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Executive Summary

We are proposing a dedicated organ-specific prostate PET imager combining high resolution outside PET imager with a very high resolution transrectal probe. (The patent disclosure for the system was submitted on April 02, 2008.) The compact probe will use the multi-use novel Silicon Photomultiplier technology and will offer excellent never achieved before spatial resolution and sensitivity in the prostate region. This compact, lightweight and portable design allows for clinical flexibility, and to provide very fast feedback on biopsy guidance and/or other surgical procedures.

The proposed PET probe is a critical element of the proposed prostate PET imager. The requested funds will allow us to reduce to practice the concept outlined in the above mentioned patent disclosure. We believe that SURA/JSA has an opportunity to repeat the previous technology transfer success achieved with the breast imaging technology developed in our group. In addition, the detection technology used in this system has applications in the basic experimental nuclear physics program of the laboratory (multi-use technology), specifically in the 12 GeV upgrade Hall D detectors. Members of the group are actually playing a key role in evaluating this technology for this Hall D application. There is a lot of similarity between technical requirements for the two projects. The Silicon Photomultiplier technology was never successfully implemented before in such applications and we are positioned uniquely due to our relationship with the key producers (SensL, Hamamatsu) of this technology to be the first implementers in several applications from basic science to biomedical applications and to homeland security.