Protein with cardioprotective capabilities during heart attack discovered

November 16 2010

University of Cincinnati (UC) researchers have discovered a new protein that could be cardioprotective during heart attack, potentially leading to more targeted treatments for patients at risk.

These findings are being presented at the American Heart Association's (AHA) Scientific Sessions in Chicago Nov. 16.

Researchers in the department of pharmacology and cell biophysics, led by Chi Keung Lam, a PhD student, and Wen Zhao, PhD, under the direction of Litsa Kranias, PhD, AHA distinguished scientist and chair of the department, found that HAX-1, an anti-cell death protein, plays an important role in protecting cardiac cells and muscle during ischemia-reperfusion injury, or damage to tissue caused by blood restriction.

"Multiple cell death pathways are activated during heart attack, resulting in cell death and reduced cardiac function," Lam says. "HAX-1 has been reported to have involvement in different cell death mechanisms.

"We found that HAX-1 protein levels were reduced in hearts after ischemia-reperfusion injury."

In this study, researchers created animal models with cardiac-specific, over-produced HAX-1 by twofold and then experimentally induced heart attack.

"The hearts of these animal models showed improved contractile

performance after heart attack-related injury and decreased cell death," Zhao says. "The protective effect was associated with decreased activities of caspases three and nine. Caspases are a family of proteins that are one of the main executors of the cell-death process."

Zhao also found that mitochondria isolated from HAX-1 in the hearts of these models were resistant to swelling and to permeability transition (MPT), or decrease in the permeability of the mitochondrial membranes by calcium.

Lam adds that hearts of these models also had reduced stress response in the endoplasmic reticulum (ER), or the interconnected network within cells that synthesizes proteins, following injury.

"These findings suggest the unique cardioprotective potential of HAX-1 in ischemia-reperfusion injury," Zhao says. "The findings could lead to targeted treatments at the cellular level for patients who are at risk for heart attack and prevent cell and tissue death from ever occurring."

Provided by University of Cincinnati Academic Health Center

Citation: Protein with cardioprotective capabilities during heart attack discovered (2010, November 16) retrieved 26 April 2024 from https://medicalxpress.com/news/2010-11-protein-cardioprotective-capabilities-heart.html