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Letter to the Editor

Differential Uptake of 2-Fluoro-2-deoxy-D-glucose

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A RECENT article entitled "Differential uptake of 2-fluoro-2-deoxyglucose by normal and transformed chicken and mouse fibroblasts as a function of glucose concentration" published by Lawrence and Jullien [1] in the *European Journal of Cancer and Clinical Oncology* raises certain interesting issues regarding the correlation between *in vitro* and *in vivo* radiotracer studies with this compound (FDG). They observed an increased uptake and retention of radioactivity in transformed fibroblasts in tissue culture with ^{14}C-FDG only at low (non-physiological) hexose concentrations in the medium. Failing to observe differential uptake between normal and transformed cells at physiological glucose concentrations (corresponding to that of blood), they concluded that ^{18}F-labeled FDG would not be useful for *in vivo* tumor localization by external scanning.

We wish to point out that the authors overlooked articles published earlier demonstrating that ^{18}FDG accumulates in tumor tissue in animals [2, 3] *in vivo*. In another publication which was not cited ^{14}C-2DG (a compound which behaves similarly to FDG *in vivo*) was also shown to concentrate selectively in tumors [4]. It should also be pointed out that articles published after the Lawrence and Jullien article appeared show some extremely promising results using ^{18}FDG and positron emission tomography to study tumors in humans. For example, in one study of liver metastases from colon cancer, a 3- to 5-fold accumulation of ^{18}F in tumor relative to normal liver tissue was observed [5]. In another study ^{18}FDG was used to measure local cerebral glucose utilization in patients with cerebral glioma, and a correlation between rate of glycolysis and malignancy in primary cerebral tumors was observed [6].

Lawrence and Jullien have pointed out that *in vitro* and *in vivo* cell behavior could differ. However, this may not be the only factor that would account for such discrepancies. Fibroblasts may have relatively poor uptake of ^{18}FDG compared to other transformed cells. The *in vivo* uptake ratio between tumor and normal tissue has been found to vary within a wide range (2.10–9.15), depending on the type of tumor [3]. It should also be noted that the *in vitro* system under consideration has not been designed as a true representative of the *in vivo* system. Thus the apparent discrepancies between the results of *in vitro* and *in vivo* studies with ^{18}FDG uptake deserves further investigation.

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