

# THE HEART OF THE PROBLEM:

## *Arkansas research seeks to eradicate post-cancer cardiac damage*

By AMP Staff

Imagine surviving the rigors of cancer recovery — the days, months and weeks devoted to the fight of your life — only to be confronted with a new and unexpected challenge: heart damage. The condition is known as cancer treatment-related cardiac dysfunction (CTRCD), and it is most associated with a class of cancer drugs called anthracycline.

“As a cardiologist, I find it tragic to see a patient who had so bravely fought and defeated cancer only to be afflicted with a life-long struggle with heart damage,” said Dr. Edward Yeh, ARA Academy member and chairman of the department of internal medicine at the University of Arkansas for Medical Sciences.

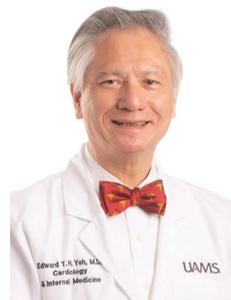
The problem intrigued Yeh so much that, in 2000, he founded the department of cardiology at the University of Texas MD Anderson Cancer Center and developed a new field of medicine



Yeh was recognized by, from left, ARA’s Jerry Adams, UAMS Chancellor Cam Patterson and Gov. Asa Hutchinson when he was inducted into the ARA Academy in 2021.

called onco-cardiology or cardio-oncology. This field specializes in caring for cancer patients who developed heart problems caused by cancer therapy. In 2020, he decided that the best place to continue pushing the boundaries of knowledge in this area was at UAMS in Little Rock.

Yeh and his team focus on one chemotherapy treatment: Doxorubicin, a type of drug known as an anthracycline. It is used to treat soft tissue, bone sarcomas and cancers of the breast, as well as certain types of leukemia and lymphoma. The instances



Dr. Edward Yeh

of Doxorubicin-related CTRCD are dose-related, but heart damage can occur at a lower dose.

Through his research, Yeh and his laboratory discovered the molecular basis of anthracycline-induced cardiotoxicity.

“What we learned about Doxorubicin is that the drug can bind itself to a protein found in the heart that prevents heart cells from reading DNA information,” he said. “From there, things can go haywire, sending the cell into a suicide cycle, which leads to heart damage. We also found that if this offending protein is removed from the cell, doxorubicin would not be able to cause heart damage. This can be accomplished by a drug, which is already approved by FDA.”

Yeh said this is not a treatment for CRTCD — it is a prevention. With one injection of this FDA-approved drug before doxorubicin begins, the risk of heart damage can be prevented in animal models.

“We are currently testing the dose and timing of giving this drug to remove the offending protein from human volunteers,” he said. “This will be followed by a clinical trial in breast cancer patients.”

Yeh said patients should not have to exchange cancer for heart disease.

“Not only can we vastly improve the quality of life for these patients, but we can also eliminate the extraordinary cost and resources connected to treating the resulting heart damage,” he said.

A lifetime of heart damage can cost, on average, more than \$100,000 dollars for patients. Yeh’s work continues at UAMS, where it is supported by the National Institutes of Health and the Arkansas Research Alliance Scholars Grant. 

*Discovery Economics is a monthly feature highlighting the work of the Arkansas Research Alliance Academy of Scholars and Fellows, a community of strategic research leaders who strive to maximize the value of discovery and progress in the state. ARA recruits, retains and focuses strategic research leaders to enhance the state’s competitiveness in the knowledge economy and the production of job-creating discoveries and innovation. Learn more at [ARAlliance.org](http://ARAlliance.org).*