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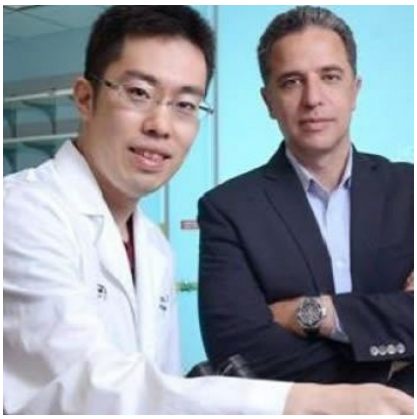
Researchers find Cell that Replenishes Heart Muscle



Researchers at UT Southwestern Medical Center have identified a cell that replenishes adult heart muscle by using a new cell lineage-tracing technique. The study is published online in *Nature*.

Most cardiomyocytes don't replenish themselves after a heart attack or other significant heart muscle damage but these researchers have identified a cell that generates new heart muscle cells. It is not a stem cell but a specialised cardiomyocyte that can divide, something which the majority of cardiomyocytes cannot do. The highly oxygenated environment of the heart does not allow most heart cells to divide and the ones that do are hypoxic. The researchers thus devised a technique that identified and traced the lineage of hypoxic cells.

Dr. Hesham Sadek, Assistant Professor of Internal Medicine and with the Hamon Center for Regenerative Science and Medicine said, "For decades, researchers have been trying to find the specialised cells that make new muscle cells in the adult heart, and we think that we have found that cell. Now we have a target to study. If we can expand this cell population, or make it divide more, then we can make new muscle cells. This is what this cell does naturally, and we can now work toward harnessing this ability to make new heart muscle when the heart has been damaged."

The UT Southwestern researchers found hypoxic microenvironments with proliferating cells scattered throughout the heart muscle and discovered that the rate of formation of new cells was between 0.3 percent and 1 percent annually. The new technique for identifying the regenerative cells is called fate mapping and could prove to be an important development for distinguishing similar regenerating cells in other organs, as well as in cancers, the researchers said.

Traditional fate mapping labels cells based on the expression of a certain gene but this new approach is based on protein stabilisation as opposed to gene expression and is a useful tool for studying hypoxia in the whole organism. Dr. Sadek explains that this approach can identify any hypoxic cell, not just cardiomyocytes so it can have significant implications for cellular turnover in any organ and even in cancer.

Source: UT Southwestern Medical Center

Image Credit: UT Southwestern

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