CMLTA COLLEGE OF MEDICAL LABORATORY TECHNOLOGISTS OF ALBERTA

WHAT ARE THE SPECIALIZED ANALYSES PERFORMED BY MEDICAL LABORATORY TECHNOLOGISTS?

MLTs utilize hundreds of analytical techniques and technologies to perform approximately 1.2 million medical laboratory tests each day in Canada. The laboratory tests performed, interpreted, and reported by MLTs provide clinicians and other healthcare providers with accurate, timely, and reliable test results upon which 85% of decisions regarding diagnosis and/or treatment are based.

Biochemistry (Clinical Chemistry) – is the study of the chemical and physiochemical processes utilizing a variety of biochemical analyses, including those to determine cholesterol and thyroid levels, enzyme levels for heart disease, and glucose levels for the diagnosis and management of diabetes.

Cytogenetics – is the study of chromosomes and the diseases associated with an abnormal number or structure of chromosomes including prenatal samples, cancer cells, blood and tissues for genetic diseases.

Molecular Genetics – is the study of DNA and RNA and looking for changes or abnormalities in genes which may be associated with specific conditions or diseases such as breast cancer and hemophilia. Molecular techniques can also identify infectious agents (like viruses and bacteria that are difficult or slow to grow in tissue cultures), and the stages of cancer and various genetic diseases.

Diagnostic Cytology - the study of cellular morphology through the microscopic evaluation and interpretation of patient specimens to provide an accurate cytologic diagnosis, including the identification of precancerous and cancerous cellular changes. Cytotechnologists will report negative (normal) gynecological results and work with pathologists in the diagnosis of abnormal findings. Cytologic diagnoses are used in the diagnosis, management, and follow-up of patient disease.

Hematology – is the study of blood, blood-forming tissues, and the related cellular components utilizing a combination of automated instrumentation, microscopic identification, and MLT interpretation. Analysis is necessary for the identification of cells associated with a wide variety of blood disorders such as leukemia and anemia, as well as the investigation of bleeding or coagulation disorders, such as hemophilia, and the monitoring of patients on anticoagulant therapies.

Histology – is the study of the microscopic identification of cells and tissues and requires an understanding of the structure and composition of cells and their organization into various organs. MLTs are responsible for preparing and staining tissues for diagnostic microscopic examination, working with tissue biopsies, and preparing frozen sections for immediate examination for patients in operating rooms.

Microbiology – is the study of the bacteria, fungi, viruses, and parasites that invade the body. The microbiology lab is often divided into the following subspecialties:

> **Bacteriology** – is the study and identification of the bacteria that cause disease in the human body and determination of the effectiveness of various antibiotics.
> **Mycology** – is the study of fungi and fungoid diseases, such as ringworm and thrush.
> **Parasitology** – is the study of parasites found on or in the human body, such as pinworm, roundworm, and tapeworm.
> **Virology** – is the study of viruses and viral diseases, including the identification and management of viral diseases.

Transfusion Science – is the study of antigens and antibodies associated with blood transfusions and it involves a keen understanding of immunology, serology, and genetics. MLTs determine the appropriate blood and blood products to be transfused, analyze various blood components to ensure they are safe for the public, prepare specialized blood products (such as clotting factor concentrates for hemophiliacs or platelets for leukemia patients), and perform tests to determine tissue and organ transplant compatibility.