A TEAM OF PROFESSIONALS TO SERVE OUR PATIENTS.

The pathologist, that Doctor spending hours behind a microscope, studying huge books, presenting colorful pictures and conferences, or dissecting tissue in the back of the lab, and the people working in the different laboratories play a crucial role in the state of the art medical team. Sometimes forgotten, sometimes mystified, and sometimes felt distant, the pathologist is an active agent of care. Pathology in our hospital and any excellent medical center is fully involved with the goal of providing the best medical care for our patients when disease strikes. Pediatric pathology is the medical specialty precisely devoted to children at different stages from the fetus to the grown young adult.

Pathology comes from the Greek words pathos-suffering and logos-word meaning study of. In the most general definition and stated in “Robbins’ Pathologic Basis of Disease Book,” Pathology “is a bridging discipline involving both basic science and clinical practice devoted to the study of the structural and functional changes in cells, tissues, and organs that underlie disease. By the use of molecular, microbiologic, immunologic, and morphologic techniques, pathology attempts to explain the whys and wherefores of the signs and symptoms manifested by patients while providing a sound foundation for rational clinical care and therapy.”

A correct diagnosis based on the examination of tissue or a body fluid that is a representative of a disease is crucial for the right management and therapy of many patients. The information obtained by the pathologist is also important to determine the prognosis or the probabilities of cure, rehabilitation, or recovery from a particular disease. It is of great importance to know whether a specific condition may occur in other siblings or family members when the diagnosed condition has genetic implications.

Pathology is an integrative medical discipline and as such, it is essential that before a final diagnosis is rendered, the pathologist needs to analyze different bearing facts of the case to issue a final report. Therefore, enough clinical information is essential for a sound interpretation of the tissue findings. This is part of the reason why there may be some differences in the turnaround time of a case. As a detective who gathers different pieces of a puzzle, the pathologist, like the clinician, needs to apply different techniques and special methods to arrive at a final conclusion. Consultations with experts in a specific field are readily available in all of the medical specialties. These experts, however, also need basic information and gathering of data before they come up with a reasonable interpretation.

ABOUT OUR SERVICES

Histopathology:
- Diagnosis: the “gold” standard in the classification or naming of many diseases is the histopathologic diagnosis. A biopsy or tissue needs to be processed adequately to be “readable”. Usually it takes between 12 to 24 hours to do this process and have slides ready. This method includes the classical staining of slides with H&E (hematoxylin and eosin) and special histochemical reactions and stains for detection of many different cell and tissue products.

Medical and surgical biopsies and surgical resections are routinely processed by these methods and include tumors, skin, gastrointestinal mucosa, transplanted organs, liver, kidney, lung, brain, bone, lymph nodes, muscle nerves and practically every organ in the human body that requires histopathologic examination. Different techniques and methods are required in each individual case for appropriate examination.

When the results are essential to change surgical or medical management, there are two methods used for a faster answer:
1. Frozen sections.
2. Rapid processing of small biopsies. Each method has specific indications and limitations and the best way to handle these cases is by talking in advance with the pathologist in charge.

Other methods and techniques available and frequently used in the diagnostic are as follows:

Work up of biopsies, fluids and surgical resections include:
1. Immunohistochemistry: special techniques and methods that use antigen-antibody reactions to detect gene products and “markers” that help to identify or classify a disease or condition.
2. Flow Cytometry.
3. Cytology.
5. Molecular and biochemical essays.
6. Microbiologic cultures.

Each case requires a particular way of handling the specimen; therefore, communication with the pathologist and/or pathology personnel is fundamental in the current practice of medicine.

HISTOLOGY NEWS

It is with great joy that we welcome, Cindy Roberts, the most recent addition to our family. Cindy joined the Histology team on, April 1, 2002. She previously worked in our Histology laboratory for a brief time, as a part-time employee, so she may look familiar to some of you. Cindy has been doing Histology since 1979. She did her training in West Germany and took her boards when she returned to the United States in 1983.
News from Histology and Cytogenetics

HISTOLOGY NEWS Cont.

Since then, she has worked in a variety of places including K.U. Medical Center and Saint Joseph Health Center. One of her favorite places to work was in Anchorage, Alaska. Some of Cindy’s expertise involves work with muscles, immunology, and dermatopathology. We are very excited to have her here and are looking forward to utilizing her skills and talents to enhance our ever-expanding field of Histology.

Rickey Hendrix is celebrating 25 years at Children’s Mercy Hospital. He said he began working at the hospital during his senior year in high school, and Rickey has been here ever since. Not too many people can say that today. Congratulations!!!

If you use the morgue, you’ll be surprised to see a new piece of equipment. Now available to you is a brand new computer. The computer will help the pathologist by allowing access to patient information. Another piece of equipment finding its home in the morgue is the old cryostat that used to be in the gross room in the Histology department. It is up and running and is available for use to do a frozen section while doing an autopsy. Eventually, we plan to have the H&E set up and the capability to do an Oil Red “O.” This will hopefully be a great convenience for the pathologist.

We are proud to announce the arrival of a new Leica cryostat in the gross room in the Histology department. Histology is very pleased with it. The Histology department will once again be starting up the muscle procedures with the help of Joan Whiting and Cindy Roberts. We are very glad to have a new cryostat for cutting frozen muscle. With a great new cryostat, Histology hopes to put out great muscle results!

THE CHILDREN’S MERCY HOSPITAL HANDS & HEARTS CYTOGENETIC LABORATORY.

- The CMH Cytogenetic lab is one of two Cytogenetic laboratories in the Kansas City area. Our laboratory performs chromosome analyses and fluorescence in situ hybridization (FISH) studies for CMH as well as many regional hospitals. During 2001, 25% of our sample volume came from CMH patients and the remaining 75% from regional clients.
- Chromosome analysis is performed to answer many different clinical questions. The type of sample needed and methods used in the laboratory depend upon the clinical indication.
  - Peripheral blood – investigate cause of developmental delay, behavioral abnormalities, physical anomalies, infertility
  - Bone marrow – investigate and define genetic changes in hematologic disorders/neoplasias to facilitate diagnosis and patient care management
  - Tumor material – investigate and define genetic changes in solid tumors to facilitate diagnosis and patient management
  - Amniotic fluid or chorionic villi – for prenatal diagnosis
  - Products of conception – investigate cause of spontaneous pregnancy loss
  - Tissues, such as skin – investigate cause of mental or physical anomalies; or grow cells for molecular or biochemical diagnostic testing
- Chromosome analysis – combination of methods to grow and prepare cells of all types to examine the chromosomes in the cell. Chromosomes are pieces of condensed chromosomes that are visible in the metaphase portion of the cell cycle. Analysis of chromosomes by routine banding methods allows detection of structural rearrangements and gain or loss of chromosomes. High-resolution methods allow detection of subtle chromosome rearrangements, such as deletions or duplications. Fluorescence in situ hybridization (FISH) method allows detection of submicroscopic deletions and duplications, rearrangement or translocation of specific genes, gain or loss of specific chromosomes or chromosome regions, etc.
- FISH studies are being requested more as new DNA probes become available, as the technology advances, and as more genetic abnormalities are recognized that can be diagnosed by using fluorescence-labeled DNA probes. Examples of FISH studies the CMH lab performs include:
  - Microdeletion syndromes, e.g., DiGeorge, Williams, Miller-Dieker, Smith-Magenis, Prader-Willi, and Angelman syndromes.
  - Cancer-associated gene rearrangements, e.g., BCR/ABL in chronic myelogenous leukemia, PML/RARA in acute promyelocytic leukemia, CCND1/IgH in mantle cell lymphoma, etc.
  - Post bone marrow or stem cell transplant (opposite sex donor).
  - To identify unknown genetic material in a cell (karyotype).
  - To define rearrangement, deletion, or duplication of genetic material in a karyotype, e.g., an unbalanced karyotype in a child with delay or an unbalanced karyotype in a leukemic population, etc.

NEWS

- 27th Annual Meeting of Association of Genetic Technologists, Cincinnati, Ohio: Two cytogenetic technologists, Lorrie Gonterman and Gene Tosatto, will be attending the meeting in June. Lorrie is giving a presentation entitled “Mosaicism for Chromosome 18p monosomy and 18q trisomy in a child with Turner Syndrome.”
- New FISH Technology Developed at CMH: Joan Knoll, PhD, and Peter Rogan, PhD are using the DNA sequence of the human genome to design and generate single copy DNA probes for detection of chromosome abnormalities in inherited and acquired diseases in both children and adults. This technology is referred to as scFISH (single copy fluorescence in situ hybridization). The probes can be customized or designed for either rare or common chromosome rearrangements.
- NIH Grant Funding: Joan Knoll, PhD, and Peter Rogan, PhD recently received a two-year grant from the National Cancer Institute to study the Philadelphia chromosome in leukemia using scFISH to determine whether there are preferential sites of breakage adjacent to the ABL1 oncogene.