

# Systematic Workflow in Ovarian Cancer Biobanking: A Focus on Quality and Standard



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**Aim:** To maintain high quality and standard of biospecimens and associated data for translational research in Ovarian Cancer

## Method:

### 1. Ethical Clearance

The Investigational Review Board at Tata Medical Centre reviews the following documents for a study approval:

- Study protocol
- Detailed Standard Operating Procedures
- Detailed Workflow
- Consent form
- Sample Access Policy by the researchers

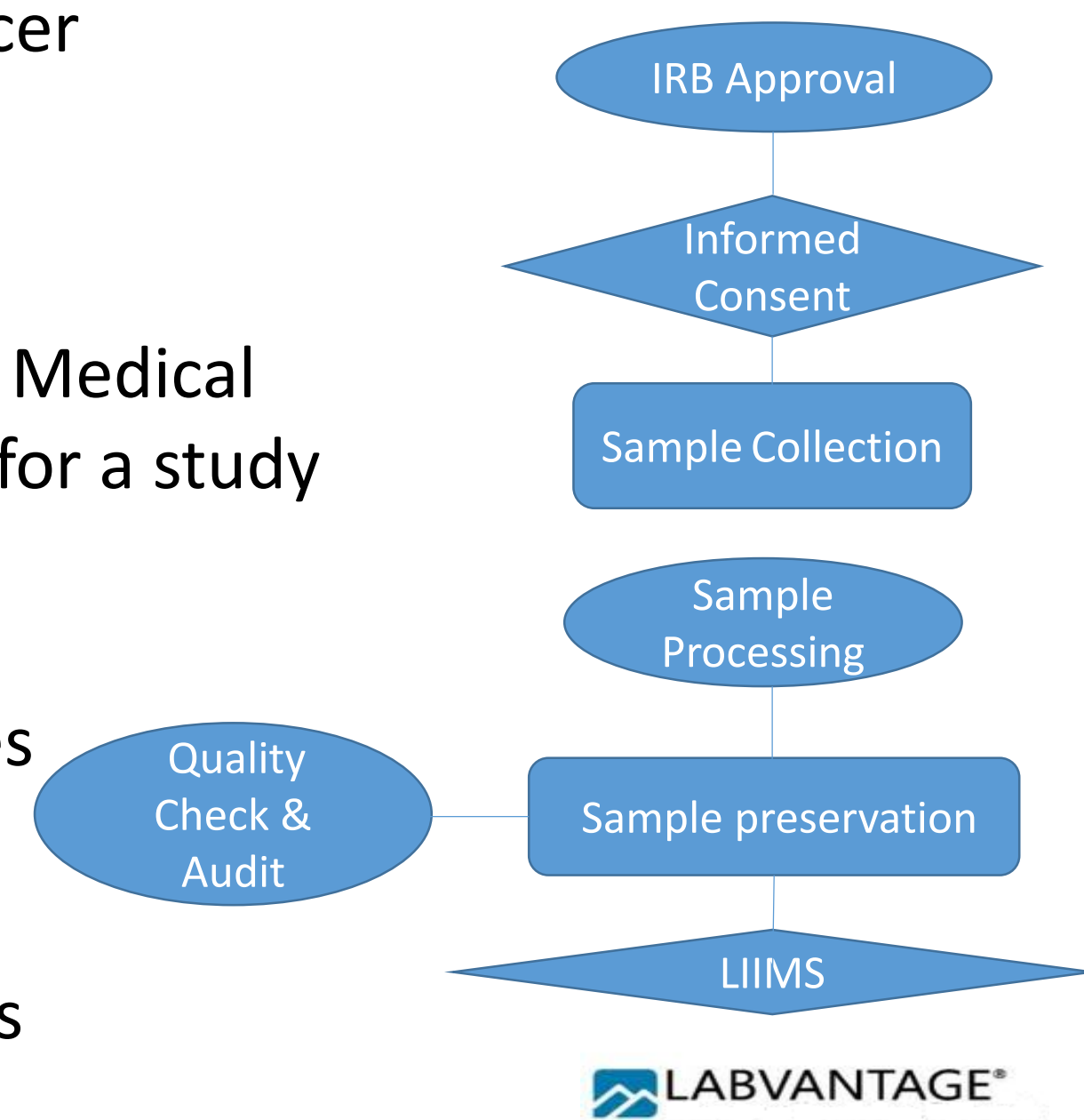


Fig. 1. Systematic Workflow in Biobank

### 2. Sample Collection and Handling

- Informed consents are obtained from Ovarian cancer patients and are pseudo-anonymised with a "BV" ID when they are recruited into the study.
- Blood, ascitic fluid and tissues of ovarian cancer patients are collected from OPD, hospital ward or OT after surgical resection.
- Rapid acquisition is ensured for each type of sample by responsible biobank representatives stationed at respective collection points.
- Samples are transferred in biobank in ice box. Careful measures are taken to reduce the cold ischemic time of tissue samples as well as other pre-analytical variables are minimum.

### 3. Sample Processing

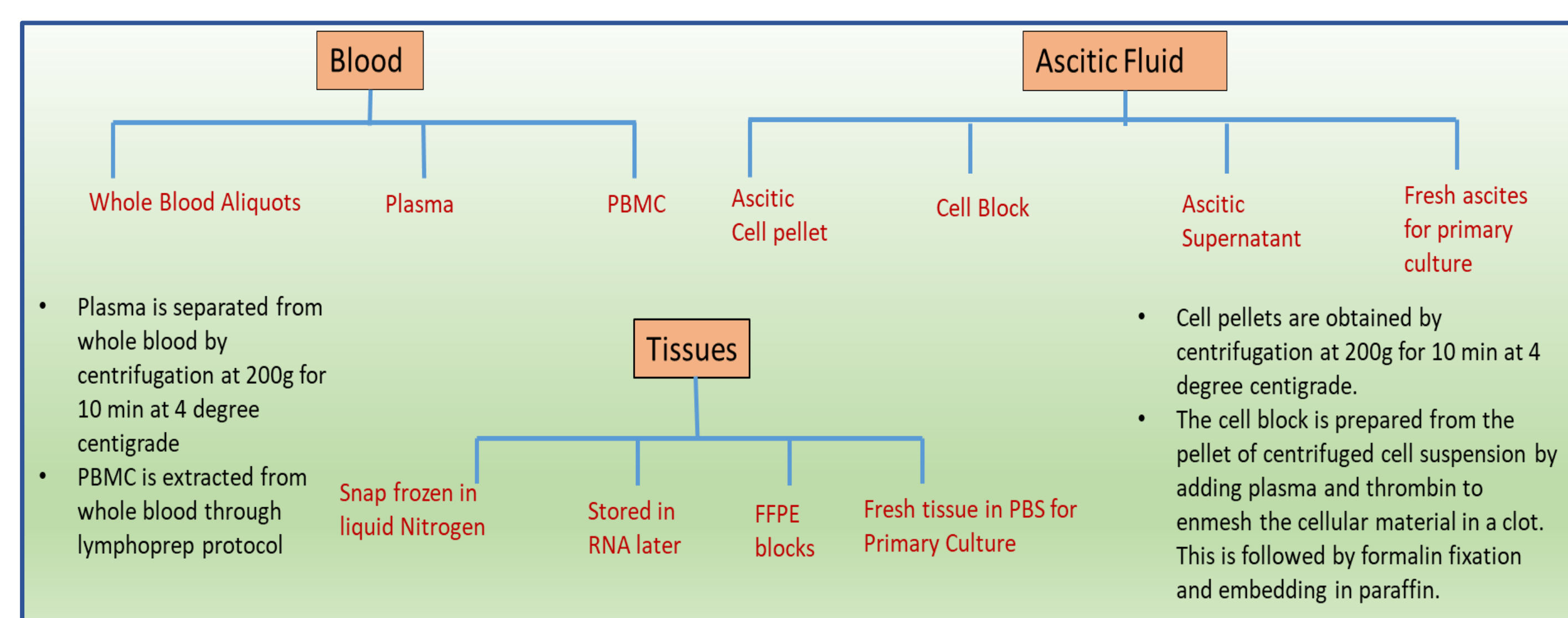


Fig 2. Sample processing in biobank: creation of aliquots and derivatives

### 4. Sample storage

Storage conditions are so chosen that the tissues retain an intact microenvironment and that the DNA, RNA and protein expressions in them as well as the body fluids do not vary significantly during the ischemic interval.

- Whole blood, plasma, PBMC ascitic cell pellet are stored at -80°C.
- Tissues are snap frozen in liquid nitrogen and finally stored at -80°C.
- Tissues are kept in RNA later overnight and finally stored at -80°C.
- Tissues in FFPE blocks are stored at 4 °C.
- Extracted DNA is stored at -20°C.



### 5. Data Storage

#### Laboratory Information Management System

- Nature of sample
- How many aliquots of the sample are preserved and currently available
- How many derivatives have been created
- What are their exact location in the biobank

**Clinical Information Management System**

- Patient demographic data
- Patient case history
- Occupational details
- Association with carcinogens
- Assessment data
- Pre-operative and post operative evaluation

#### References

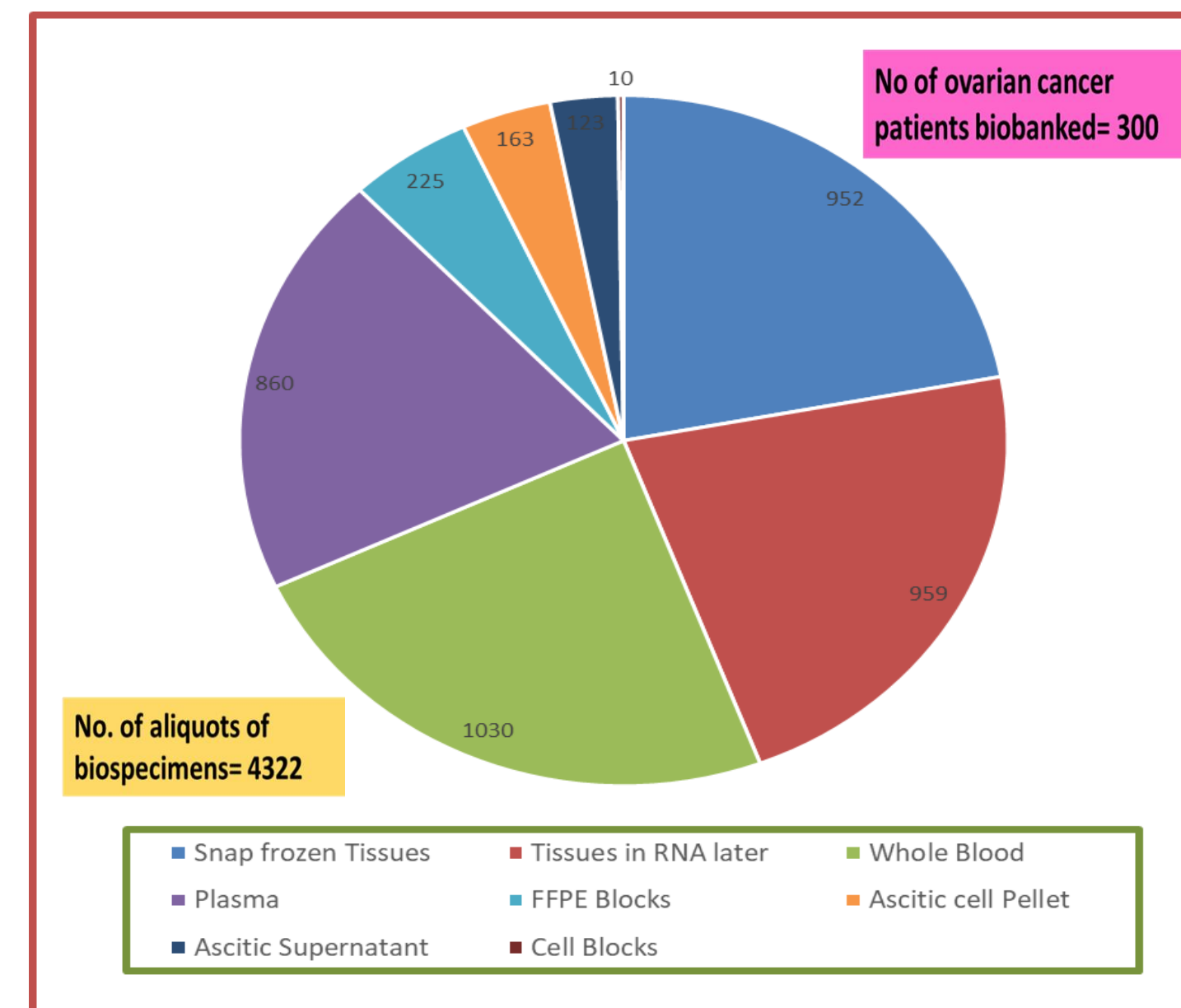
- Obtaining High-Quality Blood Specimens for Downstream Applications: A Review of Current Knowledge and Best Practices. *Biopreserv Biobank*. 2018.doi: 10.1089.
- Banking of Biological Fluids for Studies of Disease-associated Protein Biomarkers *Mol Cell Proteomics*. 2008 , 7(10): 2061–2066.
- The procurement, storage, and quality assurance of frozen blood and tissue biospecimens in pathology, biorepository, and biobank settings. *Clin Biochem*.2014 Mar;47:258-266.



#### Acknowledgement:

Ovarian cancer patients who have consented for research, Gynaecology Team Tata Medical Center, Prof. Vaskar Saha, Prof. Usha Menon, Prof. Samit Chattopadhyay, Dr. Kaushik Sengupta and Dr. Shilpak Chatterjee. Financial support received from DST-UKIERI Govt. Of India, PROVAT 1 & 7 (MedGenome), TMC Kolkata, TCS (TTCRC), Kolkata..

## Results:



Internal and external audits are conducted to review the quality of documents and examine the procedures undertaken from recruitment, to sample collection, processing and storage according to the Human Tissue Authority (HTA) codes of practice in research as well as their traceability.

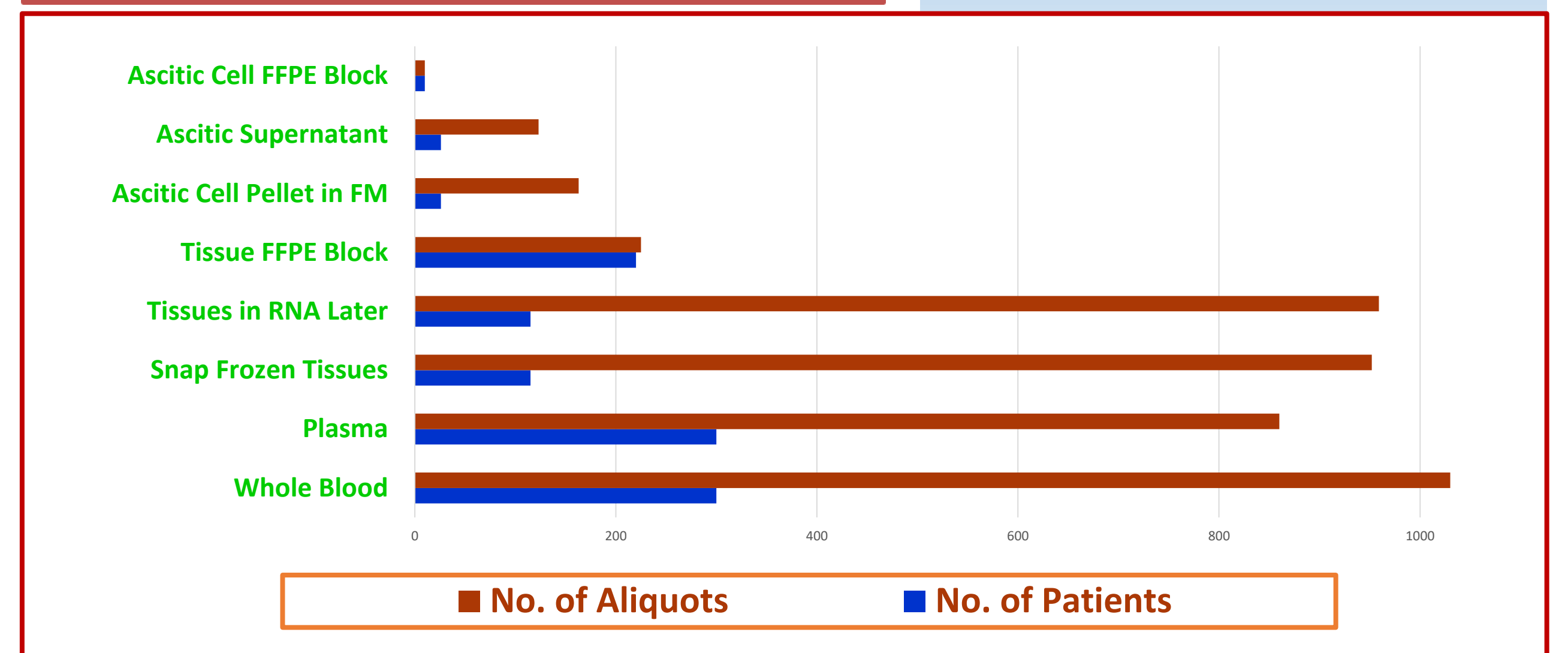


Fig.3 Biobanked ovarian cancer specimens till January 2019

## Quality of samples used in downstream research

|   |       |
|---|-------|
| No. of samples used for DNA extraction                      | 100   |
| No. of samples yielded adequate DNA for downstream research | 98    |
| Average A260/280 ratio                                      | 1.85  |
| DNA Concentration (ng/μL)                                   | 64.12 |

Table 1. QC data of extracted DNA

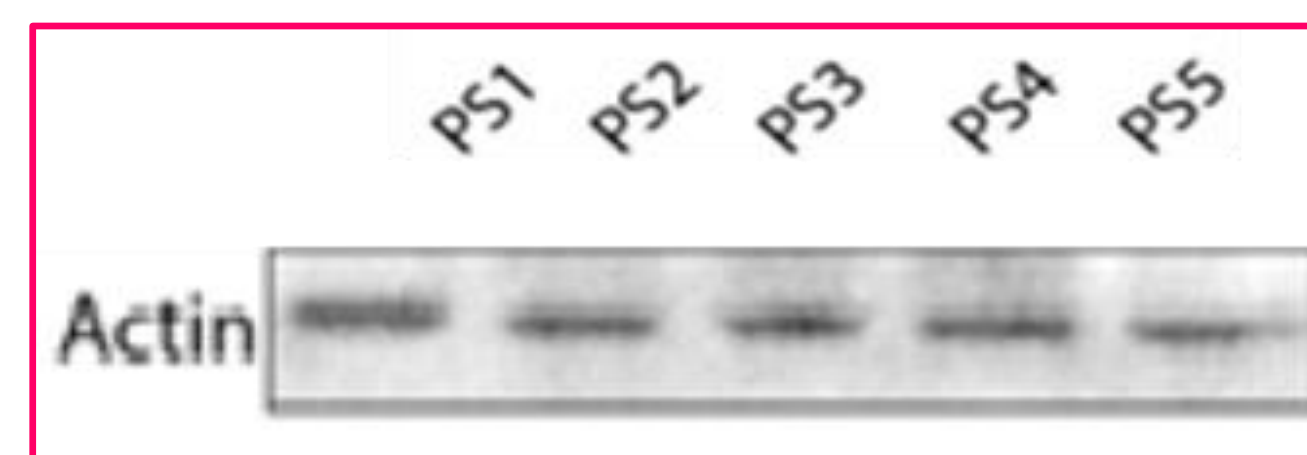


Fig. 4 Representative image of protein expression from tumour tissues obtained from TMC biobank

Protein integrity is maintained in the tissues processed in biobank.

FSC vs. SSC plot and live/dead staining in blood and tissue samples shows that the cells obtained after processing were mostly viable

Fig.5 FACS analysis of blood and tissue of ovarian cancer patient

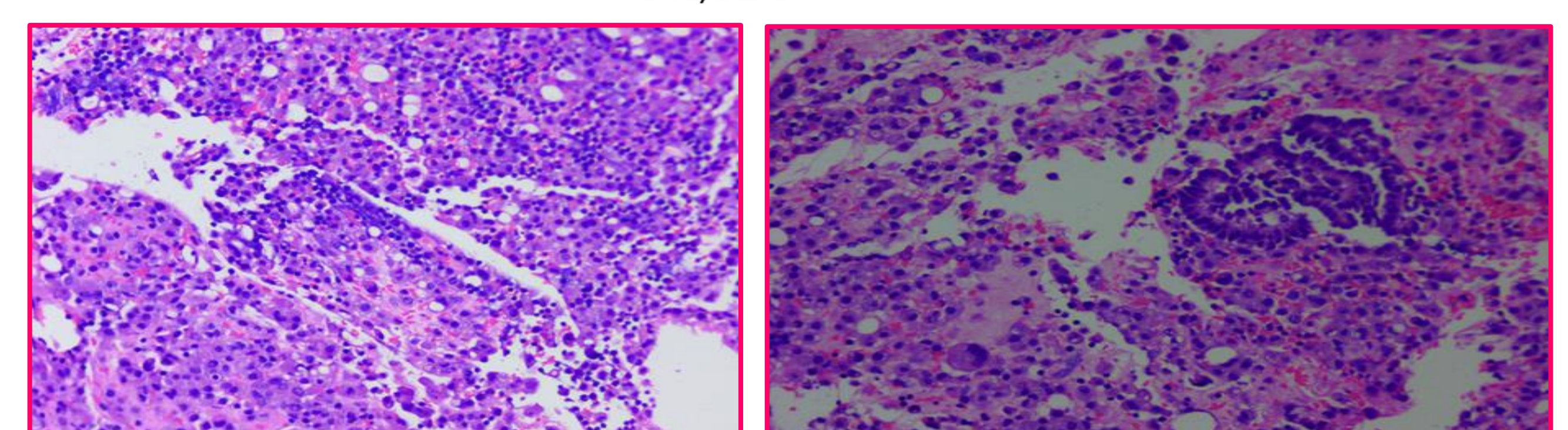
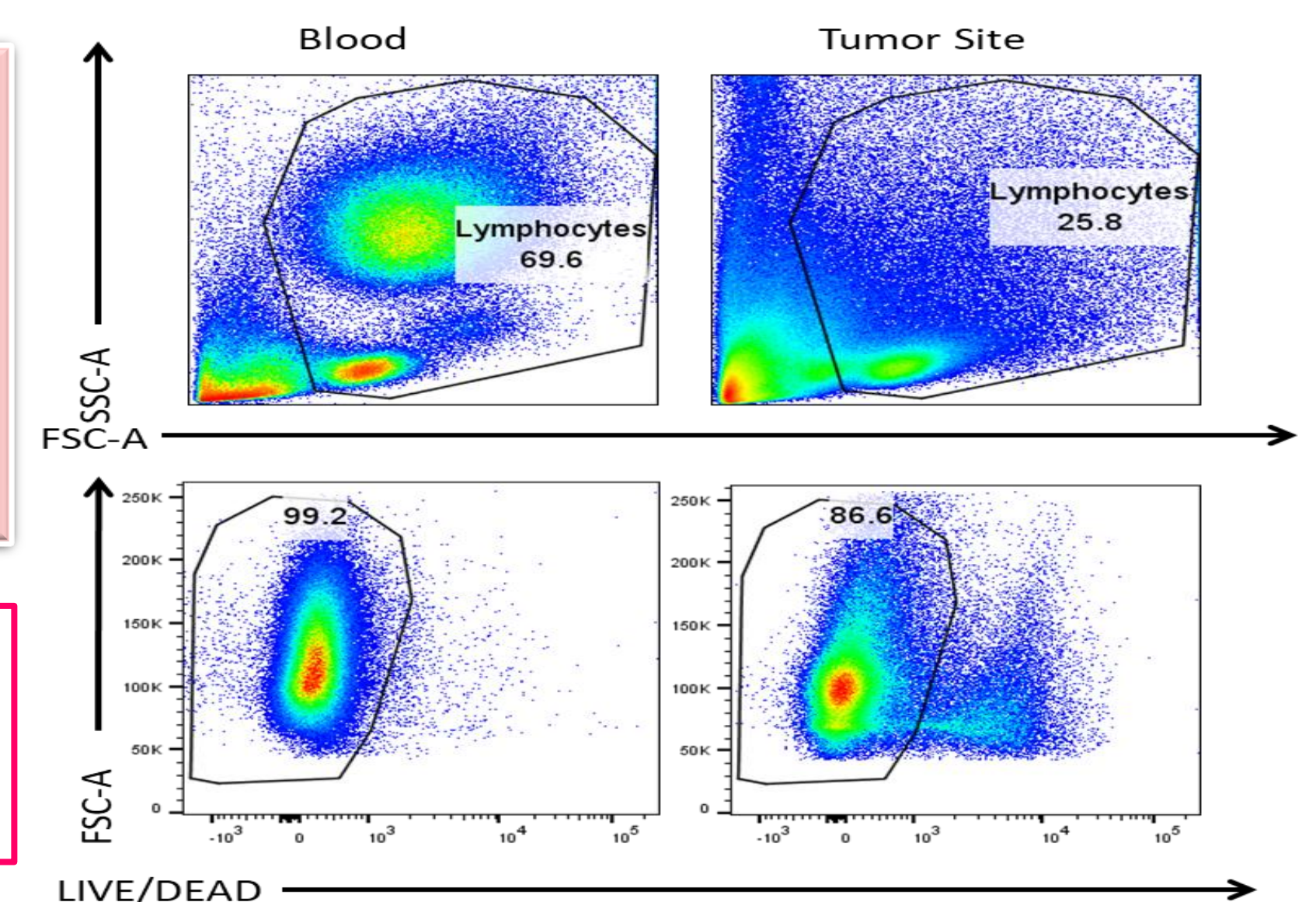


Fig. 6. H&E stained sections of FFPE cell block obtained from ascites of ovarian cancer patient, 20X magnification

#### Future implication

The process of biobanking ensures ethical and standard guidelines for collection, handling and storage of biospecimens to make high quality samples available for translational research. Seamless co-ordination between clinical and research team enables excellent qualitative and quantitative output.

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