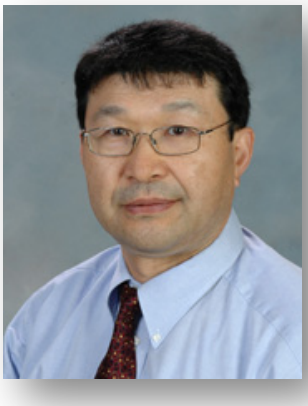
2015
CFAI 1st Special Lecture

Phagocytosis-dependent macrophage activation by chitin
--- Translational studies of oral chitin administration



Dr. Yoshimi Shibata

Professor of Biomedical Science,
College of Medicine, Florida Atlantic University

Date : 17 June (Wed)
Time : 13:00 – 14:30
Venue : Lecture room No. 2
(Graduate School of Agricultural Science)

Chitin is a glycan composed of β-1,4-linked *N*-acetyl-D-glucosamine and the second most abundant polysaccharide in nature next to cellulose. Recently, we have originally found and others confirmed that chitin microparticles (CMPs, 1 – 10 μm diameters) provide macrophage-mediated immunoregulatory effects, beneficial in allergic asthma, cancer, infection and inflammatory bowel disease in mouse models. CMPs induce classical (M1) activation of selected macrophage preparations through toll-like receptor 2 (TLR2) and myeloid differentiation primary response gene 88 (MyD88). As M1 activation by CMPs requires both phagocytosable particle size and chitin chemical composition, either large chitin beads (40 - 100 μm), soluble chitin, or de-acetylated CMPs (chitosan microparticles [CsMPs], 1 - 10 μm) induce no M1 activation. Although a molecular mechanism of macrophage activation by CMPs is largely unknown, it has been considered that macrophage chitin binding proteins involved in CMP phagocytosis play a key role, and the magnitude of macrophage activation is dependent on macrophage preparations. My lecture will update on-going studies performed in my lab. Since oral administration of chitin is a "route of choice" in humans and intestinal macrophages are unique compared to other tissue macrophages, we will further discuss how important to study intestinal macrophage activation by CMPs.

(This lecture is included in Class 2(2) of International Food & Agricultural Immunology Lecture, 2015 and is also highly recommended for Master course students)