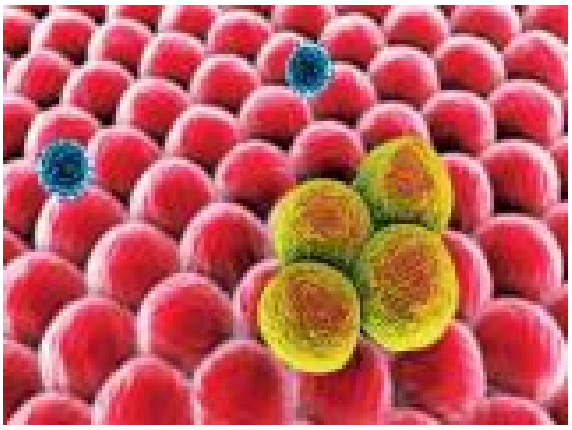

Scientists are tapping into the vast and abled immune system of human bodies to find a safe solution to cancer by blocking out proteins that prevents immune cells from fighting cancer, writes Susan Young.

New medicines that shrink tumours and have beneficial effects lasting for months to years in some cancer patients are helping breathe new life into an old idea: using a patient's own immune cells to attack malignant cells.

Several drug makers are trying to prove the safety and efficacy of new medicines that harness the body's own lines of defense. Merck, for one, is testing an immune-modulating compound in patients with metastatic, or spreading, melanoma.

In an early-stage trial, half of the patients receiving the highest-attempted dose of the drug saw their tumours shrink or disappear, and more than a year later, the vast majority of those patients who responded to that dose and lower doses were still alive. On average, the prognosis for survival, a patient with late-stage metastatic melanoma is less than a year.

"This is not a garden-variety cancer treatment development programme," says Roger Perlmutter, an immunologist who heads R&D at Merck. "This looks special at this stage," he says.

Biological components

Merck's compound is an antibody, a Y-shaped biological molecule that grabs onto a specific protein. The target protein normally prevents immune cells from attacking cancer. By blocking the activity of that protein, the antibody frees the immune cell to fight the disease. Roche, GlaxoSmithKline, Bristol-Myers Squibb, and others are also developing antibodies to release such brakes on the immune system.

New details of how these compounds work and for whom will be presented by many groups involved in the new push for cancer immunotherapy at this year's American Association for Cancer Research meeting, in San Diego.
The conference, which started on Saturday, is the largest meeting of oncologists and oncology researchers in the world. Although researchers express excitement about the potential for

immune-modulating medicines to combat cancer, some experts even use the word “cure” — many caution that it will take time to fully understand how well the treatments are working.

Just a few years ago, many in the biomedical community would have been skeptical. Numerous attempts to induce the immune system to attack cancer had proved ineffective in humans, says Charles Link, CEO of New Link Genetics, a biotech company that has been developing immunotherapies for years. “But as the sophistication of our understanding of immunology increased, new strategies evolved to attack the disease, and those strategies are turning out to work in the clinic,” says Link.

“It is exciting—we have been working on this for so long, and now finally human results show it clearly works,” says Jianzhu Chen, a biologist at the Koch Institute for Integrative Cancer Research at MIT, who studies cancer immunotherapy. “This will have a major impact on cancer treatment.”

In 2011, Bristol-Myers Squibb began to sell Yervoy, also an antibody, which was the first marketed medicine to disrupt the process that prevents immune cells from attacking cancer.

The treatment has shown to nearly double the survival rate of metastatic melanoma patients, enabling 20 percent of patients to live up to four years after diagnosis. The clinical trial of Yervoy was the first ever to show that life could be extended for advanced melanoma patients.

The antibody medicines represent just one part of the renaissance of cancer immunotherapy. There’s also been progress in a form of cellular therapy that engineers a patient’s own immune cells to better recognise cancer cells, after which they are infused back into the patient.

Other companies, such as Amgen, are developing virus-based gene therapies that selectively kill cancer cells while simultaneously making the cells better targets for the immune system. The immune system can be a powerful ally for doctors, but they must tread carefully. “We know the immune system is capable of killing any cell.

If we aren’t careful, we could trigger systemic autoimmune disease of major consequences,” says Perlmutter. “We have to take advantage of the enormous potential of immune recognition and response and at same time leave ourselves in a position where we can control that activity,” he says.

Combinative approach is the key

So far, the treatments have been tested on only a subset of cancer types — mostly melanoma but also lung cancers and breast cancers, among others.

Researchers will have to test the treatments on more cancer types to know how wide a range of malignancies they can attack, and whether certain targets, or even combination of targets, are needed.

“It may be that in different tumour types, different immune modulators will have different importance,” says Deborah Law, who heads one of Merck’s biologics research units. “Combination approaches might be most effective,” she says.