

# Interventional Photo-acoustic Imaging System

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## Technology description

### Novelty:

A novel clinical photo-acoustic imaging system to increase the effectiveness of treating cancer in the cervix, prostate, breast, and skin cancer.

### Technical Details:

Johns Hopkins researchers have developed a photo-acoustic imaging system, which is used to measure optical absorption using conventional transrectal ultrasound. Brachytherapy is mostly performed with transrectal ultrasound (TRUS) guidance. While TRUS provides adequate imaging of the soft tissue anatomy, it does not allow for localization of the implanted brachytherapy seeds. The objective of this invention is to provide an integrated system capable of visualizing brachytherapy seeds and prostate anatomy simultaneously utilizing a conventional TRUS probe coupled with an optical excitation of the brachytherapy seeds. This value can easily distinguish metals from biological tissues, thereby increasing the visibility of the seeds. The basic idea is to apply a short laser pulse to the tissue. Then, the tissue and the seeds absorb this energy and start to expand, causing an acoustic signal to propagate towards the ultrasound probe.

### Data Availability:

Under CDA / NDA

## Advantages

Brachytherapy is a form of internal radiation therapy which is placed inside the body or next to the area requiring treatment. Current systems allow adequate imaging of the soft tissue anatomy, it does not allow for localization of the implanted brachytherapy seeds. This is a major technical limitation of contemporary brachytherapy, which often causes insufficient dose to the cancer causing failure of treatment. The objective of this invention is to provide an integrated photo-acoustic imaging system capable of visualizing brachytherapy seeds and prostate anatomy simultaneously, which will increase the effectiveness of brachytherapy in treating cancer.

- Cost-effective and feasible approach that provides intra-operative measurement and calculation of absorbed doses in tissue.
- Promising more accurate and consistent implants with shorter procedure times.
- Adheres to established standards of care, while also providing practical benefits in a simple and inherently safe manner.

## Institution

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