

Oral presentation | B 食品機能 (Food Function)

📅 Thu. Aug 28, 2025 3:00 PM - 5:30 PM JST | Thu. Aug 28, 2025 6:00 AM - 8:30 AM UTC 🏢 Room A(2F 121)

[2Ap01-10] 食品機能 整腸作用、消化、吸収

Chair:Tomio Yabe

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[2Ap07] Development of Natural Polymer-Coated Nanocarriers for Enhanced Oral Mucosal Nutrient Delivery*Woojin Lee¹, Eunji Kim², Eunryung Kim^{1,2}, Hosup Jung^{1,2} (1. CFB, 2. Nbiocell)

Keywords : Nanocarriers、 Natural polymer coating、 Oral mucosal permeability、 Nutrient delivery

1. Purpose

Efficient oral mucosal delivery of nutraceuticals is increasingly important in both functional food and pharmaceutical applications. This study aims to develop a (liposomal) nanocarrier coated with natural polymers to improve mucosal permeability and colloidal stability of encapsulated functional compounds.

2. Methods

Nanocarriers encapsulating functional compounds, including vitamins and L-theanine, were prepared and homogenized using a microfluidizer to obtain uniform nanoscale particles. To improve mucoadhesive properties and colloidal stability, they were surface-coated with natural polymers, such as chitosan or pectin. Physicochemical properties, including particle size, zeta potential, and morphology, were characterized using dynamic light scattering (DLS) and transmission electron microscopy (TEM). The stability of the coated nanocarriers was assessed by incubation in a simulated oral mucosal environment. Furthermore, the effects of different polymer coatings on oral mucosal permeability and structural integrity were systematically investigated.

3. Results

Nanocarriers with an average size of 80–200 nm were successfully prepared. Surface coating with natural polymers, particle sizes increased by 5–40 nm, and changes in zeta potential confirmed effective surface coating. The coated nanocarriers exhibited excellent stability in a simulated oral mucosal environment. Furthermore, differences in oral mucosal permeability and structural integrity were observed depending on the polymer type.