

A New PET Probe for Glucose Transport and Metabolism

Tech ID: 20205 / UC Case 2004-192-0

SUMMARY

UCLA researchers in the Department of Physiology have developed a novel PET probe to monitor glucose metabolism and transport.

BACKGROUND

Positron Emission Tomography, or PET, is a functional medical imaging technique that allows physicians to monitor metabolic processes in the body. PET imaging has been particularly useful in monitoring brain activity and tumor detection by measuring glucose metabolism. This is achieved by using a PET probe that can bind to radiolabeled glucose administered during the examination. 2-[18F]-2deoxy-D-glucose, or 2FDG, the most common PET probe used to monitor glucose metabolism typically in the brain, can also be utilized to monitor heart function, and to identify tumors. This is because 2FDG is specifically taken up by cells that contain facilitated glucose transporters, or GLUTs, which are typically found in the brain, and in tumor cells. This however limits the use of the probe, as it cannot be used to monitor other glucose metabolism processes which are facilitated through other common glucose transport pathways, such as the sodium/glucose cotransporter, or SGLTs. The development of a novel PET probe that can be imported by SGLTs would allow physicians to monitor glucose metabolism in previously undetectable organ systems and tissues.

INNOVATION

Professor Ernest Wright and colleagues at UCLA have developed a novel PET probe to monitor glucose metabolism and transport facilitated by SGLTs. This novel innovation can be used to monitor glucose metabolism in the kidneys, small intestines, heart, lung, brain, prostate, testis, and uterus, as well as metastatic tumor lesions. Additionally, the probe is highly specific for SGLTs, and is not a substrate for traditional GLUTs.

APPLICATIONS

- ▶ Measure efficacy of SGLT inhibitors which are associated with a variety of metabolic diseases (e.g. obesity, diabetes)
- ▶ Monitor health and disease states of a variety of tissues and organ systems by visualizing glucose metabolism and transport (kidneys, small intestine, heart, lungs, brain, prostate, reproductive organs, tumors)

ADVANTAGES

- ▶ Provides detection of previously undetectable glucose metabolism pathways in a variety of organ systems and tissues
- ▶ More versatile than traditional PET probes (targets a wider variety of organ systems and tissues)
- ▶ Highly specific for SGLT, and is not a substrate for GLUT

RELATED MATERIALS

- ▶ Kepe V, Scafolio C, Liu J, Yong WH, Bergsneider M, Huang S-C, Barrio JR, and Wright EM. Position emission tomography of sodium glucose cotransport activity in high grade astrocytomas. J Neurooncol. 2018 Jul;138(3):557-569. doi: 10.1007/s11060-018-2823-7; PMID: 29525972

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,845,999	09/30/2014	2004-192



INVENTORS

- ▶ Wright, Ernest M.

OTHER INFORMATION

KEYWORDS

Positron emission tomography, PET, PET imaging, 2FDG, 2-[18F]-2deoxy-D-glucose, PET probe, positron emission tomography probe, glucose metabolism, monitor glucose metabolism, PET glucose, SGLT, GLUT, sodium/glucose cotransporter, functional imaging, glucose transport

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Imaging**
 - ▶ Medical
 - ▶ Molecular
- ▶ **Medical**
 - ▶ Diagnostics
 - ▶ Imaging
 - ▶ New Chemical Entities, Drug Leads

RELATED CASES

2004-192-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [Identification of the First Human Glucose Sensor: A New Target for Treatment of Diabetes, Obesity, and Related Metabolic Disorders](#)

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