Could a Vaccine Prevent Cancer?

The second biggest killer behind heart disease, cancer is responsible for claiming the lives of almost 10 million people around the world each year. For decades, scientists have been investigating ways to combat this malignant disease, with recent breakthroughs such as cancer modelling and gene therapy providing hope for effective treatment plans going forward.

However, the old adage that prevention is always better than the cure certainly holds true for cancers of all kinds. Now, a new study from Cleveland Clinic in Ohio, USA, is aiming to discover a viable vaccine candidate that can prevent tumours from developing in high-risk breast cancer patients.

A nasty customer

The new research is specifically aimed at preventing the formation of triple-negative breast cancer, which is the deadliest strain of the disease. Although it accounts for a small percentage of all breast cancers (15% or less), triple-negative breast cancer is responsible for a disproportionately high number of deaths.

It also has a higher rate of recurrence among recovered patients and certain groups of society are particularly vulnerable to it. For example, Black women are twice as likely to develop it than other ethnicities, while between 70% and 80% of tumours which occur in females who suffer from mutations in their BRCA1 genes are those which cause triple-negative breast cancer.

A targeted approach

As such, it's one of the most aggressive and lethal types of breast cancer prevalent among the population, making it an ideal target for treatment and prevention. With that in mind, Dr Vincent Tuohy has developed a vaccine which he believes will arrest the progress of existing tumours and prevent new ones from emerging.

The vaccine works by targeting a lactation protein which occurs exclusively in breasts. The protein, a-lactalbumin, disappears in the mature, post-lactational tissue of a healthy individual, but remains in those suffering from triple-negative breast cancer. As such, the vaccine aims to stimulate a response to a-lactalbumin, as well as provoking the immune system to ward off any emerging tumours.

Ground-breaking research

Dr Tuohy has already found conclusive evidence that the vaccine is effective in mice and is now turning to the human population. The new clinical trial recently received the rubber stamp from the Food and Drug Administration (FDA) to go ahead and will involve participation from between 18 and 24 women who have undergone successful treatment for early-stage triple-negative breast cancer in the previous three years, but remain at high risk of contracting the disease again.

This initial study is intended to find out the maximum dose that the patients can tolerate and the vaccine will be administered to each patient three times at two-week intervals, with subjects closely monitored for side-effects. If successful, it's expected that a future study will replicate similar conditions but in healthy patients who are at high risk of developing breast cancer.