

Porcine regulatory T cells: mechanisms and T-cell targets of suppression

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Abstract

Tregs are well known for their potent suppressive capacity on various immune reactions. In swine, the phenotypical existence as well as the suppressive activity of Foxp3⁺ Tregs could be demonstrated but more detailed functional investigations are still lacking. Therefore, we focussed in this study on the functional analysis of porcine Tregs. We observed that besides TCR stimulation exogenous IL-2 is required for activation. Furthermore, we analysed the following mechanisms of suppression known from other species: (i) cell-cell contact dependency (ii) production of soluble suppressive factors and (iii) competition for growth factors. Our experiments revealed that suppression by porcine Tregs is abrogated by blocking cell-cell contact or by supplementing excessive amounts of IL-2. Additionally it could be shown that porcine Tregs produce immunosuppressive IL-10. Thereby, we demonstrate that activated porcine Tregs can use all three main mechanisms of suppression mentioned above. Further investigations on target T-cells of Treg suppressive activity were performed using CFSE proliferation assays in combination with six-colour flow cytometry. These studies demonstrated that porcine Tregs are able to suppress the proliferation of all analysed T-cell subsets: T-helper cells, cytotoxic T lymphocytes and TCR- $\gamma\delta$ -T cells.