



ZELLCHEMING-CONFERENCE

CELLULOSE-BASED MATERIALS –  
FROM SCIENCE TO TECHNOLOGY

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### **Engineering Pickering emulsions with cellulose and chitin nanofiber complexes**

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### **Abstract**

Naturally-derived chitin nanofiber (ChNF) is a promising biobased, green, efficient Pickering stabilizer due to its capability to enable oil/water interfacial super-stabilization at low concentration. However, chitin-based emulsions tend to flocculate and coalesce under harsh environmental stresses (high pH and salt) because of their positively-charged nature. In this study, we used negatively-charged cellulose nanofibril (CNF) to modify ChNF electrostatically, achieving super-stable Pickering emulsions with high pH and salt tolerance. Pickering systems with tunable droplet diameter and stability against oil coalescence and creaming during long-term storage were controllably achieved. The stability of emulsions against environmental stresses (pH and salt) was demonstrated under pH range of 3 to 11 and salt concentration range of 100 to 500 mM. Our study paves a way for the efficient use of all biobased materials on developing green Pickering multiphase systems in applications of foodstuff, cosmetics, and pharmaceuticals.

### **KEYWORDS:**

Chitin nanofiber  
Cellulose nanofiber  
Pickering emulsion  
pH resistance  
Salt resistance



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### **Biography**

Siqi Huan is a postdoc in University of British Columbia. Her current research interest includes developing emerging manufacture techniques (including 3D-printing, electrospinning, multi-phase templating) to design and create multifunctional bio-based materials with advanced architectures.

