

## Microscale Device and Method for Purification of Radiopharmaceuticals

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### SUMMARY

UCLA researchers from the Departments of Molecular & Medical Pharmacology and Bioengineering have developed a novel method for the purification of radiopharmaceuticals for the on-demand production of positron emission tomography (PET) tracers.

### BACKGROUND

Positron emission tomography (PET) is a real-time, in vivo 3D imaging technique that has unparalleled specificity and sensitivity for visualizing biochemical processes. Though several tracers have been advanced to the clinic, the development and translation of others is hindered by the limited availability and high production cost of these short-lived compounds. Microfluidic radiochemistry can remove this bottleneck, enabling low-cost PET tracer production on demand. While significant enhancements of microfluidic tools for many parts of the PET tracer production process has occurred in the last few years, there has been relatively little development of improving the process of microscale purification.

### INNOVATION

UCLA researchers have developed a novel device and method for the purification of radiopharmaceuticals. This device is designed around a method called capillary electrophoresis (CE) that relies on an electric field to drive a sample through a capillary or a microchannel and perform separation. The novel CE method is able to accommodate the larger sample volumes required for purification processes, as opposed to the typical 5-50 nanoliter volumes in traditional analytical CE which is 20-200x too small. In addition, integration into a microfluidic device critically links the radiation detection to fraction collection which allows purification of the desired product peak from the overall crude reaction mixture.

### APPLICATIONS

- ▶ Purification of PET tracers
- ▶ Purification of radiopharmaceuticals

### ADVANTAGES

- ▶ Microliter volume purification using capillary electrophoresis
- ▶ Can directly purify radioactive product from crude mixture
- ▶ Allows for on-demand production of PET tracers and radiopharmaceuticals
- ▶ Lowers size, cost, and complexity of radiopharmaceutical production equipment
- ▶ Speeds up radiopharmaceutical production

### PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,660,571	05/30/2023	2017-450
European Patent Office	Published Application	3541505A2	09/25/2019	2017-450

### ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Device and Method for Microscale Chemical Reactions](#)
- ▶ [Novel Method of Radiofluorination](#)
- ▶ [Digital Microfluidic Platform for Radiochemistry](#)

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### INVENTORS

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### OTHER INFORMATION

#### KEYWORDS

Positron emission tomography, PET, tracer, radiopharmaceutical, microfluidic, purification, capillary electrophoresis, CE, radiotracer, microchip electrophoresis, CE, targeted radionuclide therapy, microfluidics, fraction collection, radiation detector

#### CATEGORIZED AS

- ▶ [Imaging](#)
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#### RELATED CASES

2017-450-0

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