

第51回日本免疫学会学術集会 Technical Seminar T03

1日目 2022年12月7日 (水) 11:45-12:45

テクニカルセミナー T03 Room F 会場 (会議室A4)
《 熊本城ホール 》

演題：

3D chromatin structure dynamics during dendritic cell differentiation and activation

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Dr. Daisuke Kurotaki

要旨：

Dendritic cells (DCs) are essential for triggering both innate and acquired immune responses. These cells originate from bone marrow hematopoietic stem cells via intermediate progenitors. In eukaryotic nuclei, DNA is packaged into 3D chromatin structures that have been implicated in gene regulation. However, the chromatin structure reorganization dynamics during DC differentiation remained unknown. Recently, we analyzed 3D chromatin structures in DCs and their progenitors (Kurotaki et al. PNAS 2022). In genomic regions at DC-specific genes, the 3D chromatin structures were reorganized upon DC differentiation. Mechanistically, the transcription factor IRF8, indispensable for DC differentiation, promoted chromatin structure changes in DC progenitors, leading to DC-specific gene induction. Using an infection model, we found that the chromatin structures of host defense-related gene loci were preestablished in unstimulated DCs, indicating that the formation of higher-order chromatin structures prior to infection may contribute to the rapid responses to pathogens. Overall, these results suggest that chromatin structure reorganization is closely related to the establishment of DC-specific gene expression and immune functions. In this Technical Seminar, I will introduce the basics of the Hi-C technique and our recent chromatin structure analysis data.

Reference: Kurotaki D et al. Chromatin structure undergoes global and local reorganization during murine dendritic cell development and activation. Proc Natl Acad Sci USA 119(34): e2207009119, 2022. doi:10.1073/pnas.2207009119.

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