Weill Cornell Medicine

Dual HPLC-TLC Platform for Enhanced Quality Control of Alpha-Emitting Radiotherapeutics

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Background & Unmet Need

- Radiopharmaceuticals using alpha-emitting isotopes like Ac-225 are emerging as powerful therapeutic tools for treating cancer
- Current quality control methods using radioHPLC or radioTLC alone cannot accurately assess the purity of complex alpha-emitting compounds
- Rapid, accurate purity verification is critical for patient safety and regulatory compliance in radiopharmaceutical production
- Manual handling of radioactive samples increases personnel exposure risks
- **Unmet Need:** A standardized method of accurate and rapid quality control analysis of complex radiopharmaceuticals that does not compromise analytical precision and minimizes radiation exposure

Technology Overview

- **The Technology:** An integrated HPLC-radioTLC analysis platform for precise radiopharmaceutical quality control
- The platform features a chemically resistant moving stage with protective cover, compatible with multiple radioTLC scanner models
- The system uses disposable inserts with absorption-lined wells to prevent cross-contamination
- **PoC Data**: A working prototype has been validated across multiple radionuclides (225Ac and 134Ce) and diverse radiopharmaceutical types including small molecules, peptides, antibodies, and nanoparticles.
- The platform demonstrates rapid analysis times (~30 minutes) while maintaining robust analytical integrity

Inventors:
James Kelly
Anja Wacker

Patents:
Provisional Filed

Publications:
N/A

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Technology Applications

- Quality control analysis in GMP radiopharmaceutical manufacturing
- Clinical radiopharmacy operations requiring standardized QC procedures
- Analysis of novel radiotherapeutics in research settings

Technology Advantages

- Enables precise identification of radiolabeled compounds and their impurities
- Reduces operator radiation exposure through improved handling design
- Compatible with existing radioTLC equipment through versatile stage design
- Accommodates both manual and automated fraction collection methods

Supporting Data / Figures

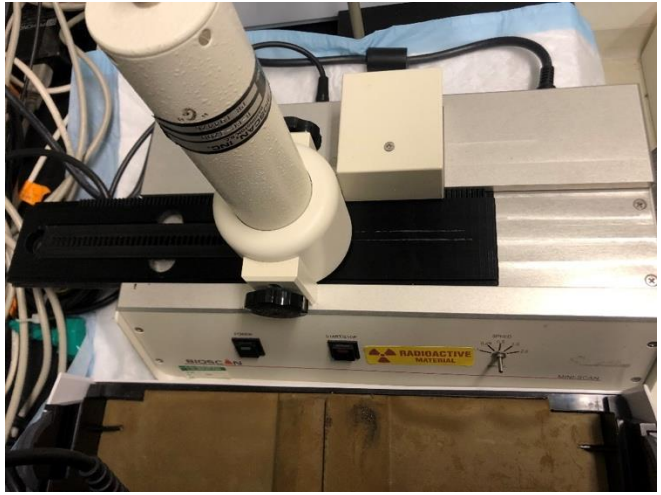

Figure 1: Prototype of the integrated HPLC-radioTLC platform showing the 3D-printed customizable moving stage with disposable insert installed in a commercial radioTLC scanner.

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