

# TGFβ induces murine CXCR5 and Bcl6 and differentially specifies Tfh versus Th17 cell fates

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## Abstract

T follicular helper (Tfh) cells are essential for effective antibody responses but deciphering the intrinsic wiring of mouse Tfh cells has long been hampered by the lack of a reliable protocol for their generation *in vitro*. We report that TGFβ induces robust expression of the Tfh hallmark molecules CXCR5 and Bcl6 in activated mouse CD4 T cells *in vitro* and that TGFβ-induced mouse CXCR5-positive Tfh cells are functional and provide critical help to B cells in a contact-dependent manner. Detailed dissection of the TGFβ-induced molecular pathways revealed that CXCR5 expression is independent of Bcl6 and that excess IL-2 in high-density T cell cultures interferes with the TGFβ-induced Tfh cell program. Notably, classical TGFβ-induced Th17 cultures also yield separate CXCR5-positive and IL-17A-producing cells, thus highlighting shared and distinct cell fate trajectories of Tfh and Th17 cells and thereby underscoring the pleiotropic functions of TGFβ in T helper cell biology.