

2015-388 Fully Automated Synthesis of 16 β -[18F] Fluorodihydrotestosterone ([18F]-FDHT)

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Technology description

TITLE:

Fully Automated Synthesis of 16 β - 18F-Fluorodihydrotestosterone (18F-FDHT)

SUMMARY:

UCLA researchers in the Department of Molecular and Medical Pharmacology have developed a method for the fully automated synthesis of 16 β - 18F-fluorodihydrotestosterone (18F-FDHT), a probe to monitor prostate cancer.

BACKGROUND:

Prostate cancer is the second leading cause of cancer-related death in American men. Effective management of prostate cancer requires early detection and the availability of accurate diagnostic modalities for predicting and monitoring the disease. Increased androgen receptor (AR) expression in primary tumors of prostate cancer is a strong indicator of disease; however, due to heterogeneity of the tumors, biopsy samples alone may not be sufficient for disease detection. Molecular imaging agents that can non-invasively provide information for distinguishing AR-positive tumors are critically important for the treatment of prostate cancer. 16 β -18F-fluorodihydrotestosterone (18F-FDHT), a fluorinated analog of the native AR-binding ligand dihydrotestosterone, has proven to be one of the most effective in vivo AR-binding radiotracers studied to date. The demand for 18F-FDHT is expected to increase as the clinical potential of this PET tracer to predict AR expression levels in prostate cancer patients is being recognized. Currently, the clinical production of 18F-FDHT is generally performed manually by trained radiochemists; as such, its widespread use is limited to a few sites. Automation of this synthesis would enable many more facilities currently equipped for PET synthesis to routinely obtain 18F-FDHT without the need for specialized personnel.

INNOVATION:

UCLA researchers led by Prof. Jennifer Murphy have developed a new fully automated method to manufacture the 18F-FDHT probe using the ELIXSYS system. This will allow PET centers around the globe without the expertise to synthesize these PET probes to begin utilizing 18F-FDHT as a widespread probe to monitor prostate cancer.

Application area

This automatically generated 18F-FDHT probe will be a great utility in monitoring and diagnosing prostate cancer patients.

Advantages

- Highly reproducible synthetic strategy
- Lowers radiation exposure to PET probe synthetic chemists
- Enables PET centers with ELIXSYS systems to make probe at will
- Production does not require specially trained radiochemist

Institution

[University of California, Los Angeles](#)

Inventors

[Mark Lazari](#)

BIOENG

[Jennifer Murphy](#)

Assistant Professor

PHARMACOL

联系我们



叶先生

电话：021-65679356

手机：13414935137

邮箱：yeyingsheng@zf-ym.com