

**Abstract:**

The central tolerance, which is established in the thymus, significantly reduces the self-reactive repertoire of T cells and thereby prevents the development of auto-immune diseases. Essential for this process is the protein Auto-immune regulator (Aire), which is expressed by rare medullary thymic epithelial cells (mTEC). Aire drives the promiscuous gene expression of thousands of tissue restricted antigens which are critical for efficient negative selection of self-reactive T cells and the selection of T regulatory cells. The research of the last two decades have uncovered the role of NF-kappa B signaling in establishment of central tolerance. Here I summarize the most important evidence revealing the key role of NF-kappa B signaling in mTECs development and direct regulation of Aire gene expression, which argues for previously unappreciated fact that NF-kappa B signaling is the master regulator of processes that guide the development, maintenance and function of central tolerance.

**Key words:** *Central tolerance, NF-kappa B, Aire, mTEC, thymus*