Virus-specific T lymphocytes home to the skin during natural dengue infection

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Dengue virus is transmitted through the skin by the bite of an infected mosquito. Infection with dengue can cause a wide spectrum of clinical manifestations, from a self-limiting febrile illness termed "dengue fever" to the more severe life-threatening forms termed "dengue hemorrhagic fever" and "dengue shock syndromes" that are characterized by plasma leakage and hemorrhagic manifestations.

T lymphocytes (or T cells) are an important cellular component of the immune response to viruses. Virus-specific T cells that recognize the virus are generated during the early phases of infection and a fraction of these will persist long-term as memory T cells to provide protection against re-infection. A protective role of T lymphocytes during dengue infection has started to emerge in the last few years. Despite these evidences the current experimental anti-dengue vaccine does not target T cells and this may explain its limited protective efficacy during recent clinical trials.

In this study we provide insights into the workings of the T lymphocyte component of anti-dengue immunity by addressing the mechanisms by which T cells respond to dengue i.e. the site where they encounter dengue virus and their subsequent capacity to traffic to specific tissues. We identify dengue-specific T cells circulating in the blood of acute dengue-infected patients and show that they possess the characteristics of highly efficient anti-viral effectors capable of killing virus-infected cells. In particular, we find that dengue-specific T cells express a molecule that was described to drive recruitment of cells to the skin: the cutaneous lymphocyte-associated antigen (CLA). In line with their expression of CLA, dengue-specific T cells were present at higher frequencies in the skin as compared to the peripheral blood of dengue patients. Our data supports a role for skin-directed immunosurveillance against dengue and suggests that a vaccine targeting the dengue-immune response to the skin could have protective effects.
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