

# Drug trio improved effectiveness of cancer treatment, protected heart

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Combining cancer medication with a drug for erectile dysfunction and one for heart transplants helped kill cancer cells and protected the heart from damage, in a study presented at the American Heart Association's Scientific Sessions 2012.

For decades, doxorubicin has been a powerful anti-cancer treatment for various human cancers, including breast, ovarian, colon and prostate. But its use has been limited due to harmful, possibly irreversible effects on the heart.

In this study, using cell and animal models, researchers found that sildenafil alone or in combination with rapamycin (an immunosuppressant used to prevent post-transplant [organ rejection](#)) significantly improved the anti-cancer effects of doxorubicin while protecting the heart. The combination of all three medications showed the most powerful effect, researchers said.

"Because sildenafil and rapamycin are clinically approved drugs that both protect heart muscle, we thought that combining these drugs with doxorubicin would be a unique strategy to eliminate the cardiac side effects of doxorubicin while further improving its cancer-killing ability," said Rakesh Kukreja, Ph.D., study co-author and professor of internal medicine and cardiology, Virginia Commonwealth University (VCU) School of Medicine in Richmond.

"The drug combination led to a dramatic protection of heart muscle

from apoptosis (cellular self-destruction) and, to a lesser extent, necrosis (cell death from disease)," said David E. Durrant, study lead author and Ph.D. candidate at the VCU School of Medicine. "We think this combination therapy may have excellent potential to move forward into clinical trials and eventually improve life expectancy of cancer patients."

More research is needed to understand how sildenafil and rapamycin work together to improve doxorubicin treatment, Durrant said.

Provided by American Heart Association

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