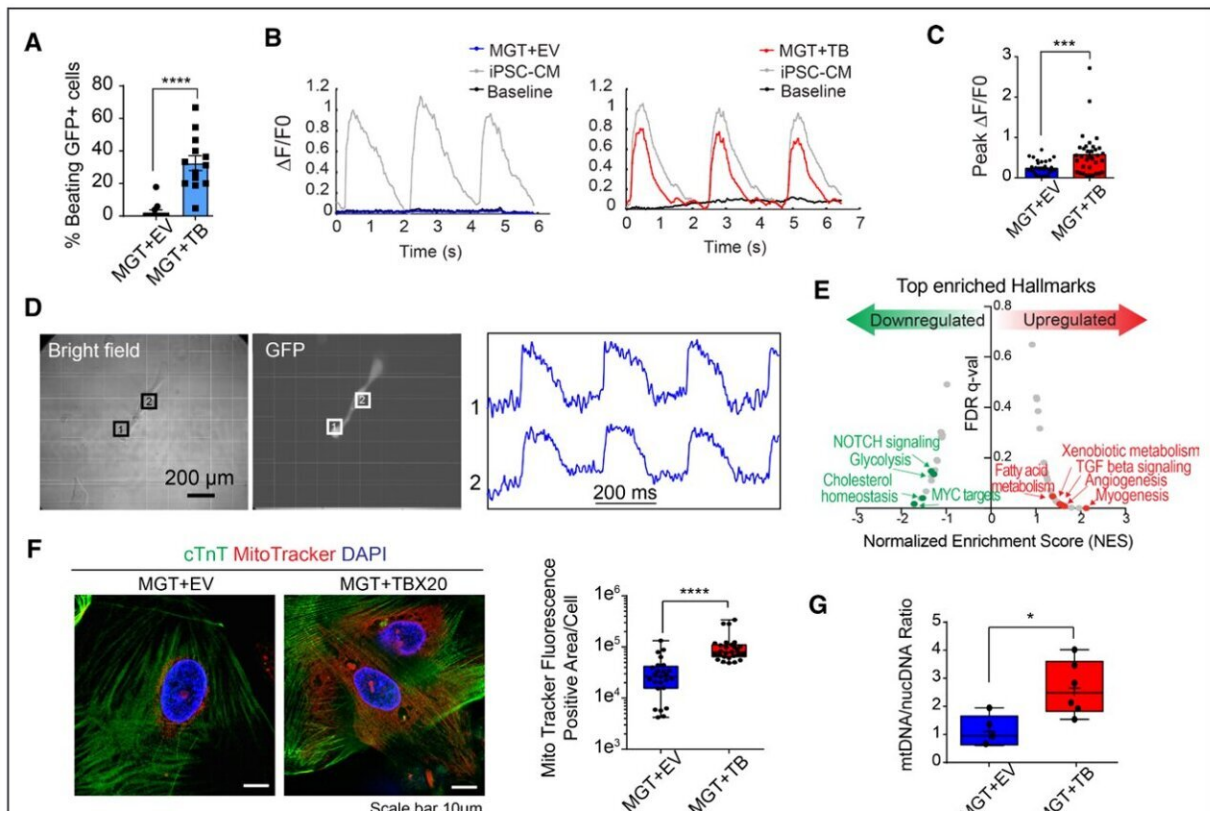


# TBX20 enhances reprogramming of heart fibroblasts into heart muscle cells

October 21 2022, by Jeff Hansen



TBX20 overexpression leads to functional improvement of hiCMs. A, Quantification of observed beating human induced cardiomyocytes (hiCMs) derived from H9-derived fibroblasts (H9Fs) after 1 month of co-culture with human induced pluripotent stem cell-derived cardiomyocytes (iPSC-CMs; n=10 for each group, repeated 2 times independently). B, Tracing and measurements from microscopy imaging show calcium transients in MGT + empty vector (EV) or MGT+TBX20 co-cultured cells as indicated in A. C, Quantification of measured peak  $\Delta F/F_0$  in co-cultured hiCMs (n=33, repeated 2 times

independently). D, Bright field and GFP (green fluorescent protein) fluorescence images showing MGT+TBX20-induced individual hiCMs after co-culture. Right panel shows the selected optical traces of membrane potential ( $V_m$ ) during spontaneous beating with a cycle length of 270 ms. E, Gene set enrichment analysis of RNA sequencing data from H9F-derived hiCMs showing the enriched hallmarks in TBX20 upregulated and downregulated genes. F, Representative images and quantification of mitochondria content labeled using MitoTracker in cardiac troponin T (cTnT)+ hiCMs derived from H9F (n=20 per group). Scale bars, 10  $\mu\text{m}$ . G, Reverse transcription quantitative polymerase chain reaction results showing the relative ratio of mitochondria DNA to the total genomic DNA in H9F-derived hiCMs (n=6 per group). H, Representative oxygen consumption rate profile analyzed from mito-stress Seahorse assay in hiCMs derived from H9Fs (n=10 per group, repeated 3 times independently). I, Quantification of basal respiration, maximal respiration, proton leak, spare respiratory capacity, adenosine triphosphate (ATP) production, and spare respiratory capacity as a percentage in hiCMs treated with MGT+TBX20 or MGT+EV from H9Fs (n=10 per group). J, Representative extracellular acidification rate profile analyzed from glucose-stress Seahorse assay in TBX20-treated or EV-treated hiCMs derived from H9Fs (n=10 per group). K, Quantification of glycolysis, glycolytic capacity, and glycolytic reserve in H9F-derived hiCMs transduced with TBX20 or EV (n=10 per group). All data are expressed as mean  $\pm$  SEM (A, C, F, G, I, and K, Student t test). \*P

Citation: TBX20 enhances reprogramming of heart fibroblasts into heart muscle cells (2022, October 21) retrieved 17 January 2023 from <https://medicalxpress.com/news/2022-10-tbx20-reprogramming-heart-fibroblasts-muscle.html>

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