免疫・微生物学教室セミナー

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Cell-extrinsic and -intrinsic role of miRNAs in regulating Treg cell differentiation and function

Abstract: MicroRNA (miRNA), are tightly regulated in the immune system as aberrant expression of miRNAs often results in hematopoietic malignancies and autoimmune diseases. Individual miRNAs that are prevalently expressed in Treg cells have been reported to play crucial roles in regulating multiple aspects of Treg cell biology. Here we show that miR-155, a microRNA whose elevated expression in regulatory T (Treg) cells has previously been shown to be crucial for their development and homeostasis, also contributes to thymic Treg cell differentiation by promoting medullary thymic epithelial cell (mTEC) maturation. On the other hand, we find another miRNA family, miR-15/16 while is also highly expressed in Treg cells, is dispensable for their development. Instead, miR-15/16 acts as key regulators in limiting effector Treg cell differentiation. Mice with Treg-specific ablation of miR-15/16 clusters display attenuated immune responses during autoimmune neuro-inflammation and viral infection. Together, our work demonstrates that miRNAs ensure optimal Treg cell-mediated immune regulation through promoting their development in the thymus and controlling their differentiation in the periphery in both cell-intrinsic and -extrinsic manners.

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