Antibiotic offers potential for anti-cancer activity

January 28 2011

An antibiotic known for its immunosuppressive functions could also point the way to the development of new anti-cancer agents, researchers at the Indiana University School of Medicine have reported.

The study determined that the compound, tautomycetin, targets an enzyme called SHP2, which plays an important role in cell activities such as proliferation and differentiation. Interestingly, SHP2 mutations are also known to cause several types of leukemia and solid tumors. The findings were reported in the Jan. 28, 2011, issue of the journal *Chemistry and Biology*.

The potential for developing anti-cancer agents grew out of an attempt to determine how the compound, tautomycetin, exerts its immune suppression activities, said Zhong-Yin Zhang, Ph.D., Robert A. Harris Professor and chairman of the Department of Biochemistry and Molecular Biology.

The finding is also encouraging because SHP2 is a member of a large family of enzymes called protein tyrosine phosphotases (PTPs), which are important in the signaling processes that control all essential cellular functions. Dysregulation of PTP activity has been linked to several human diseases, including cancer, diabetes, and immune dysfunctions. But their makeup has made it difficult to find potential drugs to act on them, characteristics that have labeled the PTPs as "undruggable," Dr. Zhang said.

"So we have identified a lead – a natural product produced by the bacteria *Streptomyces* – that should serve as a foundation for the development of therapeutic agents for a large family of protein tyrosine phosphotase targets. Until now these targets, including SHP2 for leukemia and other cancers, have been deemed undruggable," he said.

Provided by Indiana University School of Medicine