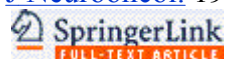




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1: [J Neurooncol.](#) 1997 Dec;35(3):193-209.



Growth factors, glia and gliomas.

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The abilities of growth factors to cause normal cells to express the properties associated with transformed cells is discussed in specific reference to the oligodendrocyte-type-2 astrocyte (O-2A) progenitor cell. In the O-2A lineage, it has been possible to use growth factors and other defined molecules to induce or promote in normal cells all of the main properties of tumor cells, these being continued cell division in the absence of differentiation, more subtle modulations of self-renewal probabilities, promotion of cell migration and inhibition of programmed cell death. In addition to our studies on primary cells, our application to the growth of human tumor specimens of techniques utilized to study primary glial progenitor cells has allowed us to isolate a human glioblastoma multiforme (GBM)-derived population that expresses many properties otherwise uniquely expressed by oligodendrocyte-type-2 astrocyte (O-2A) progenitor cells. Hu-O-2A/Gb1 (for Human O-2A lineage Glioblastoma number 1) cells responded to similar mitogens and differentiation modulators as rodent O-2A progenitors, and generated cells with features of precursor cells, oligodendrocytes and astrocytes. Moreover, ¹H-NMR analysis of amino acid composition demonstrated a striking conservation of types and quantities of free amino acids between the human tumour cells and the rodent primary cells. Hu-O-2A/Gb1 cells represent the first human glioma-derived population for which unambiguous lineage assignment has been possible. Our results thus demonstrate that the human O-2A lineage can contribute to one of the most malignant of glial tumours. Our analyses further indicate that at least two distinct glial lineages can generate glioblastomas. In addition, the highly diagnostic ¹H-NMR spectrum expressed by Hu-O-2A/Gb1 cells raises the possibility of eventual non-invasive identification of tumors of this lineage.

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