Cytochrome P450 in human brain tumours.

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of xenobiotics, including carcinogens and anti-cancer drugs. This family of enzymes are thus involved in tumour development and the response of established tumours to anti-cancer drugs. In this study, we have investigated the presence and cellular localization of individual families of P450 in normal human brain and primary brain tumours. Sections of formalin-fixed wax-embedded normal and tumour brain were used and the immunoreactivity of individual P450s was identified using light microscopic immunohistochemistry. In normal brain, immunoreactivity was observed for CYP1A, CYP2C, CYP2E1 and CYP3A, while there was no immunoreactivity for CYP1B1. Immunoreactivity in normal brain was mainly localized to neuronal cell bodies. All the tumours studied were astrocytomas, and CYP1A was present in 96% of tumours, while CYP1B1 was present in 87% of tumours. There was no significant immunoreactivity for CYP2C and CYP2E1. CYP3A immunoreactivity was identified in 43% of tumours. In all cases, positive immunoreactivity for each P450 was identified in tumour cells and, generally, in positively staining cells, the immunoreactivity was strong. The presence of individual forms of the CYP1 and CYP3A families in brain tumours provides further evidence for the expression of specific forms of P450 in malignant tumours. Individual forms of P450 in brain tumours could be important therapeutically for the development of anti-cancer drugs that are activated by those forms of P450.

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The cytochromes P450 (P450) are a large group of constitutive and inducible oxidative enzymes with a major role in the metabolism