Statement of Work

National Cancer Institute
Office of Physical Sciences-Oncology
Physical Sciences-Oncology Centers (PS-OC) Program

PS-OC Network Bioresource Core Facility (PBCF)

1. INTRODUCTION

The National Cancer Institute (NCI) Office of the Deputy Director has as its mission the task of planning, developing, executing, and implementing rapid strategic scientific and technology initiatives that keep the Institute ahead of the scientific curve with respect to potential new exciting areas and discoveries. This may involve the development and application of advanced technologies, synergy of large scale and individual initiated research, and/or forging novel partnerships that emphasize innovation, trans-disciplinary teams and convergence of scientific disciplines to enable the translation of discoveries into new interventions, both domestically and in the international arena, to detect, prevent and treat cancer more effectively.

Under the leadership of the NCI Deputy Director, the Office coordinates several efforts both within NCI and outside of NCI to carry-out its function of supporting timely execution and implementation of activities that have trans-NCI benefit. Within the NCI, the Office manages and oversees the NCI Center for Strategic Scientific Initiatives (CSSI) that includes (1) The Cancer Genome Atlas (TCGA) Program Office; (2) Office of Cancer Nanotechnology Research; (3) Office of Cancer Clinical Proteomics Research; (4) Office of Physical Sciences-Oncology; (5) Office of Biorepositories and Biospecimen Research; (6) Office of Cancer Genomics; (7) Knowledge Management and Special Projects Branch; (8) Center for Global Cancer Health Research. These offices support extramural research programs and lead standards and policy development initiatives with the goal of accelerating advances in biomedical technology and furthering the vision of personalized medicine.

The Office of Physical Sciences-Oncology (OPSO) (1) serves as a nexus for the development and implementation of physical science-based initiatives to enable progress in cancer research for NCI and its integration across trans-NCI, trans-NIH, and inter-agency activities; (2) enables the development of discoveries and new fields of study based on the application of aspects of the physical sciences approaches to cancer research; (3) and facilitates the exploration of novel and innovative approaches to advance our understanding of the physical laws and principles that shape and govern the emergence and behavior of cancer at all scales.

One of the OPSO initiatives is the establishment of a network of physical sciences-oncology centers through the Physical Sciences-Oncology Centers (PS-OC) program. These centers will enable the convergence of physics, chemistry, mathematics and engineering with existing disciplines in cancer research by building trans-disciplinary teams and infrastructure to generate new knowledge and paradigm-shifting science. The ultimate goal of these centers is to catalyze new fields of study in basic and clinical cancer research by utilizing physical sciences/engineering principles to enable a better understanding of the disease at all length scales, which may lead to exponential progress against the way cancer is treated and diagnosed.

This contract will support both the mission of the PS-OC program and OPSO through providing a centralized resource of biological specimens for Physical Sciences-Oncology Network members. The PS-OC Network Bioresource Core Facility (PBCF) shall function to increase the time and cost efficiency of the transfer of standardized biological specimens to Physical Sciences-Oncology Network members. The availability of standardized biological specimens will facilitate data sharing and meaningful cross comparisons of data sets across the PS-OC Network.

2. PROJECT BACKGROUND

The Office of Physical Sciences-Oncology (OPSO) currently houses the Physical Sciences-Oncology Centers (PS-OC) program. Each Physical Sciences-Oncology Center (PS-OC) has unique capabilities in terms of its physical science approach to studying cancer. In order to develop a common language among the Centers, a pilot project was proposed to utilize common cell lines and Standard Operating Procedures (SOPs) so that physical science metrics could be easily standardized across the PS-OC Network. To test the feasibility of providing an initial common benchmark, the pilot cell line project was initiated in November 2009. Participating laboratories within the PS-OC Network carried out and shared the results of a set of pilot experiments utilizing two (2) human breast cancer cell lines to facilitate inter-PS-OC communications and accelerate the understanding of PS-OC specific technologies and techniques. The cell lines were authenticated and distributed along with necessary cell culture reagents from a single laboratory to ensure that all participants were starting with the same biospecimens. Furthermore, a standard operating procedure was developed. Results of the cell line project were presented at the PS-OC First Annual Network Investigators' Meeting in April 2010 and also at a follow-up meeting in June 2010. A Network publication is anticipated as a result of this pilot project in 2011.

From the PS-OC pilot cell line project, it has become apparent that utilization of cell lines and tissues with common reagents and standard operating procedures is critical for cross comparison of data sets. *The PS-OC Program falls within the Physical Sciences-Oncology Network where the Physical Sciences-Oncology Network members are defined as investigators supported by the NCI OPSO and their collaborators*. Because members of the Physical Sciences-Oncology Network study at least sixteen (16) different types of cancer, there is need for the establishment of a PS-OC Network Bioresource Core Facility (PBCF). The PBCF shall be a centralized biodistributor and biorepository that serves to provide Physical Sciences-Oncology Network members with common, standardized stocks of authenticated cell lines and primary cells (non-malignant and cancerous), cell culture reagents and related SOPs upon request. The PBCF shall also have the capability to prepare and distribute extracts of RNA, DNA and protein from human cell lines, primary cells and tissues. Moreover, any modified cell lines could be deposited by Physical Sciences-Oncology Network members to the PBCF for authentication and distribution to collaborators within the Physical Sciences-Oncology Network. In coordination with the PBCF, designated members of the Physical Sciences-Oncology Network will assist in the maintenance of SOP development. The PBCF shall develop a website for use by the Physical Sciences-Oncology Network members to provide product information and to function as an online ordering system.

The requirement outlined in this statement of work is a follow-on requirement for the NCI OPSO, and it shall continue to support both the mission of the PS-OC program and OPSO through providing a centralized resource of standardized biological specimens for Physical Sciences-Oncology Network members. The PBCF shall ultimately function to increase both the time and cost efficiency of the transfer of biological specimens to Physical Sciences-Oncology Network members.

3. OBJECTIVE

The goal of this project is to provide a central bioresource core facility, the PS-OC Network Bioresource Core Facility (PBCF), to all members of the Physical Sciences-Oncology Network. The PBCF shall serve as a biorepository and a distributor of standardized biospecimens and their molecular derivatives to the Physical Sciences-Oncology Network members.

4. SCOPE OF WORK

Independently, and not as an agent of the Government, the Contractor shall perform the services described below. The Contractor shall provide qualified personnel, material, equipment and facilities not otherwise provided by the Government during performance of this contract.

4.1 PBCF Capabilities Required for Supporting this Statement of Work

During performance of the contract, the Contractor shall maintain the required capabilities outlined below – including but not limited to expertise, personnel, protocols, systems, and technology to:

a. Propagate and authenticate at least 31 authenticated human cell lines (See Appendix 1 for specific required cell lines). The 31 required cell lines include the following types of non-tumorigenic epithelial cell lines: 1 breast, 1 prostate, 1 pancreatic, and 1 lung; and the following types of cancer cell lines: 5 breast, 5 prostate, 2 brain, 3 ovarian, 2 pancreatic, 6 colorectal, and 2 non-small cell lung along with B-lymphoblasts from each of the 2 non-small cell lung cancer patients. The list of required cell lines shown in Appendix 1 shall be subject to change and addition by the NCI Contracting Officer Technical Representative (COTR). The Contractor shall have the capability of adding skin, liver, esophagus (Barrett's), lymphoma (Burkitt's) and leukemia (AML and CML) cancer cell lines at the time of Contract award or anytime thereafter. Whenever possible, non-tumorigenic human cell lines that have been hTERT-immortalized shall be made available alongside with tumorigenic cell lines from the same organ. The Contractor shall coordinate with the NCI COTR to decide on specific lot numbers of the cell lines that shall be made available to the Physical Sciences-Oncology Network. The Contractor shall propagate a token stock (15 vials), a seed stock (25 vials), and a distribution stock (100 vials) of all 31 required cell lines within four months of Contract award. Each vial of cells shall contain at least 500,000 cells. Additional stocks shall be propagated as needed with prior approval by the NCI COTR.

b. Conduct initial verification and authentication tests of all 31 required cell lines within 30 days of Contract award. Verification tests of any additional cell lines requested for distribution by the NCI COTR and any deposited cell lines and tissues shall be conducted within 30 days of the request. The verification tests shall include a sterility check (ensuring cultures are free from bacteria, fungi, viruses and mycoplasma contaminants), species verification, and identity testing including karyotype analysis.Distribute cell lines upon request to members of the Physical Sciences-Oncology Network. Upon first request by an investigator for each specific cell line, the Contractor shall also include with cell line shipment, the necessary reagents for cell culture (i.e.,. basal growth media, sera, trypsin, freeze media, and growth factors, where applicable.

c. Develop detailed Standard Operating Procedures (SOPs) for the maintenance, propagation and preservation of each required cell line and any deposited cell lines in coordination with PS-OC Network members who have had extensive experience culturing each specific cell line, if applicable, and with the NCI Contracting Officer Technical Representative (COTR). SOPs shall include culture conditions, growth characteristics, photomicrographs of cells post-seeding and prior to subculture, growth characteristics and results from quality control tests. SOPs for all 31 required cell lines

shall be completed within 60 days of Contract award. SOPs shall be in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines

d. Provide documentation for each research material with every shipment (i.e, .documentation about the cell line [background and description of cell line and the detailed SOP], basal growth media, sera, trypsin, freeze media, and growth factors).

e. Procure biospecimens under appropriate ethical, legal and contractual guidelines adherent to NIH policy for this project.

f. Acquire, authenticate, propagate, store, and distribute at least 4 3rd party cell lines per year from Physical Sciences-Oncology Network members and distribute to Physical Sciences-Oncology Network members upon receipt of orders/requests. The Contractor shall complete authentication and propagation of 3rd party cell lines within 4 months of initial receipt. With the exception of shipping and handling charges, orders/requests of biospecimens shall be provided at no cost to the investigator. Information regarding the cell lines shall be de-identified. The cell deposit services shall include general collection, standard safe, cGMP safe and patent deposit services.

g. Manage a biorepository, including biospecimen storage management, tracking and logistics, shipping/receiving, request processing, and recipient feedback capture.

h. Provide secure inventory and storage for Physical Sciences-Oncology Network research materials.

i. Provide derivatives (DNA, RNA, protein) of at least 4 per year of the required cell lines and accessioned, authenticated 3rd party cell lines. Specific cell lines that require derivative production will be subject to approval by the NCI COTR. Required quantities are: 100 vials of DNA at 10 μg/vial, 100 vials of RNA at 10 μg/vial and 100 vials of protein at 1 mg/vial to be produced within 30 days of request by the NCI COTR.

j. Organize PBCF operating and management infrastructure, reporting systems, and necessary laboratory certifications, and personnel credentials.

k. Develop Standard Operating Procedures (SOP) in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines, where none yet exist, in coordination with the NCI Contracting Officer Technical Representative (COTR) for all activities.

l. Execute the signing and receipt of a Material Transfer Agreement (MTA) and a Transfer Addendum (TA) with each Physical Sciences-Oncology Network home institution. The parent MTA and TA shall include any subcontracted institutions of Physical Sciences-Oncology Network in the parent institution.

m. Perform administrative duties associated with processing of orders and shipment logistics.

n. Distribute research materials within the scope of this Statement of Work (SOW) to Physical Sciences-Oncology Network members, upon placement of orders/requests.

o. Provide NCI with a written monthly informing report with regard to distribution of all research materials within the Physical Sciences-Oncology Network.

p. Provide annual on-site cell culture training (theory and wet-lab) at the Contractor facility to Physical Sciences-Oncology Network members and offer training for common cellular biochemistry techniques.

q. Capability of one of the Contractor's program/project managers to travel to the annual PS-OC Network Investigators' Meeting to discuss the services provided by the PBCF and set up one-on-one discussions with investigators (i.e., potential depositors of cells, tissue, animals). The meeting will be in April annually, and the exact dates and location will vary year-to-year. A meeting report shall be provided to the NCI COTR within 7 days of the meeting adjournment.

r. Documented experience with secure database and website development to: provide NCI COTR with a status of the distribution of all research materials within the Physical Sciences-Oncology Network and inventory updates; allow for NCI COTR to view orders in real time and to view and update the list of Physical Sciences-Oncology Network members; and allow Physical Sciences-Oncology Network members to view the available biospecimens, reagents, and biorepository services and to place orders.

4.1.1 The Contractor shall provide all necessary personnel, expertise and other resources as necessary to provide a centralized facility to uniformly distribute authenticated cell lines and process tissues and associated data for any one cancer being studied and to distribute aliquots of harvested cells, related culture media, sera and reagents to multiple Physical Sciences-Oncology Network sites upon request. Tissues shall be received by the Contractor from contributing Physical Sciences-Oncology sites. The Contractor shall receive tissues and de-identified clinical data from Physical Sciences-Oncology Network members according to the approved SOPs (or some other procedure other than direction from the NCI COTR as the NCI COTR should provide technical oversight). Tissue specimens shall be subject to Quality Control (QC), individual cell types shall be harvested from the tissue specimens (also subject to QC), and distributed to Physical Sciences-Oncology Network members upon request. The Contractor shall coordinate receipt, internal processing and distribution work flow to provide consistently high quality cell lines and biomolecules in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines to the multiple Physical Sciences-Oncology Network sites. All operations shall be governed by SOP in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines.

The Contractor shall provide a suitable air-conditioned facility containing sufficient floor space for the installation and storage of equipment and all items necessary for the successful operation in performing the tasks identified in this Statement of Work. The Contractor shall document current facilities and equipment to be used under this Contractor facility to include in-house state of the art in vitro mammalian cell culture facilities, liquid nitrogen storage tanks, freezers at -80°C and -20°C, and refrigerators at 4°C.

The Contractor's facility shall be supported by a bulk liquid nitrogen stand tank with a capacity of at least 6000 gallons that provides nitrogen to the individual freezers, and backup electrical power is provided by an emergency generator. The Contractor's facility shall be supported by fire, intrusion, and equipment alarm systems with access control designed to monitor facility-wide adverse conditions, such as fire and other emergencies, access and egress, facility equipment malfunction, laboratory equipment malfunction, and freezer and cold room failures. The Contractor's biorepository facility shall be secured with access only by authorized individuals.

The Contractor shall store biological materials and derivatives (DNA, RNA and protein) at the following temperatures: cryopreserved cells shall be stored in all-vapor storage liquid nitrogen freezers where they are maintained at temperatures below -140°C; DNA, RNA and protein shall be maintained at temperatures below -70°C. The freezers shall be alarmed and monitored for temperature failure via internal probes, power disruption to individual freezers and other potential malfunctions. Freezer monitoring shall be redundant occurring at multiple locations including an offsite location. Trained staff shall be on 24 hours standby to immediately respond to alarm notifications, and operating empty spare freezers shall be available in the event material needs to be relocated.

The Contractor shall label and catalog vials of all biological specimens in a consistent and clear manner. The vials shall be bar-coded with information identifying the specimen, date of storage, lot number, passage number, and unique tracking number for monitoring the inventory. The Contractor shall use temperature-resistant labels that are able to withstand extreme temperatures such as liquid nitrogen (-196°C).

4.1.2 The Contractor shall perform, as a single entity, all the biospecimen processing capabilities described in this SOW needed to support any one (1) cancer studied by Physical Sciences-Oncology Network site. Key activities of the Contractor shall include developing SOP to govern receipt, processing, management and distribution of biospecimens at a level of quality that supports genomic characterization in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines.

4.1.3 Definitions

Biospecimen: includes all biological specimens, including tissue in any format (e.g. solid, frozen, formalin fixed, paraffin embedded, cell pellets, whole blood, etc.).

Biomolecule: includes all processed biological specimens (cell derivatives), including extracted RNA, DNA and protein from cell lines and tissues.

Authentication: tests to determine the presence of microbial contamination and the combination of both genomic analyses, such as RNA expression, epigenetics, and copy number alteration.

5. TASKS TO BE PERFORMED

TASK 1. NON-SCIENTIFIC TASKS

Task 1.1 Project Management

The Contractor shall be responsible for ensuring the accuracy, timeliness and completion of all tasks performed under this contract. The NCI Contracting Officer Technical Representative (COTR) shall monitor and approve all tasks/transactions performed under this effort. Document deliverables shall be delivered in PDF format (Adobe Systems, Inc., San Jose, CA) and/or Microsoft Office Suite. The status of all deliverables shall be tracked by the NCI COTR. The Contractor shall request prior approval on all activities not included in the plan or any modifications to the plan after approval has been given.

Task 1.1.1 Project Management Plan (PMP)

The Contractor shall submit a draft of the Project Management Plan (PMP) describing the means of accomplishing project objectives. The PMP should define an iterative/incremental development approach. The incremental iteration shall address deliverables, due dates, and timelines. The draft PMP shall be negotiated with the CO and COTR prior to award and a final PMP shall be due no later than twenty (20) calendar days post award.

The draft PMP shall be included in the proposal and shall include planning, tracking, executing and completing all tasks. The PMP shall describe the technical approach, organizational resources and management controls to be employed to meet the cost,

performance and schedule requirements for this contract. The PMP shall detail methods for producing the deliverables, timeline, and allocation of staff and other resources necessary to produce the incremental deliverables. The Contractor shall deliver the PMP in electronic form in Microsoft Word™ format. Based on the PMP, the NCI COTR shall provide approval to move forward on activities planned. The Contractor shall request prior approval on all activities not included in the PMP or any modifications to the PMP after approval has been given.

Task 1.1.2 Risk Management Plan (RMP)

The PMP shall include a Risk Management Plan (RMP) to identify potential technical problems that might arise during the course of work. The Contractor shall suggest solutions or alternative approaches to address these potential problems.

The following examples are illustrative of technical problems, along with possible solutions, that might arise during this project:

Problem: A cell line may be contaminated.
Solution: The Contractor shall perform the standard battery of authentication tests to provide cell lines that are free of contaminants. The Contractor's standard policy for contaminated cell lines shall be applicable to any situations of contamination should they occur. The Contractor's policy for contamination shall be stated on the Contractor's website.
Problem: The culture conditions, as recommended by the Contractor, for growth of a particular cell line fails to produce a sufficient number of cells for an investigator's experiments.
Solution: The Contractor shall provide technical support, including on-site hands-on training, about culture requirements and conditions. If any cell lines fail to grow, the Contractor's standard policy shall be applicable. The Contractor's policy for growth failure of cell lines shall be stated on the Contractor's website.
Alternate solution: If a majority of recipient investigators encounter similar problems pertaining to the culture of the same cell line, and the Contractor is unable to remedy the technical problem, NCI may opt to remove that cell line from the list of distributed cell lines to the Physical Sciences-Oncology Network.
Problem: A cell line may be incorrectly labeled by the Contractor. Detection of a mislabeled vial may only be discernible when an investigator uploads data (e.g., data from RNA analyses, signaling pathways) in a common database and discrepancies are noted when comparing data from another investigator's laboratory.
Solution: The Contractor shall provide the correct cell line at no additional cost to the investigator or to NCI.

Task 1.2 Monthly Informing Reports

The Contractor shall provide NCI with a written monthly informing report documenting the type and quantity of research materials distributed amongst the Physical Sciences-Oncology Network members and their specific locations. If requests hit 75% of the amount of the contract award, then the Contractor shall notify NCI. Additionally, the Contractor shall notify NCI when and if the number of stock vials reaches 30%, 10% and 1% of the initial total vial number.

Task 1.3 Semi-Annual Status and Financial Reports

The Contractor shall document the efforts performed in the completion of each task in a detailed Semi-Annual Status Report. Reporting requirements for the Status Report shall be outlined at a Kickoff web- or tele-conference meeting. In addition to the items listed below, the first Status Report shall include the roster of all Contractor key personnel performing work under this contract. If changes are made to the Contractor personnel, the roster shall be updated and included on the related monthly status report. Status Reports shall include, at a minimum:

- Program status overview
- Description of work completed and work outstanding
- Issues or obstacles impeding progress and recommended solutions
- Resolution of previously-identified issues
- Status of deliverables/milestones
- Topics or issues identified for special interest

The Financial Reports shall include, but not be limited to:

- Budgeted total hours
- Actual hours expended for the reporting period by unit including breakdown by labor category and name
- Actual hours expended to date by task including breakdown by labor category and name –include task totals and task order total
- Actual costs expended to date and for the reporting period (based on actual hours)
- Estimated Cost *to* Completion
- Estimated Cost *at* Completion
- Task/cost variance (for >10% variance include explanation/analysis, justifying the variance)
- Other direct costs (ODC)

In addition to the Financial Reports, anytime an invoice is generated, an email shall be sent to the NCI COTR at least seven (7) calendar days in advance of required sign off. The invoice shall be attached as a PDF in the email sent to the NCI COTR.

Task 1.4 Project Meetings and Site Visits

Project meetings are to be held by teleconference on an “as needed” basis. Site visits by the NCI COTR shall occur at least once annually and on an “as needed” basis.

Task 1.5 Material Transfer Agreements (MTA) and Transfer Addendums (TA)

The Contractor shall execute a Material Transfer Agreement (MTA) and a Transfer Addendum (TA) specific to the Physical Sciences-Oncology Network. The Contractor shall consult with the NCI COTR with regard to a process for the signing and receipt of a Material Transfer Agreement (MTA) and a Transfer Addendum (TA) from the Physical Sciences-Oncology Network home institutions**.** The parent MTA and TA shall include any subcontracted institutions of Physical Sciences-Oncology Network in the parent institution. The Contractor shall maintain a catalog of MTAs and TAs for Physical Sciences-Oncology Network and ensure it is up to date.

Task 1.6 Project Summary Report

The Contractor shall submit a Project Summary Report at least twenty (20) days prior to contract expiration or annual continuation to describe the work accomplished, issues, resolutions to the project and lessons learned.

Task 1.7 Information Sessions at the Annual PS-OC Network Investigators' Meeting

One of the Contractor's program/project managers shall attend the annual PS-OC Network Investigators' Meeting to discuss the services provided by the PBCF and set up, in coordination with the NCI COTR, one-on-one discussions with investigators (i.e., potential depositors of cells, tissue, animals). The meeting will be held annually in April and the exact dates and location will vary year-to-year.

Task 1.8 Website and Database Development (Time Frame = 2 mos to develop from period of contract award)

The Contractor shall create a secure website to: allow COTR access to view orders in real time and to update the list of Physical Sciences-Oncology Network members, and to allow Physical Sciences-Oncology Network members to view the available biospecimens, reagents, and biorepository services. A link to the secure PBCF website shall be accessible via the existing ATCC website.

The PBCF secure database shall include:

- List of Physical Sciences-Oncology Network members with their associated center (if applicable), institution if different from the center site, email addresses and telephone numbers.
- Documentation on all available biospecimens and reagents
    - CoA
    - SOP (provide default protocol normally provided by the Contractor until the detailed SOP is developed)
    - Phase contrast images of cells in culture, when first seeded and at roughly 70-80% confluence
    - Details on the background of each cell line
- Depositor information on 3rd party cell lines.

The PBCF secure website shall include the following requirements:

- Search tool
- Simple user name and password requirements. Both user name and password to be supplied by the user
    - User name of at least 5 characters
    - Password of at least 7 characters
    - Random temporary passwords to be sent if user forgets password. Requirement for user to change password immediately if logging in using a temporary password.
- For access by NCI COTR and Contracting Officers
    - View and download monthly informing reports
    - View and download PBCF inventory
    - View orders in real time

    - View, download, and update the list of Physical Sciences-Oncology Network members
    - View, download, and update documentation on all available biospecimens and reagents
- For access by Physical Sciences-Oncology Network members, NCI COTR, and Contracting Officers
    - View PBCF inventory
    - Track order status
    - View list of Physical Sciences-Oncology Network members with contact information
    - View and place orders
    - Instructions on how to deposit 3rd party biospecimens
- Cross-talk with the PS-OC Data Coordination Center (DCC)
    - Link to the cell line from the DCC web page (under construction)

TASK 2. SCIENTIFIC TASKS

The Contractor shall be directly responsible for ensuring the accuracy, timeliness and completion of all tasks under this contract. The Contractor shall assume responsibility to meet the cost, performance and schedule requirement throughout execution of the tasks. Specifically, the Contractor shall perform these tasks:

Task 2.1 Standard Operating Procedures development

- The Contractor shall develop Standard Operating Procedures (SOP) in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines, where none yet exist, in coordination with the NCI Contracting Officer Technical Representative (COTR) for all activities. The Contractor shall provide a draft of these SOPs at the time of contract award.
- Standard Operating Procedures for the in vitro culture of cell lines being shipped shall be developed and provided with each shipment. A draft of the Contractor's pre-existing SOPs for in-house cell lines listed in Appendix 1 shall be provided at the time of contract award. The Contractor shall provide revisions to the SOPs as required in the bullet point below within thirty (30) calendar days following contract award. The Contractor shall immediately notify the NCI COTR concerning any unforeseen updates/changes made to SOPs and provide the NCI COTR with an electronic version of the revised SOP within 10 calendar days of implementation. Final SOPs shall be provided within sixty (60) days of Contract award.
    - In coordination with PS-OC Network members who have had extensive experience culturing each cell line, if applicable, and with the NCI Contracting Officer Technical Representative (COTR), the Contractor shall develop SOPs that include materials and methods for:
        - Thawing cells
        - Subculturing/Passaging the cell line (adherent cultures and suspension cultures, if applicable)
        - Freezing cells

Task 2.2 Initial verification

The Contractor shall provide assurance that all in-house cancer cell lines and any normal counterpart cell lines selected for distribution have been tested for:

- Contamination: test for presence of mycoplasma and other bacterial or fungal agents.
- Species verification: utilize a DNA Bar-coding / Isoenzyme test to verify cell line species
- Identity testing. Provide a genetic profile or DNA fingerprint for all cell lines using STR (Short Tandem Repeat) analysis. Conduct karyotype analysis.
- Karyotype analysis

The Contractor shall provide the dates of tests and upon request by the NCI COTR shall provide all relevant experimental data and analyses. If Karyotype Analysis has not been conducted in the past, the Contractor shall perform Karyotype analysis and provide data and analyzed results to the NCI COTR. The Karyotype results for each PBCF cell line shall be made available for all members of the Physical Sciences-Oncology Network. Initial verification tests shall be completed within thirty (30) days of Contract award for the 31 required cell lines listed in Appendix 1 and within thirty (30) days of request for all additional cell lines.

Task 2.3 Distribution of authenticated Contractor cell lines to members of the Physical Sciences-Oncology Network.

The Contractor shall be accountable for the following:

- Propagation and quality control testing of Contractor cell lines, consisting of:
    - Ampule passage number (where known)
    - Population doubling level (where applicable)
    - Total cells/mL (at least 500,000 cells per vial)
    - Post-freeze recovery
    - Post-freeze viability
    - Growth properties
    - Morphology
    - Mycoplasma testing (Hoechst stain and agar culture)
    - Species determination via COI assay
    - Species determination via STR (human cell lines only)
    - Sterility testing via BacT/ALERT (aerobic and anaerobic conditions)

Task 2.4 Accession, authenticate, produce and distribute new cell lines originating from PS-OC program members for the use by Physical Sciences-Oncology Network members.

The Contractor shall be accountable for the following efforts:

- Sourcing/shipping logistics administration of acquiring line
- Propagation of a token stock (15 vials) and quality control testing consisting of:
    - Ampule passage number (where known)
    - Population doubling level (where applicable)
    - Total cells/mL (at least 500,000 cells per vial)

    - Post-freeze recovery
    - Post-freeze viability
    - Growth properties
    - Morphology
    - Mycoplasma testing (PCR or Hoechst/live culture)
    - Species determination via COI assay
    - Species determination via STR (human cell lines only)
    - Sterility testing via BacT/ALERT (aerobic and anaerobic conditions)
- Propagation of an initial seed stock (25 vials) and quality control testing consisting of:
    - Ampule passage number (where known)
    - Population doubling level (where applicable)
    - Total cells/mL (at least 500,000 cells per vial)
    - Post-freeze recovery
    - Post-freeze viability
    - Growth properties
    - Morphology
    - Mycoplasma testing (PCR or Hoechst/live culture)
    - Species determination via COI assay
    - Species determination via STR (human cell lines only)
    - Sterility testing via BacT/ALERT (aerobic and anaerobic conditions)
- Propagation of an initial distribution stock (100 vials) and quality control testing consisting of:
    - Ampule passage number (where known)
    - Population doubling level (where applicable)
    - Total cells/mL (at least 500,000 cells per vial)
    - Post-freeze recovery
    - Post-freeze viability
    - Growth properties
    - Morphology
    - Mycoplasma testing (PCR or Hoechst/live culture)
    - Species determination via COI assay
    - Species determination via STR (human cell lines only)
    - Sterility testing via BacT/ALERT (aerobic and anaerobic conditions)
    - Human pathogenic virus testing via PCR (HIV, HepB, HepC, HPV, EBV and CMV)
- Creation of product documentation including, but not limited to:
    - Product sheets
    - Certificates of analysis
    - Additional regulatory documents as necessary

The Contractor shall completed the above efforts listed in Task 2.4 within four (4) months of initial receipt of the 3rd party cell lines.

Task 2.5 Propagation and quality control testing of new distribution stock (100 vials) from existing seed stocks

- Quality control testing consisting of the following:
    - Ampule passage number (where known)
    - Population doubling level (where applicable)

- Total cells/mL (at least 500,000 cells per vial)
- Post-freeze recovery
- Post-freeze viability
- Growth properties
- Morphology
- Mycoplasma testing (PCR or Hoechst/live culture)
- Species determination via COI assay
- Species determination via STR (human cell lines only)
- Sterility testing via BacT/ALERT (aerobic and anaerobic conditions)

Task 2.6 Provide derivatives (DNA, RNA, Cell pellets, Cell lysates) of existing Contractor cell lines and accessioned authenticated 3rd party cell lines.

- DNA: 100 vials at 10μg/vial, purity between 1.8 and 2.0 (as determined by A_{260}/A_{280}) and integrity determined by agarose gel electrophoresis
- RNA: 100 vials at 10μg/vial, purity between 1.9 and 2.1 (as determined by A_{260}/A_{280}) and integrity determined by agarose gel electrophoresis or Bioanalyzer or a comparable device
- Protein: 100 vials at 1 mg at a concentration of at least 0.75 - 1.5 mg/ml per vial, concentration determined by the bicinchoninic acid (BCA) assay.

Derivatives shall be produced within thirty (30) days of request by the NCI COTR.

Task 2.7 Distribution of the necessary Contractor reagents (e.g. media, sera, trypsin, growth factors, etc.) for the culturing of each cell line to Physical Sciences-Oncology Network members.

- The necessary reagents shall be provided upon first request for any given cell line
- Product sheets for reagents shall be provided with each shipment. If the Contractor does not have certain reagents in-house, the Contractor shall provide the Physical Sciences-Oncology Network members with an alternate vendor and catalog number.

Task 2.8 Delivery of necessary documentation for each distributed research material (e.g. cell line, media, sera, etc.) included with each shipment.

- Product sheets shall be provided with each shipment
- Certificates of analysis for each product shall be sent electronically to each Physical Sciences-Oncology Network member concurrent to shipment
- Standard Operating Procedure (SOP) for in vitro culture conditions of all cell lines being shipped shall be provided with each shipment.

Task 2.9 Creation of secure inventory and storage for all PBCF research materials at the Contractor's facility.

- Access to the Contractor's storage facility containing all PBCF research materials shall be limited to authorized personnel.

Task 2.10 Provide annual on-site Contractor cell culture training (theory and wet-lab) to Physical Sciences-Oncology Network members and offer training for common cellular biochemistry techniques.

- If a Physical Sciences-Oncology Network member requests a training visit, the Contractor shall report the request for training and shall submit a report summarizing the information shared during the training to the NCI COTR
- The Contractor shall offer beginner cell culture training to Physical Sciences-Oncology Network members with little to no prior experience.

Task 2.11 Authenticate, produce, distribute and store 3rd party primary cells from Physical Sciences-Oncology Network members to Physical Sciences-Oncology Network members.

- The Contractor shall perform this task in accordance with the NCI Office of Biorepository and Biospecimen Research (OBBR) Best Practices Guidelines.
- Refer to Task 2.4 for specific tests and quantities that are required.

Task 2.12 Guarantee of retrieval of any undistributed biospecimens or biomolecules.

- Within sixty (60) calendar days before the contract ends, the Contractor shall return any undistributed biospecimens or biomolecules including all and any expansion thereof, that have been deposited to the PBCF to the NCI.

6. DELIVERABLES, DELIVERABLES SCHEDULE, DELIVERABLES REVIEW

The Contractor shall provide the following deliverables:

6.1 All reports and plans listed in the table below shall be submitted to the Contracting Officer (CO) and the COTR. Unless specified otherwise, the COTR shall have a maximum of twelve (12) working days from the day the draft deliverable is received to review the deliverable and give approval, or return the deliverable to the Contractor with comments. All days identified are intended to be normal business days unless otherwise specified.

6.1.1 The following table contains a list of deliverables with notation of due dates.

REFERENCE	DELIVERABLE	DUE Date
Task 1.1.1	Project Management Plan	Draft in the proposal and final PMP due within twenty (20) calendar days following

REFERENCE	DELIVERABLE	DUE Date
		contract award.
Task 1.1.2	Risk Management Plan	Final submission due within twenty (20) calendar days following contract award. Updates due every 3 months if applicable.
Task 1.2	Monthly Information Report	Due 10 calendar days after end of each month.
Task 1.3	Semi-Annual Status and Financial Reports	Due on or before the contract anniversary date and every six (6) months thereafter (semi-annually).
Task 1.4	Project Meetings and Site Visits	As determined by the COTR
Task 1.5	Material Transfer Agreements and Transfer Addendums	Due within thirty (30) calendar days following contract award and for additional institutions as needed
Task 1.6	Project Summary Report	Due at least twenty (20) days prior to contract expiration or annual continuation
Task 1.7	Information Sessions at Annual PS-OC Network Investigators' Meeting	Annually in April (exact date and location to vary every year)
Task 1.8	Database and Website Development	Draft due thirty (30) calendar days following contract award and final website to go live within sixty (60) calendar days following contract award.

REFERENCE	DELIVERABLE	DUE Date
Task 2.1	Standard Operating Procedures (SOP) Development	Draft due at the time of contract award; Required revisions due within thirty (30) calendar days following contract award; Unforeseen updates/changes due within ten (10) calendar days of implementation. Final SOPs for required cell lines due within sixty (60) days following contrat award.
Task 2.2	Initial Verification Report	Due within thirty (30) days following contract award, and within thirty (30) days following a request or a cell line deposit
Task 2.3	Report annotating the authentication of cell lines to be distributed	Due within thirty (30) days following contract award and as needed thereafter
Task 2.4	Reports of 1. accession, 2. authentication 3. propagation, and 4. distribution of newly deposited cell lines	Due within four (4) months of initial receipt of 3rd party cell lines.
Task 2.5	Report plan to begin propagation and QC testing of new distribution stocks	At least five (5) calendar days prior to beginning task
Task 2.6	Report completion of derivative production. Report requests for derivatives: orders received and number of kits distributed	Completion of derivative production is due within thirty (30) days following request by NCI COTR. Requests for derivatives by Network Investigators are due within five (5) calendar days of request and five (5) calendar days after distribution

REFERENCE	DELIVERABLE	DUE Date
Task 2.7	Distribution of necessary Contractor reagents for the culturing of each cell line to PS-OC members	At the time of each shipment upon first request for any given cell line.
Task 2.8	Product sheets and COAs for all research materials and SOPs for in vitro culture of all cell lines	Within sixty (60) calendar days following contract award
Task 2.9	Report annotating the secure inventory and storage of PS-OC research materials	Within thirty (30) days following contract award
Task 2.10	Report requests for training and report annotating material covered at training session	NCI COTR shall be notified of requests within five (5) calendar days after the request, and NCI COTR shall receive the training report within five (5) calendar days after the training session
Task 2.11	Reports of 1. accession, 2. authentication 3. production and 4. distribution of newly deposited primary cells	Within five (5) days of completion of each task as required
Task 2.12	Report annotating any undistributed biospecimens or biomolecules and return any undistributed biospecimens or biomolecules including all and any expansion thereof, that have been deposited to the PBCF to the NCI.	Within sixty (60) calendar days prior to contract expiration

7. PLACE OF PERFORMANCE

The tasks outlined in this Statement of Work (SOW) shall be conducted solely at the facilities of the awarded Contractor.

8. PERIOD OF PERFORMANCE

The period of performance is five (5) years, including a base period of one (1) year followed by four (4) successive one-year options.

9. END OF CONTRACT TERMS (Phase-out/Transition Plan)

The Contractor shall transfer within fourteen (14) calendar days prior to the expiration date of this contract: 1) all undistributed biospecimens and biomolecules deposited to the PBCF by a Physical Sciences-Oncology Network member, including all and any expansion therefore, shall be returned to the NCI or successful Contractor; 2) the entire database for the repository under this contract to the new site of the repository or to NCI. Developed protocols and procedures that describe in detail the transfer of all materials and database shall be provided to the incoming/new Contractor or NCI within fourteen (14) calendar days of award of the contract. Procedures and protocols shall be approved by the NCI COTR before implementation.

10. PERSONNEL

Contractor personnel shall have experience in each of the following areas: cell culture, molecular biology, biochemistry, basic imaging, tissue processing and database management. The project manager shall have a Ph.D. in cell and molecular biology or a related field of study, and the technicians performing the work should have at least a B.S. degree in cell and molecular biology or a related field of study.

11. APPENDICES

11.1 Appendix 1

- List of cell lines

11.2. Appendix 2

- List of Physical Sciences-Oncology Network members (Spreadsheet of All Personnel – To be provided at time of award)

APPENDIX 1: Cell Lines Prioritized
PS-OC Network Bioresource Core Facility (PBCF)

Tissue	Cell Line	Catalog #	Description
Breast	hTERT-HME1	CRL-4010	hTERT immortalized mammary epithelium, non-tumorigenic
Breast	MCF-7	HTB-22	weakly metastatic
Breast	T-47D	HTB-133	ductal carcinoma
Breast	ZR-75-1	CRL-1500	ductal carcinoma
Prostate	RWPE-1	CRL-11609	HPV-18 immortalized prostate epithelium, non-tumorigenic
Prostate	22Rv1	CRL-2505	prostate carcinoma from primary site
Prostate	LNCaP	CRL-1740	metastatic prostate carcinoma from lymph node
Prostate	PC-3	CRL-1435	metastatic prostate carcinoma from bone
Prostate	DU 145	HTB-81	metastatic prostate carcinoma from brain
Prostate	VCaP	CRL-2876	metastatic prostate carcinoma from vertebrae
Brain	U-87	HTB-14	malignant glioblastoma
Brain	T98G	CRL-1690	glioblastoma multiforme
Ovary	HTB-75	Caov-3	ovarian adenocarcinoma from primary site
Ovary	SKOV-3	HTB-77	ovarian adenocarcinoma from ascites met
Ovary	NIH: OVCAR-3	HTB-161	ovarian adenocarcinoma from ascites met
Pancreas	hTERT-HPNE	CRL-4023	hTERT immortalized pancreatic epithelium, non-tumorigenic
Pancreas	Panc-1	CRL-1469	pancreatic epithelioid carcinoma
Pancreas	Capan-1	HTB-79	pancreatic adenocarcinoma from liver
Lung	NL20	CRL-2503	SV-40 large T antigen immortalized lung epithelium, , non-tumorigenic
Lung	NCI-H2087	CRL-5922	non-small cell lung cancer adenocarcinoma lymph node metastasis (lung primary)
B-lymphoblast	NCI-BL2087	CRL-5965	B-lymphoblast (normal tissue) from NSCLC patient above
Colorectal	HT-29	HTB-38	colorectal adenocarcinoma; CpG island methylator phenotype
Colorectal	SW480	CCL-228	colorectal adenocarcinoma; microsattelite stable
Colorectal	HCT116	CCL-247	colorectal adenocarcinoma; microsattelite unstable
Breast	MDA-MB-231	HTB-26	highly metastatic adenocarcinoma
Breast	DU4475	HTB-123	cutaneous metastatic nodule advanced breast cancer
Colorectal	Caco-2	HTB-37	colorectal adenocarcinoma; microsattelite stable
Colorectal	HCT116	CCL-247	colorectal adenocarcinoma; microsattelite unstable
Colorectal	LoVo	CCL-229	colorectal adenocarcinoma; microsattelite unstable
Lung	NCI-H2126	CCL-256	non-small cell lung cancer adenocarcinoma pleural effusion metastasis (lung primary)
B Lymphoblast	NCI-BL2126	CCL-256.1	B-lymphoblast (normal tissue) from NSCLC patient above