BioSpectrum the business of Bio & Health Sciences ASIA EDITION

Bacterial protein azurin has anti-cancer potential

12 November 2012 | News | By BioSpectrum Bureau

Bacterial protein azurin has anti-cancer potential

New Delhi: A relatively new potential anti-cancer agent in form of azurin, a bacterial protein called arsenate reductase, has shown remarkable progress. This came to fore when Dr Ananda Mohan Chakrabarty, distinguished professor, University of Illinois, Chicago, revealed few key facts about his project where the series of studies have shown that a soil bacterium produces a protein, azurin, which it uses as a weapon, possibly to defend itself against cancer cells that might end up harming the microbe.

Speaking on the sidelines of the International Bioenergy Summit 2012,held at New Delhi from, Dr Chakrabarty elaborated, "The azurin is a protein with multiple domains and working differently from the other dry compounds. It has a unique property that it enters only cancer cells and does not affect the normal cells. It will also make the tumor repressive."

Dr Chakrabarty who is most notable for his role in developing a genetically engineered organism using plasmid transfer while working at GE, called for the out of box thinking. He said, "The cure might not just come from those who are working in the area. It might come from unexpected quarters too.
We found that an opportunistic bacterium, Pseudomonas aeruginosa, that grows in the soil and marshes but is often found in the lungs of cystic fibrosis patients, may offer a new route to cancer therapy.

As of now the molecule has been tested in the mice model successfully and the results from the trials have been very promising. Azurin sets off this death sequence by forming a complex with the well-known tumor suppressor protein p53,

stabilizing it, and activating caspases that induces apoptosis in cancer cells. P53 normally stops cells that are damaged from reproducing and encourages them to commit apoptosis, but a majority of cancer cells have damaged or missing p53. As per Dr Chakraborty, the Phase I trials in stage IV (terminally ill) cancer patients have shown great results. "About 15 patients of age group 50-80 years who were put through trials showed that two patients recovered partially and two showed the complete disappearance of tumor. I think it is remarkable and demands our more attention."

Apart from having promising anti-cancer properties, azurin has shown considerable anti-malarial and ant-HIV properties too. At present the focus of Dr Chakrabarty's group is mainly on testing azurin's properties against cancerous cells. However, the group is also looking at other properties that will be given due consideration soon in the future. "Generally the approach has been one drug for one target whereas our approach has been one drug for multiple targets and diseases,"concludes Dr Chakraborty.