COX2 Probes for Multimodal Imaging

VANDERBILT UNIVERSITY
CTTC Center for Technology Transfer & Commercialization

Summary

Inventors at Vanderbilt University have developed a novel chemical design and synthesis process for azulene-based COX2 contrast agents which can be used for molecular imaging, via a variety of imaging techniques. These COX2 probes can be utilized for numerous applications, including imaging cancers and inflammation caused by arthritis and cardiovascular diseases. The process for developing these COX2 contrast agents has been significantly improved through a convergent synthesis process which reduces the required steps to establish the COX2 precursors.

Addressed Need

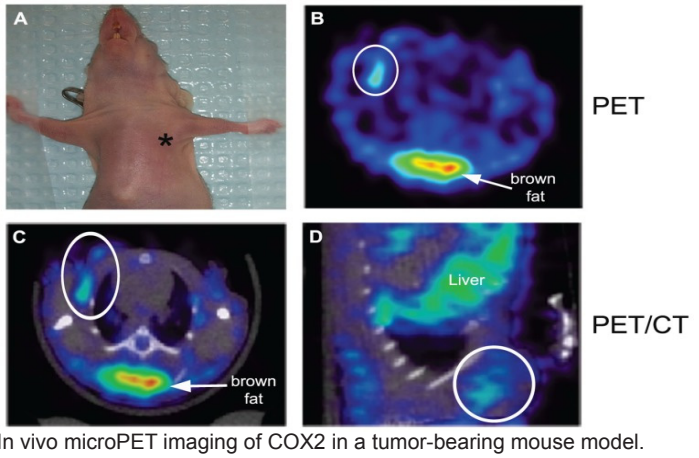
- » Difficulty labeling precursers with fluoride
- » Current synthesis requires too many steps
- » COX2 probes do not currently exist for PET/SPECT imaging devices

Technology Description

This novel synthesis process creates COX2 contrast agents for molecular imaging, either positron emission tomography (PET) or singe photon emission computed tomography (SPECT) or optical or magnetic resonance imaging. COX2 is a useful marker in detection of early stages of cancer as they are not expressed in normal tissues, but are “turned on” in early stages of inflammatory lesions and premalignant and malignant tumors. Convergent synthesis is used to obtain the COX2 precursors in the minimum possible number of steps of synthesis. In addition to the COX2 PET probes and synthesis process, this invention describes a process for labeling the COX2 probes with [18F] Fluoride. These probes can be used for imaging cancers and inflammations such as arthritis or cardiovascular diseases.

Competitive Advantages

- » Optimized for use with positron emission tomography (PET), magnetic resonance imaging (MRI), and single photon emission computed tomography (SPECT)
- » Convergent synthesis strategy minimizes steps required for COX2 precursor synthesis
- » Novel [18F] Fluoride labeling strategy for precursor label
- » Wide array of potential imaging applications



In vivo microPET imaging of COX2 in a tumor-bearing mouse model. At the time of imaging, tumor size was approximately 4 mm in diameter (*, tumor) (A). Representative PET image of an axial section showing tumor uptake of 18F-COX2 probe (white circle) (B). Fused PET/CT axial image (C). Fused PET/CT sagittal view of the tumor (D).

Intellectual Property Status

- » Pending US Patent Application

CTTC CONTACT:
Masood Machingal, Ph.D.
Phone: (615) 343-3548
masood.machingal@vanderbilt.edu

VANDERBILT INVENTORS
Wellington Pham, Ph.D.
Donald D. Nolting, Ph.D.
John C. Gore, Ph.D.

VU REFERENCE: VU12179

Link to Vanderbilt technologies available for licensing