

# IIT-I develops low-cost drug with less side effects to treat blood cancer

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**Indore:** Indian Institute of Technology (IIT) Indore has developed a cost-effective new asparaginase drug (M-ASPAR) using protein engineering approach to treat Acute Lymphoblastic Leukemia (ALL) having relatively less side-effects.

ALL is a type of blood cancer representing nearly a quarter of cancer cases diagnosed among children. Around 25,000 new cases of ALL are diagnosed in India each year.

The institute said repeated administration of asparaginase currently in use for the treatment of ALL patients causes serious side effects such as allergic reactions, neurotoxicity, immunogenicity, hypersensitivity and toxicity to the pancreas, liver and spleen among other organs.

There is a global search for asparaginase variants with better safety profile also due to the immunogenic nature of current asparaginase formulations the treatment of relapse ALL is significantly compromised, the institute said.

Principal Investigator of the research Professor Avin-



ash Sonawane, department of Biosciences and Biomedical Engineering at IIT Indore said, "Since last 12 years, with the financial support from DBT, SERB, DST and BRNS, Government of India, we were working to develop a novel asparaginase drug that can reduce serious side effects as well as improve the treatment of primary and relapse ALL treatment."

"M-ASPAR asparaginase is significantly less immunogenic, could kill leukemic cells, is more stable, and causes fewer toxicities including neurotoxicity in non clinical studies. Thus it can be expected to reduce the cost of treatment, alleviate side effects and also improve outcomes of relapsed ALL," said Sonawane.

The research team led by professor Sonawane includes

Dr Ranjit Mehta, Soumika Sengupta and Mainak Biswas.

Researchers said despite being in World Health Organization's list of essential medicines, access to good quality asparaginase in India and several other Asian, African and South American countries has been a problem.

IIT-Indore in collaboration with Advanced Centre for Treatment, Research and Education in Cancer, Tata Memorial Centre (ACTREC, TMC), Mumbai and a Mumbai based biopharmaceutical company are going to start phase-I and II clinical trials of M-ASPAR.

Dr Vikram Gota, collaborator and an expert in clinical trials from ACTREC said, "In phase I clinical trial the safety, tolerability and pharmacokinetics of the drug will be stu-

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died in 25-30 ALL patients and the number of patients for subsequent phase 2 and 3 trials will be determined during the planning stage of these trials. This collaboration with IIT-Indore has provided a great opportunity for ACTREC to participate in the development of an indigenous product that promises access to an improved version of asparaginase at affordable cost to patients."

Prof Neelesh Kumar Jain, director (Officiating) said "Research has always been the forte of institutes like IITs. Such development in the field of human health is very vital as it would lead to significant reduction in the side effects and most importantly reduce the cost of the treatment. The Institute will strongly support the phase I and II trials till we reach a logical conclusion."