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Design and development of cancer drugs by addressing genomics abnormalities

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It is universally accepted that cancer is a genetic disease. Advances in human genomics have offered us comprehensive knowledge to decipher mutations of specific genes responsible for cancer initiation and progression. An understanding of genetic aberrations, especially those of cancer causing genes, has offered hopes to treat specific cancers by a variety of strategies. Although gene therapy to infuse correct genes which are devoid of mutations and immunotherapy to boost immune systems remain attractive strategies, an explosive growth in the development of targeted cancer therapy to effectively treat specific types of cancer has emerged. These therapies have targeted specific genes responsible for promoting tumor growth, angiogenesis, and metastasis. The first part of the presentation will focus on the effectiveness of a select group of anticancer compounds to treat breast, ovarian, colon and lung cancers. The second part of the talk will focus on the resistance to treatment, and reoccurrence of the disease after brief remission. The final portion of the talk will concentrate on the development of multi-target therapy from my laboratory. This multi-target therapy is based on the development of a new class of small molecules, phosphaplatins, that effectively promote a variety of tumor suppression and apoptotic genes that include FAS, PTEN, P53, PUMA, and Bax, and concomitantly inhibit angiogenesis by activating PEDF and suppressing VEGFR2 genes. The signaling mechanisms of phosphaplatins to trigger apoptosis, anti-angiogenesis, and anti-metastasis will be presented. The effectiveness of phosphaplatins will also be compared with those of combinational therapies in preclinical settings.

Biography

Rathindra N. Bose, Ph.D., is the Vice Chancellor and Vice President for Research and Technology Transfer at the University of Houston System and University of Houston. He is a tenured professor in the department of Chemistry, and holds joint appointments in the departments Biology and Biochemistry and Pharmacological & Pharmaceutical Sciences. He received his Ph.D. degree in Chemistry from Georgetown University, Washington D.C. Among Dr. Bose's achievements include the discovery of a new class of multi-target anticancer agents, that exhibits excellent efficacy against metastatic ovarian, lung, and head and neck cancers without exhibiting severe toxicity.

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