医学セミナー・第 14 回分子遺伝疫学セミナー
“Seminars in Medical Sciences” Lecture

Evolutionary and functional significance of host-pathogen interaction through leukocyte immunoglobulin-like receptors

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Date: January 5, 2017

Time: 17:00-18:15

Venue: Faculty of Medicine Building, Room 483（医学医療系棟 483）

This seminar is one of the seminars for the subject “Seminar in Medical Sciences” in Doctoral Programs in Biomedical Sciences and Clinical Sciences. The seminar will be given in English, but questions in Japanese are also welcome.

The host immune system has constantly interacted with diverse microorganisms. This host-pathogen interaction has shaped genetic diversity of both host and microorganism. However, the evolutionary and functional significance of the genetic diversity is not fully understood.

This seminar will introduce unexpected discoveries of host-pathogen interaction by genetic and functional analyses of leukocyte immunoglobulin-like receptors (LILRs). The LILR is a multigene family of humans, which consists of two pseudogenes and 11 functional genes. First unexpected discovery was that *LILRA3* deficiency is skewed toward a higher frequency in Northeast Asian populations than Southeast Asian, European, and African populations. *LILRA3* has turned out to be the most differentiated of all of the copy-number-variable genes in the human genome, suggesting that the *LILRA3* gene is sensitive to the local environment that includes microorganisms. Second unexpected discovery was that LILRA2 has a unique function that detects dangerous immunological situations in which antibodies are destroyed by microbial pathogens. I would like to give the background of these unexpected findings and discuss about host-pathogen coevolution.

References

1. Hirayasu K, et al. Microbially cleaved immunoglobulins are sensed by the innate immune receptor LILRA2. ***Nat Microbiol.*** 2016;1(6):16054.
2. Hirayasu K, et al. Functional and genetic diversity of leukocyte immunoglobulin-like receptor and implication for disease associations. ***J Hum Genet.*** 2015;60(11):703-708.
3. Hirayasu K, et al. Evidence for natural selection on leukocyte immunoglobulin-like receptors for HLA class I in Northeast Asians. ***Am J Hum Genet***. 2008;82(5):1075-1083.

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