## Congratulations to IMCB's latest PhD graduate – Kerem FIDAN

**Thursday, 24 September 2020**



**Thesis Title: Non-Canonical Functions of Telomerase in Inflammation**

Telomerase is a ribonucleoprotein complex that consists of the telomerase reverse transcriptase protein (TERT) and telomerase RNA component (TERC). Canonical function of telomerase is the maintenance of telomeres. In addition to canonical function, it has been shown that telomerase has non-canonical functions and can be involved in several cellular signaling pathways including NF-kB and Wnt pathways. However, non-canonical functions of TERT is yet to be understood in detail.

In this study, I have studied the non-canonical function of telomerase. For this purpose, I utilized two different mouse models: $TERT^{+/+}$ and $TERT^{-/-}$. While $TERT^{-/-}$ mice are lack of TERT expression, $TERT^{+/+}$ mice express enzymatically active TERT protein. TRAP assay confirmed the loss of telomerase activity in $TERT^{-/-}$ mice thymocytes and splenocytes. Both mice models were treated with several agents to study the non-canonical function of TERT in various tissues. RNA sequencing results showed differentially expressed genes between $TERT^{+/+}$ and

TERT^{-/-} mice upon treatment. Those genes were later validated with RT-qPCR and western blot experiments. Overall, my study reveals several differentially expressed genes that play a role in non-canonical function of telomerase under various condition.
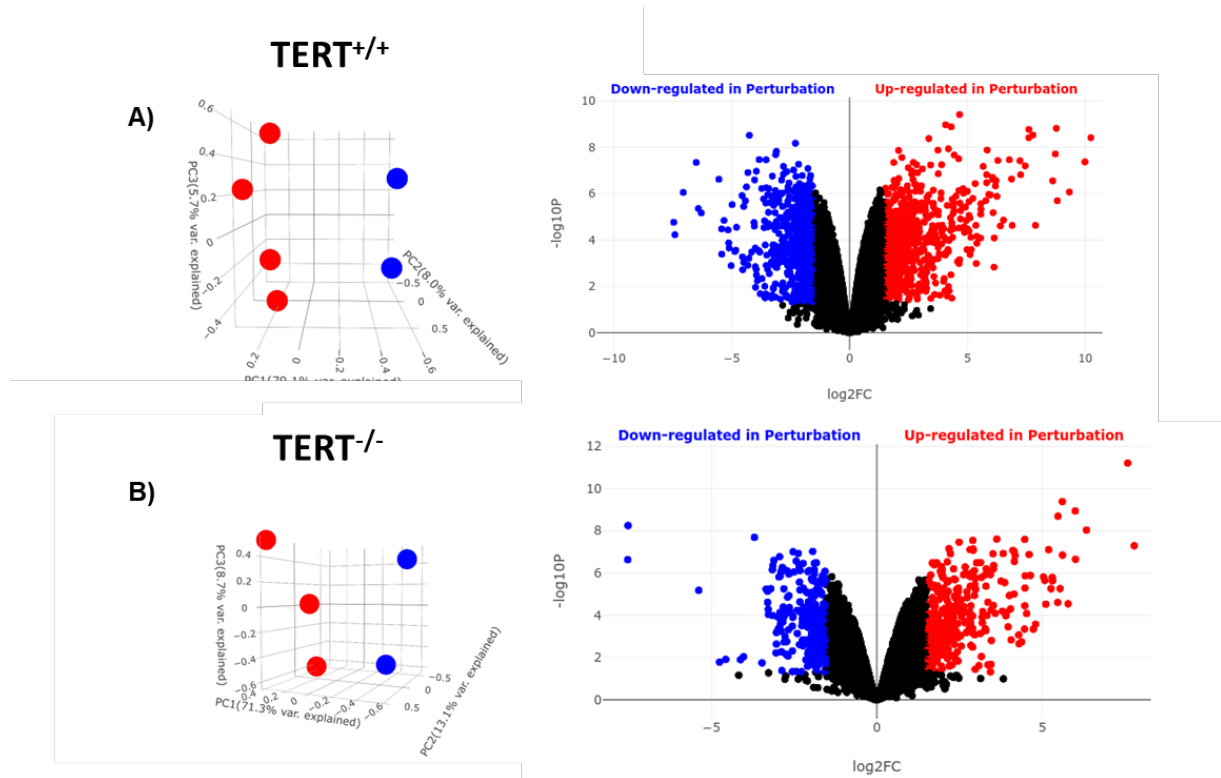
**Supervisor:** Dr. Vinay TERGAONKAR



**Figure Legend: PCA and scatter plot of bulk RNA sequencing of TERT^{+/+} and TERT^{-/-} mice.** A) PCA and scatter plot for TERT^{+/+} mice where untreated and treated TERT^{+/+} mice show differentially expressed genes. B) PCA and scatter plot for TERT^{-/-} mice. For all PCA plots, blue dots represent untreated mouse samples, red dots represent treated mouse samples. For all scatter plots, red dots represent significantly upregulated genes in untreated samples, blue dots represent upregulated genes in treated samples, black dots represent insignificant genes.