Annals of Nuclear Medicine Vol. 8, No. 1, 75–83, 1994

Autoradiographic analysis of [^{14}C]deoxy-D-glucose in thyroid cancer xenografts: A comparative study with pathologic correlation

Masahiro KUBOTA,*† Takatoshi TSUDA,*†† Takashi MINASE,** Kunihiro NAKADA*** and Masayori FURUDATE***

*Department of Radiology, School of Medicine, Sapporo Medical University
**Clinical Laboratory of NTT Sapporo Hospital
***Department of Nuclear Medicine, Faculty of Medicine, Hokkaido University
† Department of Radiology, Teine Keijinkai Hospital
†† Department of Radiology, Kushiro Chuo Hospital

An experimental model of thyroid cancer was prepared for evaluating the accumulation of [^{14}C]deoxy-D-glucose ([^{14}C]DG) in thyroid cancer xenografts (AC2). A continuous cell line established from a biopsy specimen of a metastatic thyroid carcinoma possessed the ability to synthesize the cellular protein without increase in cell division after adding bovine TSH *in vitro*. The histological sections of the xenografts resected from the ^{131}I treated nude mice mainly consisted of structures showing follicular and trabecular growth. Immunohistochemically the cytoplasm of the tumor cells was positive for human thyroglobulin(hTg). These observations provide strong evidence that the AC2 cell originates in the thyroid follicular epithelium. By comparing autoradiographic accumulation patterns of [^{14}C]DG and histopathological examinations, it was found that the uptake of [^{14}C]DG was higher in the granulation tissues surrounding necrosis than in viable tumor cells of trabeculary growing and follicle forming tissues.

It is suggested that the degree of [^{14}C]DG content reflects not only tumor cell viability and proliferation but also the inflammatory and degenerative reaction accompanying tumor cell growth.

Key words: thyroid carcinoma xenograft, [^{14}C]deoxy-D-glucose ([^{14}C]DG), autoradiography