Washington University in St. Louis
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S1PR2-TARGETED PET TRACERS

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Technology Description

Researchers at Washington University in St. Louis and colleagues have developed S1PR2-targeted PET tracers. Sphingosine-1-phosphate (S1P) is an important bioactive lipid that regulates critical biological functions by acting through five specific G protein-coupled S1P receptors (S1PR 1-5). Each subtype has specific expression and function. S1PR2 plays a key role in demyelinating diseases of the central nervous system, anaphylaxis, inflammation and cancer. As such, S1PR2 expression levels and distribution can serve as a biomarker for a variety of diseases. PET imaging could be used to assess S1PR2, however effective S1PR2-targeted PET tracers are needed. To help meet this need the inventors have generated a series of novel compounds that are highly potent and selective for binding S1PR2. These tracers could be used for early diagnosis and monitoring of inflammatory diseases such as MS, lung fibrosis, liver fibrosis, diabetes, and cancer. This technology provides compounds that can serve as PET tracers to diagnose and monitor S1PR2-associated diseases and assess therapeutic efficacy.

Stage of Research

Lead S1PR2 tracers have been evaluated *in vitro* and *in vivo* in diabetes, MS and diabetic pulmonary fibrosis models. Additional characterization of the PET tracers is ongoing.

Applications

- PET tracer for S1PR2-associated diseases including- MS, cholangiopathies, diabetic neuropathy, lung fibrosis, liver fibrosis, and cancer
  - Diagnose disease
  - Monitor disease progression
  - Assess therapeutic efficacy
- Research tool
- Drug development

Key Advantages

- Highly selective for S1PR2
- Highly potent
- Higher binding affinity for S1PR2 than previous compounds
- Binds S1PR2 receptors directly
- No *in vivo* phosphorylation required

Publications

- Luo Z, Yue X, Yang H, Liu H, Klein RS, Tu Z. Design and synthesis of pyrazolopyridine derivatives as sphingosine 1-phosphate receptor 2 ligands. Bioorg Med Chem Lett. 2018 Feb 1;28(3):488-496. doi: 10.1016/j.bmcl.2017.12.010. Epub 2017 Dec 6.

Patents

- Provisional patent application has been filed.

Related Web Links

- Dr. Tu profile