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Pituitary adenoma stem cells.

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The identification of a subpopulation of brain tumor cells with potent tumorigenic capacity strengthens the cancer stem cell hypothesis of the origin of the tumors that has recently attracted the attention of many researchers. Reports have been published on the identification of tumor cells with stem cells characteristics in different types of tumors (acute myelogenic leukemia, breast cancer, prostate cancer, bone sarcomas, liver cancer, and melanomas). We and other groups have previously reported the isolation of cancer stem cells from adult glioblastoma multiforme. These cells express stem cell markers, and when differentiated they express glial and neuronal markers. In vivo they give a tumor that recapitulates the characteristics of the tumor in the patient. More recently we have isolated tumor stem-like cells also from benign tumors like pituitary adenomas. Cells derived from pituitary adenomas are able to grow as floating aggregates resembling the neurospheres (typical of normal stem cells) in a medium supplemented by growth factors (EGF and bFGF). The immunocytochemical analysis revealed that pituitary tumor stem-like cells are positives for nestin and, when grown for ten days in differentiation medium they express GFAP, BIII tubulin, and S-100. In vitro tumor stem-like cells derived from a patient with a somatotroph adenoma showed high production of growth hormone and prolactin, while cells derived from the same patient but grown in presence of fetal bovine serum showed no production of hormones.

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