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Singapore study uncovers new mechanism for heart attack recovery

A Singaporean scientific study has revealed how stem cells mature into heart muscle, paving the way for new heart disease treatments.



Key Takeaways

A Singaporean study led by Assistant Professor Lynn Yap discovered that the protein midkine can repair damaged blood vessels and accelerate recovery after heart attacks.

The research tracked genetic activity during different stages of heart cell regeneration using a technique that maps thousands of genes' activity within tissue.

Cardiovascular progenitor cells (CVP) derived from human pluripotent stem cells can develop into various heart cell types, offering potential for regenerating heart muscle.

Identifying midkine as a key factor in promoting blood vessel growth may help maintain heart function and reduce heart failure risk.

The findings could accelerate the development of new stem cell-based therapies for heart disease.

A Singaporean scientific study has revealed new methods for recovering from deadly heart attacks, offering fresh insights into how undifferentiated cells known as stem cells develop and mature into heart muscle cells. This breakthrough could pave the way for innovative treatments for heart disease.

According to the study led by Assistant Professor Lynn Yap from the Lee Kong Chian School of Medicine at Nanyang Technological University in Singapore, the research is among the latest to track genetic activity during different stages of heart cell regeneration. The team discovered that a protein called midkine has the ability to repair damaged blood vessels, which could help accelerate recovery after heart attacks.

Stem cells are fundamental building blocks in the body, capable of developing into any cell type, making them promising candidates for repairing damaged tissues. A specific type of stem cell, known as cardiovascular progenitor cells (CVP) derived from human pluripotent stem cells, can develop into various heart cell types, opening the door to using them for regenerating heart muscle in patients.

Unlike traditional methods of measuring genetic activity, this technique captures the activity of thousands of genes simultaneously while preserving information about where these genes are active within the tissue. The technology identifies gene activity at thousands of microscopic points by detecting RNA molecules produced when genes are activated, with each point acting as a microscopic sensor to create a detailed map of genetic activity.

Dr. Lynn Yap stated that the study provides insights into how stem cells interact with damaged heart tissue to regenerate muscle, potentially accelerating the development of new stem cell-based therapies for heart disease.

The study concluded that identifying midkine as a key factor in promoting blood vessel growth, and targeting this protein, helps maintain heart function and reduces the likelihood and severity of heart failure. A deeper understanding of how midkine works could enable its use in future heart disease treatments.

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