Center for Tissue Processing

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Center for Tissue Processing

The Tissue Collection and Banking Facility (TCBF) at the University of Alabama at Birmingham (UAB) has extensive experience in the collection, processing, storage, and distribution of human tissue samples for research. This facility has provided prospective procurement services to UAB investigators since 1978, and has provided services to investigators throughout the United States and Canada as the Southern Division of the NCI sponsored Cooperative Human Tissue Network (CHTN) since 1987.

In addition, this facility has provided biorepository banking services to a number of projects at UAB, including the Breast, Ovarian, and Pancreatic SPOREs, the Early Detection Research Network, the Genitourinary Bank, the UAB Liver Center, and the Skin Disease Research Center.

The Center for Tissue Processing at UAB, which will function as a part of the UAB TCBF, will optimally and rapidly process specimens of lung from patients with primary (idiopathic) pulmonary arterial hypertension as well as related pulmonary diseases which can serve as controls. The specimens will be collected at UAB and at other extramural Transplant and Preparation Centers. Tissues collected at extramural sites will be sent to the UAB Center for Tissue Processing by overnight shipment and tissues collected by the UAB Transplant and Preparation Center will be transferred directly to the UAB Center for Tissue Processing.

We recommend that, at the April 6 meeting, standard processing methods should be defined for use by all of the IPAH Processing Centers. For example, we recommend that fixed tissues from standard locations in each lung will be cut in 1.5 x 1.0 x 0.3 cm sections and processed to paraffin blocks. Each block will be labeled uniquely as to case number, and to location within the lung from which the tissue was obtained.

Similarly, upon receipt of frozen specimens of arteries, veins and supporting pulmonary tissues, we recommend that these will be identified, organized and stored in liquid nitrogen freezers for subsequent molecular and proteomic studies.

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It the goal of the University of Colorado Tissue Center to provide high quality tissue processing, accurate phenotypic characterization of pulmonary vascular remodeling, and state-of-the art tools to investigate and validate potential markers and pathogenetically relevant molecules. The Core

provides the following tasks:

Task 1. To coordinate lung tissue collection with Transplant and Collection Centers, and in collaboration with Transplant and Preparation Centers, develop fixation and processing protocols for subsequent phenotypic characterization, cellular and molecular studies of IPAH, and normal pulmonary arteries.

Task 2. To define and catalogue critical histological and phenotypical characteristics of pulmonary vascular processes in IPAH, other pulmonary hypertensive states, and normal lungs (in conjunction with the Data Bank and Coordinating Center).

Task 3. To prepare optimal whole lung samples, cell sectioning, tissue microarrays, and cell- (vascular and inflammatory cells) and lung-specific (airways, vessels, alveoli) samples using laser dissection (LCM) for exploratory studies aimed at candidate molecular processes and genetic or proteomic markers associated with pulmonary hypertension (in collaboration with the Center for Cell Studies, Genomics, and Proteomics and Biomarkers).

Task 4. To provide histomorphological and analytical morphometric support for studies involving human pathological samples.

The Core digitally scans the key 6 HE stained slides corresponding to the arms of a clock with the Aperio system. The images are analyzed and digitally annotated for key histopathological findings. The findings are then entered in a pathologic form with semi-quantitative assessment of key pathologic alterations; these alterations form the basis of the final pathologic diagnosis.

The image, annotations, and diagnostic forms are available to investigators for their education, correlation with the findings of their studies, and feedback with their pathologist, among others.

The core has implemented state of the art methods for optimization of DNA and RNA extraction for genetic and expression studies, respectively, reliant on laser capture microdissection.