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INVESTIGATIONS ON THE INVASION OF CHORIOCARCINOMA CELLS GROWN AS SPHEROIDS

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For studies of invasion in vitro, multicellular three-dimensional systems have been found to give more reliable data than monolayer systems (Mareel, 1980).

Therefore we are using multicellular aggregates of human choriocarcinoma cell lines. These spheroids (SPHs) maintain several morphological and functional characteristics of the normal trophoblast (Grummer et al, *Trophoblast Research*, 4, in press).

Invasiveness of three choriocarcinoma cell lines grown as SPHs (Bewo, Jeg-3, JAr) was tested in the Mareel-assay (Mareel et al, 1979). Tumour cell SPHs and chicken heart fragments (PHF) were precultured separately for 3 days. They were then confronted on semi-solid agar in petri dishes for 24 h and subsequently cocultred on a gyratory shaker at 37°C, 5 per cent CO_2 in air for up to 14 days. All three cell lines were proven to be invasive in this assay. After 3 days of coculture beginning of invasion could already be observed. Whereas invasion of BeWo and Jeg-3 cells into PHFs progressed relatively slowly, invasion proceeded faster with JAr cells. With the latter, PHFs were greatly replaced by cancer cells after 14 days of coculture, while major remnants of PHFs were still detectable in case of the other two cell lines.

Human endometrium of the early secretory phase was also used as a host tissue in a pilot series of experiments. The endometrium was precultured with E_2 and progesterone for 3 days. In confrontation culture adhesion and invasion of choriocarcinoma cells was observed. Existing morphology leaves it open so far whether invasion proceeded always through an intact regenerated epithelium or through minor defects in the epithelium.

This three-dimensional organ culture system may be an interesting model for the study of trophoblast invasion.

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