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Australia develops new solution for stem cell manufacturing

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A unique 3D printed system for harvesting stem cells from bioreactors



Researchers at University of Technology Sydney have developed a unique 3D printed system for harvesting stem cells from bioreactors, offering the potential for high quality, wide-scale production of stem cells in Australia at a lower cost.

Stem cells offer great promise in the treatment of many diseases and injuries, from arthritis and diabetes to cancer, due to their ability to replace damaged cells. However, current technology used to harvest stem cells is labour intensive, time consuming and expensive.

This translational research was done in collaboration with industry partner Regeneus – an Australian biotechnology company developing stem cell therapies to treat inflammatory conditions and pain.

Mesenchymal stem cells are initially extracted from human bone marrow, fat tissue or blood. They are then transferred to a bioreactor in the lab and combined with microcarriers to allow the cells to proliferate.

The new system combines four micromixers, one spiral microfluidic separator and one microfluidic concentrator to detach and separate the mesenchymal stem cells from microcarriers and concentrate them for downstream processing.

According to the researchers, other bioprocessing industrial challenges can also be addressed using the same technology and workflow, helping to reduce costs and increase the quality of a range of life-saving products including stem cells and CAR-T cells.