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Meeting abstract

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Signal transduction studies on single cell level: P38, but not NFATc2, is the main regulator of NFATc1/A expression in human Th cells

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NFATc2 and NFATc1 are the most prominent NFAT factors in T helper (Th) cells. They overlap in their functions for cytokine expression and were commonly activated by T-cell receptor (TcR)/calcium/calcineurin signaling pathway. However, they differ strikingly in their mode of expression. NFATc2 is constitutively expressed in Th cells, whereas the NFATc1/A, the most prominent NFATc1 isoform in Th cells, is strongly induced by antigen-specific stimulation of T-cell receptor (TcR) and co-receptor(s).

The regulation of NFATc1/A expression is controversially discussed. Single cell analysis of activated transcription factors and signaling molecules enabled us to show that the activated kinase p38 is the main component for NFATc1/A induction. Using specific inhibitors and the existing different modes of activation of signaling pathways we could rule out that activated NFATc2 and NF-kB play a prominent role in regulating NFATc1/A expression. Furthermore, we clearly demonstrated that NFATc1/A induction does not exhibit a switch-like dependence on calcineurin/NFATc2 activity.

In general, our data and results confirmed the relevance and importance to study cell signaling on single cell level.