

## Prof. Yu-Min Yang

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### Research Interests

Nano-Colloidal Domain - where physics, chemistry, biology, and technology meet

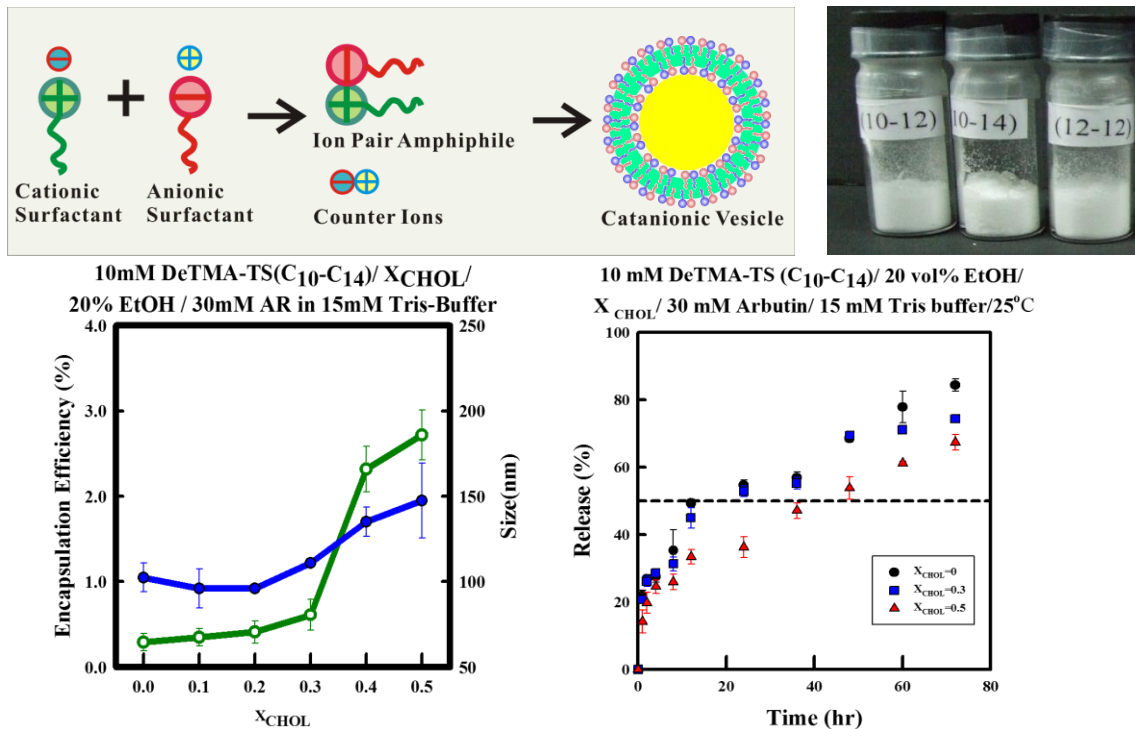
Recent developments in many modern nano-technologies involve new materials or processes in which interfaces (or surfaces) and colloids play a crucial role. They reveal the interaction of a spectrum of disciplines in which physics, chemistry, biology, and technology intersect. Understanding and utilizing the special properties of molecules at interfaces constitutes goal of our research. These include some of the themes in nano-colloid science: novel surfactants, self-assembly, construction of supramolecular architecture, nanoconfinement and compartmentalization, fabrication of nanoparticulate thin films. A few of our current research topics which exemplify the breadth of our interests follows: vesicular drug delivery systems; creation of bio-inspired surfaces; microfluidics.

### Representative Publications

1. Chun Wei Chiu, Chien Hsiang Chang, **Yu Min Yang**, 2013, Gelation of Ethosome-like Catanionic Vesicles by Water-Soluble Polymers: Ethanol and Cholesterol Effects, *Soft Matter*, 9, 7628-7636.
2. **Yu Min Yang**, Fabrication of Antireflective Self-cleaning Surfaces Using Layer-by-Layer Assembly Techniques, Chapter 10 in *Self-cleaning Materials and Surfaces: A Nanotechnology Approach*, W. A. Daoud(Editor), Wiley, New York, 2013.
3. Yu San Liu, Chih Fang Wen, **Yu Min Yang**, 2014, Cholesterol Effects on the Vesicular Membrane Rigidity and Drug Encapsulation Efficiency of Ethosome-like Catanionic Vesicles, *Sci. Adv. Mater.*, 6, 954-962.
4. Wei Han Lee, Yi Li Tang, Tzu Chin Chiu, **Yu Min Yang**, 2015, Synthesis of Ion-Pair Amphiphiles and Calorimetric Study on the Gel to Liquid-Crystalline Phase Transition Behavior of Their Bilayers, *J. Chem. Eng. Data*, 60, 1119-1125.
5. Chen Hsuan Lee, **Yu Min Yang**, Kuen Lin Leu, Hung Yin Lin, Chia Hua Liang, Chien Hsiang Chang, 2015, Exploring Physical Stability Characteristics of Positively Charged Catanionic Vesicle/DNA Complexes, *Colloid Polym. Sci.*, 293, 2239-2247.

## Development of ethosome-like cationic vesicles for dermal drug delivery

Novel vesicles prepared from ion-pair amphiphiles (IPAs) as carriers of hydrophilic (eg arbutin) and hydrophobic (eg vitamine E acetate) drugs may find potential applications in cosmetics and transdermal drug delivery.



## Creation of bio-inspired surfaces by using of layer-by-layer(LbL) assembly strategy

Bio-inspired surfaces with different functionalities such as antireflection, superhydrophobicity, superhydrophilicity, omniphobicity, self-cleaning characteristics, patterned/gradient wettability, and tunable adhesion are designed and fabricated by means of Langmuir-Blodgett(LB) deposition, electrostatic assembly, and self assembly. These surfaces may find potential applications in fluid handling and transportation, optical sensing, medicine, and as self-cleaning and antifouling materials operating in extreme environments.

