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Elucidating mitochondrial dynamics and localisation upon T cell activation through advanced microscopy

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T cell lymphocytes are crucial players of the adaptive immune system as they are involved in both the cytotoxic and humoral responses [1]. Several studies have uncovered that immune synapse formation and signal transduction are necessary for successful T cell lymphocyte function following activation via TRC triggering [2, 3, 4]; and mitochondria seem to play a role in both of these areas [5,6]. Specifically, mitochondria have been shown to play a role in T cell activation by providing a local pool of ATP and performing calcium intake buffering at the immune synapse [5]. Furthermore, mitochondria ROS signals are necessary for efficient T cell activation and for signal transduction events that lead to T cell proliferation [5]. In the present research, we explore T cell activation and mitochondrial positioning within the Jurkat cell line through the use of Structured Illumination Microscopy revealing an enrichment at the Immune synapse in a time-dependent manner, supporting their role in early T cell activation.

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