

Pune: IISER team develops synthetic molecule capable of targeting, killing cancer cells

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After over a year-long study on breast cancer cells, the team now plans to conduct similar trials on other cancer cells as well as on animals in near future. (File)

A team of researchers from the city has developed a synthetic molecule, which when used as a drug, is capable of targeting and killing cancer cells with limited chances for the development of drug resistance among patients.

Pinaki Talukdar from the chemistry department at Indian Institute of Science, Education and Research (IISER), Pune, who led the team of researchers, said newly-developed fluorescent molecules could arrest the process of cancer cell growth and accelerate its destruction. The molecule is composed of aromatic, amides and hydroxyl groups.

The study was conducted on breast cancer cell. When targeted on a breast cancer cell, the molecule was found to bind with the cell membrane. “Usually, cancer drugs bind with either proteins, nucleic acids or other receptors – present in the cancer cell. Due to this affinity, patients develop resistance to drugs,” Talukdar said.

Drug resistance poses stiff challenges before the medical care givers, who are forced to reinvent newer treatment regimens for patients, especially those under prolonged cancer treatment, he added.

In a normal human body, according to scientists, cells die naturally through a process called apoptosis, which ensures to keep a check on the cell growth.

“However, in case of a cancer cell, this natural process remains diluted and the cell keeps multiplying rapidly within the body. Once bound with the membrane, the molecule was naturally able to create an artificial ionic channel that allowed easy transportation of ions of sodium, potassium and chlorides into the cell. Due to such an inflow, the cell’s ionic balance was disturbed, causing destruction or death of the cancer cell,” he said.

On the performance of the molecules in attacking cancer cells, Talukdar said, “Once induced, the molecule took no time to settle over the membrane and within a few hours of incubation, the cancer cell was destroyed.”

While clinical trials are yet to be conducted, the team believes the synthetic molecule could be considered as an alternative strategy in cancer treatment.

After over a year-long study on breast cancer cells, the team now plans to conduct similar trials on other cancer cells as well as on animals in near future.

According to records maintained by India Against Cancer — an initiative run by National Institute of Cancer Prevention and Research, operating under Indian Council of Medical Research (ICMR) — of two women diagnosed with breast cancer, one eventually dies. Breast cancer alone amounts to 14 per cent of total cancer

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“This molecule can be tried in combination with the existing drugs used in cancer treatment. Our future studies will explore its efficacy in different types of cancer cells,” Talukdar said.

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