

慶應医学会例会

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感染症学教室セミナー 2025年3月13日(木)

CD8⁺ T cell differentiation and its clinical significance after COVID-19 mRNA vaccination



Shin Eui-Cheol 教授 (申 宜澈 教授)
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Professor Eui-Cheol Shin received his M.D. and Ph.D. from Yonsei University College of Medicine in Seoul, and then began his career at the National Institutes of Health (NIH) in the U.S. He is currently a professor at the Korea Advanced Institute of Science and Technology (KAIST). He has also been elected as a Fellow of the Korea Academy of Science and Technology in 2019 and a Fellow of the National Academy of Medicine of Korea in 2024.

Professor Shin's laboratory studies T cell responses in human viral diseases and cancer, with a focus on cytotoxic T cells, and is particularly interested in "T cell-mediated immunopathogenesis," "T cell senescence," "reinvigoration of exhausted T cells," and "immune responses in SARS-CoV-2 infection".

During the COVID-19 pandemic, despite the development and unprecedented pace of clinical use of mRNA-based SARS-CoV-2 vaccines as an emergency response, new variants of concern (VOCs) and subvariants kept emerging. Professor Shin focused his research on "functional characteristics of SARS-CoV-2-specific T cells after infection, vaccination, and breakthrough infection" and came to the following three findings.

- (1) SARS-CoV-2 infection or mRNA vaccination successfully generates CD8⁺ stem cell-like memory T (T_{SCM}) cells.
- (2) The generation of T_{SCM} cells by mRNA vaccination significantly correlates with the longevity of CD8⁺ memory T cell responses.
- (3) Memory CD8⁺ T cells gradually acquire an aging-like T_{EMRA} cell phenotype after repeated mRNA vaccination.

In this talk, he will discuss the differentiation of CD8⁺ T cells into T_{SCM} or T_{EMRA} and its clinical significance in relation to COVID-19 mRNA vaccination.

References

Jung MK et al. *Nat Microbiol* 7:909, 2022
Noh JY et al. *Nat Rev Immunol* 21:687, 2021
Jung JH et al. *Nat Commun* 12:4043, 2021
Jung S et al. *Cell Rep* 40:111138, 2022

The event will be held in English at 3:00 p.m. in the lounge on the first floor of Building 3 (South Wing)

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