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Diversity in mycobacteria: Distribution, host specificity, morphology and genome

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The genus *Mycobacterium* consists of many species which are widely distributed throughout the global environment. *M. tuberculosis* is one of the major pathogens for human. Other mycobacterial species are called nontuberculous mycobacteria (NTM) and some of them are recognized as opportunistic pathogen in human, livestock, and wild life. NTM are thought to be acquired from the environment via ingestion, inhalation, and dermal contact, causing lymphadenitis, pulmonary and disseminated infection, and skin and soft tissue infection. The notable feature of mycobacteria is their envelopes having a high lipid content. Various lipid-containing components, such as trehalose dimycolate (TDM), trehalose monomycolate (TMM), glycopeptidolipid (GPL), and mycolic acids are likely to contributing to the pathogenesis, the resistance to chemical and physical changes, the biofilm forming ability, and the morphology. The prevalence of NTM disease has been increasing three times over last ten years in Japan. *M. avium* subsp. *hominissuis* (MAH) disease is the most frequent, leading to a current public health problem. MAH was found at MAH-disease patients' residential bathrooms with polyclonal colonization. Furthermore, some isolates were identical or similar to their respective clinical isolates by pulsed field gel electrophoresis, suggesting that bathroom is one of the infection sources. Variable number of tandem repeat and other genetic analyses of the 334 isolates revealed the genetic diversity with geographical and host dependent variations. MAH forms biofilms which may serve as a reservoir. On the abiotic surface MAH forms biofilm composed of flat layers covered with a film-like extracellular matrix, while at air-liquid interface MAH forms pellicles which show a decrease in the TDM and TMM contents and an increase in the GPL content compared with those of planktonic cells. The diversity in mycobacteria might be responsible for adaptation to the various circumstances to survive.

keywords: nontuberculous mycobacteria, *Mycobacterium avium* subsp. *hominissuis*, distribution, biofilm, diversity
