DEPARTMENT OF ONCO-PATHOLOGY

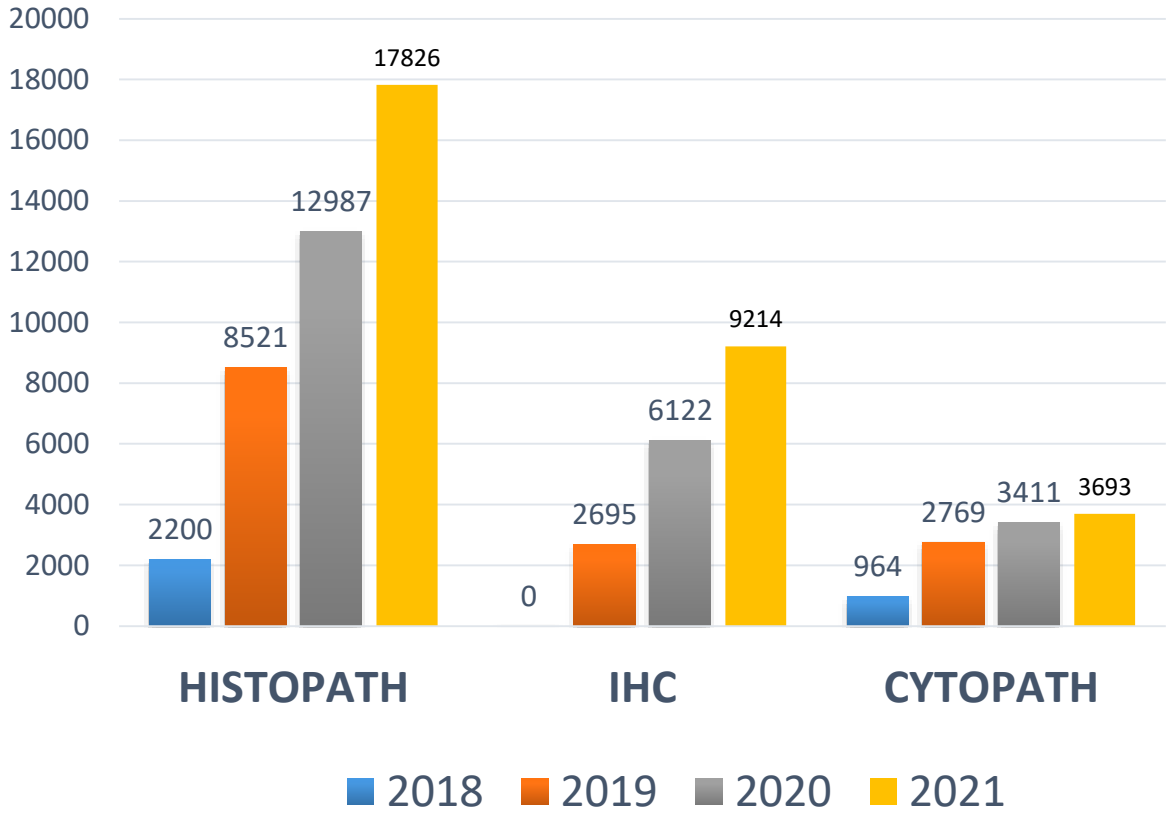
A. HISTOPATHOLOGY & CYTOPATHOLOGY LABORATORY
B. MOLECULAR PATHOLOGY LABORATORY

Histopathology & Cytopathology Laboratory under the Department of Oncopathology provides a wide range of in-house diagnostic services of histopathology, fine needle aspiration cytology, exfoliative cytology, frozen section services, immunohistochemistry (IHC) and molecular pathology tests for patients treated at MPMMCC/HBCH as well as for referral cases from outside hospitals. The laboratory is well-equipped with automated tissue processors, automated slide stainers, automated immunostainers, grossing stations, microtomes, embedding stations, biosafety cabinet, electrical bone saw, bone decalcifier, cover slip mounting device, cytocentrifuge, cryostats and immunohistochemistry analysis for diagnostic, predictive and prognostic markers are enabled in the department both through automated and manual methods. An extensive panel of IHC markers are available in the department, numbering almost 140, which greatly helps in achieving the precise diagnosis and also in predicting response to certain targeted therapies, in otherwise terminally ill cancer patients, whose only management remains palliative care. Thus, such tests with positive outcomes manifest as a ray of hope for these most unfortunate patients. For reporting as well as teaching purposes, the department utilizes mono-header, bi-header and penta-head microscopes. Histopathology reporting is done on Synoptic Reporting System and cytopathology reporting is done in DIS. All the pathology reports are linked to Electronic Medical Record (EMR).

The department started Frozen section services for intraoperative diagnosis from the month of March 2021. More importantly, the Molecular Pathology services commenced from October 2021. With the availability of molecular pathology services now, which is a first in the Purvanchal region by a government institute, the management of the patients, especially those of lung cancer, has been greatly benefitted. Also, the dependency of this institute on the parent institute of Tata Memorial Hospital, Mumbai has lessened. The Department is hopeful that in the very near future, it will become self-reliant in offering a varied range of critical molecular pathology services.

The department rendered diagnostic services to 17,826 Histopathology cases in the year 2021 that included small biopsies, big specimens, cell blocks and referral materials. Overall, there was a rise in total number of cases approximately by 37% over 2020 and a tremendous 109% over 2019. The total number of Cytopathology cases reported was 3693, and Frozen section services were offered in 422 cases. Total number of Immunostained slides pertaining to the IHC was 9214; a rise of 51% over 2020, and an astounding 242% over 2019. Molecular

pathology services (EGFR Mutation Status) were offered to 57 cases, pertaining to lung cancer patients.



Quality Initiatives: The laboratory is enrolled in External Quality Assurance (EQA) proficiency program with reputed laboratories for histopathology, cytopathology and immunohistochemistry.

RESEARCH:

In this era of translational medicine, the Department of Oncopathology has envisaged setting up of fully functional Cytogenetics and Molecular Pathology laboratories in the very near future. This will be of immense benefit in the identification of predictive biomarkers, prognostication of various diseases and diagnostic confirmation of some. The laboratory archives all the slides and blocks and, when required, retrieves and issues them for Institutional Ethics Committee (IEC) - approved projects of pathologists, clinicians, and scientists within the centre. The pathologists are involved as principal investigators or co-investigators in several IEC approved projects, and are actively involved in publication of original articles/case reports in peer reviewed indexed medical journals.

EDUCATION:

The department of Onco-Pathology has applied to the National Medical Commission for provision of DM Oncopathology programme for the next academic session and is hopeful of a positive outcome. The Department regularly participates in joint clinics as well as in the Institute

academic meet. The faculties also participate in national/international conferences. Weekly academic presentations are held in the department. Resident doctors and technical staff are encouraged to participate in conferences and continuing medical education (CME) programs. The department is gearing up for applying to the National Accreditation Board for Testing and Calibration Laboratories (NABL) and acquiring the vaunted accreditation with the objective of maintaining the highest quality in the diagnostic services. Regular assessment of all the staff members as well as the trainees is done and the records related to the Standard Operating Manuals (SOPs), equipment, inventory and the log sheets are being maintained. Dr. Zachariah Chowdhury was invited as a speaker and delivered a talk on Hodgkin Lymphoma in the monthly webinar series organized by Dr. B Borooah Cancer Institute, Guwahati in September 2021. He also delivered an offline lecture on Interesting Cases in the Department of Pathology at Assam Medical College & Hospital, Dibrugarh in September 2021. Last but not the least, a Pathology Specimen Museum in the department has been established, which is a visual treat and also plays an important part in the fostering of academic environment.

Staff Members:

Professor	Dr. Shashikant C.U. Patne
Associate Professor	Dr. Zachariah Chowdhury
Assistant Professor	Dr Ipsita Dhal Dr Sadaf Haiyat
Scientific Officer (C)	Mr Abhinav Kant Mr S. Rajasekhar, Ms Shailja Singh
Scientific Assistant (B)	Mr Avinash Anand Mrs Poonam Adhav Mr Dharmendra Mishra Ms Ragini Yadav
Scientific Assistant	Mr Ramresh Yadav, (Adhoc) Mr Chandra Prakash, (Contractual) Miss Jyoti Patel, (Contractual) Mr Sunil Kumar Adhav, (Contractual) Mr Brikh Raj Pandey, (Contractual)
Laboratory Technician	Ms Preeti Verma Ms Anita Kumari Ms Manisha Kumari
Others	Mrs Monalisha Anand, Typist Mr Vikash Jaiswal, Trade Helper Ms Hema Singh, Trade Helper Mr Pintoo Bharti, Laboratory Attendant Mr Durga Prasad Pathak, Housekeeping Staff Mr Sunil, Housekeeping Staff Mrs Sonam Maurya, Housekeeping Staff

C. HEMATOPATHOLOGY LABORATORY

Under the Department of Onco-Pathology, Hematopathology Laboratory at HBCH/MPMMCC is a service laboratory for the diagnosis of hematological malignancies, monitoring of patients while on therapy for all malignancies and preoperative & postoperative hematological workup of surgical patients. The laboratory does Minimal Residual Disease testing for post treatment monitoring of patients of B Cell Acute Lymphoblastic Leukemia, T cell Acute Lymphoblastic Leukemia, Acute Myeloid Leukemia and Multiple Myeloma as well as stem cell enumeration by flow cytometry. The process of establishing and standardizing Molecular techniques including RQ-PCR, Sanger Sequencing and Next Generation Sequencing is underway and is likely to get over in next few months. The laboratory lays great emphasis on quality and follows a strict quality control protocol as per the NABL guidelines.

Service

During 2021, the laboratory performed a total of **1,41,240** routine tests (hemogram plus coagulation assays including D-Dimer) and specialized tests including **1483** bone marrow aspirate morphology and cytochemistry, **375** fluid cytology and **1500** flow cytometric Immunophenotyping. Lab services include detection of high resolution MRD for acute leukemias (B-ALL, T-ALL, AML) and multiple myeloma as well as involvement of hematolymphoid malignancies in cerebrospinal fluid and other rare sites. The laboratory performs stem cell enumeration assays for pre and post-harvest apheresis samples required for Bone Marrow Transplantation, both for in-house patients and also receives such samples from other institutes like BHU. 1373 samples for molecular testing were outsourced to ACTREC during 2020-21, which will hopefully be started in-house soon.

Research:

Faculty members are engaged in several research projects including:

- Role of immune-escape mechanisms in prognostication of B-ALL and AML patients.
- Utility of newer leukemic stem cell antigens in risk stratification of AML patients.
- Standardization of lymph nodal biopsy flow cytometry and study of new nuclear markers in lymphoma subtyping.
- Analysis of the predictive role of Circulating Tumour Cells detected by flow cytometry as a biomarker in lung cancers.

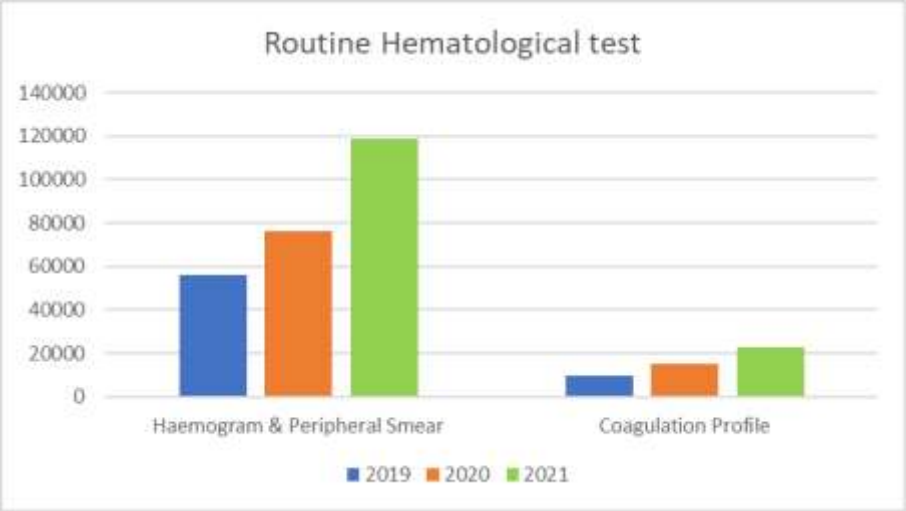
Two posters were presented from the department during the international Haematology Conference 2021 on topics such as correlation of AML-MRD & NGS in AML as well as significance

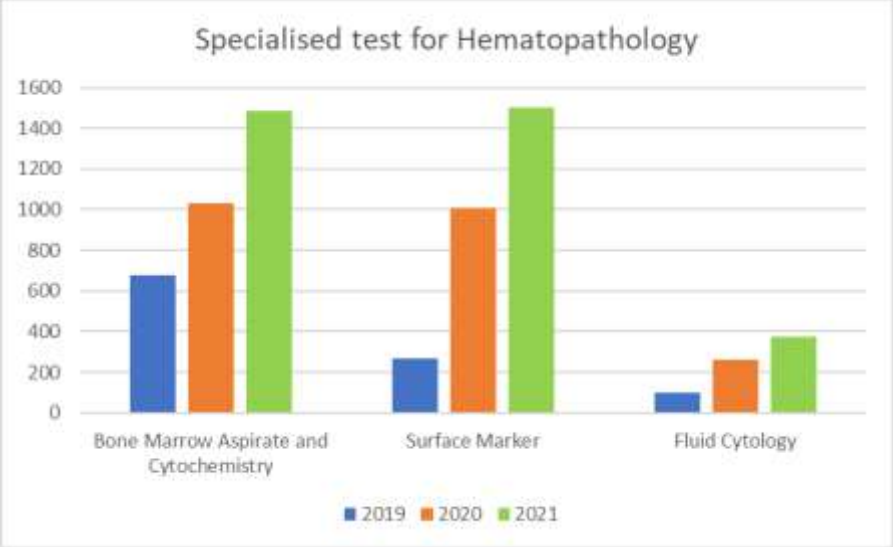
of CSF flow cytometry in improving risk stratification of ALL patients. The faculty are also on the medical expert panel of national clinical trial regulatory bodies such as CDSCO.

Education

In pursuit of NABL Accreditation, all technical staff were imparted training in ISO 15189.The laboratory currently conducts post-basic course in Hematopathology for technicians and is likely to expand the training module to include six months basic and advanced training in flow cytometry and molecular haematology for technicians and a 2-year post MD Hematopathology Fellowship program for pathologists and one-year postdoctoral fellowship in Molecular Haemato-Oncology.

Total number of tests done in Haematopathology Laboratory in the year 2021.





Staff Members:

Associate Professor	Dr. Neha Singh, SO 'E'
Assistant Professor	Dr. Avinash Gupta, SO 'E'
SOC	Mr. Rohit K Kori Mr. Nilesh Dhole