

Department of Laboratory Medicine

(Seoul National University Hospital)

1. Introduction

Department of Laboratory Medicine is dedicated to perform various laboratory tests required for the diagnosis and therapeutic monitoring of patients. The subspecialties of the laboratory medicine are diagnostic hematology, clinical chemistry, diagnostic immunology, clinical microbiology, molecular genetics, and cytogenetics. A total of 250 faculty members which consist of laboratory physicians and medical technologists provide the highest quality and the specialized laboratory tests for patients and physicians. Department of Laboratory Medicine performs about 20 million tests per year. The test items cover from simple urine dipstick tests to complex genetic tests. The number of the test items is more than 1,200 and is steadily on the rise. We participate in proficiency tests and are certified from the key domestic and international accreditation bodies. Besides managing and performing routine laboratory tests of various fields, consultation to physicians for laboratory tests are major roles of laboratory physicians.

The major research areas of the laboratory physicians are various subjects related to clinical laboratory tests which covers the discovery and verification of biomarkers for numerous diseases. We have the most up-to-date laboratory techniques and instruments for the diagnosis and discovery of biomarkers. Joining the training program will guide the trainee through the routine laboratory tests and the way to the research.



2. Short-term visiting fellowship program

The trainee is expected to learn the essential components of laboratory tests. They are preanalytical, analytical, and postanalytical phases of each area of the laboratory tests. More specifically, the basic components of the laboratory management such as design of a laboratory, selection and introduction of instrument and reagents, staffing, and quality assurance of quantitative and qualitative tests are covered. The trainee can also participate in the interpretation of the laboratory data and consultation to physicians.

1) Duration: 2 weeks or 4 weeks program. Specialized areas can be selected by the trainee in 4 weeks program.

2) Accommodation: Accommodations can be made in the dormitory located inside the hospital compounds. Nearby motels at 10 minutes of distant on walk are another option by trainees' will or when the dormitory is not available.

3) Educational contents

① Molecular genetics

- Molecular diagnostics for hereditary tumor: to understand molecular characteristics of hereditary tumor syndromes (including hereditary breast/ovary syndrome, hereditary non-polyposis colorectal cancer, neurofibromatosis, multiple endocrine neoplasia, pheochromocytoma/paraganglioma syndrome, and so on) and to learn how to apply various molecular techniques to diagnose them

- Molecular diagnostics for solid tumor: to understand role and significance of genetic abnormalities (KIT, RAS, EGFR, ALK, and so on) in cancer development and progress, and to learn how to apply various molecular techniques to diagnose them

- Molecular diagnostics for hematologic malignancy: to understand role of genetic abnormalities (BCR-ABL1, RUNX1-RUNX1T1, PML-RARA, Ig or TCR rearrangement, JAK2, FLT3, CEBPA, and so on) in development and progress of hematologic malignancies, and to learn how to apply various molecular techniques to diagnose them

- Molecular technology for oncology: to learn principles and applications of various molecular technologies from basic ones like nucleic acid extraction or PCR to more advanced ones like genome sequencing

(2) Cytogenetics

Short Title	Duration	Detailed Contents
G-banding karyotyping of leukemic cells	1 week	WHO genetic changes of AML Myeloma G-banding Technic
Molecular cytogenetic karyotyping	1 week	FISH staging for ALL, AML, MPN, MM Probe strategy: Principles Signal Reading and Interpretation
Quantitation of Interphase Telomere (Demonstration)	2 days	Gallery Demonstration & Self Tutorial Review

(3) Clinical Chemistry

- General laboratory management issues: design of a laboratory, selection and introduction of instrument and reagents, and staffing
- Quality control and assurance program to guarantee the highly precise and accurate laboratory tests
- Automation of laboratory tests in preanalytical, analytical, and postanalytical phases
- Clinical significance of clinical chemistry test items

(4) Diagnostic hematology

- Interpretation of laboratory tests related to hematologic disorders such as CBC, bone marrow biopsy, special staining, flow cytometry, and cytogenetics
- Coagulation tests and interpretation of the results
- Selection and establishment of laboratory techniques related to diagnostic hematology

(5) Clinical Microbiology

- Selection and establishment of laboratory techniques related to clinical microbiology depending on the types of specimens, test volumes, and automation.
- Identification and antimicrobial susceptibility testing for common pathogens
- Identification and antimicrobial susceptibility testing for drug-resistant pathogens

- Specific issues related to bacteria, virus, fungus, and mycobacteria
- Infection control program

⑥ Diagnostic immunology

- Techniques, quality control, and interpretation of HLA typing, HLA crossmatching, and PRA tests
- Techniques, quality control, and interpretation of serologic tests
- Types of autoantibodies and their identifications

⑦ Transfusion medicine

- General issues related to blood donation, storage, and issue
- ABO/Rh typing, crossmatching, and unexpected antibodies
- Indication of various apheresis and techniques of apheresis

4) Curriculum

- The curriculum can be arranged depending on the trainee's interest and the faculty's schedule

5) Routine time table

Mon	Tue	Wed	Thu	Fri
8 am Observation and training of laboratory tests	8 am Journal club Lab meeting	8 am Staff lecture Lab meeting	8 am Observation and training of laboratory tests	8 am Conference Lab meeting
1 pm Observation and training of laboratory tests	1 pm Observation and training of laboratory tests	1 pm Management meeting	1 pm Observation and training of laboratory tests	1 pm Observation and training of laboratory tests
4 pm Interpretation and reporting of results	4 pm Interpretation and reporting of results	4 pm Interpretation and reporting of results	4 pm Interpretation and reporting of results	4 pm Interpretation and reporting of results

6) Research activities

① Molecular genetics

Research activities focus on development or application of novel diagnostic and discovery of novel genetic causes of various disorders.

② Cytogenetics

Prof. Dong Soon Lee is a hematopathologist with special interests in oncology. Research project includes molecular cytogenetic study, tailored treatment of cancer, bio-cell chip development and histopathology of bone marrow. She is in charge of Molecular Imaging Laboratory with development of Bio-cell chip. Bio-cell chip is a cell array which hundreds of single cells are fixed onto a small slide glass. Each cell on the chip has been sampled from a patient's lesion and has been through a preservation process to maintain its morphology, proteins, and genes. 300~500 pcs of cells are fixed onto a small area of 70 mm X 30 mm. This chip can be used to test hundreds of samples at once or to carry out hundreds of tests on one kind of sample at once. Bio Cell chip technology is a "cell version" of Ultra-high throughput technology which enables large number of multiple tests to be done on many, various samples.

③ Clinical chemistry

Research activities focus on discovery and verification of novel biomarkers using proteomics technology. LC-MS/MS based techniques are basic approaches for discovery and the verification of candidate biomarkers in various types of samples, such as plasma, serum, cells, and tissues. Verification of genetic variation in protein level is another area of interest.

④ The trainee can contact each faculty member for specific research activity in advance.



3. Faculty lists in Department of Laboratory Medicine

Clinical Microbiology



Eui Chong Kim

Professor

Transfusion Medicine



Kyou Sup Han

Professor

Molecular genetics



Sung Sup Park

Professor



Moon Woo Seong

Clinical assistant professor

Diagnostic immunology



Myoung Hee Park

Professor



Eun Young Song

Associate professor

Diagnostic Hematology



Dong Soon Lee

Professor



Hyun Kyung Kim

Associate professor

Cytogenetics



Dong Soon Lee

Professor

Clinical Chemistry



Sang Hoon Song

Clinical assistant professor

4. Homepages

Seoul National University Hospital

<http://www.snuh.org/english/>

Information of Korea

<http://www.visitkorea.com/>

Information of Seoul

<http://www.visitseoul.net/>

5. Contact point

Sang Hoon Song (Clinical assistant professor)

E-mail : cloak21@snu.ac.kr