



Molecular and Immunologic Translational Science (MITS) Core laboratory in the Cancer Center

INTRODUCTION

The Cancer Therapeutics (CRX) program has established a new Core within the Cancer Center as a shared resource, the Molecular and Immunologic Translational Science (MITS) Core. This core combines the expertise and capabilities of the former MAPS (Molecular Assessment and Preclinical Studies) Core Facility with the Human Immune Therapy Center's (HITC) Immune Monitoring Laboratory, and it has integrated seamlessly with the existing CCSG cores.

The major goals of this core facility are to enable translational laboratory studies to support the work of clinical trialists and laboratory scientists by performing analyses of blood and tissues to lead to high-impact findings of the effects of new therapies on human cancer patients. The MITS Core can also support preclinical studies with human and murine tissues, including in vivo murine experiments, that can provide preliminary data to enable grant applications to the NIH, DOD, Foundations, or industry. Goals for the MITS core also incorporate expanded bioinformatics, expanded services, and new equipment to support high-throughput analyses and reporting. An initial investment in these efforts has enhanced the ability of the MITS Core to support the scientific goals of the Cancer Center and to support development of investigators.

IN VIVO MURINE STUDIES from former MAPS Core

Engraftments of Cancer

Cell Lines, Patient Tumors, Mouse/Rat Cancer models offered are Ectopic – SC in flank or hindleg; Orthotopic - colon, kidney, mammary gland, omentum, ovarian bursa, pancreas, peritoneum, prostate, tibia, tongue; Metastatic - carotid, intra-cardiac, intravenous

Administration of Therapeutics

Efficacy, Maximum Tolerated Dose (MTD) and Pharmacokinetic (PK) studies by gavage, intra-tumor, SC, IP, IV, osmotic pumps, ad libitum in medicated feed or water

Collection of Data

Cancer Growth, Disease Progression & Animal Health via weight checks and health assessments, caliper measurements, bioluminescence imaging (IVIS), & serial bleeding

Collection of Specimens for RNA, Protein, IHC and Pharmacokinetic (PK) Analysis

Consultations & Training

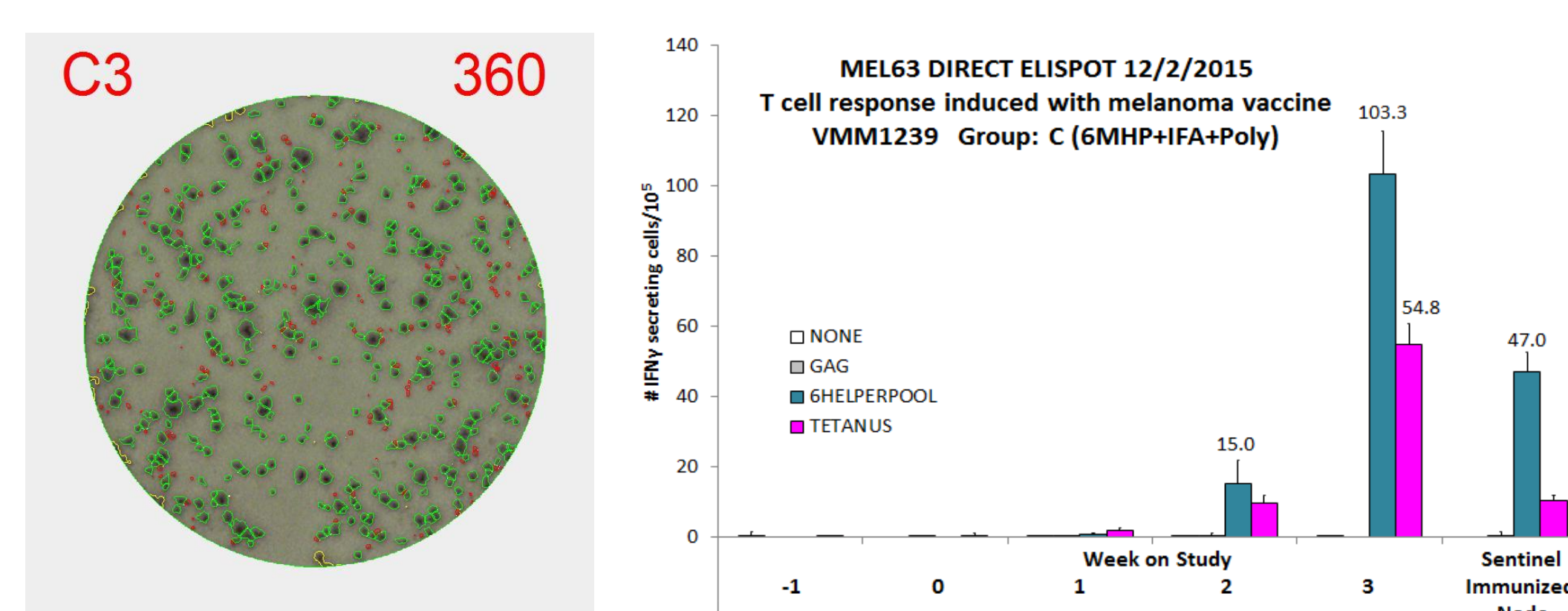
SPECIMEN BANKING

Specimen banking and distribution: Short-term cryogenic sample banking to support clinical trials where investigators anticipate repeated access to the samples for correlative studies. This includes informatics to support specimen tracking, and to manage laboratory data analysis and reporting. *Note: the BTRF provides tissue collection and shipping to clinical trial sponsors, and storage that does not require repeated access.*

ANALYSIS OF HUMAN SAMPLES

Immunologic monitoring of patients on clinical trials. Patient serum, blood, tumor tissue or other tissue may be evaluated by one of several immunologic assays.

Consultation on optimal assays as well as assay development and optimization: ELISpot assay, ELISA assays for serum antibodies or other proteins, ELISA assays of lysates of tumor tissue or other tissue for protein, Cell proliferation assays, and Flow cytometry of PBMC or viable cell suspensions of tumor specimens. Up to 14 antibodies may be studied concurrently, using either intact viable cells or fixed permeabilized cells, or both. Samples may be analyzed in the flow cytometry core after staining in the MITS lab.



Left: CEF Pool response from a normal donor (@200K cells/well) by IFN- γ ELISpot. Right: Immune response to vaccine by ELISpot assay of PBMC

Cell culture and banking of cell lines. Tumor cell lines or lymphocyte cell lines may be maintained in the MITS, for future use in immune monitoring assays or other correlative studies. This includes multiple services:

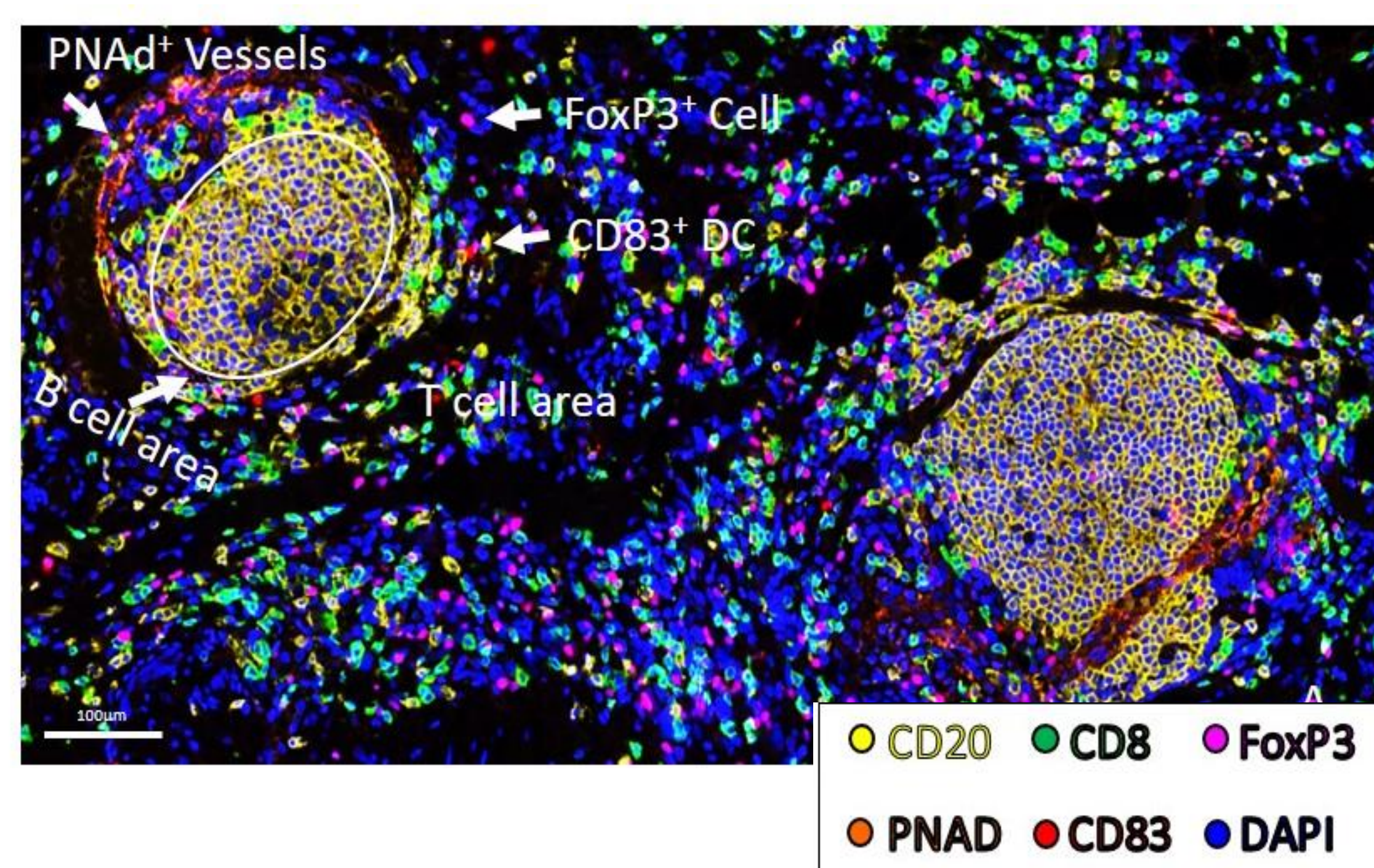
Established cell lines may be passaged in sterile conditions for future use and/or for banking of multiple samples of the cell line(s).

A master cell line bank may be created and maintained for an established cancer cell line.

Registration of new cell lines. Many journals now require testing of working stocks of cell lines to verify that they match the original cell line. Users can work with the MITS staff to have this testing done and information stored.

Cell viability enumeration. Single cell suspensions can be enumerated with the Guava cytometer.

Immunofluorescence multi-parameter tissue histology: Multicolor immunofluorescence on human tissues, formalin-fixed paraffin-embedded. Up to 7 colors can be included on one slide. Automated image analysis included. Over 10 panels relevant for immunologic studies are currently optimized and available. Costs will include disposable supplies, antibodies, and Opal Kits. Additional new panels can be developed, contingent on available antibodies, with consultation and estimation of costs.



NEW SERVICES

New assay development and optimization: Staff and faculty consultation will be available to plan and to design new assays for correlative science.

CLOSELY INTERACTING CORES

- Biorepository and Tissue Research Facility
- Flow Cytometry Core
- Biomolecular Core
- Biostatistics Core

FACULTY and STAFF

Dr. Craig Slingluff Jr, MD Faculty Advisor for human immunology

Dr. Charles Landen, MD Faculty Advisor for murine studies

Primary Staff:

- Kelly Smith, BS, Interim Technical Director
- Marya Dunlap-Brown, MS, Lab Specialist Senior for murine studies
- Samuel Young, BS, Technician

Associated Staff:

- Walter Olson, PhD
- Donna Deacon, BS
- Ileana Mauldin, PhD, Research Assistant Professor

LOCATIONS

The MITS Core is based in three interactive locations:

Immune Monitoring Laboratory (IML) and office occupies 1500ft² on the 3rd floor of the University Hospital West Complex (Old Medical School Building, Room 3835/3842) and includes the main laboratory, ante room, clean room, and small freezer room (3835a,b,c,d). The clean room is a 200ft² facility with positive pressure ventilation and separated from the main lab by an anteroom for gowning prior to entry. Adjacent to this laboratory, is an office area, Room 3842.

Animal Services Laboratory (former MAPS lab). Room 4767 of the Old Medical School Building. This is several hundred square feet of space.

Immunohistology Laboratory (IHL). Room G715 of the Carter-Harrison building houses the Vectra 3 automated quantitative pathology imaging system (Perkin-Elmer) in a 200-slide configuration, plus immunohistochemistry equipment and an adjacent office. Part of this space also is used by Dr. Slingluff in the Department of Surgery for his research work.

Freezer/equipment room on the 4th floor of the Old Medical School Building, Room 4765.