

Board of Studies Meeting

C. Program – Post Doctoral Certificate Course in Hematopathology

Duration -01 year

Program Objectives and Scope of the Course

The one-year PDCC course is focused on providing a comprehensive training in laboratory hematology, to candidates, who have obtained their requisite post-graduate qualification in Pathology. It is designed for young pathologists to plan a career in hematology as an investigative and consultative hematopathologist. The program stresses on inculcating a multi-parametric approach in students for diagnosing various hematological disorders by combining clinical information with routine standard diagnostic hematopathology and complementing it with the data obtained from ancillary investigations like flow cytometry and molecular techniques. These trained students may go on to become independent hematopathologists or further refine their training by opting for DM courses or fellowships in specialised areas like flow cytometry/molecular genetics.

Objectives - The PDCC course will encompass the key areas of laboratory hematology to train the Medical Post graduates as laboratory hematologists, so that at the end of the training program, the student will have an in-depth understanding about the etiology, pathogenesis, and diagnosis of various hematological disorders.

Program Outcomes – The ‘PDCC Hematopathology’ program outcomes are enumerated below. The program will enable the candidate to acquire the following skills -

1. Diagnose all patients with neoplastic and non-neoplastic hematological disorders, specially related to bone marrow pathology.
2. Perform specialized investigations like flow cytometry, platelet function assay, factor/inhibitor assay etc.
3. Gain exposure on molecular hematology, its principles, utility and an in depth knowledge of different molecular techniques used in the diagnosis and management of benign and malignant hematological disorders.
4. Collate and interpret laboratory and clinical data so as to guide management of patients with hematological diseases.
5. Orient oneself for advanced diagnostic techniques in hematology.
6. Interpret results of low-resolution HLA typing and Chimerism.
7. Has acquired skills to establish an effective communication with the patients, patients' relatives, health administration, and academicians in the field of laboratory and clinical hematology.

Course Curriculum for PDCC Hematopathology

The training PDCC degree shall be on a full-time responsibility for the tasks/investigations entrusted to his / her care. Training will include involvement in laboratory work, OPD work and research studies. The participation of the students in all facets of educational process is essential.

Minimum Qualification Required for Admission

Lt Col Varun Bajpai
Executive Registrar
SGPGIMS, Lucknow

44

[Handwritten signatures and initials]

Board of Studies Meeting

5. Apply basic hematological skills like performing bone marrow, staining smears, sample preparation for flow cytometry etc.
6. The student shall also develop an understanding of the working of different automated platforms in the laboratory involve in processing samples. The basics of hematology analysers, coagulation analysers, HPLC, flow cytometry etc involved in routine practise.
7. He will also develop skills to understand the principles of different advanced laboratory tests like FISH, cyto genetics, HLA typing and molecular tests, their applications and interpretation of reports.
8. He should be able to communicate the reports in a meaningful manner to the clinicians and their impact on diagnosis and prognosis.
9. Should also acquire basic skills of the role of laboratory in HSC and transfusion medicine.
10. Quality assurance of laboratory

Training in Allied branches

1. Transfusion Medicine

- A. ABO/Rh typing
- B. Cross matching
- C. Blood components preparation and storage
- D. Direct and indirect antiglobulin (Coombs) tests, warm and cold autoantibody (Cold agglutinin) titre, Donath Land-stainer cold auto antibody screening and titration.

2. Medical Genetics

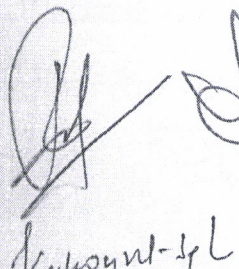
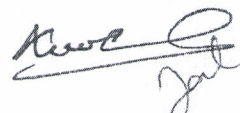
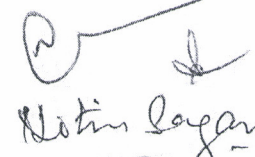

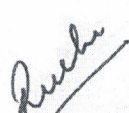

- A. Principles and practice of separation and identification of normal and abnormal hemoglobin by electrophoresis and chromatography
- B. Screening for red cell G6PD deficiency and quantitative estimation of red cell G6PD activity.
- C. Principles of estimation and significance of serum ferritin, Iron and TIBC.

Training Schedule

S No.	Posting	Duration (mo)
1	Morphology (Bone marrow/Lymph node/Peripheral Smear reporting)	04
2	Flow cytometry	03
3	Molecular and Transplant Biology Laboratory	01
4	Coagulation Laboratory	01
5	Cancer cytogenetics Laboratory	01
6	Medical Genetics	15 days
7	Transfusion Medicine	15 days
8	Clinical/OPD/Ward Posting	01


Lt Col Varun Bajpai vs
 Executive Registrar
 SGGIMS, Lucknow

46

Board of Studies Meeting

Method of Computing Program Outcome

Evaluation

The candidates will be evaluated by continuous assessment and a formal exit examination at the end of 1 year.

The summative assessment examination shall include two heads:

- A. Theory examination.
- B. Practical, Clinical examination, and Viva-voce.

Theory examination and Practical/Clinical, Viva-voce shall be separate heads of passing.

Theory examination shall comprise of 02 papers, each representing the two courses included in the program. Passing percentage shall be cumulatively 50% with minimum of 40% marks in each theory paper.

Practical /Clinical examination consisting of

- (i) Morphology slides
- (ii) Practical exercises,
- (iii) Short clinical cases/case scenarios
- (iv) Laboratory spots
- (v) viva voce

Passing percentage shall be 50%. The detailed marks are provided below -

Examination Scheme –

Theory

Total marks - 200

S No.	Papers	Max. Marks
1	Basic and Laboratory Hematology	100
2	Hematopathology – neoplastic and non-neoplastic	100
Total Marks		200

Practical -

Total marks – 300


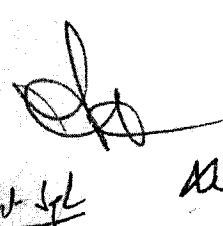
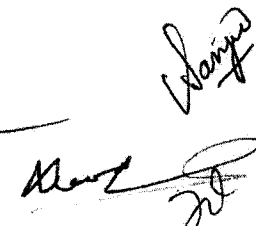
S No.	Exercise	Max. Marks
1	Microscopy Slides (15)	100
2	Short case (02)	50
3	Laboratory Competence (Practical Exercises) (02 * 25 marks) Laboratory Spots (10 * 5 marks)	100
4	Viva - Voce	50
Total Marks		300

Varun

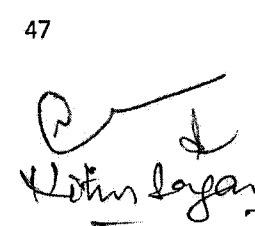
Lt Col Varun Bajpai vs
Executive Registrar
SGPGIMS, Lucknow


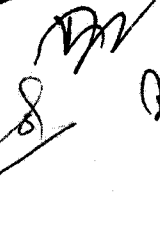
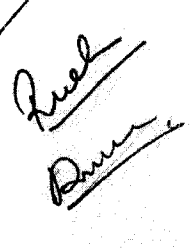
Marks required for passing the examination: The candidate should obtain a minimum of 50% separately in theory, clinical and laboratory examination.

Continuous monitoring progress of studies (Internal monitoring)

47



Board of Studies Meeting

Continuous appraisal and regular assessment of the candidate will be carried out. The monitoring shall be done by the faculty in the department based on participation of the students in various teaching / learning activities like

1. Journal club presentation
2. Clinical lab meets
3. Seminar
4. Microteaching.

Log book

Every candidate shall maintain a work dairy and record his/ her participation in the training programs conducted by the department such as journal reviews, seminars, etc. Special mention should be made of the presentations and procedures performed by the candidate. The student's monthly performance will be recorded by the faculty of the department / laboratory where he / she has worked. The log book shall be scrutinized and certified by the Head of the Department and presented in the university examination.

Course (Theory and Practical)

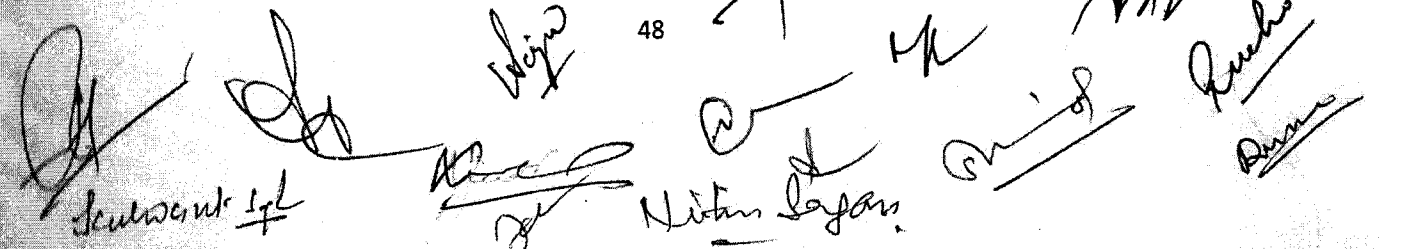
The syllabus covered by the candidate is broadly listed below. The post-graduate student will be responsible primarily for the acquisition of knowledge in all areas of Haematopath by actively participating in the weekly academic programs comprising of seminars, seminars, lectures, journal review meetings, clinical rounds, case presentations, discussions and other continuing medical education (CME) activities.

A. Theory

1. Basic Science
 - a) Normal hematopoiesis
 - b) Hemostasis
2. Disorders of Red cells
 - Nutritional Anemia
 - Hemolytic Anemia
 - Thalassemia and other Hemoglobinopathies
 - Other Red cell disorder
3. Disorders of Hemostasis and coagulation
 - Thrombocytopenia and platelet disorders
 - Coagulation disorders
 - Thrombosis
4. Benign and immunological disorders of Leucocytes
 - Infectious mononucleosis and other EBV associated disorders
 - Immunodeficiencies
 - Langerhan cell histiocytosis
5. Hematological Malignancies
 - Myeloproliferative Neoplasms



Lt Col Varun Bajpai vs
Executive Registrar
SGPGIMS, Lucknow


48
Nitin Bajpai

Board of Studies Meeting

- Myelodysplastic Syndromes
- MDS/MPN overlap disorders
- Acute Myeloid Leukemia
- Disorders of Mast cells
- Acute Lymphoblastic Leukemia
- Plasma cell disorders
- Mature lymphoid neoplasm/Lymphoproliferative disorders
- 6. Hematopoietic stem cell transplantation
 - HLA typing and family screening for donors
 - Stem cell mobilisation and enumeration
 - Stem cell harvest, processing and storage
 - Post transplant chimerism analysis
- 7. Laboratory organization and management
- 8. Quality assurance of laboratory

Practical Skills

1. General Laboratory Haematology

- A. Blood collection of samples venipuncture and finger prick methods of sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
 - a. Determination of blood counts (Haemoglobin, haematocrit, total WBC and platelets) manually and use of automated electronic blood cell counters including principles and practice.
- B. Preparation of blood films
- C. Staining of peripheral blood films and bone marrow smears with Romanowsky stains, reticulocyte staining, performing Cytochemistry PAS, Myeloperoxidase, Iron staining and reticulin stain.

2. Laboratory Investigation of Haemolytic Anaemias

- A. HbS solubility test/ Screening for unstable hemoglobin (heat instability and Isopropanol tests).
- B. Supravital staining for HbH inclusions.
- C. PNH flow cytometry.

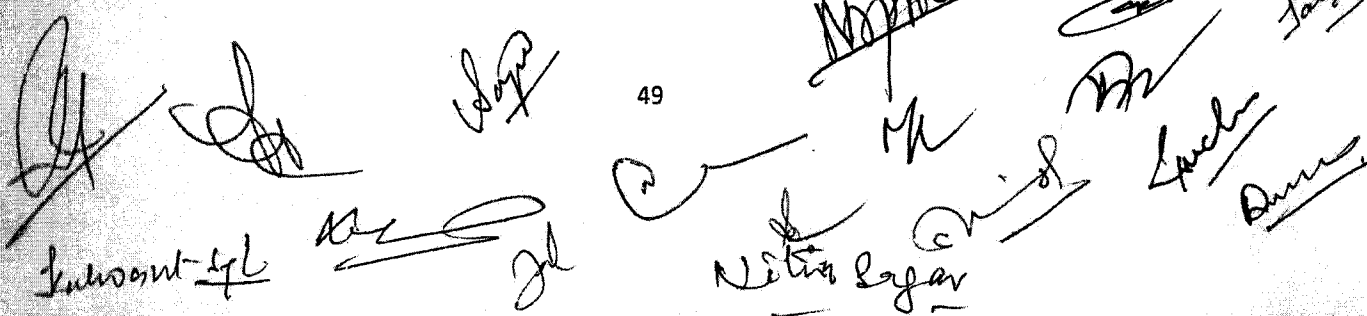
3. Laboratory Investigation of Bleeding and Thrombotic Disorders

- A. Basic coagulation screen and coagulation factor abnormalities
- B. Correction/Mixing studies
- C. Manual and automated factor assays
- D. Urea solubility test for factor XIII
- E. Factor Inhibitor – screening and quantification.
- F. Platelets - Principles, practice and interpretation of platelet aggregometry tests.
- G. Principles for assays of plasma AT III, protein C, protein S activated protein C resistance.
- H. Screening for lupus anticoagulant and anti beta 2 gpI antibody screening tests- principles screening tests and interpretation of results



Lt Col Varun Bajpai vs
Executive Registrar
SGPGIMS, Lucknow

of



Board of Studies Meeting

4. Laboratory Investigations for Hematological malignancies

- A. Screening of samples for flow cytometry including peripheral blood, bone marrow and fine needle aspiration from Lymph nodes
- B. A working knowledge of the principles and practice of flow cytometry, sample preparation and interpretation.
- C. Integration of morphology, flow cytometry and molecular findings

5. Molecular Biology

Understanding the principles involved in the molecular diagnosis of Haematological disorders

- A. DNA and RNA extraction
- B. Principles and Setting up of PCR - Polymerase Chain Reaction.
- C. Principles of RT and RQ- PCR
- D. ARMS/ASO PCR and other techniques to evaluate polymorphisms
- E. Mutation detection principles and techniques
- F. Sequencing – principles and techniques

6. Clinical Skills

- A. Primary management of patients in the OPD
- B. Managing patients in chemotherapy wards.
- C. Administering various chemotherapy drugs

Faculty for the Course -


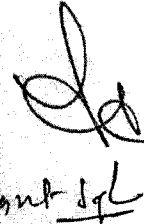
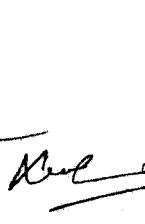
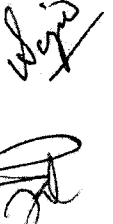
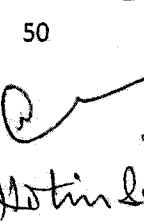
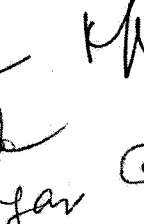

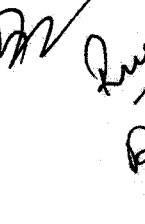
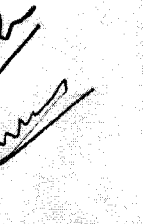
S No.	Name and Designation	Department
1	Dr Soniya Nityanand, Professor (On deputation)	Hematology
2	Dr Rajesh Kashyap, Professor	Hematology
3	Dr Ruchi Gupta, Professor (Lab)	Hematology
4	Dr Khaliqur Rahman, Add Professor (Lab)	Hematology
5	Dr Dinesh Chandra, Assist Professor (Lab)	Hematology
6	Dr Sanjeev, Assist Professor	Hematology
7	Dr Manish Kumar Singh	Hematology
8	Dr R.K. Chaudhary, Professor and Head	Transfusion Medicine
9	Dr Shubha Phadke, Head	Medical Genetics

Revision of the syllabus for PDCC Hematopathology

Syllabus for the PDCC Hematopathology program is revised. This revision is based on the inputs obtained from the students, faculty, alumni, and the subject expert. In revision, we attempted to make our syllabus more comprehensive; further we also tried to make our syllabus appropriate to meet the national and the regional health need and disease burden. Over all, almost 25% of syllabus was revised.


 Lt Col Varun Bajpai vs
 Executive Registrar
 SSGPIMS, Lucknow

50

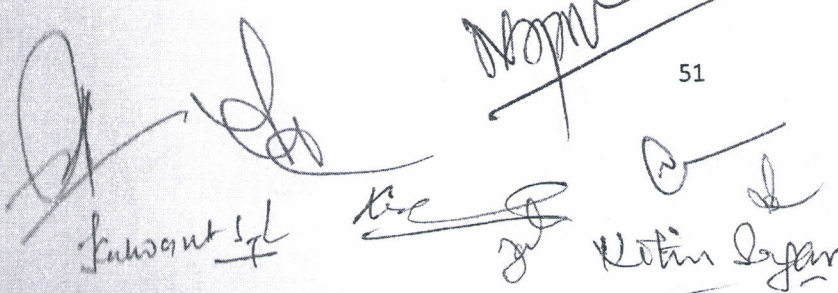
Board of Studies Meeting

Addition done in syllabus of the PDCC Hematopathology program after revision

1. Principals of Immuno-/Cellular therapy
2. Molecular monitoring of residual disease in acute leukemias
3. Applicability of next generation sequencing in leukemias, unexplained anemia
4. Basic concepts of Hereditary Immunodeficiency Disorders
5. Basic knowledge of bio-informatic tools
6. Methods of HLA typing (serological and cell-based)
7. Principals and applications of Next Generation Flow Cytometry
8. Application of Newer technologies in translational research like gene editing, CRISPR etc



Lt Col Varun Bajpai VS
Executive Registrar
SGPGIMS, Lucknow



Subroto Saha
Anupam
Kotim Saha



Handwritten signatures of other board members.