

Novel Non-Immunogenic Positron Emission Tomography Gene Reporter

Tech ID: 30321 / UC Case 2007-474-0

SUMMARY

UCLA researchers in the Department of Pharmacology and Department of Microbiology, Immunology, & Molecular Genetics have developed a novel positron emission tomography reporter gene to preferentially trap radiolabeled deoxycytidine analogs.

BACKGROUND

Positron Emission Tomography (PET) is a non-invasive imaging tool that is used to monitor the metabolic activity of tissues within a patient's body. PET scanners detect positron emitting isotopes or probes that are taken up by biologically active cells. This technique has been modified as a reporter system for cellular imaging. In a PET reporter gene system, a reporter gene is introduced to cells of interest that encodes either an enzyme or a receptor that functions to induce the accumulation of PET probes into or onto a cell surface. Once the cells are labeled by the presence of the PET probes, they can be detected within the body by a PET scanner, thus allowing downstream image analysis of cells of interest.

INNOVATION

UCLA researchers have developed a novel gene that encodes an enhanced version of deoxycytidine kinase (EdCK) to function as a PET reporter. EdCK preferentially traps radiolabeled analogs of deoxycytidine, a novel field of probes. This EdCK has been modified to achieve high levels of expression and reporter activity within cells, making it a robust system for labeling cells of interest. Furthermore, EdCK is a human gene and therefore would not cause an immunogenic response in human subjects, making it a potential tool for labeling cells for cell transplantation therapy.

APPLICATIONS

- ▶ Targeted cell labeling in vitro and in vivo

ADVANTAGES

- ▶ Utilizes novel fluorinated deoxycytidine analogs (which may have improved pharmacokinetics and signal-to-noise ratios compared to currently used probes)
- ▶ Non-immunogenic

STATE OF DEVELOPMENT

Testing in cell culture to determine the efficacy of EdCK compared to dCK as a PET reporter.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Nucleic Acid Tetramers For High Efficiency Multiplexed Cell Sorting
- ▶ Mouse Model Deficient for the Proton Sensing Gpcr T-cell Death-associated Gene 8 (tdag)
- ▶ Anti-Human Deoxycytidine Kinase (dCK) Monoclonal Antibody
- ▶ Targeted Mass Spectrometry Approaches To Detect Kinase Pathways For Personalized Medicine
- ▶ G2A GPCR Deficient Mouse Model and G2A Monoclonal Antibody
- ▶ Proton-sensing G Protein-coupled Receptor 4 Knockout

CONTACT

UCLA Technology Development
Group
ncd@tdg.ucla.edu
tel: 310.794.0558.



INVENTORS

- ▶ Witte, Owen N.

OTHER INFORMATION

KEYWORDS

Positron emission tomography, PET,
PET probe, reporter system, cell
targeting, gene reporter, imaging, non-
immunogenic, deoxycytidine,
deoxycytidine kinase

CATEGORIZED AS

- ▶ **Imaging**
 - ▶ Medical
 - ▶ Molecular
- ▶ **Medical**
 - ▶ Imaging
 - ▶ Research Tools
- ▶ **Research Tools**
 - ▶ Expression System

RELATED CASES

2007-474-0

- ▶ [Derivation Of A Human Neuroendocrine Prostate Cancer Cell Line With Defined Oncogenic Drivers](#)
- ▶ [Novel Polyclonal Antibody to Detect a Bruton's Tyrosine Kinase Phosphorylation Site](#)
- ▶ [Non-Immunogenic Positron Emission Tomography Gene Reporter Systems](#)

Gateway to Innovation, Research and Entrepreneurship

UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

tdg.ucla.edu

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

© 2019, The Regents of the University of California

[Terms of use](#)

[Privacy Notice](#)

