

Triggerable Oxygen Nanobubbles for Drug Delivery, Diagnosis, and Enhanced Survival

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Categories:

- Biomedical Engineering

Keywords:

- Biomedical Engineering
- Diagnostic Imaging
- Drug Delivery
- Imaging
- Medical Diagnostics
- Ultrasound Imaging

Ultrasound has a broad clinical utility in prostate cancer diagnosis because of its diagnostic capabilities, ease of use, portability, and ability to reveal fluid flow and structure of anatomy in vivo. Several commercial ultrasound contrast agents exist, but are synthesized using fluorinated gases or air and have sizes in the micron range. Past efforts have at most synthesized ~500 nm-sized particles and primarily functioned as a contrast agent. These large particles fail to take advantage of the enhanced permeability and retention (EPR) effect.

Researchers at Purdue University have capitalized on the broad clinical utility of ultrasound. This technology is the first nanosized oxygen- and cargo-bearing bubbles that can be tuned to first image at a low intensity and selectively release cargo upon an ultrasound trigger at a higher intensity.

Advantages:

- Enhanced permeability and retention inside tumor vasculature.
- Controlled drug release
- Avoids immune system response.
- Transport of material through the encapsulating layer.

Potential Applications:

- Pharmaceutical industry
- Medical/Healthcare
- Cancer drug delivery and diagnosis
- Therapy for cancerous tumors

People:

- Irudayaraj, Joseph (Project leader)
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Intellectual Property:

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