Transcription factor EB controls epicardial EMT

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During heart development, epithelial-mesenchymal transition (EMT) sustains differentiation of epicardial cells into vascular smooth muscle cells and cardiac interstitial fibroblasts. We have shown that the oncogenic Transcription Factor EB (TFEB), a master gene of autophagy, regulates epicardial EMT. By exploiting epicardial specific mouse genetic models, transcriptomic and massive chromatin immunoprecipitation sequencing and cell biology approaches we have brought evidences that TFEB regulates the EMT activity of transforming-growth factor (TGF)β and this effect results from the activation of the transcription of Thymine-Guanine-interacting factor 1, a TGFβ/Smad pathway repressor. Interestingly, the EMT regulatory activity of TFEB is not restricted to epicardial cells but it is extended to different endodermal and mesodermal cell types.