

Use of Pharmacogenomics to Tailor Cancer Therapeutics

Cancer is the leading cause of death globally, and is responsible for an estimated 9.6 million deaths in alone 2018. About 1 in 6 deaths is due to cancer. Although a variety of treatments are available for curing Cancer such as Chemotherapy, Radiation Therapy and Immunotherapy but they also carry certain side effects which can further deteriorate patient's condition. Drug development continues to be costly and slow, with medications failing due to lack of efficacy or presence of toxicity. Since we know that specific predisposition gene mutations cause cancer such as the BRCA genes in breast cancer, it would be apt if we promote the use of pharmacogenomics to develop certain tailoring therapeutics based on an individual's genetic makeup, repurposing medications and rational drug development. With the development of Precision Medicine, we can understand whether the patient can handle a particular medicine by performing Genetic profiling, develop therapies and use the drugs approved by FDA that target specific tumor cells. With the association of various softwares and algorithms these drug easily map the mutations and provide a better treatment to their patients. Different therapeutic approaches are required for molecularly distinct subtypes of cancers. The use of the monoclonal antibodies (trastuzumab and cetuximab) in HER2-positive breast cancer and tyrosine kinase inhibitors (gefitinib, crizotinib, imatinib and erlotinib) in chronic myeloid leukaemia and lung cancer are examples that emphasise on the role of personalized medicines in cancer treatment. Finally, we focus on advances, challenges and future perspectives of personalized medicine in cancer.