

Docket #: S21-453

Super-Stealth Gold Molecular Clusters for Lymph Node Imaging in the NIR-II Optical Window

Researchers in the Dai lab have developed a novel NIR-II (Near Infrared II) fluorescent probe for enhanced *in vivo* imaging of sentinel lymph nodes.

The uncontrolled metastasis of cancer results in very poor prognoses for patients. Therefore, it is critical for physicians to correctly identify metastases as early as possible. The lymph nodes are some of first organs that many metastasizing cancer cells commonly spread through. The lymph node which cancer cells are most likely to spread to can thus serve as 'sentinels' to identify the early metastases of cancers through biopsy. In order perform these sentinel lymph node biopsies (SLNBs), the lymph nodes are first identified through imaging of injected radioactive or fluorescent dyes. However, currently available methods suffer from uncertainty in the timing of injection before imaging and/or low signal-to-noise ratios.

The Dai lab's novel NIR-II fluorescent probe allows mapping of lymph nodes within minutes of injection, rapid renal clearance, low non-specific tissue binding, low toxicity, and higher signal-to-noise ratio (up to ~22 fold) than currently utilized indocyanine green (ICG) dyes.

Applications

- Sentinel Lymph Node Biopsy(SLNB) *in vivo* optical imaging

Advantages

- Mapping of lymph nodes within minutes
- rapid clearance

- low non-specific tissue binding
- low toxicity
- high signal-to-noise

Publications

- Baghdasaryan, A., Wang, F., Ren, F., Ma, Z., Li, J., Zhou, X., ... & Dai, H. (2022). [Phosphorylcholine-conjugated gold-molecular clusters improve signal for Lymph Node NIR-II fluorescence imaging in preclinical cancer models](#). Nature communications, 13(1), 1-11.

Patents

- Published Application: [WO2023-0248850A](#)

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