

# Preparation of spherical microparticles for drug delivery from chemically synthesized collagen with high biosafety

**Toshiki Miyazaki**

*Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology*

Polymer microspheres are expected as novel drug delivery carrier for medical treatment. In addition, if hydrophilic/hydrophobic control is appropriately achieved on the microspheres, the incorporated drug can slowly release into body. Among the component of the microspheres, chemically synthesized collagen with amino acid sequence of prolin-hydroxyprolin-glycin is promised material because they have no risk of contamination with external pathogens. In the present study, microspheres of chemically synthesized collagen were prepared by cross-linking in water-in-oil emulsion. Water-in-oil emulsion was prepared from synthetic collagen solution as water phase and paraffin solution of surfactant Span 80 as oil phase by ultrasonic emulsification. Microparticles were prepared by addition of cross-linking agents into the emulsion. Surface structural changes were characterized by Fourier-transform infrared spectroscopy, scanning electron microscope and contact angle measurement. Microspheres with 5 to 10  $\mu\text{m}$  in size were obtained. although some particles were peanut-like shape. It was found from model experiment on surface modification on natural collagen films that treatment with biphenyl-4-carboxylic acid was effective for fabrication of hydrophobic surface, suggesting that control in drug delivery properties is possible by this type of surface modification. Drug delivery from the microspheres should be examined in future study.