A Cure for Leukemia?

Researchers at the University of Pennsylvania may have discovered an innovative approach in combating cancer itself: HIV.

PRACTICAL SCIENCE WITH PHIL FREDA

A few weeks back, a research team from the University of Pennsylvania simultaneously published some amazing results in both the *New England Journal of Medicine* and in *Science Translational Medicine*.
Out of three individuals who were part of the research project, two of them appear to be free of cancer, and the third had their cancer load reduced by 70 percent.

According to MSNBC, in each of the patients, as much as five pounds of cancerous tissue has been completely destroyed, and is still gone after a year's time.
All three of the patients were diagnosed with chronic lymphocytic leukemia (CLL), which is the most common form of leukemia, or cancer of the blood.
According to an article on MSNBC, CLL affects about 15,000 people in the United States, and kills about 4,300 people per year.
Standard chemotherapy and radiation treatments are successful at keeping the disease at bay.

Bone marrow transplants were the only known cure for the disease until this point.

The problem with transplants is that they require a suitable match and have horrible side effects like rejection and infection.

So how did they do it?

The Penn research team used a very interesting and unorthodox approach.

Using benign, genetically engineered HIV virions, the virus that causes AIDS, the researchers implanted genes that attack cancerous growth.
After the gene altering of the virus, the researchers extracted white blood cells, which are part of the body's immune system, from each of the patients.

These white blood cells were allowed to be infected by the altered HIV virus. Instead of inserting harmful gene information, these "good" viruses implanted cancer targeting genes and powerful growth factor genes.

These modified white blood cells where then injected back into the respective patient that they were originally extracted from, nullifying the chances of rejection.

Once back in the body, the growth factor gene enabled these white blood cells, armed to the teeth with cancer targeting and cancer destroying genes, to replicate at a rate far above normal.

According to MSNBC, previous attempts to use re-injected white blood cells failed because they died out too soon before they could make a dent in the cancerous growth.

But with the enhanced growth genes, these white blood cells multiplied at a rate of about a thousand fold above normal.

The white blood cells moved through the body like assassins in the night, destroying cancerous growths in their wake.

Are there any side effects?

As the white blood cells traveled through the body and killed cancerous cells, the patients experienced the fevers, aches and pains that are commonly associated with any normal infection.

Other than this, side effects have been minimal.

How are the patients holding up?

One of the patients that volunteered in this program, Bill Ludwig, was told by doctors that he would die from his leukemia within a matter of weeks.

A year ago, however, he received the experimental treatment and is alive and well.

Ludwig was quoted on MSNBC as stating, "I'm more closer to the people I love and I appreciate them more... I'm getting emotional ... the grass is greener, and flowers smell wonderful."

The other two patients have chosen to remain anonymous, but one of them, a scientist, was quoted on MSNBC as stating,

"I am still trying to grasp the enormity of what I am a part of—and of what the results will mean to countless others with CLL or other forms of cancer. When I was a young scientist, like many I'm sure, I dreamed that I might make a discovery that would make a difference to mankind—I never imagined I would be part of the experiment."

What is the future of this research?

This amazing research approach has only been tried on three people as of now because of a lack of funding.

The National Cancer Institute and several pharmaceutical companies have declined to pay for the research.

None of these sources have made a formal statement as of why, but according to MSNBC, some guess that the reasons why may be because of shortage of funds or that the fact that this type of experimental research is too risky for monetary backing.

The project was actually funded by the Alliance for Cancer Gene Therapy, which is a charity founded by Barbara and Edward Netter after their daughter-in-law died of cancer.

The funds provided by their charity were enough to finance the three individuals in the initial experiment.

It is important to realize that this research is very new and only had positive results with three patients.

However, research like this, like previous research that led to the AIDS patients being cured, is an important initial step in experimental cancer research.
Hopefully, the Penn research team will be funded for further research.

Who knows, in the future, steps that were used in this experimental research may become commonplace in cancer treatment.

Think about it!