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学位論文の題名	Differences in the immune microenvironment between improved and non-improved cases of vitiligo after halo nevus excision （サットン母斑切除後の白斑改善例と非改善例の免疫微小環境の違い） J Dermatol Sci. 2023 Mar;109(3):136-142.
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abstract

Background: Halo nevus, also called Sutton's nevus, is a nevus cell nevus surrounded by vitiligo thought to be caused by a T-cell mediated immune response to the nevus antigen. The immune microenvironment is mysterious, however, as vitiligo often does not improve even when the nevus cells are removed. When vitiligo occurs around malignant melanoma, hemangiomas, among others, it is called Sutton's phenomenon. Vitiligo in melanoma patients is called "melanoma-associated vitiligo" and is associated with favorable outcomes. Vitiligo is sometimes observed in patients who respond to immune checkpoint inhibitor therapy as a "preferable" immune-related adverse event (irAE), and the mechanism of improvement has attracted the attention of researchers

Objectives: To analyze the clinical course and immune microenvironment of patients with halo nevus who had undergone nevus excision.

Methods: We collected 54 halo nevus patients and performed multivariate analysis and immunohistochemical analysis, including multiplexed immune cell phenotyping and spatial single-cell analyses using the PhenoCycler® assay.

Results: Multivariate analysis revealed that only the presence or absence of vitiligo vulgaris at the time of consultation was associated with improvement in the surrounding vitiligo following excision. Expression of programmed death-ligand 1 in nevus cells was significantly higher in non-improved cases compared with improved cases. The PhenoCycler® assay revealed that CD107a-positive and CD21-positive cells were more prevalent in improved cases than in non-improved cases. In the improved cases, active cell-cell interactions, centered on CD21-positive cells, were observed, whereas in the non-improved cases, cell-cell interactions were sparse. Instead, a dense infiltration of CD8-positive cells and CD3 and CD4-positive cells was observed in non-improved cases.

Conclusion: Elucidation of the immune microenvironment of halo nevus is also relevant to melanomaassociated vitiligo and will contribute to our understanding of tumor immunity