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Singapore advances stem cell technology to first-in-man clinical trial

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First-of-its-kind in Singapore, the clinical trial will test a technology that enables specific cell therapy products to be manufactured for use in patients



Institutes and centres under the SingHealth Duke-NUS Academic Medical Centre (AMC) are joining hands together with Singapore's first private cord blood bank, Cordlife Group Limited (Cordlife), to test a novel technology that expands the number of blood-forming stem cells from stored umbilical cord blood (UCB) in a first-in-man study in Singapore.

This is the first time a home-grown UCB cell therapy is being tested on humans. The technology has the potential to increase treatment options for patients suffering from blood cancers or blood-related conditions.

One of the most effective treatments for patients with blood cancers, such as leukaemia, lymphomas and hereditary blood-related conditions, such as thalassaemia is to transplant haematopoietic stem and progenitor cells (HSPCs) harvested from UCB.

However, the current applications of HSPCs are limited as the number of HSPCs that can be harvested from a UCB is typically low, yielding few useable units for adult transplant patients. Administering a UCB with low cell count often results in slower recovery and greater susceptibility to fatal infections.

The technology to be tested in this trial uses a laboratory-synthesised compound called C7 for ex-vivo expansion of HSPCs, which, in turn, enables specific cell therapy products to be manufactured for use in patients.

This clinical trial is supported by the Singapore Ministry of Health's National Medical Research Council under its Clinical Trials Grant-Industry Collaborative Trials (CTC-ICT) Scheme and funding from Cordlife.

Leading this clinical trial is Dr Francesca Lim, a consultant at SGH's Department of Haematology and SingHealth Duke-NUS Blood Cancer Centre, who said, "The ability to expand UCB HSPCs for clinical use provides an opportunity to overcome cord blood transplants' short-term disadvantages of low total cell dose. This is an important step forward to improve treatment outcomes for transplant patients, especially those who rely on umbilical cord blood as the only source of grafts due to the lack of a fully matched bone marrow or peripheral blood stem cells."