Docket #: S23-025

Detecting neuroinflammation: Novel PET tracers allow accurate tracking innate immune activation

Researchers at Stanford have identified GPR84 as a new highly specific imaging biomarker of neuroinflammation and innate immune activation. After proving that GPR84 is significantly upregulated in both human cells/tissues (in the context of inflammation) and mouse models of neuroinflammatory diseases, they developed PET tracers that bind with high specificity to this target.

Tracking the innate immune system is vital when developing new therapies for a range of diseases, including cancer, inflammatory bowel disease, and neurodegenerative diseases, to enable patient stratification and real-time monitoring of therapeutic response. In particular within the central nervous system this has been challenging due to the lack of methods to detect and quantify inflammation in the brain with high specificity in a non-invasive manner.

This new approach developed by researchers at Stanford, involving PET tracers targeting GPR84, could be used to more accurately diagnose and stage neurological diseases, and other inflammatory coniditons, in addition to aiding in the development of better therapies for diseases such as, Alzheimer's disease and Parkinson's disease.

Stage of Development
In vivo preclinical

Applications

- Research into understanding innate immune responses in the context of disease
- Detection of innate immune activation and neuroinflammation

- Monitoring response to immunomodulatory drugs

Advantages

- More specific detection of innate immune activation non-invasively
- Novel target and tools for tracking neuroinflammation

Publications

- Kalita, Mausam., et al. PET Imaging of Innate Immune Activation Using 11C Radiotracers Targeting GPR84. *American Chemical Society* (2023)

Patents

- Published Application: WO2024220480
- Published Application: 20260091147

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