DIFFERENTIATION OF CHORIOCARCINOMA CELLS AND NORMAL TROPHOBLAST CELLS IN RESPONSE TO EXTRACELLULAR MATRIX

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Effects of extracellular matrix (ECM) as a differentiation signal on the human trophoblast were tested using BeWo-choriocarcinoma cells (C) and normal human trophoblast (T) isolated from term placenta. In both cell types differentiation was stimulated only on three-dimensional flexible substrata like gels of collagen type I or Matrigel (basement membrane-like matrix) as opposed to two-dimensional rigid substrates where matrix molecules were adsorbed to tissue culture plastic.

Differences: the secretion of chorionic gonadotropin and the incorporation of methionine into secreted proteins are increased similarly in both cell types on Matrigel. On collagen I and on placental ECM these markers are stimulated in C but diminished in T. The activity of the heat-stable alkaline phosphatase is regulated inversely in both cell types: On Matrigel reduction in T versus stimulation in C; on placental ECM increase in T and regression in C. Fibronectin production is influenced by ECM in T but is non-detectable in C. The proliferation of C was retarded on ECM, while T does not proliferate in culture.

These results show that, in spite of many similarities between both cell types, BeWo cells and trophoblast from term placenta react differently to ECM. This differential response may be helpful in defining the peculiarities of the behavior of the malignant versus the normal trophoblast. (Supported by Dr Mildred Scheel Stiftung für Krebsforschung.)