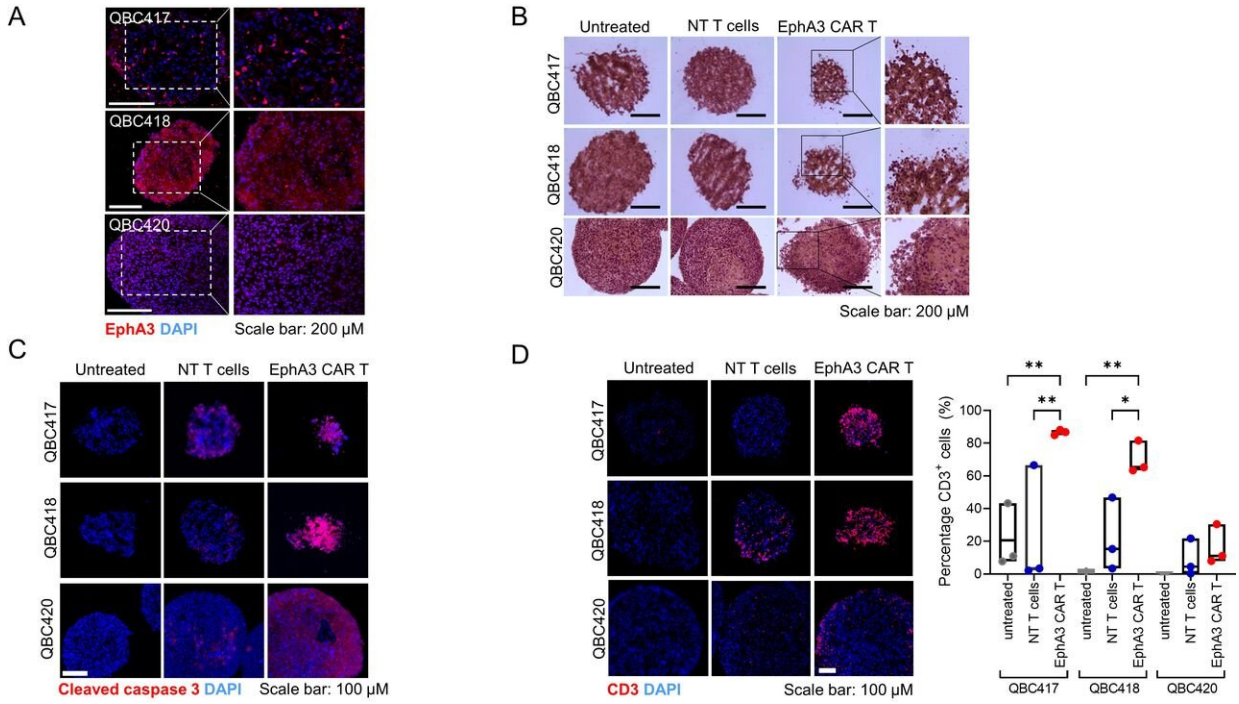
Researchers develop pioneering immunotherapy for aggressive brain cancer

August 8 2024



EphA3-CAR T cells infiltrate glioblastoma. Credit: *Journal for ImmunoTherapy of Cancer* (2024). DOI: 10.1136/jitc-2024-009403

QIMR Berghofer researchers have developed super-charged immune cells that could potentially improve glioblastoma survival by fighting the deadly brain cancer and preventing its recurrence.

The researchers have developed a promising CAR T cell immunotherapy

that is genetically engineered to target and destroy glioblastoma cancer cells.

Lead researcher Professor Rajiv Khanna AO said early preclinical results suggested that the CAR T cells could kill tumor cells and potentially prevent the cancer returning.

"This therapy specifically targets cancer cells to prevent disease recurrence, which would be a breakthrough for patients with this deadly disease," said Professor Khanna.

"Primary brain cancer can often be managed if recurrence is prevented. Unfortunately, once brain cancer recurs, the current life expectancy is typically less than six months. Our goal is to prevent recurrence by treating the disease at its earliest stage."

The results have been published in the *Journal for ImmunoTherapy of Cancer*.

"These findings are hugely encouraging for the future of cancer treatment. Preclinical results suggest that these killer CAR T cells can eliminate treatment-resistant tumor cells within the brain by attaching to and destroying newly formed cancerous blood vessels and stem cells," Professor Khanna said.

The CAR T cells are equipped with a special tool that successfully helps them find and attack a protein called EphA3, which is commonly found in glioblastoma tumors.

Dr. Paulo Martins from QIMR Berghofer said this method could also be a game changer in the treatment of other cancers. "This new approach could also help fight other EphA3-positive cancers including breast, lung, prostate, melanoma, and some blood cancers by preventing

metastatic or recurrent tumors."

The research is still in the early stages and is expected to proceed to a phase 1 clinical trial of the therapy, involving patients with EphA3-positive glioblastoma.

The trial will be conducted in collaboration with neurosurgeon Professor David Walker from the Newro Foundation and Briz Brain & Spine and is expected to start within the next year.

"Our long-term goal is to take this cell therapy from early phase development right through to the clinic, helping to save lives," said Professor Khanna.

The treatment was tested in pre-clinical models including patient-derived glioblastoma organoids (a three-dimensional, mini-organ made from human cells and tissue).

QIMR Berghofer's spinout company, Cyteph will advance the development of the EphA3 CAR T cells, in the hope they will ultimately be offered as an "off-the-shelf" adoptive immunotherapy for wider patient access and affordability. The potential new treatment builds on the work of another QIMR Berghofer trial focused on CMV-specific T cell immunotherapy.

More information: Paulo Martins et al, EphA3 CAR T cells are effective against glioblastoma in preclinical models, *Journal for ImmunoTherapy of Cancer* (2024). DOI: 10.1136/jitc-2024-009403. jitc.bmj.com/content/12/8/e009403

Provided by ICES