

EDITORIAL

The prime objectives of publishing the research journal – ‘Journal of Applied and Fundamental Sciences’ - are:

- i) to create a healthy and dynamic research atmosphere in the Basic sciences, viz. Chemistry, Physics, Mathematics and Biosciences for the benefits of the research workers particularly in the NE region of India comprising of eight states,
- ii) to publish standard research papers with a view to sharing innovative ideas, techniques, the frontiers of knowledge, and scientific findings to other research teams for helping in their work,
- iii) to bring professional benefits of the researchers by their publications,
- iv) to generate an opportunity of serving the world people with a better knowledge of the Universe, Life and Technological developments.

The New Education Policy, 2020 in India highlights that the research activity in a university should be of multidisciplinary, cross disciplinary and interdisciplinary nature. This kind of research will transform the Indian society to a class of dynamic, productive and thoughtful citizens, and will help the scholars to develop quality skills like hard skill, soft skill, communication skill, research skill, professional skill, life skill, technological skill etc. One of the multidisciplinary research fields in the basic sciences is “Cancer Diseases and Treatment Strategies”. As we know, cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020. The most common cancers in 2020 were breast, lung, colon & rectum, prostate, skin, and stomach.

Though many schemes for treating cancer tumors, viz. chemotherapy, surgery, immunotherapy, radiation therapy, oncolytic virus therapy, hormone therapy, hyperthermia, photodynamic therapy, stem cell transplant, targeted therapy, nanomedicine with modern technology, etc. are developed, but still no concrete strategies have been evolved for successful regression and destruction of established tumors, and consequently the death rate has been increased year after year. Some effective therapies are:

Chemotherapy is a very useful treatment for cancer. Many chemotherapeutic drugs, viz. Cytosine Arabinose (Ara-C), 5- Fluorouracil and Prednisone working in the G1 and S phase of the cell-cycle, and Bleomycin and Vincristine working in the M phase of the cell cycle, are worth-mentioning. The discovery of oncolytic viruses provides a new strategy to alleviate or even cure malignant tumors. There are many kinds of oncolytic viruses, such as herpes simplex virus, adenovirus, and Coxsackievirus. An oncolytic virus is a genetically engineered or naturally existing virus that can selectively replicate in cancer cells and then kill them without damaging the healthy cells. Clinical research of oncolytic virus began in the sixties of the 20th century under the guidance of Professor Aina Muceniece, the outstanding Latvian scientist, at the Latvian institute of Microbiology and Virology. A decade-long research led to the development of oncolytic virus ECHO-7 medication. **Immunotherapy** is a form of biological medicine that uses living organisms to treat cancer. Cancer immunotherapy seeks to stimulate the immune system to destroy tumors and boost the immune system to fight cancer cells. Immunological checkpoint inhibitors such as cytokines and antibodies against vaccines, adoptive cell therapy, co-inhibitor T-cell receptor PD-1 and IL-2 therapy are different types of immunotherapies. In 2018 the Nobel Prize was awarded to James P Allison and Tasuku Honjo, for their discovery of drugs to treat cancer by preventing negative immune regulation. In the same century, the first scientific effort to convert a patient’s immune system into cancer treatment was said to have been performed by two German physicians Fehleisen and Busch, who independently observed the decline of tumors after erysipelas infection. The next major development came from William Bradley Coley, known today as the Father of **Immunotherapy**.

Since all the strategies developed so far for treating cancers have had limitations, rigorous research on cancer diseases with the help of mathematical models along with nonlinear technique, optimal control theory, simulation theory, nanotechnology, artificial intelligence, big data analysis etc. is of utmost importance for the welfare of the mankind all over the world.

As the Chief Editor, I express my heartiest thanks and gratitude to all the authors, all the editors, all the members of the Advisory Board, Dr M. Baruah (Director of SFAS), Fr. (Dr.) S. Mavelly (Hon’ble VC) and Fr. (Dr.) J. Jose, (Hon’ble Registrar) for their full cooperation and support.

Prof. Tarini Kumar Dutta
Chief Editor