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Cytochrome P450 CYP1B1 Over-Expression in Primary and Metastatic Ovarian Cancer

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Ovarian cancer is the leading cause of death from gynaecological malignancies worldwide. Little improvement has been made in the long-term outcome of this disease, with the five-year survival rate of patients at only 30%. This poor prognosis is due to the late presentation of the disease and also to ovarian cancer's unpredictable response to chemotherapy. CYP1B1 is a tumour-related form of the cytochrome P450 group of enzymes, which we have previously shown to be over-expressed in a range of primary solid tumours of different histological types. However, its presence in metastatic tumours has not been investigated until now. In this study, we have conducted a comprehensive immunohistochemical investigation into the presence of CYP1B1 in primary and metastatic ovarian cancer. Immunohistochemistry was performed on formalin fixed wax embedded sections using a monoclonal antibody to human CYP1B1. CYP1B1 immunoreactivity was localised to the cytoplasm of tumour cells. Increased expression of CYP1B1 was found in the majority (92%) of ovarian cancers, whereas only 8% of tumours displayed no CYP1B1 immunoreactivity. There was a strong correlation between CYP1B1 expression in primary and metastatic ovarian cancer ($p = 0.005$ Spearman rank correlation test). In contrast, no detectable CYP1B1 was found in a normal ovary. This study indicates that CYP1B1 is highly expressed in ovarian cancer and its expression is maintained in metastatic tumours.