

Researchers discover novel pathway that may promote immune system balance

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Researchers at UCLA's Jonsson Cancer Center have discovered a novel anti-inflammatory cell signaling pathway that may serve as a vital Yin-Yang mechanism to maintain the delicate balance of immune response.

The discovery, published in the June issue of the peer-reviewed journal *Cell*, may lead to new ways to fight cancer and inflammatory diseases, said Ke Shuai, a professor of hematology/oncology, a researcher at UCLA's Jonsson Cancer Center and lead author of the study.

“The big picture message in this study is the finding of a new cellular pathway that operates to restrict inflammation and immunity.” Shuai said. “The immune system is vital in fighting pathogenic infections and can be mobilized to kill tumor cells. This discovery offers a strategy that will allow for the design of drugs to modulate the immune system. It's a new way to look at drug design.”

Shuai and his colleagues discovered the PIAS1 anti-inflammatory pathway, a pathway commonly used by a wide variety of stimulants that regulate immune system response and trigger inflammation. While inflammation is part of the body's natural defense system against infection, Shuai said, unbalanced inflammation can make people more vulnerable to diseases such as cancer.

The PIAS1 pathway serves as the Yin to the inflammation triggering Yang, working to keep a healthy balance in the immune system. Upon a bacterial or viral challenge to the body, important immune regulatory

genes are turned on in the nucleus of cells to fight infections. Shuai and his team discovered that PIAS1 is switched on to block the production of immune regulatory genes, resulting in the prevention of excessive inflammatory responses.

In cancer, the immune system can be mobilized to kill tumor cells, for example, the development of anti-tumor vaccines. In this case, a drug deactivating the PIAS1 pathway could be developed to boost the immune system to fight cancer. In addition, such a drug may be potentially useful for combating viral diseases such as HIV, Shuai said.

Shuai's research team next plans to investigate strategies such as using small chemical molecules that can target the PIAS1 signaling pathway for the treatment of cancer and other inflammatory disorders.

Source: University of California - Los Angeles

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