

FACILITIES AND RESOURCES- TRANSLATIONAL PATHOLOGY CORE

Overview

Translational Pathology Core (TPC) of the USC Norris Comprehensive Cancer Center (NCCC) works to facilitate high-impact cancer research by providing high-quality human tissue procurement, processing, and banking resources to NCCC investigators working on all aspects of cancer research. The TPC is an NCCC-managed Shared Resource (SR) with a satellite operation at our partner hospital Children's Hospital of Los Angeles (CHLA), enabling support for both adult and pediatric research.

The close alignment of the TPC with the USC Departments of Pathology at Keck and CHLA allows for exquisite control over the pre-analytic phase in handling biospecimens as well as ready access to specialized technologies such as whole slide scanning, image analysis, immunohistochemistry/immunofluorescence, and new antibody validation. Immunohistochemistry technicians are seamlessly integrated into the TPC, making the core highly efficient in supporting NCCC investigators' needs.

Space

The TPC has available over 7000 square feet of space divided over the USC Health Sciences Campus and CHLA facilities that allows it to accommodate large scale research projects. Access to laboratory areas is controlled by electronic badge readers, and the freezer storage rooms is accessed via key code or badge readers.

Long-term storage of biospecimens is provided on-site in freezer storage areas, with access to upright -80C freezers and LN2 storage units, as well as temperature-controlled room temperature storage for Formalin-Fixed Paraffin-Embedded tissue blocks. All freezers are subject to 24-hour temperature monitoring, with alarms when temperatures are out of range, using the monitoring system iSensix. Extra liquid nitrogen is kept on-site for manual feeding of freezers in the event of mechanical failure. All freezers are powered on the hospital emergency power supply.

Equipment

- 5 full-size MVE 1879 liquid N2 freezers - Each freezer has capacity for 70,200 (1.5ml) vials or 17,550 OCT blocks.
- 1 Sanyo MDF-U53VA Ultralow Freezer (-80 degrees C)
- 1 Philips Ultra Fast Whole Slide Scanner
- 1 Thermofisher STP-120 tissue processor
- 1 Mikron HM540 Microtome for sectioning FFPE tissues
- 1 Mikron HM520 Cryostat for frozen sectioning
- 3 Beckman Centrifuges (1 Refrigerated)
- 1 Tissue-Tek Embedding Center
- 1 Shandon Varistain Slide Stainer

- 1 Manual Tissue Microarray Apparatus
- 5 LN2 (-180°C) freezers
- 2 -80° C freezers
- 2 -20° C freezers
- 2 -4° C freezers
- Aperio AT2 ScanScope slide scanner
- Thermo Fisher X1R Centrifuge
- Bond RXm Processing Module IHC Stainer
- Thermo Fisher Excelsior AS Tissue Processor
- Sakura Tissue Tek VIP Tissue Processor
- Thermo Fisher HistoStar Embedding Center
- Leica cold plate
- 1 - 3D Thermo Fisher Histotech TMA Master 2 – Automated Computerized TMA Maker

Key Services

Key services include consultation for design and feasibility and those below

- Procurement, processing, tracking, and distribution of FFPE tumor tissue from NCCC hospitals including LAC+USC Medical Center, Keck Hospital, Norris Cancer Hospital, and CHLA
- Procurement, processing, tracking, and distribution of fresh/frozen tissue. This has been greatly enhanced by the new biobanking informatics platform, OpenSpecimen
- Immunohistochemistry/Immunofluorescence, including new antibody validation
- Design and construction of tissue micro-arrays (TMAs) including a new automated TMA instrument
- Whole slide scanning utilizing the Hamamatsu NanoZoomer platform with z-stack scanning capability enabling digitization of cytology and hematology as well as histology specimens
- Image analysis with VisioPharm software
- Multiplex immunofluorescence (MPIF) high throughput scanning using the Akoya Biosystems Vectra Polaris platform with InForm image analysis software*
- Histology services including custom embedding and processing; sub-specialty Anatomic Pathology review
- Processing blood for serum, plasma, and peripheral blood mononuclear cells (PBMC)
- Ficoll-hypaque blood/bone marrow specimens
- Processing urine, cerebrospinal fluid and other body fluids