



Figure 1. Store-operated Ca²⁺ entry (SOCE) in T cells is mediated by Orai1 and Stim1.

In resting cells, a steep gradient in Ca²⁺ concentrations exists between the cytoplasm and the extracellular space as well as the endoplasmic reticulum (ER). The intracellular Ca²⁺ concentrations in T cells is tightly regulated and kept between ~100 nM in resting cells and ~1 μM following T-cell receptor (TCR) stimulation.

Antigen recognition through the TCR results in activation of several signal transduction cascades leading to the activation of phospholipase C_γ (PLC_γ), which catalyzes the hydrolysis of PtdIns(4,5)P₂ to InsP₃ and DAG. InsP₃ binds to and opens InsP₃ receptors in the membrane of the ER, resulting in release of Ca²⁺ from intracellular Ca²⁺ stores. A decrease in the Ca²⁺ content of the ER is "sensed" by stromal interaction molecule 1 (STIM1), which in turn activates calcium-release activated calcium (CRAC) channels in the plasma membrane. Ca²⁺ influx through CRAC channels and elevated intracellular Ca²⁺ concentration activate Ca²⁺-dependent enzymes such as calcineurin and thereby transcription factors such as NFAT, NF-κB, CREB and Oct/OAP.

-- From Feske 2007, *Nature Reviews Immunology*.