Regulation of *TFR* cell differentiation by *KLF2* Mediated by *KLF2* mediated *BLIPM1* and T-Bet expression.

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Accepted on August 03, 2020

Editorial Note

In normal circumstances, the germinal centre reaction (GC) in response to infectious agent results in production of antibodies (Ab) preventing aberrant inflammation and autoimmune diseases. In germinal centre the production of Ab is triggered by T follicular helper (*TFH*) cells. In this fundamental process *TFR* (T cell subset) play critical role in suppression of *TFH* and B cell priming by maintaining the GC reaction. Many studies have reported that follicular regulatory T (*TFR*) cell have derived by T regulatory cell (Treg) in response to viral infection. The follicular regulatory T cells shares many similar characters as *TFH* and Treg cells [1]. The transcription factors Bcl6 and *BLIMP1* shows antagonistic effect for each other, this ultimate process play indirect role in GC maintenance. The regulator *BLIMP1* activates the expression of the *TFR* cell marker PD-1 [2]. Here, we focused to clarify the mechanism behind the *TFR* cell differentiation, factors involved in this mechanism and the extent to which *KLF2* and T- bet independently govern *TFR* cell differentiation by using previous research and review on *TFR*, *TFH*, Bcl-6, *BLIMP1*, T-bet (Tbex21), *NAFT2* and *KLF2* as a reference. Our results will provide a novel mechanism by gene expression of T-bet and *KLF2* in regulation of *TFR* differentiation through Bcl-6 - *BLIMP1* inhibition and activation. It will also illuminate the role of *NAFT2* controlling the T-bet (Tbx21) expression in *TFR* cell differentiation as a future research focus. We are focusing on our hypothesis that whether *KLF2* show its efficiency in T-bet – *BLIMP1* complex formation in *TFR* cell which is previously reported in *TFH* cell.

To determine T-bet/*KLF2* dependently or independently regulate *TFR* differentiation. Since it's an interesting question to investigate in detail as no group has reported any detailed information yet. To analyse T-bet/*KLF2* play a direct or indirect role in *TFR* differentiation by regulating *BLIMP1*. It is still unclear if *BLIMP1* is activated by T-bet/*KLF2* by direct pathway or any alternative pathway. This research direction will shed light on some novel transcription factor which could be involved in *TFR* differentiation [3].

The transcription factor *KLF2* regulates many processes in *TFH* and Treg cell. More focus is needed to know the regulators involved in Treg, *TFH* and *TFR* differentiation by *KLF2*. It is also important to know the transcriptional and epigenetic modification of *KLF2* and T-bet in *TFR* differentiation.

References

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