Non-Radioactive MRI Imaging Agent

Published date: June 25, 2018

Technology description

A novel, non-radioactive, alternative MRI imaging agent that may replace ^{18}FDG PET imaging of tumors and other tissues where glucose consumption is high.
The alternative agent, which is labeled with oxygen-17, can be synthesized through straightforward chemistry and is expected to accumulate in select tissues in the same manner as the current ^{18}FDG agent. Accumulation of the alternative agent will allow for indirect image enhancement of H-MRI and can be used for direct O-MRI, with hyperpolarization affording increased sensitivity both for indirect and direct imaging. Studies conducted on mice using other compounds labeled with oxygen-17 have demonstrated the feasibility of replacing PET with MRI using this novel, non-radioactive, alternative agent. The alternative agent is easier to prepare than the currently used ^{18}FDG, allows for a wider use of commonly used MRI imaging instruments, and has therapeutic as well as diagnostic potential (theranostic potential).

Background

Positron emission tomography (PET) is a nuclear medicine, functional imaging technique that is used to observe metabolic processes in the body. PET scans can be used to detect cancerous tissues and cells in the body that may not always be found through computed tomography (CT) or magnetic resonance imaging (MRI). The PET system detects pairs of gamma rays emitted indirectly by a positron-emitting radionuclide (tracer), which is introduced into the body on a biologically active molecule. ^{18}F-fluorodeoxyglucose (^{18}FDG) is currently the radiopharmaceutical most widely used in PET scans to aide in the detection of tumor cells and other cells with high glucose consumption. Exposure of adults to radiation from PET imaging with ^{18}FDG is not considered to be dangerous. However, it is not recommended for pregnant women and children. Post resection or treatment surveillance is often needed for young children, requiring more CT and PET exposure to radiation with yearly or biannual imaging screening. PET scanners also carry high operating costs compared to CT and MRI alternatives. There exists is a need for a non-radioactive and affordable, alternative imaging agent with the same effectiveness and detection capabilities as the currently used radiopharmaceutical ^{18}FDG.

Technology Description

Researchers at the University of New Mexico have proposed the development of a novel, non-radioactive, alternative MRI imaging agent that may replace ^{18} FDG PET imaging of tumors and other tissues where glucose consumption is high. The alternative agent, which is labeled with oxygen-17, can be synthesized through straightforward chemistry and is expected to accumulate in select tissues in the same manner as the current ^{18} FDG agent. Accumulation of the alternative agent will allow for indirect image enhancement of H-MRI and can be used for direct O-MRI, with hyperpolarization affording increased sensitivity both for indirect and direct imaging. Studies conducted on mice using other compounds labeled with oxygen-17 have demonstrated the feasibility of replacing PET with MRI using this novel, non-radioactive, alternative agent. The alternative agent is easier to prepare than the currently used ^{18} FDG, allows for a wider use of commonly used MRI imaging instruments, and has therapeutic as well as diagnostic potential (theranostic potential).

About STC.UNM

As the technology-transfer and economic-development organization for the University of New Mexico, STC.UNM protects and commercializes technologies developed at the University of New Mexico (UNM) by filing patents and copyrights and transferring the technologies to the marketplace. We connect the business communication (companies, entrepreneurs and investors) to these UNM technologies for licensing opportunities and the creation of startup companies. Visit www.stc.unm.edu.

STC.UNM
SUPPORTING TECHNOLOGY TRANSFER AND CATALYZING ECONOMIC DEVELOPMENT AT THE UNIVERSITY OF NEW MEXICO

Application area

Non-radioactive, alternative imaging agent to detect cancerous tissues by MRI
Cheaper alternative to the currently used ^{18} FDG agent
Therapeutic and diagnostic potential
Allows for increased sensitivity and a wider use of commonly used MRI imaging instruments to detect cancerous and cancer-like cells and tissues
Applications in medical imaging, PET scans, MRI

Institution

The University of New Mexico

Inventors

Thomas Vander Jagt
David Vander Jagt