FINDING THE MOST RESPONSIVE B CELL POPULATION WITH INDUCIBLE REGULATORY PHENOTYPE IN MICE

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A specific and functionally important subset of B cells - known as regulatory B (Breg) cells - are specialized to suppress immune responses and control various immunological diseases, like autoimmunity. Regulatory B cells are characterized by cell surface markers and by the inducible IL-10 production.

Different activation signals, including Toll-like receptors (TLRs), B cell antigen receptor (BCR) or CD40-stimulation can trigger the regulatory transformation of certain B cells but it is not clear which of these signals are the most effective and which B cells have the most susceptible phenotype. In our work we studied three different subpopulations of B cells found in murine spleen (Transitional-2-Marginal Zone Precursors (T2-MZP), Marginal Zone (MZ) and Follicular (FO) B cells), which are all natural sources of regulatory B cells. We aimed to find the most responsive B cell pool and generate Breg cells through the stimulation of the BCR and TLR9 and to further characterize the signalling cascades leading to their suppressive function.

We set up different in vitro cultures using sorted B cells from T2-MZP, MZ or FO B cell pools from the spleen of DBA/1 mice and stimulated them via their BCR and/or TLR9 for different times. The tendency of regulatory transformation was checked by IL-10 production using IL-10-specific ELISA or fluorescent intracellular IL-10 staining. The number of IL-10 producing B cells were detected by FACS analysis.

Based on our experimental set up, we found that B cells from the marginal zone compartment transformed most efficiently into regulatory cells and showed the highest tendency to produce the suppressive IL-10 cytokine. The in vitro generation of Breg cells will help us to study their signalling characteristics and their role in the remission of different autoimmune diseases.

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