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

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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 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