The Prostate Cancer Biorepository Network (PCBN)

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BACKGROUND: The PCBN was developed to respond to the need for high quality, well-characterized and well-annotated biospecimens, and to conduct research to evaluate the impact of pre-analytical variability on biomarker assay results. Operations are expected to begin in June 2011. Initial DOD funding is a pilot effort, with a goal of becoming self-sustaining and expanding the Network after 3 years.

DESCRIPTION OF THE PCBN: Specimens include tissues from biopsies, prostatectomies (fresh frozen and formalin fixed tissues), serum, plasma, buffy coat, prostatic fluid, and derived specimens such as DNA and RNA, linked to clinical, pathology and outcome data, and supported by an informatics infrastructure centered on caTissue. The PCBN will also conduct biospecimen science research to annotate critical parameters in the biospecimen "life cycle," and evaluate the impact of variation in those parameters on the molecular integrity of research tissues.

Experience in tissue microarrays (TMAs) is a particular strength of PCBN. Specimens from a wide range of disease phenotypes will be made available. Specimens with value for characterizing the lethal phenotype, and for characterizing men with indolent disease suitable for active surveillance are of particular importance.

PCBN Structure

PCB draws specimens from extensive clinical populations

- 1300+ radical prostatectomies performed annually
- 1400+ prostate biopsies performed annually
- Extensive collection of formalin fixed tissues; large proportion are Gleason > 7
- Frozen tissue from more than 3000 prostatectomies
- Body fluids - serum, plasma, buffy coat, prostate fluid, many matched to tissue
- Frozen seminal vesicle tissue – source of normal tissue, germline DNA
- Derived specimens (RNA, DNA) obtained with consistent protocol

Specimen application process

- website prostatebiorepository.org to be opened by June, with online catalog and application forms
- review of applications will consider type & number of specimens/data requested, preliminary data, biostatistical justification
- specimens with high research value (e.g. metastatic tissue, cases with extensive follow-up, minimal disease biopsy) will be prioritized for projects with more mature data
- opportunities for collaboration will be available
- competitive fee schedule
- oversight of PCBN includes external advisors, prostate cancer advocates

Biospecimen science

Planned studies include impact of variability on canonical biomarkers:

- impact of fixation variability (under-fixation and over-fixation)
- variability in processing schedules
- time from devascularization (open and robotic surgery)
- thermal history – effect on RNA yield, integrity, transcriptome profiles

Resources targeted for future development, evaluation

- whole genome amplification
- nitrocellulose blots of biopsy tissue
- metastatic tissue; serum & plasma from men with metastatic disease
- men in active surveillance programs
- increased ethnic diversity