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Comparative characterization of double-positive $CD4^+8^+$ cells in the thymus and small intestine of mice

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ABSTRACT

This study focused on double-positive (DP) $CD4^+8^+$ cells in both the intestine and thymus. In normal mice, the proportion of DP cells in the intestine increased with aging, while that of DP cells in the thymus remained unchanged. When mice were exposed to restraint stress for 18 h, intestinal DP cells were resistant to restraint stress, while thymic DP cells were sensitive to such stress in terms of apoptotic properties. Intestinal intraepithelial lymphocytes (IEL) and thymocytes were then cultured and the number of living cells were analyzed. The number of DP cells in the thymus decreased prominently in *in vitro* culture. Interestingly, a similar phenomenon was found in intestinal DP cells in *in vitro* culture. When thymocytes were isolated from mice exposed to restraint stress, these DP cells were found to become sensitive to apoptosis in *in vitro* culture. Phenotypic characterization revealed that DP cells in the intestine were $CD3^+CD25^-CD44^+CD69^+$, while those in the thymus were $CD3^-CD25^+CD44^-CD69^-$. These results suggest that DP cells in the intestine were more mature than those in the thymus and that DP cells of IEL and thymus were generated as primitive T cells in phylogeny but later developed along independent pathways at each site.

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