Biospecimen Processing & Biorepository (BPB) LabLaunch Internship 2024

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Fred Hutch Cancer Center

About me

Name: Delaney Dodson
Pronouns: she/her/hers
College I attend: Shoreline Community College
Program: Biotechnology Lab Specialist Certification
Favorite classes: Cell Culture, Ecology, Ornithology
Career interests: Lab work & research
What I enjoy doing for fun: reading fantasy novels & memoirs, running, music
What motivated me to do this program: Gain transferable lab experience and meet new people ☺

Overview of Biospecimen Processing & Biorepository Lab

Lab Members: 10
Principal Investigator: Jianhong Cao, Ph.D.
Key Responsibilities: Blood processing, mycoplasma testing, DNA and cell line preservation, DNA/RNA extraction, PBMC/plasma/serum isolation

LabLaunch intern storing samples in a liquid nitrogen tank

Services & Research Areas: Biospecimen processing, supporting research with lab assays, biorepository services for internal and external investigators
Sample Types: Peripheral blood, cord blood, serum, plasma, cerebrospinal fluid, bone marrow mononuclear cells
Sample Sources: Internal (Fred Hutch & partners) and external research labs/institutes
Lab Tests/Protocols: Flow cytometry, B-cell line transformation, DNA/RNA extraction and isolation, PCR, clinical research SOPs
Data Generated: DNA/RNA purity, biospecimen management, research data

Connection to Fred Hutch mission

The BPB lab supports cancer and infectious disease research by providing a reliable inventory of PBMC, plasma, serum, and other biospecimens for internal and external investigators. BPB aids researchers by processing patient immune cells and sharing valuable information about stored cells. These services advance research and enable new techniques in the fight against cancer and other life-threatening diseases.

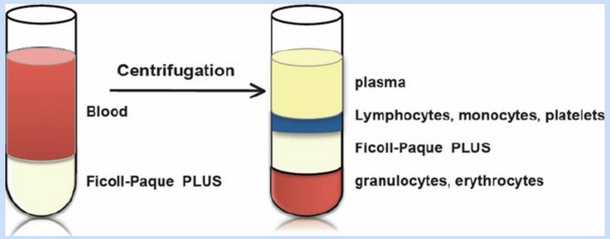
Trainings and skills I learned in BPB

Aliquoting reagents for use in purification/isolation techniques needed in BPB operations:

- Ficoll Hypaque – used as a lymphocyte separation medium
- Viacount – used in quantitative analysis of cell count and viability
- PBS – buffer used in storage and analysis steps of studies involving cells

Processing and cryopreservation of biospecimens via specific Standard Operating Procedures (SOPs) for individual study needs:

- Peripheral blood mononuclear cell (PBMC) isolation -> used in functional assays to assess immune responses such as cytokine production & cytotoxicity
- Serum/plasma -> analyzed to identify biomarkers for diseases, monitor levels of antibodies

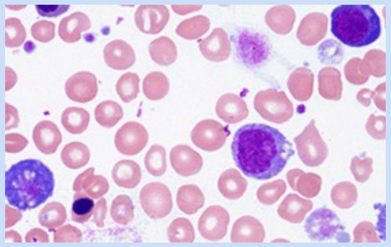


Separation of mononuclear cells based on density gradient created using Ficoll after centrifugation

Maintenance of lab equipment and standard protocols in disposing of hazardous materials and liquids:

- Environmental Health & Safety (EH&S) protocols for hazardous materials handling and accident prevention
- Biohazard waste procedures
- Cleaning freezers regularly
- Following best practices in maintaining clean and sterile environment within lab spaces and biosafety cabinets

Biological hazard symbol used for labeling biological substances that may be harmful to living beings



Peripheral Blood Mononuclear Cells (PBMCs) visualized using a blood smear

Fulfillment of International Histocompatibility Working Group (IHWG) orders and research requests:

- Isolated DNA
- B-lymphoblastoid cell lines
- Peripheral and bone marrow mononuclear cells

Highlight of summer internship

Processing a Cord Blood Sample

The BPB processes Cord Blood samples, which is blood that is collected from the placenta and umbilical cord after childbirth. This type of blood is unique as it contains hematopoietic stem cells, which have wide ranging applications in healthcare and research. From this blood, development of new advanced therapies can be studied and new innovative ways to mitigate cancers and other immunodeficiencies can be uncovered.