



## Letter to the Editor

## BRG1, the key regulator in heart development and its physiopathology

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## Dear editor:

Brg1, the essential ATPase subunit of the Brg1/Brm associated-factor (BAF) complex, plays a critical role during heart development and disease. Recently, Zhang et al. demonstrated that BRG1 interacts with JMJD2B to alter the chromatin structure surrounding the PODXL promoter in endothelial cells to promote neutrophil infiltration and to contribute to cardiac ischemia-reperfusion injury in mice [1]. This research further deepens our understanding of BRG1 and its function, especially in heart physiopathology. One of characteristic of cardiac hypertrophy is fetal genes re-expression [2]. BRG1 maintains cardiomyocytes in an embryonic state by regulating BMP10 and p57<sup>kip2</sup> expression [3]. Interestingly, BRG1 re-activated in patients with hypertrophic cardiomyopathy, and increased BRG1 interacts with HDAC and PARP to induce a pathological  $\alpha$ -MHC to  $\beta$ -MHC shift, which eventually lead to cardiac hypertrophy [3]. In addition, BRG1 also interacts with T $\beta$ 4 to discrete regulatory elements in the Wt1 locus (the master regulator of embryonic epicardium-derived cells) in developing and adult heart after myocardial infarction [4]. Importantly, BRG1 also plays an indispensable role during adult heart regeneration. In zebrafish, BRG1 expression level was induced after amputated

ventricular apexes. Increased BRG1 interacts with Dnmt3ab to increase the methylation level of CpG sites at the cdkn1c promoter, which will inhibits cdkn1c expression, a cyclin-dependent kinase inhibitor, to facilitate heart regeneration [5]. These results seem to contradict the findings of BRG1 derived from vascular endothelial cells, in which BRG1 deficiency alleviate cardiac ischemia-reperfusion injury. Thus, whether BRG1 has different role in different cell type during cardiac injury needs further investigation.

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## Conflict of interest disclosure

None.

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