1172-76-315   **Wen Li*** (`wenli@math.ucla.edu`), **Kyung Ha**, **Ghulam Destgeer**, **Mengxing Ouyang**, **Dino Di Carlo** and **Andrea L. Bertozzi**. *Simulation and analysis of 3D micro-encapsulation using efficient threshold dynamics.*

Droplet-based microfluidics technology is important for bioengineering research and design. Novel micro-encapsulation techniques allow for the creation, analysis, and manipulation of uniform-sized microscale drop carrier particles (dropicles). Numerical simulation and analysis play a vital guiding role in microparticle design. We present an efficient volume preserving threshold dynamics method to model the equilibrium state of micro-encapsulation based on amphiphilic microparticles of different structures and dimensions. The effectiveness, validity, and efficiency of the method are verified by comparing with other numerical methods and laboratory experiments. Through the comparative analysis of total interfacial energy with different particle dimension ratios, an optimal particle structure that can encapsulate uniform micro dropicles is preliminarily obtained. (Received August 31, 2021)