Understanding virtual memory CD8+ T Cells

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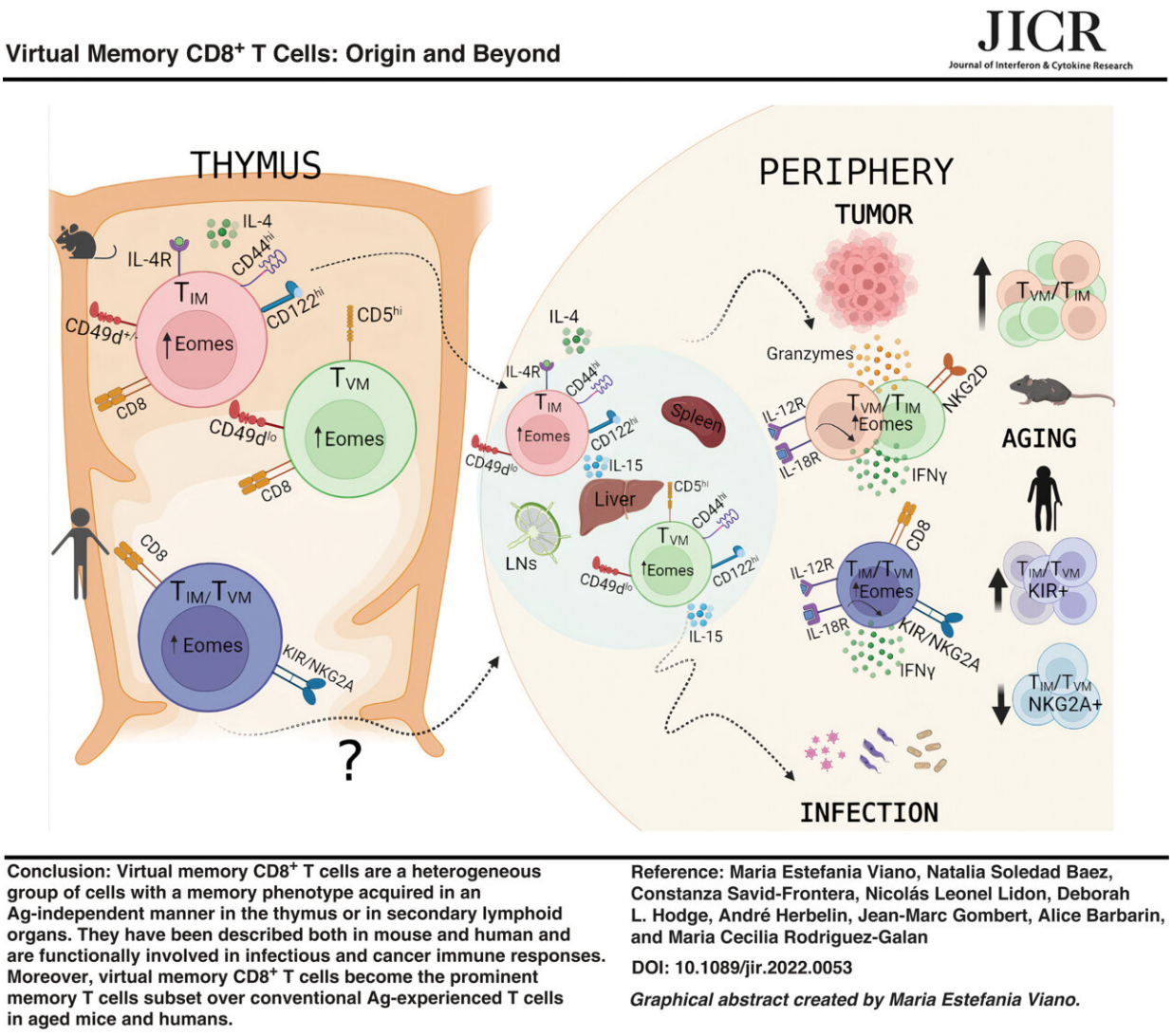

Conclusion: Virtual memory CD8+ T cells are a heterogeneous group of cells with a memory phenotype acquired in an Ag-independent manner in the thymus or in secondary lymphoid organs. They have been described both in mouse and human and are functionally involved in infectious and cancer immune responses. Moreover, virtual memory CD8+ T cells become the prominent memory T cells subset over conventional Ag-experienced T cells in aged mice and humans.

Reference: Maria Estefania Viano, Natalia Soledad Baez, Constanza Savid-Frontera, Nicolás Leonel Lidon, Deborah L. Hodge, André Herbelin, Jean-Marc Gombert, Alice Barbarin, and Maria Cecilia Rodriguez-Galan

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Graphical abstract created by Maria Estefania Viano.

Credit: Maria Estefania Viano et al, *Journal of Interferon & Cytokine Research* (2022). DOI: 10.1089/jir.2022.0053

Virtual memory CD8+ T cells (T_{VM}) are a relatively recent discovery in humans. A new review discusses what is known about them from mouse models and their cellular equivalents in humans, as described in the *Journal of Interferon & Cytokine Research (JICR)*.

Maria Cecillia Rodriguez-Galan, from Universidad Nacional de Córdoba, and coauthors review the biology and development of innate memory (T_{IM}) and T_{VM}) cells in mice and humans. They describe the effector mechanisms of T_{IM}/T_{VM} cells, the role of T_{IM}/T_{VM} in the infectious process, the role of T_{IM}/T_{VM} in cancer, T_{VM} cells during aging, and cytokines and T_{IM}/T_{VM} cells.

"The discovery of human CD8+ T cells with identical characteristics to murine T_{VM} cells has aroused enormous interest in recent years and has posed a new challenge in trying to understand not only their role in different pathological processes, but also to discriminate what roles have been erroneously assigned to specific memory cells instead of virtual memory cells," state the investigators. "Numerous publications are currently emerging that are clarifying more and more about the origin, functional characteristics and their role in different pathological processes, especially in infections and cancer, which will provide a new edge to understand their key role in the immune system."

"Most immunological T cell memory is trained by exposure to antigens delivered by invading pathogens. However, a population of memory T cells emerge[s] in the absence of obvious prior antigen exposure, termed 'virtual memory' cells. The article by Viano and colleagues is a comprehensive review of our knowledge of this mysterious population of cells—origin, phenotype, and effector function. The authors also discuss similar populations of virtual memory CD8+ T cells in humans. The manuscript will be of particular interest to vaccinologists, immunologists, and infectious disease researchers," says *Journal of Interferon & Cytokine Research* Editor-in-Chief David L. (Woody)

Woodland, Ph.D.

More information: Maria Estefania Viano et al, Virtual Memory CD8+ T Cells: Origin and Beyond, *Journal of Interferon & Cytokine Research* (2022). DOI: 10.1089/jir.2022.0053

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