Jounal of Molecular Pathophysiology, 2022
VOL 11, NO. 1, PAGE 01

PERSPECTIVE

Open Access

Cancer Pathophysiology: An Emerging Field in Diagnosis

James Lee*
Department of Neurosurgery, Morehouse School of Medicine, Atlanta, USA

ARTICLE HISTORY
Received: 04-Jan-2022, Manuscript No. JMOLPAT-22-52175;
Editor assigned: 06-Jan-2022, PreQC No: JMOLPAT-22-52175 (PQ);
Reviewed: 20-Jan-2022, QC No: JMOLPAT-22-52175;
Revised: 25-Jan-2022, Manuscript No: JMOLPAT-22-52175 (R).
Published: 01-Feb-2022

Description

Today, the field of molecular diagnostics is growing rapidly with new technologies such as next-generation sequencing. Molecular pathology study is commonly used in diagnosis of various cancers and infectious diseases. There are various techniques to diagnose the disease include quantitative polymerase chain reaction, multiplex PCR, DNA microarray, *in situ* hybridization, *in situ* RNA sequencing, DNA sequencing, antibody based immunofluorescence tissue assays, molecular profiling of pathogens, and analysis of bacterial genes for antimicrobial resistance. The purpose of molecular pathology is to elucidate the mechanisms of disease by identifying its molecular mechanism and pathway alterations in DNA. In order to evaluate the disease pathology various core discipline such as biochemistry, cell biology, molecular biology, proteomics, and genetics fields were applied. Cancer is the second most common cause of death world-widely. The DNA sequence of a cancer cell genome generally acquires a somatic mutations these include insertions, or deletions of small or large fragments of DNA, substitution of base pairs, genomic amplification, and rearrangements of base pairs. Somatic mutations play a role in cancer initiation and progression of the disease; others may act as carriers of mutation. Completely new DNA sequences are acquired from human papilloma virus, human T lymphotropic virus, and human herpes virus 8, Epstein Barr virus, hepatitis B virus, which are known to contribute to the genesis of one or more types of cancer. In many human cancers, somatic mutations in the mitochondrial genomes have been analyzed, but their role is not clear. The mutation of the DNA may occur either by external or internal mutations. Studies have shown that the mutation rates is higher when the individual subsequently expose to the external mutagens, like tobacco smoke carcinogens, aflatoxins, and radiation, which are associated with lung, liver, and skin cancers, respectively. Pathogenesis of cancer includes molecular pathogenesis, chemical, physical (radiation, non-radiation factors), biological and viral oncogenesis. The abnormalities in the mutated gene is regulated by activation of growth promoting oncogenes, inhibition of cancer suppressor genes, abnormal apoptosis, failure of DNA repair genes. Cancer is diagnosed directly by physical examination (assessing the body for lumps), changes in the skin color or enlargement of an organ that may indicate the presence of cancer. Laboratory tests such as urine and blood tests may also clear out the abnormalities. Computerized tomography scan, bone scan, magnetic resonance imaging, positron emission tomography scan, ultrasound and X-ray are the imaging tests which are used to diagnose the cancer cells. In most situations biopsy is the only way to diagnose the cancers. After diagnosing the disease, people with cancer will have only one treatment such as Chemotherapy, Hormone Therapy, Hyperthermia, Immunotherapy, Photodynamic Therapy, Radiation Therapy, Stem Cell Transplant, Surgery and targeted therapy. But most people have a combination of treatments, such as surgery with chemotherapy and radiation therapy. Nonclinical drug development is well recognized within the pharmaceutical industry, the effectiveness of molecular pathology as an adjunct to histopathology study. Many of the techniques of molecular pathology rely on the use of labeled antibodies and nucleic acid probes and are either slide-or fluid-based to diagnose the diseased condition. Molecular testing is an important part of the diagnosis of any patient with cancer.

Contact: Lee J, E-mail: leejames123@gmail.com