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# How can cancer research be illuminated by brain research (and vice versa)?

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## Abstract

Cancer and brain research have historically followed concrete pathways and converged mostly to studying brain cancer. Nowadays, the fields of neuro-oncology and neuroendocrine regulation of tumorigenesis are both emerging fields of intense research and promising applications. An increasing body of evidence suggests that somatic mutations in cancer-related genes are prevalent in several noncancerous brain disorders. These findings highlighting that certain aspects of cancer development/progression and pathologies of the nervous system share molecular alterations, could assist in elucidating the unique hallmarks of cancer and in cancer drugs repurposing for brain disorders. In so doing, identifying the commonalities in these conditions could be crucial not only for better understanding the basis of these pathologies but also for considering the previously underappreciated and/or neglected possibility of using drugs known to be effective in one type of pathology for the other type.

**Keywords:** Alzheimer disease; brain; cancer; next-generation sequencing.

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