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NUCLEAR MEDICINE

Theranostic Biomimetic Chelating Platform for Delivery of Radionuclides

Brief Description of Technology

A method of creating various siderocalin-metal chelator combinations capable of binding metallic radioisotopes used in nuclear medicine with high affinity.

BUSINESS OPPORTUNITY
Exclusive license
Non-exclusive license
Sponsored research

TECHNOLOGY TYPE
Diagnostic
Therapeutic

STAGE OF DEVELOPMENT
Preclinical *in vitro*

PATENT INFORMATION
Patent pending

INVESTIGATOR
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Technology Overview

Nuclear medicine is the diagnosis (e.g., positron emission topography (PET)) or treatment (e.g., radioimmunotherapy (RIT)) of many conditions by administering radioactive isotopes to a subject. While nuclear medicine offers many attractive potential diagnostic and therapeutic advantages, its real-world performance is often disappointing. Dr. Strong has developed a theranostic two-stage biomimetic platform using Siderocalin-metal chelator combinations to selectively bind with high affinity to a wide range of metallic radioisotopes used in nuclear medicine. This improved method allows for sequential biological tracking of a biologic fusion protein with Siderocalin with an imaging radionuclide (e.g., indium, zirconium), followed by RIT (e.g., with thorium), without changing the biologic.

Applications

- Biomimetic platform for photoluminescence, separation, and transport applications (e.g., indium for SPECT, zirconium for PET)
- Radioimmunotherapy (e.g., thorium, actinium, astatine)
- Sensitize luminescence of radionuclides

Advantages

- Minimizes off-target side effects from systemic circulating radiation
- Allows for universal chelators that can be used to first map selective delivery route and then bind and administer radionuclides ("mix and go" platform)
- Decreases manufacturing costs and effort (e.g., no chemistry coupling step)

Market Overview

Greater than 60% of patients with cancer need to undergo radiation therapy and in Europe alone, there will be approximately 4 million new cancer patients by 2025. The nuclear medicine global market is expected to reach USD 9.37 billion by 2024 and is driven by production of novel radiopharmaceuticals and radioisotopes, enhanced imaging technology (hybrid imaging), and emerging alpha therapy-based targeted cancer treatment.