Washington University in St. Louis
Office of Technology Management

NOVEL METHOD AND DEVICE TO PRODUCE FLUORINE-18 PET TRACERS

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T-019276

Technology Description

Researchers at Washington University in St. Louis (WUSTL) have developed a new method and device for the preparation of flourine-18 (F-18) radiolabeled compounds as positron emission tomography (PET) tracers. PET is a widely used clinical and research imaging tool that will play a key role in personalized medical care in the future. F-18 is the most commonly used radioisotope for PET. However, the conventional method of preparation using azeotropic drying in an automated module requires multiple hardware for the time-consuming drying steps, and the dried fluoride often results in inconsistent radiolabeling and low yields. Further the conventional procedure is not suitable for microfluidic radiochemistry or on-demand production for the future need of personalized medical care. To overcome these limitations the inventors have developed a new method (WUSTL technology T-015970) and device (WUSTL technology T-019276) for preparing F-18 radiolabeled compounds. This method eliminates the need for the conventional drying step (and therefor the hardware requirement), and resulted F-18 has high radioactivity for conventional nucleophilic substitution and also is ideal for novel radiofluorination chemistry. In addition, the inventors have further improved the method by developing a pump device to control multiple continuous steps in the production process. These technologies not only improve the reproducibility and reliability of the F-18 radiolabeling but also enable on-demand synthesis of F-18 PET tracers for future needs for personalized medical care.

Stage of Research

Validation studies are ongoing.

Applications

- Production of F-18 radiotracers for PET

Key Advantages

- Simple
- Highly efficient in elution and radiolabeling
- Fewer precursors required for production
- Reliable and reproducible
- Flexible- can use a variety of bases/solvents
- Ready to use with reduced preparation time
- Compatible with currently available radiosynthesis modules
- Ideal for automated production/minimization

- Ideal for novel radiofluorination chemistry
- Enables microfluidic radiochemistry and on-demand synthesis

Patents

- US patent application- Synthesizing pet tracers using [F-18] sulfonyl fluoride as a source of [F-18] fluoride (publication number US 2017/0197912 A1)
- Provisional patent application filed for technology T-019270

Related Web Links

- Dr. Dong Zhou