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Ewing's Sarcoma and Epstein–Barr Virus

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EWING'S SARCOMA (ES) is a highly malignant tumour which occurs primarily in the bones of children and young adults. Both its aetiology and its histogenesis are unknown; immunohistochemical studies indicate that conventionally diagnosed ES is a heterogenous entity which may be related to blastomas or to peripheral neuroectodermal tumours (PNETs) [1]. The latter view is supported by the demonstration of a common chromosomal lesion, t(11;22) (q24;q12) or del(22)q(12), and expression of the MIC2 gene [2].

Epstein–Barr virus (EBV) has been demonstrated and is thought to play an aetiological role in nasopharyngeal carcinomas and various lymphoid malignancies [3, 4]. A recent case report describes a patient with persistent polyclonal B-lymphocytosis, EBV antibodies and subsequent malignant pulmonary blastoma [5].

The polymerase chain reaction (PCR) allows detection of (virus-)specific genome sequences in routinely processed, archival tissue material [6]. EBV can be detected by the amplification of a 110 bp sequence of the highly conserved *Bam* H1W region, which is reiterated 10–11 times [6].

We examined pathological material from 7 patients with ES (aged 3, 5, 13, 15, 16 (extraskeletal), 19 and 61 years, respectively) and 2 with rhabdomyosarcomas (4 and 18 years old), all immunohistochemically confirmed. Diagnostic paraffin blocks were chosen and 7 μm sections were cut from each, placed in a 0.5 ml tube and deparaffinised by boiling. The supernatant was transferred to another tube, and PCR buffer including *Taq* polymerase, the four deoxynucleotide triphosphates and oligonucleotide primers specific for EBV was added to a total of 0.1 ml. The reaction mixture was overlaid with mineral oil to prevent vaporisation and subjected to 30 cycles of amplification, followed by dot blotting and hybridisation with a ^{32}P-endlabelled oligonucleotide probe specific to the internal part of the amplified sequence of EBV. Negative controls consisted of heart tissue, and paraffin-embedded pellets of Raji cells (which contain about 50 EBV genome copies each) were used as positive controls. Sections of paraffin-embedded tissue from nasopharyngeal carcinomas in two Greenlandic patients were also included.

As would be expected, EBV was present in both nasopharyngeal carcinomas, but we could not demonstrate its presence in the nine sarcomas.

Considering the extreme sensitivity of the PCR method, it is thus highly unlikely that EBV plays a role in the evolution of these sarcomas.

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Excessive Toxicity of Mitoxantrone Combined with Etoposide in Advanced Non-small Cell Lung Cancer

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NON-SMALL CELL LUNG CANCER (NSCLC) is responsive to combination chemotherapy and a short but significant prolongation of survival has been achieved in advanced disease with treatment [1]. At present, however, there is no standard chemotherapeutic regimen for NSCLC and existing protocols still lack the efficacy required to produce an acceptable number of complete remissions. Etoposide has an objective response rate of 11% in NSCLC as a single agent [2]. Mitoxantrone alone has also shown modest activity in NSCLC, with response rates ranging from 10% to

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