BRAC UNIVERSITY
School of Pharmacy

PHARMA HIGHLIGHTS

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Brac University Launches the School of Pharmacy

BRAC University launched its School of Pharmacy, the first of its kind in the country, through a ceremony on Saturday, 30 July, 2022. Dr. Dipu Moni M.P., Honorable Minister, Ministry of Education attended the event as the chief guest. Professor Sazzad Hossain, Member, University Grants Commission of Bangladesh, Ms Tamara Hasan Abed, Chairperson, Board of Trustees, BRAC University, Professor Vincent Chang, Vice-Chancellor, BRAC University, Professor Dr Eva Rahman Kabir, Dean, School of Pharmacy also attended and spoke at the event. Dr. David Dowland, Registrar, BRAC University moderated the event. Ambassador of the Kingdom of Bhutan to Bangladesh Rinchen Kuentsyl and Second Secretary of the Embassy of Nepal to Bangladesh Ranjan Yadav were also among the guests. Leading industrialists from the pharmaceutical sector and top academicians from various educational institutions also attended the event. The continuous support provided by Mr. M Mosaddek Hossain, Vice-President, Pharmacy Council of Bangladesh was acknowledged at the event.

Addressing the ceremony as the chief guest, Dr. Dipu Moni said, the launching of the School of Pharmacy would help pioneers of Bangladesh's pharmaceutical industry make the transition from formulations to active pharmaceutical ingredients (API). It will boost efforts underway to build a 200-acre API park in Gazipur. With the industry already meeting 97 percent of local demand and exporting products to 157 countries, its net worth is expected to reach $6 billion by 2025, she said.

Ms. Tamara Hasan Abed, Chairperson, Board of Trustees, BRAC University, expressed hope that the School of Pharmacy would help redefine educational research and patient care in Bangladesh. "We want our students to become leaders who make thoughtful and sustained contributions to society. One of the major aims of the School of Pharmacy is to contribute to the generation of graduates with a strong sense of ethics, which they can bring to their professional life alongside the professional skills and creativity needed by the industry," she said.

Professor Vincent Chang, Vice-Chancellor of BRAC University, said BRAC University is committed to playing a key role in producing quality human resources for Bangladesh, which along with technology and capital are the key drivers of a country's economic growth. With its Vision 2041 to become a developed nation, and a top-down approach is needed from the government to build an ecosystem conducive to the generation of quality graduates, he said.

Professor Sazzad Hossain, Member, University Grants Commission of Bangladesh, lauded the launching and said it reflected BRAC University's motto of "Inspiring Excellence".

Professor Dr. Eva Rahman Kabir, Dean of the School of Pharmacy said, in line with BRAC University's vision for teaching and research, the School of Pharmacy aims to conduct education and research of the highest quality and relevance to make

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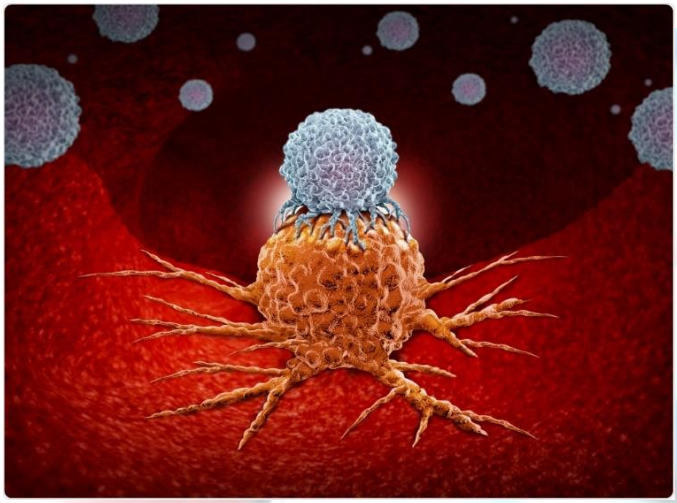
a long-lasting impact in society. “We have collaborations with institutions like North Dakota State University and California Northstate University in the US and Leeds Beckett University in the UK to strengthen our teaching and research initiatives,” she said.

Wasif Bin Ahmed, an alumnus, shared how the Department of Pharmacy inspired him to take on several challenging careers. Dr. Fakhrul Ahsan, a Distinguished Professor in the Department of Pharmaceutical and Biomedical Sciences at the California Northstate University College of Pharmacy, and Dr Miraz Rahman, a Professor of Medicinal Chemistry in School of Cancer & Pharmaceutical Sciences, King’s College London, also shared their messages through video platforms.

Written by: School of Pharmacy

Cancer Immunotherapy: The Emergence of Dostarlimab



In some exceptional cases, our immune system might not function as per usual. For instance, genetic mutation can make the immune system slow or non-functional. Again, alteration of certain protein or signaling pathways can switch off the immune system. As a result, unable to eliminate or kill the tumor and cancerous cells, we end up with cancer and other deadly diseases. Immunotherapy is a biotechnological intervention which aids our immune system to function properly. A very recent and hyped topic is the emergence of Dostarlimab, which has been approved as monotherapy in patients with mismatch repair deficient (dMMR) recurrent or advanced endometrial cancer. Patients with endometrial cancer have been found to be cured miraculously with this monotherapy where their DNA repair is non-functional and ultimately causes cancer. Immunotherapy has several techniques which we can use according to our necessities. For example, immune checkpoint inhibitors, T-cell transfer therapy, monoclonal antibodies, immune system modulators etc. Before application of these techniques, rigorous screening is done and then a suitable technique is selected. In endometrial cancer, microsatellite instability is observed which occurs due to defective DNA MMR genes that are responsible for repairing mismatched bases. If any of the MMR proteins (MLH1, MSH2, MSH6, and PMS2) fails to express properly due to genetic mutation or epigenetic silencing, then we can notice an accumulation of DNA replication errors at microsatellite regions. The recent discovery, Dostarlimab is a humanized monoclonal antibody that binds with high affinity to PD-1 which eventually inhibits the binding with PD-L1 and PD-L2. By blocking PD-1, it triggers our immune system and invades the cancerous cells. This stimulation is especially stimulating T-cells.

Dostarlimab is a yet another medication that has proven the power of immunotherapy in cancer treatment. The fear of cancer treatment can be mitigated if we can implement cancer immunotherapy properly and explore more recent advances of medical biotechnology. Immunotherapy can replace chemotherapies and surgeries which have many side effects. It proves that pharmaceuticals and biotechnology can work together for the betterment of medical sectors. Cancer immunotherapy has already established itself as a promising strategy to treat cancer. The success of Dostarlimab strengthens this notion further. Notably, combination therapies which include different immune checkpoint inhibitors can be efficacious.

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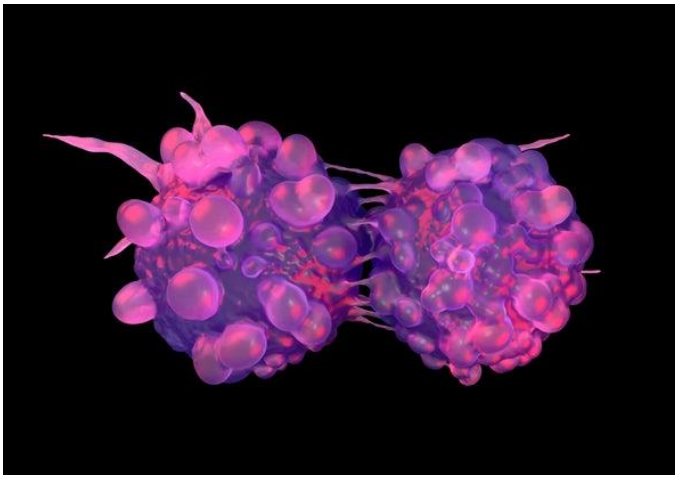
Drug Resistance in Cancer Chemotherapy



Cancer is one of the main causes of death worldwide. According to GLOBOCAN 2020 estimates of cancer incidence and mortality, an estimated 19.3 million new cancer cases (18.1 million excluding non-melanoma skin cancer) and almost 10.0 million cancer deaths (9.9 million excluding non-melanoma skin cancer) have occurred in 2020. Despite the significant development in methods of cancer treatment during the past decades, chemotherapy still remains the mainstay of cancer treatment. Multidrug resistance (MDR) is responsible for over 90% of deaths in cancer patients receiving traditional chemotherapeutics or novel targeted drugs. The mechanisms of MDR include elevated metabolism of xenobiotics, enhanced efflux of drugs, growth factors, increased DNA repair capacity, and genetic factors. Some of the cells that are not killed by the chemotherapy mutate (change) and become resistant to the drug. Once they multiply, there may be more resistant cells than cells that are sensitive to the chemotherapy. Additionally, a cancer cell may produce hundreds of copies of a particular gene. This gene triggers an overproduction of protein that renders the anticancer drug ineffective. Cancer cells also may pump the drug out of the cell as fast as it is going in using a molecule called p-glycoprotein. They may stop taking in the drugs because the protein that transports the drug across the cell wall stops working. Moreover, the cancer cells may learn how to repair the DNA breaks caused by some anti-cancer drugs. Rapidly increasing numbers of biomedical studies are focused on designing chemotherapeutics that are able to evade or reverse MDR. Several studies show that over 90% mortality of cancer patients is attributed to drug resistance. Each of these mechanisms leads to reduction of the therapeutic efficacy of administered drugs, causing more difficulty in tumor treatment.

Research is underway to investigate ways of minimizing or preventing chemotherapy resistance. Attempts to overcome resistance mainly involve the use of combination drug therapy using different classes of drugs with minimally overlapping toxicities to allow maximal dosages and with narrowest cycle intervals, necessary for bone marrow recovery. Adjuvant therapy with P-glycoprotein inhibitors and, in specific instances, the use of growth factor and protein kinase-C inhibitors are newer experimental approaches that may also prove effective in abrogating or delaying onset of resistance. Gene knockout using antisense molecules may be another effective way of blocking drug resistance genes. Conversely, drug resistance may also be used to good purpose by transplanting retrovirally transformed CD34 cells expressing the MDR gene to protect the bone marrow during high-dose chemotherapy.

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