Impact of Mechanical Stress on the Immune-surveillance function of dendritic cells

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Dendritic cells (DCs) exert their immune-surveillance function by sampling tissues and migrating to lymph nodes where they transmit the information to T cells. In homeostasis, only few DCs migrate to lymph nodes, this being nonetheless essential to maintain T cell tolerance. Upon inflammation, the number of migratory DCs increases and they now activate T cells that initiate the adaptive immune response. The microenvironment of DCs in peripheral tissues therefore determines the information transmitted to T lymphocytes and type of immune response these cells ultimately develop.

The DC microenvironment in tissues consists not only of biochemical cues (cytokines, chemokines, microbial products…) but also of physical ones (geometry, pressure, stiffness…). The latter result from the materials tissues are made of -cells, matrix and fluid- and from their 3-D organization. How physical signals impact the immune-surveillance function of DCs is unknown. This question becomes highly relevant when considering the tremendous physical changes that peripheral tissues undergo upon inflammation/infection.

During my talk, I will discuss how the mechanical stress that DCs experience in peripheral tissues shapes their migration and immune-surveillance functions.