

Krill Oil Nanoemulsions

VTIP 21-139: “Low-Energy Krill Oil-in-Water Nanoemulsions for Nutraceutical and Flavor”

THE CHALLENGE

Krill oil is gaining attention as it is rich in both omega-3 fatty acids and astaxanthin, which demonstrate biological benefits in cancer prevention as well as treatment of Alzheimer’s, Parkinson’s disease, high cholesterol, and various metabolic diseases. However, both omega-3 fatty acids and astaxanthins in krill oil are sensitive to environmental stressors such as heat, light, and oxygen, greatly impacting the stability, bioavailability, and sensory acceptability. Current methods of emulsifying krill oil to increase absorption require high-energy perturbations which can affect the stability of these molecules.

OUR SOLUTION

Sean O’Keefe and Tiantian Lin have discovered novel methods of making krill oil nanoemulsions (<100 nm). The emulsions produced with these methods are transparent and thermodynamically stable. Additionally, these emulsions have the potential to be easily incorporated into various products to improve bioavailability of omega-3s and astaxanthins, enhance their health benefits, as well as moderate their flavor and texture. The method of producing nanoemulsions with food-grade ingredients is low cost, low energy, and inexpensive, offering many potential for applications in the food and pharmaceutical industries.



Krill is a small crustacean found worldwide with high biomass in Antarctic waters



Nanoemulsions produced with varying levels of surfactant-to-oil ratios. Altering the surfactant-to-oil ratio within nanoemulsions alters particle size.



CONTACT:

David Irvin

davidi86@vt.edu

540-231-7376