

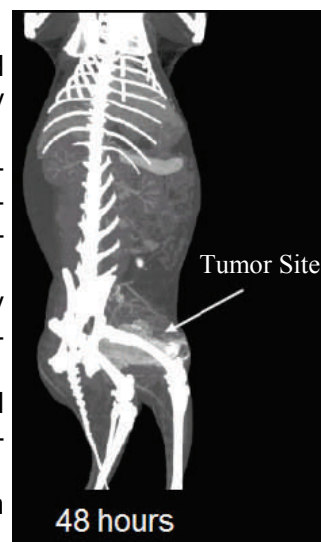
## Multi-Modal Imaging Contrast Agent

### Overview of Technology:

Each medical imaging modality has unique strengths and limitations and it is often through the use of multiple modalities that a complete assessment of a patient is achieved. The use of CT and MR for radiation treatment planning, PET/CT in oncological diagnoses and PET/MRI in neurosurgery are a few instances of the role of multimodal imaging in treatment planning and diagnosis. However, very few attempts have been made to develop a contrast agent that can be used across multiple imaging modalities. Due to its stability, prolonged imaging window, and modular nature; the liposome-based contrast agent platform described here is an effective system to integrate the complementary information gained from the use of currently available non-invasive imaging techniques (CT, MR, SPECT, PET and optical).

### Advantages, key features and potential applications of this invention:

- Liposomes provide a versatile carrier system to simultaneously load and deliver modality-specific contrast agents at approximate ratios to satisfy the sensitivity differential that exists across various imaging systems.
- Long residency time *in vivo* makes it attractive for use in application requiring long scan time, and repeated imaging sessions in multiple modalities, by minimizing the number of contrast agent administrations required.
- The critical size of this nanosystem allows for its retention within healthy blood vessels and extravasations at locations of enhanced cellular permeability such as those found in tumors and inflammation sites.
- Kits containing a suitable combination of the liposome carrier, signal modifying moieties, therapeutic agents and biological targets may be easily customized for a wide range of research and clinical applications.
- Data obtained using this liposome system can be readily quantified with all or any combination of CT, MR, PET and SPECT imaging.
- All components of this system are FDA approved and the overall system has shown no toxicity in pre-clinical models.



*Passive tumor targeting via the enhanced permeation and retention phenomenon*

### Related Publication:

Zheng, J, Jaffray, D & Allen, C. "Quantitative CT Imaging of the spatial and temporal distribution of liposomes in a rabbit tumor model." *Mol Pharm* May 2009 epub

### Patents:

US11/816,054, CA2,596,595, EP6705162.3 - Filed 6 February 2006

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