

Researchers discover plant derivative

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Researchers at The Feinstein Institute for Medical Research have discovered that tanshinones, which come from the plant Danshen and are highly valued in Chinese traditional medicine, protect against the life-threatening condition sepsis. The findings are published in the December issue of *Biochemical Pharmacology*.

Inflammation is necessary for maintaining good health – without inflammation, wounds and infections would never heal. However, persistent and constant inflammation can damage tissue and organs, and lead to diseases such as [sepsis](#). Sepsis affects approximately 750,000 Americans each year, 28 to 50 percent of whom die from the condition, and costs the nation's [healthcare system](#) nearly \$17 billion annually. It is a potentially life-threatening complication of an infection or injury, and occurs when chemicals released into the [bloodstream](#) to fight the infection trigger inflammation throughout the body. The result is that organs become damaged, including liver, heart, lungs, kidney and brain. If excessive damage occurs, it may be irreversible. For years, Feinstein Institute researchers have been trying to identify ways to halt persistent and constant inflammation.

Tanshinones have been used for treatment of cardiovascular and [cerebrovascular diseases](#). Based on research on mice conducted by Haichao Wang, PhD, and his colleagues, including Kevin J. Tracey, MD, and Andrew E. Sama, MD, at the Feinstein Institute, tanshinone IIA sodium sulfonate (TSN-SS) effectively inhibited the release of HMGB1 outside of cells. HMGB1 is a deoxyribonucleic acid (DNA) protein that mediates [inflammation](#) and, if over expressed, causes sepsis.

Furthermore, Dr. Wang and his colleagues previously discovered that inhibition of HMGB1 by TSN-SS protected against sepsis-induced animal mortality and cardiovascular dysfunction in animals.

"Dr. Wang's research on TSN-SS has uncovered details that offer a new mechanism for intracellular [drug delivery](#)," said Sarah Dunsmore, Ph.D., of the National Institutes of Health's National Institute of General Medical Sciences, which partially supported the work. "These findings have broad significance and implications for treating a variety of conditions, including cancer, sepsis and Alzheimer's disease."

The NIH grant numbers that supported this study are AT005076 and GM063075.

The Feinstein Institute, in alliance with the Cleveland Clinic, is exploring opportunities to commercialize patent technologies relating to the use of TSN-SS in the treatment of human diseases.

"This novel therapy opens up more applications for the use of Chinese traditional medicine in western medicine, and it is my hope that it will be tested for efficacy in sepsis clinical trials in the near term." said Dr. Wang.

Provided by North Shore-Long Island Jewish Health System

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