and exclude food effect. Thirdly, OMS technology is capable way for personalized medicine as filling hard gelatin capsule with various OMs containing different active compounds.

### Description

Whole technology is based on preparation hard gelatin capsules filled with OMs containing one or more active compounds. Therefore, it is possible to prepare personalized medicine for each patient depends to his/her needs. We have successfully formulated several active compounds. In general, oil marble is a oil droplet covered by solid particles, particles are just at shell and represents only 10-30% w/w to total mass of marble. However, that is enough to be hard for further handling and filling. We have been focusing on oil marbles (OMs) with encapsulated oil phase, because we are targeting to the lipophilic/hydrophobic active compounds. The active compound is dissolved in oils then surfactants and polymers are added to the mixture. All together works as Self micro emulsifying drug delivery system (SMEDDS), but due to our unique technique we obtain solid SMEDDS. Particles stop OMs coalescing and even helps the dissolution or regress recrystallization. The OMs are manufactured on our unique pilot scale device called Spheromat, which is right now in semicontinuous regime. Main advantages: • Lipid based formulation for bioavailability enhancement and food effect elimination. • Possibility for personalized medicine for various active compounds. • Solid SMEDDS for easier handling. • Unique technology with strong based knowledge. • Own IP protection

## Commercial opportunity

We have developed novel technology based on oil marbles combining several approaches. We have prepared OMs with several active compounds and one best candidate was studied in vivo study showing the food effect elimination and bioavailability enhancement. We picked tens of most promising compounds (technology and sales prognosis point of view) for testing.