**AWARD NUMBER:** W81XWH-18-2-0016

**TITLE:** Prostate Cancer Biorepository Network (PCBN)

**PRINCIPAL INVESTIGATOR:** Jonathan Melamed, MD

**CONTRACTING ORGANIZATION:** New York University School of Medicine
550 First Avenue
New York, NY 10016

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**TYPE OF REPORT:** Annual

**PREPARED FOR:** U.S. Army Medical Research and Development Command
Fort Detrick, Maryland 21702-5012

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**5c. PROGRAM ELEMENT NUMBER**

**6. AUTHOR(S)**
Jonathan Melamed, MD

**Email:** melamj01@nyulangone.org

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**5e. TASK NUMBER**

**5f. WORK UNIT NUMBER**

**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)**

NYU School of Medicine
550 First Avenue
New York, NY 10016

**8. PERFORMING ORGANIZATION REPORT NUMBER**

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**14. ABSTRACT**

The goal of this proposal is to contribute to the continued development of infrastructure and operations of the Prostate Cancer Biorepository Network (PCBN). A prostate cancer biorepository fulfils an important need to enable prostate cancer research to be conducted by the wider research community through making readily available clinical biospecimens. Only few academic centers with high volume prostate cancer clinical services and an already developed banking infrastructure are well positioned to enable biospecimen collection. An external funding source as provided by the DOD enables support for the consortium of institutional biorepositories of the PCBN to provide to the wider research community. The major goal of the PCBN is to develop a biorepository with high-quality, well-annotated biospecimens obtained in a systematic, reproducible fashion using optimized and standardized protocols. A main focus of the PCBN is to accrue biospecimens that are in "limited supply" and documented to be most needed by the prostate cancer community (e.g. castration-resistant disease, metastatic disease, primary untreated "de novo" metastatic disease, high-risk disease, tumors of the aggressive variant phenotype, disproportionately affected populations). The PCBN is funded as a consortium of participating network sites that include: New York University, University of Washington, Washington University, Institute of Cancer Research (United Kingdom) and overall guidance of the coordinating center at Johns Hopkins University. The goal of the NYU network site is to collaboratively contribute toward the PCBN goals, through participation in infrastructure development, biospecimen accrual and derivative product development for the purpose of disbursement to investigators to enhance prostate cancer research.

**15. SUBJECT TERMS**
Prostate Cancer, Biorepository, tissue microarrays, tissue bank, advanced cancer, ethnicity

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
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| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | USAMRMC |
| Unclassified | Unclassified | Unclassified | Unclassified | 8 | 19b. TELEPHONE NUMBER *(include area code)* |

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## 1. INTRODUCTION:

The goal of this proposal is to contribute to the continued development of infrastructure and operations of the Prostate Cancer Biorepository Network (PCBN). A prostate cancer biorepository fulfils an important need to enable prostate cancer research to be conducted by the wider research community through making readily available clinical biospecimens. Only few academic centers with high volume prostate cancer clinical services and an already developed banking infrastructure are well positioned to enable biospecimen collection. An external funding source as provided by the DOD enables support for the consortium of institutional biorepositories of the PCBN to provide to the wider research community. The major goal of the PCBN is to develop a biorepository with high-quality, well-annotated biospecimens obtained in a systematic, reproducible fashion using optimized and standardized protocols. A main focus of the PCBN is to accrue biospecimens that are in "limited supply" and documented to be most needed by the prostate cancer community (e.g. castration-resistant disease, metastatic disease, primary untreated "de novo" metastatic disease, high-risk disease, tumors of the aggressive variant phenotype, disproportionately affected populations). The PCBN is funded as a consortium of participating network sites that include: New York University, University of Washington, Washington University, Institute of Cancer Research (United Kingdom) and overall guidance of the coordinating center at Johns Hopkins University. The goal of the NYU network site is to collaboratively contribute toward the PCBN goals, through participation in infrastructure development, biospecimen accrual and derivative product development for the purpose of disbursement to investigators to enhance prostate cancer research.

## 2. KEYWORDS:

Prostate cancer, biorepository, biomarkers, tissue microarrays, tissue bank, rapid autopsy, advanced cancer, ethnicity

## 3. ACCOMPLISHMENTS:

### a. What were the major goals of the project?

| Major Goals | Timeline | % Complete |
|---|---|---|
| **Specific Aim 1:** Collect, process, and store biospecimens annotated with clinical and pathology data from well-characterized populations of patients. | | |
| **Task 1:** Obtain HRPO and IRB approvals (will apply primarily to ICR Network Site, other sites have these in place for ongoing Network activities). | 1-36 | 100% |
| **Task 2**: Each pathology resource site contributes prospectively collected biospecimens from a minimum of 50 patients per year with the expectation that biospecimen contribution will exceed the minimum requirement. A minimum of 50% of the samples collected across the entire Network will be those in limited supply and documented to be the most needed by the prostate cancer research community, as determined by the required annual survey | 1-36 | 33.3% |
| **Task 3:** Annotate, perform quality control for processing, storage and clinical data collection for prospective specimen accrual | 1-36 | 33.3% |
| **Task 4:** Report on performance metrics | Semi-annually | 33.3% |
| **Specific Aim 2:** Maintain an informatics infrastructure for secure data storage and transfer, and a web-accessible portal for users to learn about and access specimens from the PCBN. | | |
| **Task 1:** Data elements used to annotate demographic, clinical, pathology, and biospecimen life cycle provided to the Coordinating Center, and the Network Site participates in the process of defining and harmonizing a set of common data elements (CDEs). | 1-6 | 100% |
| **Specific Aim 3:** Develop harmonized SOPs for biospecimen acquisition, processing, storage and quality control to increase the fidelity of biospecimens provided to investigators. | | |
| **Task 1:** This encompasses the initial work required to develop standard operating procedures (SOPs) incorporated into the PCBN infrastructure. These SOPs govern how the prospective collection during this award at each Network Site is annotated, undergoes quality control, storage and is made available for distribution to investigators. The harmonization of SOPs is an ongoing PCBN effort. | 1-6 | 100% |
| **Task 2:** Finalize SOPs for all 5 Network operations in Task 1 | 6-9 | 100% |
| **Task 3:** Review (annual) of Network operation, use of SOPs, composition of repository | 12,24,36 | 33.3% |
| **Specific Aim 4:** Distribute biospecimens according to a prioritization plan to ensure maximal use by the prostate cancer community. | | |
| **Task 1:** Continue offering biospecimens from all Network Sites to the research community using prioritization plan outlined in Tissue and Data Access Policy that is already developed and available to all investigators/detailed and posted online on our website | 1-36 | 33.3% |
| **Task 2:** Review specimen requests, distribute specimens to approved scientists. | 1-36 | 33.3% |
| **Task 3:** Review of sources of patients and biospecimens at each site that can be made available to the repository. Discussion every six months on what derivatives might be useful to the group. New TMAs, RNA, DNA, new methods to collect cfDNA etc. | Annual Review. discuss 6 monthly | 33.3% |

**b. What was accomplished under these goals?**

**Regulatory Approval:** NYU site is subject to regulatory approval by NYU IRB, VA IRB, Bellevue IRB, BRANY IRB for H&H facilities, and New York State Dept. of Health. These are all active and up to date.

| NYU / Bellevue | | |
|---|---|---|
| HRPO Log Number: E00073.1a (previously A-18319.a) | | |
| NYU IRB Number: 8723 | | |
| Submission | Submission | Approval |
| NYU Continuing Review | 2/28/2019 | 3/6/2019 |
| HRPO Continuing Review | 3/14/2019 | 4/24/19 |

| VA | | |
|---|---|---|
| HRPO Log Number: E00073.1b (previously A-18319.b) | | |
| VA IRB Number: 00036 | | |
| Submission | Submission | Approval |
| VA Continuing Review | 6/23/2019 | 8/21/2019 |
| HRPO Continuing Review | 9/4/2018 | 9/7/2018 |

**BRANY IRB:** approved 7/17/2017 (retrospective study, exempt from continuing review)
**New York State DOH:** approved through September 2020

**Accrual**

**Limited Supply Accrual:** There is a continued concerted effort to increase identification, enrollment, and accrual of "limited supply" samples. During this report period, the following was accomplished:

1) A rapid autopsy procurement was successfully performed in November 2018.
2) Two (2) metastatic patients enrolled in the study have expressed wishes to donate their body post-mortem as rapid autopsy candidates in the NYU rapid autopsy protocol.
3) Identification and retrieval of archival FFPE samples from castrate resistant and metastatic prostate cancer cases was performed. The samples and corresponding clinical data were extracted from multiple sources.

| Biospecimen Accrual for "Limited Supply": 10/1/2018 –9/30/2019 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Cohort** | **Number of Samples** | | | | | | |
| | **Blood** | **FFPE Tissue*** | **Frozen Tissue*** | **Fresh Tissue*** | **Urine** | **Other Biofluids**** | **TOTAL** |
| Castrate-resistant disease | 3 | 40 | 1 | 1 | 1 | 0 | 46 |
| Metastatic disease | 24 | 1 | 1 | 1 | 10 | 0 | 37 |
| "De Novo" metastatic disease | 19 | 11 | 11 | 0 | 9 | 18 | 68 |
| Disproportionately affected population*** | 56 | 9 | 9 | 0 | 4 | 17 | 95 |
| Active Surveillance | 12 | 0 | 0 | 0 | 2 | 0 | 14 |
| **TOTAL** | 114 | 61 | 22 | 2 | 26 | 35 | **260** |

*Tissue represented as number of cases, each case has multiple samples
** Seminal vesicle fluid and Prostatic fluid
***African American patients

**Routine Biospecimen Accrual:**

| Biospecimen Accrual: Oct 1 2018 – Sept 30 2019 | |
|---|---|
| **Samples Collected** | **Total Collected** |
| **Tissue** | |
| Radical Prostatectomy | 104 |
| **Fluids** | |
| Prostatic fluid | 77 |
| Seminal Vesicle fluid | 73 |
| Urine | 51 |
| Blood Samples | 267 - *Serum (63), Plasma (102), Buffy Coat (102)* |
| **TOTAL** | **572** |

**Data**

At Bellevue Medical Center, new HIS and LIS (Hospital and Laboratory information systems) have been introduced, namely EPIC and Cerner Millenium. These now offer the advantage of tracking patients and their care across all the New York City public Health system (11 public hospital facilities) and easier monitoring of clinic schedules and patient interactions, for better and more comprehensive subject and data tracking. The clinical outcome and other data for the NYU PCBN Tissue Microarray (TMA) cohorts are updated on a semi-annual basis with monthly quality assurance. Clinical outcome was updated for the 217 Case Biochemical Recurrence TMA, 114 Race Case TMA, and 56 Hormone Sensitivity TMA.

**Products Created**

A NYU Hormone Sensitivity TMA was constructed and made available to PCBN during this reporting period. This TMA is composed of two blocks, consisting of 125 cases (Matched primary prostate cancer from androgen treated and non-androgen treated cases).

**Products Requested and Fulfilled**

| Product | Amount | Investigator Site | Completed |
|---|---|---|---|
| 217 Biochemical Recurrence TMA | 1 set | North Carolina State University | 12/11/2018 |
| 56 Case Hormone Sensitivity TMA | 2 sets | University of Wisconsin | 1/7/2019 |
| 114 Case Race TMA | 1 set | Baylor University | 3/25/2019 |
| Extracted RNA Samples | 20 | University of Newcastle | 5/1/2019 |
| Blood Serum Samples | 10 | University of Newcastle | 5/1/2019 |
| 217 Biochemical Recurrence TMA | 1 set | Radboud University Medical Center | 6/7/19 |
| 56 Case Hormone Sensitivity TMA | 2 sets | University of Nebraska | 5/2/2019 |
| 217 Biochemical Recurrence TMA | 1 set | Beth Israel Deaconess Medical Center | 9/18/19 |
| 217 Biochemical Recurrence TMA | 4 sets | Cold Spring Harbor Laboratories | 9/25/19 |

**c. What opportunities for training and professional development has the project provided?**
Emily Dube has completed a Bioinformatics Masters degree.

**d. How were the results disseminated to communities of interest?**
Nothing to report

**e. What do you plan to do during the next reporting period to accomplish the goals?**
(1) Refine the data for the newly constructed Hormone Sensitivity TMA & prepare digitized scans of H&E slides and IHC studies for investigator use (2) Construct additional TMA sets to include a radical prostatectomy hormone naïve control cohort, neuroendocrine cases, and pre/post treatment TURPs (3) Identify and retrieve cases for collaborative metastatic TMA (4) Construct TMA of matched N1 and N0 radical prostatectomy cases.

**4. IMPACT:**

**a. What was the impact on the development of the principal discipline(s) of the project?**
Nothing to report

**b. What was the impact on other disciplines?**
Nothing to report

**c. What was the impact on technology transfer?**
Nothing to report

**d. What was the impact on society beyond science and technology?**
Nothing to report

**5. CHANGES/PROBLEMS**:

**a. Changes in approach and reasons for change**
Nothing to report

**b. Actual or anticipated problems or delays and actions or plans to resolve them**
Nothing to report

**c. Changes that had a significant impact on expenditures**
Nothing to report

**d. Significant changes in use or care of human subjects**

Nothing to report

## 6. PRODUCTS:

### a. Publications, conference papers, and presentations:

Wang, Y., Schafler, E. D., Thomas, P. A., Ha, S., David, G., Adney, E., … Logan, S. K. (2019). Prostate-specific loss of UXT promotes cancer progression. Oncotarget, 10(7), 707–716. doi:10.18632/oncotarget.26573

### b. Biospecimen Collections:

| **Biospecimen Accrual: Oct 1 2018 – Sept 30 2019** | |
|---|---|
| **Samples Collected** | **Total Collected** |
| **Tissue** | |
| Radical Prostatectomy | 104 |
| **Fluids** | |
| Prostatic fluid | 77 |
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| Urine | 51 |
| Blood Samples | 267 |
| *Serum (63)* | |
| *Plasma (102)* | |
| *Buffy Coat (102)* | |
| **TOTAL** | **572** |

| **Biospecimen Accrual for "Limited Supply": 10/1/2018 –9/30/2019** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Cohort** | **Number of Samples** | | | | | | |
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*Tissue represented as number of cases, each case has multiple samples, ** Seminal vesicle fluid and Prostatic fluid, ***African American patients

## 7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS:

### a. What individuals have worked on the project?

Jonathan Melamed, MD: no change
Peng Lee, MD PhD: no change
Emily Dube, MS: no change
Raveena Vakil, BS: no change

### b. Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

Nothing to report

### c. What other organizations were involved as partners?

Nothing to report