

APPLICATION FOR FEDERAL ASSISTANCE
SF 424 (R&R)

Obtained via FOIA by Judicial Watch, Inc.

		3. DATE RECEIVED BY STATE	State Application Identifier
1. TYPE OF SUBMISSION*		4.a. Federal Identifier	
<input type="radio"/> Pre-application <input type="radio"/> Application <input checked="" type="radio"/> Changed/Corrected Application		b. Agency Routing Number	
2. DATE SUBMITTED	Application Identifier	c. Previous Grants.gov Tracking Number GRANT12034213	
5. APPLICANT INFORMATION			Organizational DUNS*: 004514360
Legal Name*:	University of Pittsburgh		
Department:	Office of Research		
Division:			
Street1*:	123 University Place, B21		
Street2:			
City*:	Pittsburgh		
County:	Allegheny		
State*:	PA: Pennsylvania		
Province:			
Country*:	USA: UNITED STATES		
ZIP / Postal Code*:	15213-2303		
Person to be contacted on matters involving this application			
Prefix: Mr.	First Name*:	(b)(6)	Suffix:
Position/Title:			
Street1*:	123 University Place, B21		
Street2:	(b)(6)		
City*:	Pittsburgh		
County:	Allegheny		
State*:	PA: Pennsylvania		
Province:			
Country*:	USA: UNITED STATES		
ZIP / Postal Code*:	15213-2303		
Phone Number*:	(b)(6)	Fax Number:	(b)(6) Email: offres@offres.pitt.edu
6. EMPLOYER IDENTIFICATION NUMBER (EIN) or (TIN)*		25-0965591	
7. TYPE OF APPLICANT*		X: Other (specify)	
Other (Specify): private, non-profit, state-related educational ins			
Small Business Organization Type		<input type="radio"/> Women Owned <input type="radio"/> Socially and Economically Disadvantaged	
8. TYPE OF APPLICATION*		If Revision, mark appropriate box(es).	
<input checked="" type="radio"/> New <input type="radio"/> Resubmission <input type="radio"/> Renewal <input type="radio"/> Continuation <input type="radio"/> Revision		<input type="radio"/> A. Increase Award <input type="radio"/> B. Decrease Award <input type="radio"/> C. Increase Duration <input type="radio"/> D. Decrease Duration <input type="radio"/> E. Other (specify) :	
Is this application being submitted to other agencies?* <input type="radio"/> Yes <input checked="" type="radio"/> No What other Agencies?			
9. NAME OF FEDERAL AGENCY* National Institutes of Health		10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER TITLE:	
11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT* University of Pittsburgh as the GUDMAP Tissue Hub and Collection Site			
12. PROPOSED PROJECT		13. CONGRESSIONAL DISTRICTS OF APPLICANT	
Start Date*	Ending Date*	PA-014	
07/01/2016	06/30/2021		

14. PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR CONTACT INFORMATION

Prefix: Dr. First Name*: (b)(6) Suffix: M.D.
 Position/Title: (b)(6)
 Organization Name*: University of Pittsburgh
 Department: Pathology
 Division:
 Street1*: UPMC Shadyside
 Street2: 5230 Centre Avenue, (b)(6)
 City*: Pittsburgh
 County: Allegheny
 State*: PA: Pennsylvania
 Province:
 Country*: USA: UNITED STATES
 ZIP / Postal Code*: 15213-2303
 Phone Number*: (b)(6) Fax Number: Email*: (b)(6)@upmc.edu

15. ESTIMATED PROJECT FUNDING

a. Total Federal Funds Requested* \$3,207,015.00
 b. Total Non-Federal Funds* \$0.00
 c. Total Federal & Non-Federal Funds* \$3,207,015.00
 d. Estimated Program Income* \$0.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?*

a. YES THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:
 DATE:
 b. NO PROGRAM IS NOT COVERED BY E.O. 12372; OR
 PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. By signing this application, I certify (1) to the statements contained in the list of certifications* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)

I agree*

* The list of certifications and assurances, or an Internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

18. SFLL or OTHER EXPLANATORY DOCUMENTATION

File Name:

19. AUTHORIZED REPRESENTATIVE

Prefix: Dr. First Name*: (b)(6) Suffix: Ph.D.
 Position/Title*: (b)(6)
 Organization Name*: University of Pittsburgh
 Department: Office of Research
 Division:
 Street1*: 123 University Place, B21
 Street2:
 City*: Pittsburgh
 County: Allegheny
 State*: PA: Pennsylvania
 Province:
 Country*: USA: UNITED STATES
 ZIP / Postal Code*: 15213-2303
 Phone Number*: (b)(6) Fax Number: (b)(6) Email*: offres@offres.pitt.edu

Signature of Authorized Representative*

(b)(6)

Date Signed*

11/06/2015

20. PRE-APPLICATION File Name:**21. COVER LETTER ATTACHMENT** File Name:1235-Cover letter.pdf

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Project/Performance Site Location(s)

Project/Performance Site Primary Location

I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: University of Pittsburgh
Duns Number: 004514360000
Street1*: UPMC Shadyside
Street2: 5230 Centre Avenue
City*: Pittsburgh
County: Allegheny
State*: PA: Pennsylvania
Province:
Country*: USA: UNITED STATES
Zip / Postal Code*: 15232-0000
Project/Performance Site Congressional District*: PA-014

Project/Performance Site Location 1

I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: University of Pittsburgh
DUNS Number: 004514360000
Street1*: Children's Hospital of UPMC
Street2: 4401 Penn Avenue
City*: Pittsburgh
County: Allegheny
State*: PA: Pennsylvania
Province:
Country*: USA: UNITED STATES
Zip / Postal Code*: 15224-0000
Project/Performance Site Congressional District*: PA-014

Project/Performance Site Location 2

I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: University of Pittsburgh
DUNS Number: 004514360000
Street1*: (b)(4)
Street2:
City*:
County:
State*:
Province:
Country*:
Zip / Postal Code*:
Project/Performance Site Congressional District*: PA-014

File Name

Additional Location(s)

RESEARCH & RELATED Other Project Information

1. Are Human Subjects Involved?* <input checked="" type="radio"/> Yes <input type="radio"/> No	
1.a. If YES to Human Subjects Is the Project Exempt from Federal regulations? <input type="radio"/> Yes <input checked="" type="radio"/> No If YES, check appropriate exemption number: — 1 — 2 — 3 — 4 — 5 — 6 If NO, is the IRB review Pending? <input checked="" type="radio"/> Yes <input type="radio"/> No IRB Approval Date: Human Subject Assurance Number 00006790	
2. Are Vertebrate Animals Used?* <input type="radio"/> Yes <input checked="" type="radio"/> No	
2.a. If YES to Vertebrate Animals Is the IACUC review Pending? <input type="radio"/> Yes <input type="radio"/> No IACUC Approval Date: Animal Welfare Assurance Number	
3. Is proprietary/privileged information included in the application?* <input type="radio"/> Yes <input checked="" type="radio"/> No	
4.a. Does this project have an actual or potential impact - positive or negative - on the environment?* <input type="radio"/> Yes <input checked="" type="radio"/> No	
4.b. If yes, please explain: 4.c. If this project has an actual or potential impact on the environment, has an exemption been authorized or an environmental assessment (EA) or environmental impact statement (EIS) been performed? <input type="radio"/> Yes <input type="radio"/> No 4.d. If yes, please explain:	
5. Is the research performance site designated, or eligible to be designated, as a historic place?* <input type="radio"/> Yes <input checked="" type="radio"/> No	
5.a. If yes, please explain:	
6. Does this project involve activities outside the United States or partnership with international collaborators?* <input type="radio"/> Yes <input checked="" type="radio"/> No	
6.a. If yes, identify countries: 6.b. Optional Explanation:	
7. Project Summary/Abstract*	Filename 1236-Abstract Final 20151025.pdf
8. Project Narrative*	1237-Project Narrative.pdf
9. Bibliography & References Cited	1238-References Cited_Final.pdf
10. Facilities & Other Resources	1239-Facilities FINAL GUDMAP 20151030.pdf
11. Equipment	1240-Equipment FINAL GUDMAP 20151030.pdf

ABSTRACT

Congenital diseases of the genitourinary tract (kidneys, bladder, ureter, urethra etc.) are a leading cause of organ failure carrying with it an increased risk of death, and are a growing public health burden. At present, the only therapies are dialysis (for the kidneys) and organ transplantation. With the demand for transplants far exceeding supply there is an imminent need for alternate therapies. A comprehensive understanding of how the genitourinary tract develops *in utero* is necessary to effectively develop novel therapies to replace or repair injured tissue. The **GenitoUrinary Development Molecular Anatomy Project (GUDMAP)** has been successful at providing a high-resolution map of gene expression in the mouse GenitoUrinary system. However, a similar description has not been available for the human genitourinary system, nor has it been possible to develop optimized experimental techniques to grow, expand and differentiate human genitourinary progenitor cells *in vitro*. These research efforts by the developmental biology community have been hampered by the lack of a central hub for the procurement, quality control and distribution of human genitourinary samples. The Health Sciences Tissue Bank (HSTB) at the University of Pittsburgh has been involved in human tissue procurement for over 18 years, with a long standing history of collecting, maintaining and disbursing quality samples to research scientists, both in house and outside the University of Pittsburgh. HSTB is embedded within the Department of Pathology of the University of Pittsburgh Health Systems; thus providing rapid access to very high quality tissue and biological specimens. HSTB has established consenting protocols in line with the best practices recommendations from the NIH, a strong informatics backbone to facilitate specimen procurement and annotation, and has in place a robust quality control and quality assurance programs. The HSTB biorepository is fully accredited by the College of American Pathologists (CAP). HSTB has an established program accruing fetal tissues. The fetal tissue IRB has been in place since 2005. HSTB has the infrastructure for dissecting specimens and collecting different tissue types. In this calendar year, we have disbursed over 300 fresh samples collected from 77 cases. The collections can be significantly ramped up as material could have been accrued from as many as 725 cases last year. We have preliminary data showing that we can isolate the human urogenital system (kidneys, ureters and bladders) from various developmental ages (6-24 weeks). We have produced publication quality images of these genitourinary organs (including kidneys and bladder) and have also been able to isolate and expand cells from various genitourinary organs. Further, we have shipped high quality tissue to various GUDMAP investigators and they have verified the quality of the tissue sent. *We propose to act as both the GUDMAP Tissue Hub and Tissue Gathering site to build upon the pre-existing specialized collecting abilities of HSTB and provide high quality genitourinary samples to members of the scientific community including those within GUDMAP.*

Project Narrative:

An understanding of human genitourinary development is critical to tackling the growing number of developmental diseases affecting these tissues. This grant proposes to leverage the significant infrastructure of the University of Pittsburgh to provide high quality fetal tissue to the GUDMAP atlas projects.

Health Sciences Tissue Bank Facilities/Equipment Description

The Health Sciences Tissue Bank (HSTB) provides essential support for University of Pittsburgh research programs needing biological materials from patients seen at UPMC. The main objectives of the HSTB are to provide a mechanism to simplify and streamline the process of research tissue accrual and disbursement, and to provide efficient research pathology support services including histology, immunohistochemistry and paraffin tissue microarrays. The Health Sciences Tissue Bank is part of the University of Pittsburgh Core Research Facilities. Although the tissue bank is under the auspices of The University, we also have a strong working relationship with UPMC and the Department of Pathology. The HSTB has three College of American Pathology (CAP) certified laboratories in the flagship UPMC hospitals: (b)(4)

(b)(4) as well as a collection site in the community hospital (b)(4). In addition, the HSTB extensively interacts with Oncology and Pathology Informatics and has computer and server facilities located in these collaborative facilities. The facilities available to the tissue resource at each of these institutions are detailed below:

Shadyside Hospital (SYS)**Health Sciences Tissue Bank Shadyside Laboratory Space:**

The Health Sciences Tissue Bank (HSTB) administrative office is located a short distance from the (b)(4); (b)(6)

(b)(4); (b)(6)

(b)(4); (b)(6)

The HSTB laboratory and freezer room space occupies 3300 square feet. This space includes the tissue banking lab space, research histology lab space, freezer rooms and storage rooms. The space is divided into six rooms. The largest room, measuring 30'x20', is for tissue processing, slide retrieval and storage. This laboratory is equipped with a cryobath, liquid nitrogen tank and dry ice for varied methods of snap freezing tissue, a Thermo cryostat used to cut frozen sections for quality review by a pathologist. Centrifuges, Cytospin, calibrated pipettes, microscopes, and sterile supplies are available for tissue procurement and dissection. The lab space has a refrigerator to store media and other necessary reagents as well as a -80°C freezer for short term sample storage. There are 9 working stations in the lab area all equipped with desktop computers, barcode scanners and hooked up to a network printer. There is a storage area for paraffin embedded tissue blocks and slides. Locked filing cabinets are located in the space for secure storage of documents and files. These facilities provide staff with all the necessary materials to procure quality tissue for tissue collection and disbursement.

The smaller laboratory area, measuring 30'x10' is for research histology. This lab space has the unique equipment necessary for formalin fixed paraffin embedded (FFPE) tissue processing and staining, along with the specific equipment needed for paraffin tissue microarray (TMA) construction. For paraffin processing, a ThermoShandon Excelsior tissue processor and Sakura Tissue Tek embedding center are used. There are 3 Microm microtomes, 2 are equipped with histocollimators. They can be setup for routine sectioning, thick sectioning microtomy and laser capture microdissection (LCM) slides or other protocol specific requests. There is 1 automated stainer for H&E staining and 2 automated Dako stainers used for immunohistochemical (IHC) staining along with calibrated pipettes for serial dilution and titration protocols, which are used to stain tissue based on study design. The tissue microarray portion of the lab contains 2 Beecher Tissue Microarrayers with coring capabilities from 0.6 to 2.0mm. The histology lab also contains its own ThermoShandon cryostat allowing for the capability of providing frozen section slides. Included in the lab is a 2°-8°C walk-in cooler and -20°C freezer for reagent storage. Other available supplies include water baths, glassware, 2 incubator ovens, a fume hood for cover slipping and other tools needed to perform daily tasks. The histology space includes 3 active work stations with desktop computers hooked up to a network printer. One of the work stations has a Slidemate slide writer locally connected to one of the computers used for automated slide labeling.

There are two designated freezer areas. One contains 12 Thermo -80C freezers, while the other room is set up specifically for vapor phase liquid nitrogen freezers, containing 6 vessels. This space has piped liquid nitrogen from the hospital facility. Both freezer rooms also contain additional secure storage space. There are two hallways, measuring 30'x6' and 25'x8', used for filing cabinets for glass slides, paraffin blocks and supplies.

Health Sciences Tissue Bank Shadyside Office Space:

(b)(6) and the tissue banking staff have offices within the (b)(4); (b)(6) area, which are in near proximity to the (b)(4). The Director, (b)(6) has a 500 sq. ft. office suite which contains a desk space with a desktop computer and multiheaded microscope. This space also contains a conference table with seating for 8. Outside of his suite, there is an anteroom with desk space for his administrative assistant. The Assistant Director has a 110 sq. ft. office within the HSTB at UPMC

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Shadyside, along with an 80 sq. ft. shared office space for the Project and Quality Managers. The Research Histology Supervisor has a 130 sq. ft. lab space on the histology side of the main laboratory set up. All office spaces contain desktop computers with dual monitors mapped to network printers, scanners, telephones, locked filing cabinets, and other office supplies necessary for administrative operations. The rooms are also equipped with a dry-erase whiteboard for teaching assistance and microscopes as needed.

(b)(4); (b)(6) This area is approximately 450 sq. ft and includes the main gross room and the frozen section area. It functions as the central processing and sectioning lab for gross pathology at (b)(4); (b)(6). It has 5 grossing stations that have fume hoods for processing non-sterile specimens. Each of the fume hoods is equipped with PCs linked to the hospital mainframe system, sinks, and a DictaPhone Voice Processor for dictation of gross descriptions.

This facility is a fully functional surgical pathology gross room, and contains equipment necessary for this purpose. Such equipment includes: Leica CM1800 CryoStat, H&E staining station, ButcherBoy band saw for sectioning of bone, Cabinet X-Ray System Faxitron Series HP, Polarstar No-frost refrigerator, Revco -70 C upright freezer, Flammable cabinet, Cryobath CB-60 isopentane cryopreservation unit, Aculab GS-2001 Standard Digital Scale, and dissecting equipment, chemicals, glassware, and storage shelves for such purposes. This room also has a two-head American optical microscope for frozen section interpretation.

Health Sciences Tissue Bank - Imaging Services: Imaging services are offered through the Health Sciences Tissue Bank (HSTB). The digital imaging core facility offers clinical and research services. The imaging core has imaging equipment for generating, annotating, interpreting, storing and analyzing digital images. This facility is located at UPMC Shadyside in the Hillman Cancer Pavilion and has about 200 sq. ft. of space for the imaging laboratory. The imaging facility provides pathologist oversight, technical support staff and space for imaging studies, validation, training and conferencing. Images can be securely hosted and made available to investigators for remote viewing or saved locally for investigators on a DVD, USB flash drive or external hard drive.

Equipment: Imaging devices include Nikon digital cameras for macroscopic pathology and Spot insight cameras for microscopic imaging. For virtual microscopy at 20x, 40x and 60x magnification a variety of whole slide scanners (Omnyx, Aperio and Hamamatsu Nanozoomer) are available. The Nanozoomer has z-stack (multiple plane) capability.

Image analysis: The imaging facility offers image algorithm development and image analysis. The Visiopharm platform is primarily used for this work, which allows cellular structures and biomarkers in tissue samples to be detected and quantified, automated alignment of serial tissue sections, and tissue microarray (TMA) image analysis. Quantitative image analysis of immunohistochemistry can also be performed on images using Aperio's nuclear, positive pixel count or membrane algorithms.

(b)(4); (b)(6)

Health Sciences Tissue Bank (b)(4); (b)(6) Laboratory Space:

The HSTB laboratory and freezer room space occupies 1800 sq. ft in (b)(4); (b)(6). This space includes the tissue banking laboratory and three freezer rooms. The lab space is 100 sq. ft. and is equipped for tissue processing, slide retrieval and storage. This laboratory contains a cryobath and dry ice for varied methods of snap freezing tissue, a Thermo cryostat used to cut frozen sections for quality review by a pathologist. Centrifuges, cryobath, calibrated pipettes, microscopes, and sterile supplies are available for tissue procurement and dissection. The lab space has a refrigerator to store media and other necessary reagents as well as an adjacent 100 sq. ft. freezer room with a -80°C freezer for short term sample storage. There are 4 working stations in the lab area all equipped with desktop computers, barcode scanners and hooked up to a network printer. There is a storage area for paraffin embedded tissue blocks and slides. Locked filing cabinets are located in the space for secure storage of documents and files.

The Presbyterian site has three freezer rooms in (b)(4); (b)(6) one located on the (b)(4) and two located (b)(4) measuring 600 and 300 sq. ft. Combined, the freezer rooms house 14 -80°C freezers and 1 liquid nitrogen storage vessel. The largest of the three rooms located (b)(4) also has 1 desktop computer. The (b)(4); (b)(6) site also has administrative office space located down the hall from the laboratory. The office is 80 sq. ft. and contains a desktop computer and locked filing cabinets. These facilities provide staff with all the necessary materials to procure quality tissue for tissue collection and disbursement.

UPMC (b)(4); (b)(6) Pathology Gross Room:

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This area is approximately 1000 sq. ft. in area and includes the main gross room, the imaging room and the frozen section room. The main gross room lab is approximately 750 sq. ft. in area. It functions as the central processing and sectioning lab for gross pathology at (b)(4); (b)(6). There is an additional frozen section room located on the (b)(4). This frozen section room is equipped with current state-of-the-art informatics and electronics for communication with the operating rooms. This frozen section room measures approximately 400 sq. ft. in area. It has two cryostats and three cutting stations. It also contains two computers connected to the network. The frozen section room has digital video feed to and from the operating rooms. This also allows for instantaneous discussions with the surgeons as well immediate "show and tell" for them. This room serves as the center for procurement of fresh tissue samples for research.

(b)(4); (b)(6)

(b)(4); (b)(6)

(b)(4); (b)(6)

(b)(4); (b)(6)

(b)(4); (b)(6)

(b)(4); (b)(6)

Children's Hospital of Pittsburgh Facilities and Other Resources:

Children's Hospital Laboratory:

(b)(6) has a 450 sq. ft. laboratory (half a bay) on the (b)(4)

(b)(4) laboratory is equipped for sophisticated molecular and developmental biological experimentation. The pediatric nephrology division has shared facilities that includes a biosafety hood, - 20°C and -70°C freezers, cell culture incubators, Hypoxia chamber for cell and organ culture, a microtome, 2 dissecting microscopes, an upright fluorescent microscope, a digital camera, electrophoresis and power supplies, 3 thermocyclers, a high quality water purification system, a pH meter, an analytical balance and hybridization ovens. Ample bench top space, desk space and computer access is available. (b)(6) has an office on the (b)(4) that is 140 sq. ft. near (b)(6) laboratory.

(b)(6) laboratory encompasses approximately 900 square feet of laboratory space, adjacent to (b)(6), facilitating access to shared divisional equipment. (b)(6) has an

(b)(4) that is 140 sq. ft. near (b)(6) laboratory.

Animals:

N/A

Computers:

(b)(6) office and laboratory are equipped with iMac desktop computers (1 in the office and 2 in the laboratories) and ample hard drive space. These are connected to an intranet server with additional hard drive space. All computers are connected to the Internet.

(b)(6) office and laboratory are equipped with iMac desktop computers (1 in the office and 3 in the laboratories) and ample hard drive space. These are connected to an intranet server with additional hard drive space. All computers are connected to the Internet.

Clinical:

N/A

Office:

(b)(6) has an office on the (b)(4) that is 140 sq. ft. near (b)(6) laboratory. All staff in the (b)(6) lab has their own individual desk space.

(b)(6) has an office on the (b)(4) that is 140 sq. ft. near (b)(6) laboratory. All staff in the (b)(6) lab has their own individual desk space.

Other:

(b)(4) These cores both consist of a sorter (FACSArialI) and an analyzer (LSRII), as well as significant expert technical support. This will be available for the project.

Pathology Core:

The Pathology Core is located (b)(4) The Histology core will provide tissue processing, sectioning, general staining, immunohistochemistry, and in situ hybridization. This will be available for the project.

Cell Imaging Core:

The Cell Imaging Core, located (b)(4) has confocal microscopy and live cell imaging as well as technical support. This will be available for the project.

Pittsburgh Center for Kidney Research:

This center facilitates multidisciplinary research related to kidney physiology, cell biology and pathophysiology. The cores include: Core A Cellular Physiology; Core B Single Nephron and Organ Physiology; Core C Urinary Tract Epithelial Imaging; and Core D Use of Model Organisms to Elucidate Novel Aspects of Kidney Function.

Equipment:

Validation laboratories (b)(6)

(b)(6) have a fully equipped laboratory for molecular biology, and flow hoods for cell culture.

Equipment in the lab includes:

- 1 Biosafety hood (Kewaunee)
- 2 Cell culture hoods (Filtech)
- 5 freezers (3 -20 and 2 -80) (Thermo)
- 2 Cell culture incubators (Thermo)
- 1 tissue processor (Leica)
- 1 embedding station (Leica)
- 1 microtome (Thermo)
- 1 Floatation bath (Boekel)
- 3 dissecting microscopes (Leica)
- 1 upright fluorescent microscope (Leica)
- 2 digital cameras (Axio)
- 1 3D reconstructive Imaging equipment (MBF, Zeiss)
- 3 Hybridization ovens (Labnet)
- 3 electrophoresis and power supplies (Fisher)
- 3 thermocyclers (Biorad)
- 1 high quality water purification system (Millipore)
- 1 pH meter (Fisher)
- 1 analytical balance (Denver Instruments)
- 3 hybridization ovens (Fisher)
- 3 water baths (Fisher)

Health Sciences Tissue Bank Laboratories:

(b)(4); (b)(5)

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RESEARCH & RELATED Senior/Key Person Profile (Expanded)

PROFILE - Project Director/Principal Investigator		
Prefix: Dr.	First Name*: (b)(6)	Suffix: M.D.
Position/Title*:	(b)(6)	
Organization Name*:	University of Pittsburgh	
Department:	Pathology	
Division:		
Street1*:	UPMC Shadyside	
Street2*:	5230 Centre Avenue (b)(6)	
City*:	Pittsburgh	
County:	Allegheny	
State*:	PA: Pennsylvania	
Province:		
Country*:	USA: UNITED STATES	
Zip / Postal Code*:	15213-2303	
Phone Number*:	Fax Number:	E-Mail* (b)(6) @upmc.edu
Credential, e.g., agency login:	(b)(6)	
Project Role*:	PD/PI	Other Project Role Category:
Degree Type:	MD	Degree Year: 1989
Attach Biographical Sketch*:	File Name 1243-Biosketch- (b)(6) 20150825.pdf	
Attach Current & Pending Support:		

PROFILE - Senior/Key Person	
Prefix: Dr. First Name*:	(b)(6) Suffix: M.D.
Position/Title*:	(b)(6)
Organization Name*:	University of Pittsburgh
Department:	Pediatrics
Division:	(b)(6)
Street1*:	
Street2:	
City*:	Pittsburgh
County:	Allegheny
State*:	PA: Pennsylvania
Province:	
Country*:	USA: UNITED STATES
Zip / Postal Code*:	15224-0000
Phone Number*:	(b)(6) Fax Number: E-Mail*:
	(b)(6) @chp.edu
Credential, e.g., agency login:	(b)(6)
Project Role*:	Co-Investigator Other Project Role Category:
Degree Type:	MD Degree Year: 2001
Attach Biographical Sketch*:	File Name
Attach Current & Pending Support:	1244 (b)(6) biosketch- new.pdf

PROFILE - Senior/Key Person	
Prefix: Dr. First Name*:	(b)(6) Suffix: M.D.
Position/Title*:	(b)(6)
Organization Name*:	University of Pittsburgh
Department:	Pathology
Division:	
Street1*:	UPMC Shadyside Hospital (b)(6)
Street2:	5150 Centre Avenue
City*:	Pittsburgh
County:	Allegheny
State*:	PA: Pennsylvania
Province:	
Country*:	USA: UNITED STATES
Zip / Postal Code*:	15232-0000
Phone Number*:	(b)(6) Fax Number (b)(6) E-Mail* (b)(6) @upmc.edu
Credential, e.g., agency login:	(b)(6)
Project Role*:	Co-Investigator Other Project Role Category:
Degree Type:	MD Degree Year: 1996
Attach Biographical Sketch*:	File Name
Attach Current & Pending Support:	1245 (b)(6) NIH Biosketch.pdf

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PROFILE - Senior/Key Person	
Prefix: Dr.	First Name*: (b)(6) Suffix: M.D.
Position/Title*:	(b)(6)
Organization Name*:	University of Pittsburgh
Department:	Pathology
Division:	
Street1*:	(b)(6)
Street2:	
City*:	Pittsburgh
County:	Allegheny
State*:	PA: Pennsylvania
Province:	
Country*:	USA: UNITED STATES
Zip / Postal Code*:	15213-0000
Phone Number* (b)(6)	Fax Number: E-Mail*: (b)(6)@upmc.edu
Credential, e.g., agency login:	(b)(6)
Project Role*: Co-Investigator	Other Project Role Category:
Degree Type: MD	Degree Year: 1988
Attach Biographical Sketch*:	File Name 124 (b)(6) Biosketch 102315 Fetal urologic tissue bank.pdf
Attach Current & Pending Support:	

PROFILE - Senior/Key Person	
Prefix: Dr.	First Name* (b)(6) Suffix: Ph.D.
Position/Title*:	(b)(6)
Organization Name*:	University of Pittsburgh
Department:	Pediatrics
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BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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