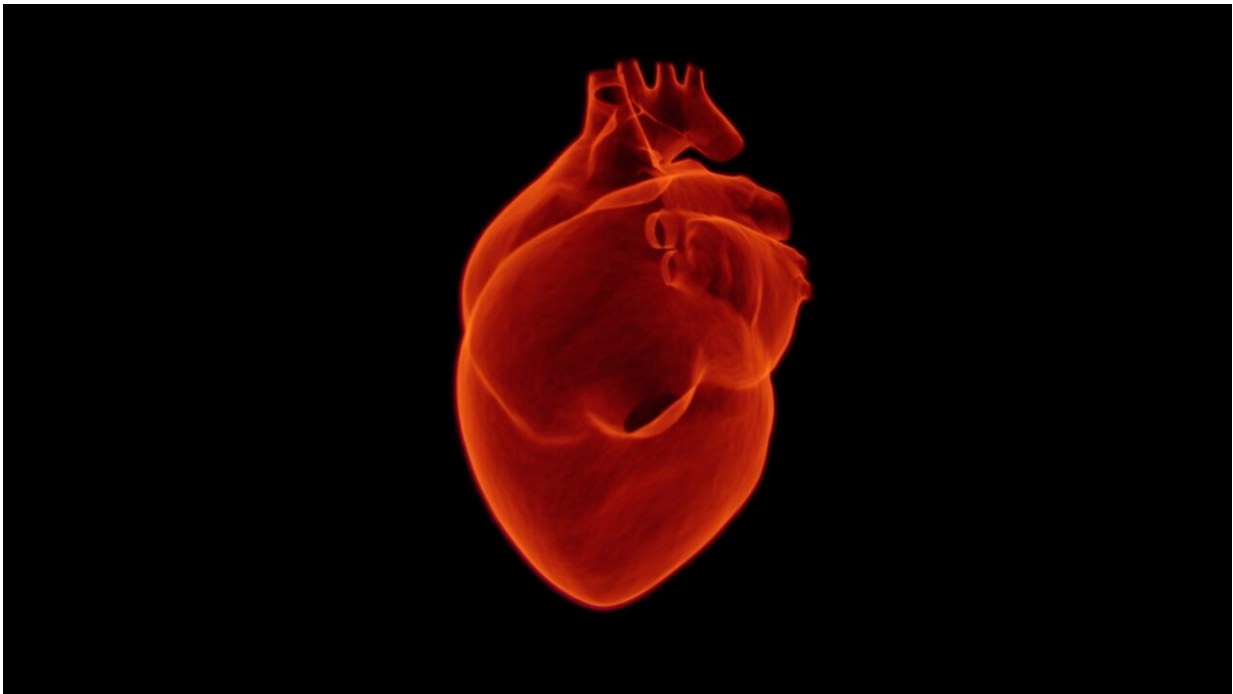


New study finds the body's defensive reaction to a heart attack could help

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Scientists from the Victor Chang Cardiac Research Institute have discovered an important protective response in the heart that could limit the damage done after a heart attack.

The new research, published in the journal *Cell Stem Cell*, has found this reactive response can prevent some of the excessive scarring—or [cardiac](#)

[fibrosis](#)—that occurs due to lack of oxygen.

Lead author, Professor Richard Harvey, from the Victor Chang Cardiac Research Institute in Sydney, Australia, says this study provides a new angle on what occurs to the heart's cells after a [heart attack](#).

"Our gene pathways sense the [lack of oxygen](#), or hypoxia, after a heart attack and mount a protective response.

"If the protective response is blocked, reactive chemicals called oxidants build up in the heart's cells, including in the beating muscle cells.

"The study has shown that oxidants also build up in the heart's "fibroblasts"—an important type of heart cell that plays an essential role in healing the heart after a heart attack," says Professor Harvey.

The study reveals that oxidant build up causes cardiac fibroblasts to expand their numbers, and too many fibroblasts lead to excessive scarring. This thick scar tissue can limit's the heart's ability to function efficiently, and can increase the risk of heart failure, as well as [sudden cardiac death](#).

Heart attacks are the leading cause of death in Australia, with one occurring every 10 minutes. But there are few drugs currently available to effectively prevent or repair the scarring damage that can occur after such an event.

Dr. Vaibhao Janbandhu, also from the Victor Chang Cardiac Research Institute and part of the research team, says it's hoped the findings will encourage the production of therapies to do just that. "Hopefully what we have discovered will lead to the pursuit of synthetic antioxidants that can specifically target different cell types in the heart after a heart attack, including fibroblasts, to limit and even repair some of the

damage."

"This study indicates there is a whole new generation of drugs required—antioxidants—that can be tailored to the responses of particular [cells](#).

"Fibrosis doesn't just involve the [heart](#) but is also seen in other injuries and diseases, so hopefully this work can eventually translate to help other conditions as well," Dr. Janbandhu says.

More information: Richard P. Harvey, Hif-1a Suppresses ROS-induced Proliferation of Cardiac Fibroblasts following Myocardial Infarction, *Cell Stem Cell* (2021). DOI: [10.1016/j.stem.2021.10.009](https://doi.org/10.1016/j.stem.2021.10.009). [www.cell.com/cell-stem-cell/fulltext/S1934-5909\(21\)00421-5](http://www.cell.com/cell-stem-cell/fulltext/S1934-5909(21)00421-5)

Provided by Victor Chang Cardiac Research Institute

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