BRG1 (or SMARCA4) is the most frequently mutated chromatin remodeling ATPase in cancer. Mutations in this gene were first recognized in human cancer cell lines derived from the adrenal gland and lung.

Studies (i) identified BRG1 (encoded by SMARCA4), the catalytic subunit of the mammalian SWI/SNF (BAF) chromatin remodeling complex, as a novel dependency in pediatric H3K27M glioma; (ii) investigated the molecular mechanisms underlying the maintenance of the progenitor state; and (iii) demonstrated efficacy for BRG1 inhibitors. The authors identified the BRG1 ATPase as a dependency in pediatric H3K27M-mutant DMG. SOX10 recruits BRG1 to regulatory elements to drive progression. Pharmacologically targeting BRG1 reduced tumor volume and improved survival in vivo. Inhibiting BRG1 ATPase represents a potential therapeutic strategy for pediatric H3K27M DMG [1)]

1)
Beytagh MC, Weiss WA. Epigenetic Rewiring Underlies SMARCA4-Dependent Maintenance of Progenitor State in Pediatric H3K27M Diffuse Midline Glioma. Cancer Discov. 2022 Dec 2;12(12):2730-2732. doi: 10.1158/2159-8290.CD-22-1030. PMID: 36458436.