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医工薬融合 GCOE Seminar Series

Center for Medical System Innovation through Multidisciplinary Integration The University of Tokyo

Secondary Metabolites of Symbiotic Bacteria in Insect Ecosystems

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Date: Thursday, December 13, 2012

Time: 16:00 - 18:00

Venue: 10F. Conference Room, Faculty of Pharmaceutical Science Research Bldg., the University of Tokyo

Insect-microorganism mutualisms are widespread in nature, and phylogenetically diverse insects have developed associations with microbes. Southern pine beetles use antibiotic-producing fungi to overcome host-tree defences and to provide nutrition for their larvae. The symbiotic system is mediated by an actinomycetous antifungal natural product, mycangimycin.1 The fungus-growing ant (attine ant) system, where an antifungal cyclic depsipeptide is produced by symbiotic Pseudonocardia sp., controls the parasitic fungi and maintains the beneficial food fungal culture by the selective activity of the antibiotic.2 In addition, diverse bioactive natural products including a new polyene cyclic lactam were identified from mud dauber-associated Streptomyces sp. Recently we investigated the dung beetle, Copris tripartitus, and the microorganisms isolated from the habitats in the search for novel bioactive natural products.3 We also studied the ecological system of the termite, Macrotermes natalensis, and the symbiotic microorganisms in the termite's gut. Here I discuss the discovery of secondary metabolites with pharmaceutical potential from symbiotic bacteria in the dung beetle and the termite ecosystems and the natural functions of the bacterial secondary metabolites in insect ecosystems.

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(2) Oh, D.-C.; Poulsen, M.; Currie, C. R.; Clardy, J. Nat. Chem. Biol. 2009, 5, 391-393.
(3) (a) Park, S.-H.; Moon, K.; Bang, H.-S.; Kim, S.-H.; Kim, D.-G.; Oh, K.-B.; Shin, J.; Oh, D.-C. Org. Lett. 2012, 14, 1258-1261. (b) Kim, S.-H.; Ko, H.; Bang, H.-S.; Park, S.-H.; Kim, D.-G.; Kwon, H. C.; Kim, S. Y.; Shin, J.; Oh, D.-C. Bioorg. Med. Chem. Lett. 2011, 21, 5715-5718.

Organizer: GCOE Program Center for Medical System Innovation through Multidisciplinary Integration, the University of Tokyo
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