

ARE THERE FACTORS PREVENTING CANCER DEVELOPMENT DURING EMBRYONIC LIFE?

LENA EINHORN

Department of Oncology of the Karolinska Institute and Hospital (Radiumhemmet) and the National Bacteriological Laboratory, S-104 01 Stockholm, Sweden

(Accepted 6 September, 1982)

On the basis of the following literature observations, a hypothesis is advanced that the development of cancer is actively inhibited during embryonic life. Although the processes of cell differentiation and proliferation are – without comparison – most pronounced during embryonic life, cancer is rarely found in the newborn and is seldom a cause of neonatal death or spontaneous abortion. Attempts to induce cancer in early-stage animal embryos by irradiation or by transplacental chemical carcinogenesis have been unsuccessful, even when exposed animals have been observed throughout their lifetime. After the period of major organogenesis, however, the embryos become susceptible to carcinogenesis. In humans, the most common embryonic tumors arise in tissues which have an unusually late ongoing development and are still partly immature at or shortly before birth. For many human embryonic tumors the survival rates are higher, and spontaneous regression more frequent, in younger children, i.e. prognosis is age-dependent. Thus, although cancer generally appears in tissues capable of proliferation and differentiation, induction of malignancy in the developmentally most active tissues seems to be beset with difficulty. One possible explanation for this paradox could be that cancer is controlled by the regulators influencing development, regulators that are most active during embryonic life.