Docket #: S10-447

Dual-isotope positron emitting tomography for disease evaluation

Stanford researchers have developed a method which can simultaneously observe two positron emitting isotopes using two distinct molecular probes and a modified PET scanner. This system enables the simultaneous observation of two different molecular processes. One of the probes is a metabolic probe, and the other probe is a selective probe that includes a ligand or antibody that is biologically responsive to receptor/antigen status. A PET system is employed that can provide simultaneous double coincidence and triple coincidence PET images. The resulting images provide simultaneous metabolic imaging and receptor/antigen imaging. Applications include disease evaluation, such as cancer staging (e.g., for breast cancer, prostate cancer, lymphoma, etc.).

Stage of Research:
Simulation studies successfully conducted which showed 3x boost in sensitivity w/BGOs

Applications

- **PET systems** - Simultaneous observation of two positron emitting isotopes with a modified PET scanner. This system is optimized for simultaneously creating F-18 and Zr-89 images for clinical and small animal PET scanners.

Advantages

- **More precise disease evaluation** - Can determine the receptor status of a tumor simultaneously with tumor burden in a single scan.
- **Simultaneous dual-isotope PET** – Allows for simultaneous imaging of Zr-89 labeled pharmaceutical and another positron emitting pharmaceutical.

- **Combined assays** - two assays can now be combined into one assay.
- **Time and Cost savings** – Single scan allows for imaging time and cost savings.

Patents

- Published Application: 20140046179
- Issued: 9,320,478 (USA)

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