NUS scientists develop painless way to kill breast cancer cells

They hope their magnetic pulse treatment will reduce the dosage needed for chemotherapy in the future.

Scientists from the National University of Singapore (NUS) have found a painless way to kill breast cancer cells by exposing them to a pulsed magnetic field. They hope this method will reduce the dosage needed for chemotherapy in the future, so that patients will have fewer side effects.

The treatment uses magnetic pulses to stimulate respiration in the cancer cells, which have elevated levels of a protein, TRP1, that is especially sensitive to the stimulation. When exposed to the magnetic field, these cells essentially hyperventilate and eventually die.

Pre-clinical trials have shown that the magnetic treatment targets only cancer cells, unlike chemotherapy and radiation therapy, which can also damage healthy cells.

Magnetic fields can also target hidden cancer cells within a tumour that chemotherapy drugs travelling through the bloodstream cannot reach, said Associate Professor Alfredo Franco-Obregón from the NUS Institute for Health Innovation & Technology (iHealthtech), who led the development of the magnetic technology.

When undergoing the magnetic treatment, the patient lies face down on a therapy bed which has an opening for the chest region. The magnetic device - a short, hollow cylinder - is placed below the opening, and generates a pulsed magnetic field.

The team said the strength of the device's magnetic field is about 60 times greater than that of the Earth's, but 1,000 times weaker than conventional magnetic resonance imaging (MRI). One treatment session would take an hour.

The NUS research team is planning to start a one-year clinical trial with the National University Cancer Institute, Singapore (NUS) in the second half of this year to determine the safety of the device, about 30 breast cancer patients will be involved.

The patients will try out the device for 30 to 60 minutes. Clinicians will look out for any side effects such as dizziness or skin changes, and track any effects on wound healing after breast surgery, for instance, said Dr Joline Lim, a consultant at NUS depart-