

5th International Congress on

Bacteriology and Infectious Diseases

May 25-26, 2017 Chicago, USA



Ananda M Chakrabarty

University of Illinois College of Medicine, USA

Bacterial infections and cancer therapy

It is widely recognized that anticancer drugs are pricey and often involve intravenous injections, thus limiting their usefulness and affordability to people in rich countries. People in poor countries or people living in rural areas often do not have access to potent anticancer drugs. Our efforts have been directed to protein products of pathogenic bacteria such as *Pseudomonas aeruginosa* for potential cancer treatment. One such cancer fighting protein, azurin, has shown significant tumor regression in mice. Since proteins are designated as biologics, and thus requiring to undergo stringent regulation by the USFDA for clinical trials, a company, CDG Therapeutics, Inc. (www.cdgti.com) has used a fragment of azurin termed p28, a peptide of 28 amino acids, for both pre-clinical and phase I clinical trials. P28 showed no toxicity in a variety of animals, whereupon the FDA approved a phase I trial of p28 in 15 stage IV cancer patients with solid tumors such as melanoma, colon, sarcoma, prostate and pancreas. These tumors were resistant to all conventional drugs and the patients were terminally ill with a life expectancy of about 6 months. When administered through intravenous injections, p28 demonstrated very little toxicity but significant beneficial effects including partial and complete regression of these drug resistant tumors in 4 patients. Encouraged by such results, the National Cancer Institute (NCI) sponsored a second phase I trial in 9 major hospitals in the US in pediatric brain tumor patients in October, 2013. That trial has been on-going for more than 2 years (<http://clinicaltrials.gov/ct2/show/NCT01975116>) suggesting that p28 not only demonstrated acceptable toxicity but significant regression of the tumors in some patients. Indeed, it is important to note that the USFDA has approved on December 02, 2015, the designation of azurin-p28 as an orphan drug for the treatment of brain tumor glioma. Another company Amrita Therapeutics in India (www.amritatherapeutics.com) has developed similar bacterial peptides as potential anticancer drugs, indicating the role that bacterial proteins/peptides can play in cancer therapy. Additionally, *azurin* gene has been cloned and expressed in plant cells. Oral consumption of such azurin-expressing plant extracts by mice allows tumor regression in tumor-bearing mice, demonstrating the potential usefulness of plant-expressed bacterial anticancer proteins in future cancer therapy.

Biography

Ananda M Chakrabarty is a Distinguished University Professor at the University of Illinois at Chicago College of Medicine. His research interest involves development of promiscuous bacterial protein/peptide drugs with anticancer, anti-viral and anti-parasitic activities. He is the Co-founder of two start-up companies, CDG Therapeutics Inc., in Chicago and Amrita Therapeutics in India.

pseudomo@uic.edu

Notes: