Docket #: S24-138

Maltotriose-based probe for imaging bacterial infections

Researchers at Stanford have developed a fluorescent dye to enable noninvasive, fast, cost-effective, and specific imaging of bacterial infections.

Bacterial infections can occur in various situations and environments. Timely and accurate detection is essential for effective treatment with minimal complications. However, current approaches, such as laboratory tests and imaging, are invasive, time-consuming, and costly. This highlights the need for an alternative diagnostic technique.

Stanford researchers have combined a single-nucleotide infrared (SnIR) fluorescent dye and a complex sugar maltotriose moiety to achieve specific and sensitive detection of bacterial infections. The resulting fluorescent probe benefits from the SnIR dye's photostable properties and maltotriose's ability to be taken up by various bacterial strain. The probe can be systemically administered, detected using in vivo fluorescence or photoacoustic imaging within an hour, and cleared from the body. This novel invention will facilitate rapid and reliable diagnosis of bacterial infections.

Stage of Development
In vivo data

Applications

- Identification of bacterial infection of surgical sites or implants
- Monitor progress of bacterial infection post treatment

Advantages

- High stability against nucleophiles

- Reduced unspecific binding
- Cleaved by renal clearance
- Good in vivo signal-to-noise ratio
- Can differentiate inflammation and infection

Publications

- Zlitni, A., Gowrishankar, G., Steinberg, I., Haywood, T., & Sam Gambhir, S. (2020). Maltotriose-based probes for fluorescence and photoacoustic imaging of bacterial infections. *Nature communications, 11*(1), 1250.

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