

## **Manufacturing hollow granules for pharmaceutical drug delivery**

**Project Supervisor: Dr Karen Hapgood**  
**Contact: karen.hapgood@eng.monash.edu.au**

**Department: Chemical Engineering**

### **The Problem**

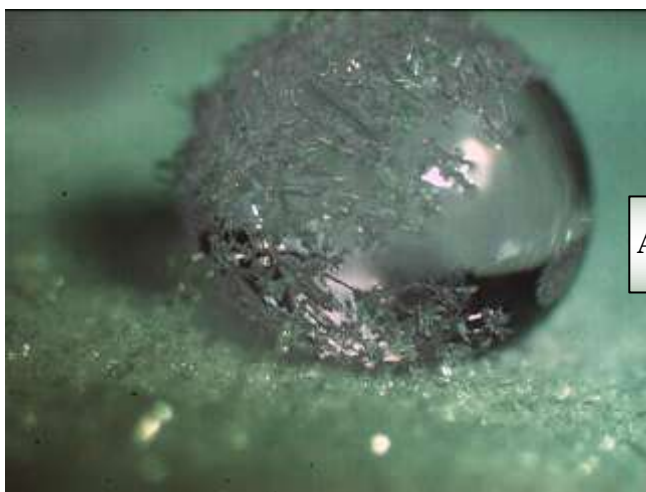
- Drug delivery & pharmaceutical engineering
- Designing engineered particles to deliver break-through drugs at controlled rate to the patient

This study aims to exploit the properties of hydrophobic drug particles to create “designer granules” with controlled size(s) and a recently discovered open, hollow structure to achieve the end-use property specification (e.g. dissolution rate). It will lead to significant advances in the understanding and industrial performance of the manufacturing process for “designer granules”.

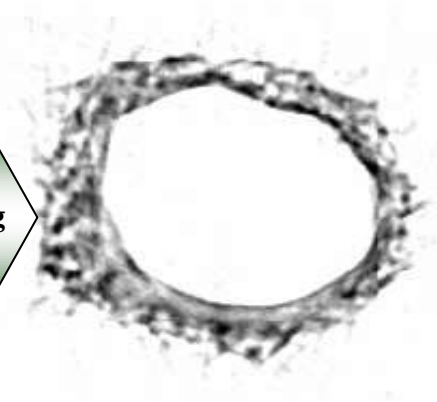
### **The Project**

Liquid marbles is example of particle design where the interior liquid is protected by the powder shell. Afterwards, by drying liquid marble and removing the internal fluid, a spherical hollow structure is formed by spreading hydrophobic powders over the drop surface.

In this project you will manufacture several batches of hollow granules and investigate the effect of changing liquid ratio on particle size distribution as well as strength and morphology of the hollow granules for several different powders.



**Liquid Marble**



**Xray image of Hollow Granule**