

# Purple periwinkles battle inflammatory diseases

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A widely and safely used plant extract acts as a novel anti-inflammatory agent that may one day be used for the treatment of chronic obstructive pulmonary disease, or COPD, as well as other inflammatory conditions. There is an urgent need for new therapies for the treatment of chronic inflammatory diseases, such as COPD, otitis media (ear infection), and atherosclerosis (chronic inflammation in the walls of arteries), because the most effective and commonly used agents - steroids - often cause serious side effects, such as liver damage, which prevent long-term use.

In a study published today in the [Proceedings of the National Academy of Sciences](#), researchers at the University of Rochester Medical Center were the first to find that vinpocetine, a natural product derived from the periwinkle plant, acts as a potent anti-inflammatory agent when tested in a mouse model of [lung inflammation](#), as well as several other types of human cells. Results of the study show that vinpocetine greatly reduces inflammation, and, unlike steroids, does not cause severe side effects.

"What is extremely exciting and promising about these findings is vinpocetine's excellent safety profile," said Chen Yan, Ph.D., associate professor within the Aab Cardiovascular Research Institute at the Medical Center and a senior author of the study. "Previously, most drugs tested in this area have failed, not because of a lack of efficacy, but because of safety issues. We're very encouraged by these results and believe vinpocetine has great potential for the treatment of COPD and other inflammatory diseases."

Vinpocetine is a well-known natural product that was originally discovered nearly 30 years ago and is currently used as a dietary supplement for the prevention and treatment of cognitive disorders, such as stroke and memory loss, in Europe, Japan and China. The therapy has no evidence of toxicity or noticeable side effects in human patients. Scientists at the University of Rochester hope to reposition this compound as an anti-inflammatory agent for the treatment of COPD, and potentially other inflammatory conditions, such as asthma, otitis media, rheumatoid arthritis, atherosclerosis and psoriasis in the future.

While steroids successfully combat inflammation, patients often pay a high price when it comes to side effects. Steroids can cause [liver damage](#), and can also suppress the immune system, increasing the likelihood of infections. With such a high risk profile, steroids are usually only used for a short period of time, which is problematic when treating chronic diseases.

"In managing chronic conditions such as COPD, it is crucial to have a therapy that can be used safely over the long term," said Jian-Dong Li, M.D., Ph.D., professor in the Department of Microbiology and Immunology at the University of Rochester Medical Center and a senior author of the study. "There is a great need for a drug like vinpocetine, because patients currently have no good options when it comes to long-term care."

Vinpocetine decreases inflammation by targeting the activity of a specific enzyme, known as IKK. IKK is responsible for regulating inflammation, and does so through the activation of a key protein, nuclear-factor kappaB (NF- $\kappa$ B). By directly inhibiting IKK, vinpocetine is able to switch off NF- $\kappa$ B, which normally produces pro-inflammatory molecules that cause inflammation. Halting the activity of NF- $\kappa$ B ultimately reduces inflammation.

"Inflammation is a hallmark of a wide range of human diseases, so there is great potential for vinpocetine to be used for several indications," said Bradford C. Berk, M.D., Ph.D., CEO of the University of Rochester Medical Center and co-author of the study. "Given vinpocetine's efficacy and solid safety profile, we believe there is great potential to bring this drug to market."

Repositioning a therapy - taking a known compound that has been used safely in humans and testing it for a new application - can be an effective way to bring new therapies to market more quickly than starting the discovery process from scratch.

Inflammatory diseases are a major cause of illness worldwide. For example, [chronic obstructive pulmonary disease](#) is the fourth leading cause of death in the United States. In people with COPD, airflow is blocked due to chronic bronchitis or emphysema, making it increasingly difficult to breathe. Most COPD is caused by long-term smoking, although genetics may play a role as well. Approximately 13.5 million people in the United States are diagnosed with COPD each year, and in 2004 the annual cost of the disease was \$37.2 billion.

Provided by University of Rochester Medical Center

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