

THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY

Oncology Pathology

SYLLABUS

GENERAL PATHOLOGY

Cellular adaptation, cell injury and programmed cell death, cellular aging, Cell signalling, cell cycle, cell cycle and cancer.

Nomenclature, Characteristics of benign and malignant neoplasms.

Differentiation and anaplasia, rate of growth

Etiology of cancer:

Tobacco, Cancer susceptibility syndromes, Viral oncogenesis, chemical and physical carcinogenesis, Tumor immune surveillance, Inflammation and tumorigenesis, inflammatory cells and stromal cells in the initiation of neoplasia and in the tumor microenvironment. Dietary factors and cancer. Cancer related to Obesity and Physical activity.

Epidemiology:

Cancer incidence, Geographic and environmental factors, Genetic predisposition to cancer, Nonhereditary Predisposing conditions, molecular epidemiology, Cancer surveillance systems.

Cancer stem cells. Tumor progression and heterogeneity, Origin of cancer stem cells, Cancer stem cells in solid organs, Leukemic stem cells, Cancer stem cell and targeted therapy.

Biology of tumor growth

Molecular basis of cancer/cancer genetics:

Cancer mechanism, oncogenes, Tumor suppressor genes, Genomic instability, Stromal Microenvironment and carcinogenesis, Warburg effect, Deregulation of cancer associated genes- Chromosomal changes, gene amplification Epigenetic change, mi RNA and Cancer. Molecular basis of multistep carcinogenesis, Genetic counselling in familial cancer.

Cancer genomics: human genome project, complete genome sequencing open reading frames

Cancer proteomics, Molecular network analysis of human cancer tissues, Serum proteomics for early stage cancer detection. Peptidome

Cancer nanotechnology

Evolution and pathogenesis of metastasis, Invasion of extracellular matrix, Vascular dissemination and naming of tumor cells, molecular genetics of metastasis.

Tumor immunity - Tumor antigens, Antitumor effector mechanism, Immune surveillance and escape.

Clinical aspects of neoplasia: local and hormonal effects. Cancer cachexia, Paraneoplastic syndromes.

Diagnostic modalities in detection of Cancer.

Imunohistochemistry, Frozen section

Molecular diagnosis: Karyotyping, flow cytometry, PCR, tissue Microarray - Gene expression profiling. Array based comparative genome hybridization. Single nucleotide polymorphism analysis, FISH,ISH.

Tumor tissue and biospecimen banking

Cancer bioinformatics - Microarray data analysis, coding sequence analysis, biomarker identification, cross validation analysis, molecular conformation studies computer assisted diagnosis, statistical graphics and analysis of cell cycle regulatory proteins.

SURGICAL PATHOLOGY

Tumors of heart/pericardium, blood vessels/lymphatics, upper respiratory tract, lung and pleura, oral cavity, salivary gland, gastrointestinal tract, hepatobiliary system, exocrine pancreas, urinary tract, female genital tract, peritoneum, breast, CNS, endocrine, lymphoreticular system, hematopoietic system skin, soft tissue, osteoarticular, ear, eye, autonomic nervous system, peripheral neuroectodermal tumors.

CYTOLOGY:

Cytological interpretation of tumors of head and neck, salivary gland, lymph nodes, breast, thyroid, lung, chest wall, pleura, mediastinum, liver and spleen, pancreas, biliary tract, intra-abdominal organs, retroperitoneum, male and female genital tract, skin, soft tissue, bone, pediatric tumors,

Exfoliative cytology-PAP smear, sputum cytology, bronchial wash, bronchial brush cytology. Urine and bladder washing, CSF Effusion and peritoneal washings.

HEMATOLOGY

Bone marrow aspiration, Biopsy and cytochemistry for all leukemia, lymphoma and MDS cases.

Laboratory management, quality control and assurance - histopathology, cytology, hematology. Automation in histopathology, cytology and hematology.

PRACTICALS:

- 1. Gross techniques in surgical pathology. General principles in gross examination.**
- 2. Histopathology reporting college of American Pathologist cancer protocols for all tumors.**
- 3. FNAc and reporting of all tumours.**
- 4. PAP smear screening and reporting using Bethesda system**
- 5. Special stains, immunohistochemistry.**
- 6. Molecular oncology training in the following:
PCR, flow cytometry, microarray, karyotyping etc.,**
- 7. Tumor board / Seminars / Journal clubs.**
- 8. Journal and article publications.**