Redirecting our immune cells to help fight children's cancer

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Immune cells, known as Natural Killer T cells, could be redirected to help fight the childhood cancer, neuroblastoma, according to research presented at the National Cancer Research Institute (NCRI) Cancer Conference in Liverpool (Tuesday).

By genetically modifying human Natural Killer T (NKT) cells so that they recognise neuroblastoma cells as being dangerous, researchers managed to achieve long-lasting remission - and in some instances cures - of mice that carried highly aggressive human neuroblastoma.

NKT cells are specialised immune cells which respond quickly to danger, such as an infection or tumour growth, and help kick-start an immune response to protect us.

The researchers, from the Texas Children's Cancer Center and Center for Cell & Gene Therapy at the Baylor College of Medicine, have harnessed this ability of NKT cells to act as a warning siren by genetically engineering them to react to a molecule often found on the surface of neuroblastoma tumours known as GD2. It is thought that these modified NKT cells will kill the tumour cells and also reactivate local immune cells that have been tricked into ignoring or even supporting the cancer.

Leonid Metelitsa, professor of paediatrics and immunology at Texas Children's Cancer Center, said: "Tumours often find ways to avoid the immune system or 'switch it off' in order to grow and survive, so any way we can switch the immune system back on and redirect it towards cancer cells would be a significant advance. By modifying these Natural Killer T cells so that they target neuroblastoma tumours and sound the alarm for the rest of the immune system we hope to have developed a new approach to treating this disease."

Neuroblastoma develops from nerve cells left over from a baby's development and there are around 100 children diagnosed with the cancer each year in the UK. Despite the number of children surviving neuroblastoma rising from 17 per cent in 1971 to 64 per cent today, the aggressive form of the disease is still very hard to treat successfully.

Dr Harpal Kumar, chief executive of Cancer Research UK and chair of the NCRI, said: "We are excited to see so much research both here and internationally into badly needed new treatments for neuroblastoma patients. Cutting edge research, such as this study, together with Cancer Research UK's newly opened trials, are making a vitally important step towards better and kinder treatments for children with neuroblastoma."

Provided by Cancer Research UK