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Concurrent expression of *erbB* receptor proteins in human meningiomas

Human meningiomas are common intracranial tumours that despite benign histology, are prone to recur. Today the diagnosis of these tumours is based on interpretation of subjective histological criteria given by WHO rendering the possibility of considerable interobserver variation and sampling bias. Thus, there is need for more objective biomarkers that can stratify meningioma patients with regard to risk of recurrence. *ErbB* receptors constitute the EGFR (epidermal growth factor receptor) family consisting of four members that all have been shown to be involved in the tumourgenesis of various human tumours, including meningiomas. We have recently published studies on the expression of each of these receptors in these tumours (1-3). On the other hand, the clinicopathological significance of their mutual expression is scarcely described. We therefore decided to summarize our data and look into this issue. 185 benign and atypical meningiomas (graded according to WHO 2016) underwent immunohistochemical analyses for expression of *c-erbB1*/EGFR, *c-erbB2*/HER2, *c-erbB3*/HER3 and *c-erbB4*/HER4. There was high co-expression of all these receptor proteins in the meningioma tissue. Most *c-erbB1*/EGFRs were phosphorylated in contrast to about 10 % of *c-erbB2*/HER2 receptors. Phosphorylation of *c-erbB1*/EGFR was associated with tumour grade, and phosphorylation of *c-erbB2*/HER2 was associated with prognosis in multivariate analyses. In conclusion, members of the EGFR receptor family are abundantly co-expressed in human meningiomas, and that may be of value in various clinicopathological settings.

Keywords: brain tumour, meningioma, *erbB*, EGFR, HER, diagnosis, prognosis, grading, histopathology, immunohistochemistry, growth factor receptor.

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