Men and women require distinct brain tumor therapies, underscoring hard-wired differences in the brain

[Glioblastomas] are the most aggressive tumors of the brain and occur at 60% higher rates in males, whether human or not. Now a startling new study published on the preprint server bioRxiv in November 2020 tracks down these differences to a gene called Brd4, a transcriptome-wide regulator of gene expression.

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The new study explored differences in GBM biology in males and females to better understand underlying factors and pathways that drive the risk and course of tumors. Earlier, the researchers found that GBM cells in male mice were more vulnerable to cancerous change-inducing events and the effects of chemotherapy. Half of these differences were confirmed in human GBM.

The BET family of proteins is involved in regulating transcription by epigenetic reading and work together with target genes to which they recruit specific transcriptional complexes. Brd4 is a BET protein that reads acetylated histones H3 and H4 throughout the entire cell cycle and specifies its cell identity.

The enhancers bound to it may therefore be responsible for the fundamental sex-dependent differences in GBM. Moreover, Brd4 inhibition is being increasingly targeted by drugs for epigenetic modulation of growth in many cancers.

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