

# Prostate-specific Membrane Antigen Targeted Plasmon-enhanced Raman Spectroscopy Reporters for Molecular Imaging of Prostate Cancer

Published date: March 17, 2017

## Technology description

### Unmet Need:

Non-invasive assessment of tumor burden and cancer-selective treatment in prostate cancer. This approach will allow visualization in real-time of the distribution and action of therapeutic agents in vivo by transducing the presence of PSMA at the tissue level to characteristic Raman spectral patterns. This nanoplex platform, therefore, directly enables the real-time imaging of prostate tumor (critical in surgical margin definition) while inhibiting the growth of prostate tumor cells.

### Technical Overview:

We have designed and engineered a nanoplex containing surface enhanced Raman spectroscopy (SERS) reporter to target prostate-specific membrane antigen (PSMA), which is expressed on the cell surface of near all prostate cancers. In this design, the PSMA-specific SERS tag, which is encoded with Raman signal molecule (4-nitrothiophenol), can target the PSMA overexpressed prostate tumor cells through the urea-based small molecule inhibitor. The unusually high affinity of the PSMA-targeted SERS probe – higher affinity than any species reported for targeting PSMA – makes it ideal for molecular radiotherapy, which requires a high-affinity interaction for long residence times of the therapeutic with tumor. Moreover, plasmonic heating of the SERS reporter can also be exploited to kill the tumor cells via the photothermal effect. Finally our reporters can be readily linked with therapeutic moieties, including but not limited to therapeutic radionuclides, prodrug enzymes and siRNA, to offer combined imaging and therapy for aggressive prostate tumors.

## Institution

[Johns Hopkins University](#)

## Inventors

[Martin Pomper](#)

Professor

Radiology SOM

[Ishan Barman](#)

Assistant Professor

Mechanical Engineering WSE

[Sangeeta Ray](#)

Assistant Professor

Radiology SOM

[Ming Li](#)

Postdoctoral Fellow

Mechanical Engineering WSE

## 联系我们



叶先生

电话 : 021-65679356

手机 : 13414935137

邮箱 : yeyingsheng@zf-ym.com