AN INSIDE LOOK AT CANCER TREATMENT

Harnessing the body's natural defences against cancer.

Immunotherapy is the new frontier in cancer treatment, and is gaining significance around the world, says Xiubao Ren, chief physician at Tianjin Medical University Cancer Institute & Hospital (TMUCIH).

Unlike traditional treatment methods such as chemotherapy and radiotherapy, which act directly on the tumour, immunotherapy stimulates the body's natural defences to fight cancer. "Checkpoint inhibitors, for example, can reduce the immunosuppressive state of immune cells, boost their immune response against cancer cells, and therefore increase their effectiveness," Ren explains.

Ren says various studies in recent years have shown the benefits of the newer treatment method, including bolstering other treatments — such as chemotherapy, increased efficacy, reduced side effects, and less recurrence of cancer.

As one of the first hospitals in China to establish an immunotherapy centre, TMUCIH has been leading the way in driving innovative basic and translational research projects in this area.

In one of these studies, Ren and his co-investigator, Li Zhou, conducted a single-centre, open-label, phase 1b trial on the use of cytokine-induced killer (CIK) cell therapy, a type of immunotherapy, in combination with chemotherapy and sintilimab, an immunotherapy medication used to treat Hodgkin's lymphoma, for patients with advanced non-small-cell lung cancer (NSCLC). CIK cells are lymphocytes expanded in vitro, and their introduction helps stimulate the body's innate anti-tumour immunity.

Ren and Zhou's work is currently going through further clinical trials for NSCLC.

In a paper published this year in *Cell Death & Disease*, Ren and colleagues studied the mechanism by which myeloid-derived suppressor cells (MDSCs) — which are immune suppressive and play a part in tumour progression and maintenance — induce regulatory B (Breg) cells, a type of lymphocyte, with immunosuppressive functions.

By conducting in vivo experiments on mice, the researchers found that by blocking two pathways — the PD-1/PD-L1 interaction and the PI3K/AKT/NF-κB signalling pathway — tumour growth and the immunosuppressive functions of a group of Breg cells could be suppressed for breast cancer.

The PD-1/PD-L1 interaction between MDSCs and Breg cells ensures that the body's immune system is activated only when needed, to lower the chances of chronic autoimmune inflammation. The PI3K/AKT/NF-κB signaling pathway is essential for certain Breg cells to exert immunosuppressive effects.

By understanding mechanisms such as these, cancer researchers can find new ways to improve the effectiveness of immunotherapy. "Immunotherapy is the future, and an important pillar of cancer research," says Ren. ■