Ionic Liquids as New Solvents for Improved Separation of Medical Isotopes

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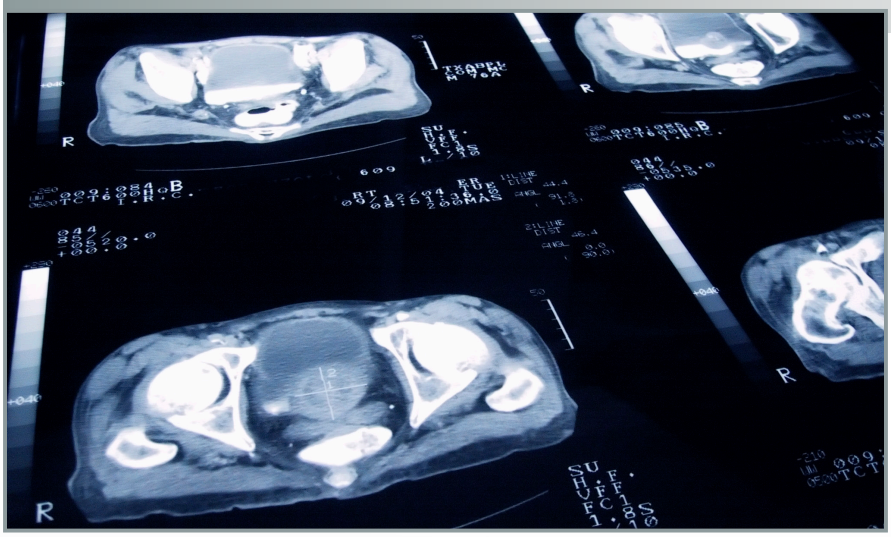

Technology Summary

The daughters of thorium-229 (actinium-225 and bismuth-213) and other alpha-emitting radioisotopes are rapidly becoming of great interest for short-range and site-specific therapy of cancers and micrometastic disease. In many of the current medical isotope generator systems, the production process uses an organic exchange resin. Radiolytic breakdown of these generators limits their size to a few millicuries and their useful lifetime to a few days.

A series of ionic liquids (ILs) have recently been applied as new solvents for potentially effective separation of different medical isotopes at ORNL. The uniqueness of these ILs includes excellent separation factors using neat ILs without any dissolved extractant ligand.

Advantages

- Clean separation; removes daughters with one step
- Less isotope degradation
- Less risk for isotope generation

Potential Applications

- Treatment of various forms of cancer
- Development of a new medical isotope generator
- Could possibly be used for Mo-99/Tcm-99 separation

Patent

Application in preparation

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