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Development of novel oral triazole antifungal compounds

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Studies on prevalence, transmission and rapid detection of Lyme disease spirochetes in the Far East

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Lyme disease is a typical emerging infectious disease, caused by infection of spirochetes, *Borrelia burgdorferi* sensu lato, via tick-bite and widely found in northern hemisphere such as in North America, Europe, Russia and East Asia including Japan. A number of investigations from various aspects revealed the actual condition of this tick borne disease in USA, Europe and Japan, however, few studies have been reported in the Far East except Japan. In this thesis, from the view points such as prevalence, transmission and detection of the pathogen, present status of Lyme disease and biology of *Borrelia burgdorferi* sensu lato in the Far East were evaluated.

The results obtained in this study are summarized as follows :

1) In the Far East, Lyme disease spirochetes are widely distributed. *Borrelia garinii* is the most prevalent *Borrelia*, and *B. afzelii* also existed. On the other hand, *B. burgdorferi* sensu stricto was not isolated from any places in this region. Main vector tick is *Ixodes persulcatus*, and possibly *I. nipponensis*.

2) Main transmission pattern of the spirochete reported previously is from vectors to reservoirs, and in the reverse order, however, a possible transmission course between a vector and another vector was shown in this study.

3) PCR-RFLP analysis based on the flagellin gene, in which has characteristic restriction sites related to each *Borrelia* species, was developed for rapid detection of Lyme disease spirochetes. This system took only two days to complete and resulted the same detection rate as usual culture detective procedure. So this PCR-RFLP system

could be used as an easy and reliable diagnostic tool for the detection and species identification of borreliae in human cutaneous biopsies.

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