

## Precision Medicine in Cancer Treatment



Precision medicine is a technique of allowing doctors to select treatment for the patients on the basis of their genetic understanding of disease. The concept of precision medicine is not new and it is already in practice. Previously, people diagnosed with cancer used to receive the same kind of treatment with the same type and stage of cancer and different people used to respond differently. Recent research made scientists understand the cause of growth and spreading of cancer is for the genetic changes in tumors and these changes may vary from person to person with the same type of cancer. In order to receive treatment from cancer, we need combination of treatments like- surgery, chemotherapy, radiation therapy and immunotherapy. So, information about genetic changes in tumor will help us to decide which treatment will work best for us and these treatments come from targeted cancer therapies.

Targeted cancer therapies or we can say precision medicines are the drugs or substances which block the spread and growth of cancer by interfering with specific molecules that are involved in the growth, progression and spread of cancer. Most targeted therapies are small molecule drugs and monoclonal antibodies. Small molecule drugs are used for targets inside the cells whereas monoclonal antibodies attach to specific targets found on cancer cells. Examples of monoclonal antibodies are- trastuzumab, pembrolizumab, rituximab etc. and of small molecule drugs are- erlotinib, sunitinib, lapatinib etc. These therapies interfere with specific proteins which help tumor to grow and spread by helping the immune system to destroy cancer cells via marking them, slowing cancer's uncontrolled growth, stopping signals that helps in blood formation by angiogenesis inhibitors, releasing toxins to cancer cells or cell death. Although there are several drugs that target specific mutations, no drug has been detected that can target all patients of a specific cancer type. Therefore, precision medicine does not apply to everyone but some discoveries have been made in lung cancer, breast cancer, neuroblastoma, colorectal cancer etc. Everyday new changes and progresses are made along with the clinical trials across US to know how well the targeted therapies might work.

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## Antiviral Effect of Butanoic Acid on HIV

HIV (Human immunodeficiency virus) which is responsible for causing AIDS has been a matter of concern for scientists for a long time. Every year almost 1 million people die from AIDS/HIV and in some countries, it is the leading cause of death. In 2019 more than 1.7 million people were infected with HIV, which was alarming phenomena already. In these 30 years since

this virus was discovered, over 30 drugs were invented but none of them could be the remedy as the drug therapy suffers from drug-resistant and can cause life threatening side effects. In this situation, a search for an anti-HIV agent was top most research priority and this lead the way of finding butanoic acid; a promising structure of anti-HIV agent. Butanoic acid acts against HIV by preventing the cleavage of the capsid-spacer peptide of the gag proteins, thereby impeding viral maturation. This causes the host cell to release virions with no infective capacity. Efficacy of butanoic acid can be influenced by various polymorphisms of gag proteins. At first, butanoic acid was found effective for herpes virus and this antiviral activity made the author interested to investigate and evaluate its vitro experiments. Later it was found that being incubated with the active chemical substances the virus loses its sensitivity and infectivity. In turn neither the pre-treatment of the cell nor the administrations at the



time of viral propagation were effective. Hepatitis B (caused by HBV) which is mostly seen in HIV patients and this virus is also susceptible to butanoic acid. This chemical substance has been shown to facilitate the translocation of the HBV protein into mitochondria of mouse hepatocytes.

This innovation has set a new goal for scientists as well as has enlightened new hope for the HIV patients.

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## Impacts of Psychosocial Stress on Physiology and Psychology



Occupational stress is a common phenomenon all over the world and researchers found ways to identify and measure job stress and stressors which included some very popular models. In this article, the focus was on effort reward imbalance largely to measure psychosocial stress. The finding was that psychosocial stress had several impacts on human physiology (e.g., cardiovascular problem, renal problem, diabetes etc.) and psychology (e.g., insomnia, anxiety, depression etc.). The study discussed about these aspects with supporting graphs, data and tables. Finally, we suggested increment of reward, salary, boosting job esteem, keeping resting period, stress management program and counselling to cope up with these stress condition to minimize the impacts.

We have seen several effects of Effort Reward Imbalance Models (ERI) related stress on our general physiology and psychology. However, the mechanism through which this ERI related stress is affecting our body is not clear in all

aspects. Moreover, some studies are contradictory to one another as well. Therefore, further studies needed to be carried out to find an explicit mechanism through which it is affecting us.

Most of the studies have been done individually on different models to identify and measure job stress. In this process, sometimes the real scenario of stress is not come out due to the shortcomings and limitations of individual models. For this reason, studies suggest employing several models at once to get the best possible result. Therefore, in the future, we can carry out these studies by using multiple accepted job stress measurement models and compare those results with former ones.

To add, though ERI is one of the most used and trusted measuring methods of psychosocial job stress in the work place, still, there was not much work done on this in our country (Bangladesh). However, it is essential to understand the real scenario of working conditions in a particular country to regulate and plan several functions including setting terms and conditions, determining acceptable and fair wages, preserving labor rights and maintaining an ideal environment for productivity of the companies as well. Moreover, these studies enable people (employees, employers, investors) to understand local market conditions, job market conditions and compare them to the global situation. In this regard, there is much more work to do related to this aspect of our country.

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