Establishment and characterization of new cell lines derived from chemically induced experimental tumors

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Summary

We have established new cell lines from N-nitrosodimethylamine induced hepatocellular carcinoma (He/De) and mesoblastic nephroma (Ne/De). The hepatocarcinoma (HeDe) and nephroblastoma (NeDe) cell lines and the tumors have been characterized with respect to their expression of GLUT-1 and GLUT-3 glucose transporters. We have examined the relationship between ^{18}FDG uptake and the expression of facilitative glucose transporters (GLUT-1 and GLUT-3). The higher ^{18}FDG uptake of tumor cells correlated with the GLUT-1 or GLUT-3 expression. Tumor cell lines expressed higher relative levels of GLUT transporters than the control cells. Significant differences were observed among the expressions of the tumors and the tumor cell lines.

Our experiments have shown that chemically induced hepatocellular carcinoma (He/De), mesoblastic nephroma (Ne/De) and myelomonocytic leukemia (My1/De) tumor cells implanted under the capsule of the kidney generate metastases in the parathymic lymph nodes. This was proved by the subcapsular implantation of clooidal ink particles, histopathology, immunohistchemistry, whole-body autoradiography and tissue distribution experiments of ^{18}FDG uptake. We regard the renal capsule–parathymic lymph node complex as an isolated system which provides an experimental approach to study angiogenesis and the potential role of parathymic lymph nodes in malignant transformation. Our system contributes to the understanding of: (a) the metastatic potential of rodent tumors; (b) the connection between the number of primary tumor cells and the temporal aspects of metastatic development. Finally our method is suitable for the experimental demonstration of chemical prevention of metastases formation.

We have found that the basic differences of potential diagnostic importance among chromatin structures of resting (Go), regenerating and hepatocellular tumor cells: 1. Nuclei of resting cells contain decondensed chromatin referred to as chromatin veil. Most of the open nuclei maintained their round shape or were only slightly elongated. 2. Nuclei of regenerating cells opened up easily and showed a vide variety of chromatin structures, typical to logaritmically growing cells with most of the cells being in S phase. 3. Supercoiling was evident from the early stage of chromatin condensation referred to as veil-like chromatin in nuclei of hepatoma cells. The tendency of intensive supercoiling in nuclei of tumor cells could be traced throughout the cell cycle.

Kémiai karcinogenezis - Chemical carcinogenesis
Kromatinkondenzáció - Chromatin condensation
Metasztázis modell - Metastasis model