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Abstract-

Signaling via the T cell receptor (TCR) is critical during the development, maintenance, and activation of T cells. Quantitative aspects of TCR signaling have an important role during positive and negative selection, lineage choice, and ability to respond to small amounts of antigen. By using a mutant mouse line expressing a hypomorphic allele of the CD3ζ chain, we show here that the strength of pre-TCR–mediated signaling during T cell development determines the diversity of the TCRβ repertoire available for positive and negative selection, and hence of the final αβTCR repertoire. This finding uncovers an unexpected, pre-TCR signaling–dependent and repertoire–shaping role for β-selection beyond selection of in-frame rearranged TCRβ chains. Our data furthermore support a model of pre-TCR signaling in which the arrangement of this receptor in stable nanoclusters determines its quantitative signaling capacity.

Index Terms-

Citation: