PET tracers for imaging bacterial infection

Dr. Sanjiv Gambhir and colleagues have developed positron emission tomography (PET) tracers to clinically image bacterial infection. Despite significant developments in the microbiology of infection, bacterial infections remain a major health issue. It is important to distinguish bacterial infection from non-bacterial inflammation as early detection and correct treatment is correlated with a greater prognosis for full recovery. Diagnosis of bacterial infection is challenging. The ability to clinically image the infection would be helpful. However, conventional imaging techniques such as MRI or CT are incapable of distinguishing bacterial infection from non-bacterial inflammation. PET imaging with the proper radiotracers could be used to distinguish infection, but bacteria-specific tracers are lacking. To overcome this limitation, the inventors have developed PET tracers with high specificity that may be used for early detection and monitoring of bacterial infection.

Stage of research
In vitro uptake assays show that uptake of the tracers is time dependent and specific to bacteria. Additional *in vivo* studies using mouse models of bacterial infection are ongoing.

Applications

- PET imaging
  - Detect and monitor bacterial infection in patients
  - Monitor response to treatment of bacterial infection

Advantages

- Allows early clinical detection and monitoring of bacterial infection

- Allows localized detection of infection
- Tracers are highly specific for bacteria- minimal background
- Novel synthesis of tracers- has economic and temporal advantages over other synthesis methods

Publications

- Gowishankar et al. Investigation of 6-[18F]-Fluoromaltose as a Novel PET Tracer for Imaging Bacterial Infection. *PLOS One.* v. 9(9); 2014.

Patents

- Published Application: 20140314671

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