

Accumulation of ^{99m}Tc -HMPAO and ^{99m}Tc -ECD in rodent and human breast tumor cell lines *in vitro*

James R. BALLINGER, Jill DUNCAN, H. Annie HUA and Masanori ICHISE

*Departments of Oncologic Imaging and Experimental Therapeutics, Ontario Cancer Institute;
Division of Nuclear Medicine, Mount Sinai Hospital;
and Faculties of Pharmacy and Medicine, University of Toronto, Canada*

The accumulation of ^{99m}Tc -HMPAO and ^{99m}Tc -ECD was studied in rat (MatB) and human (MCF-7) breast tumor cell lines *in vitro* as a function of incubation time. The general pattern was the same for both tracers and both cell lines: the tracer rapidly and extensively accumulated in the cells but a plateau was reached in 15–30 minutes. Accumulation of HMPAO was higher than that of ECD, did not show a difference between rat and human cells, and correction of HMPAO data for intracellular sequestration and extracellular metabolism resulted in a linear increase in accumulation with time. In contrast, accumulation of ECD was ~ 2 -fold higher in human cells than in rat cells but after correction for sequestration and metabolism a plateau remained. These experiments show differences between HMPAO and ECD in their accumulation and retention in breast cancer cells *in vitro* and support that the need for further work on the potential clinical role for HMPAO in tumor characterization.

Key words: technetium-99m-HMPAO; technetium-99m-ECD; tumor imaging; retention mechanism