

Media Release

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Aspirin discovery may improve cancer treatments

Scientists have uncovered the molecular pathways involved in the inhibition of protein synthesis in cells by aspirin; a discovery that may have implications for the treatment of cancer.

Salicylates, including aspirin, are used to treat a range of inflammatory conditions and can be used to prevent diseases such as cancer, but the way aspirin works is not yet fully understood.

In a paper published in the prestigious *Journal of Biological Chemistry* in April, Professor Bryan Williams, Director of the Monash Institute of Medical Research, led a collaborative study that investigated the effects of salicylates on the inhibition of protein synthesis.

“Our research showed that treating human cells with salicylates results in the phosphorylation of the translation initiation factor eIF2 α , thus inhibiting protein synthesis,” Professor Williams said.

“Inhibiting or slowing down protein synthesis reduces the accumulation of incorrectly folded proteins in cells, which reduces cellular stress and allows protein synthesis to return to normal.”

Under conditions of cellular stress, eIF2 α is phosphorylated by a group of proteins called stress-activated kinases. One of these is protein kinase R-like endoplasmic reticulum kinase (PERK).

The research showed that salicylates caused an early increase in the phosphorylation of eIF2 α in normal mouse cells, but not in cells deficient in PERK. Aspirin was shown to activate PERK. Moreover, although aspirin inhibited protein synthesis in normal cells, this did not occur significantly in cells deficient in PERK. Thus PERK plays an important role in the inhibition of protein synthesis by salicylates.

“Our research into the mechanisms by which salicylates inhibit protein synthesis could lead to the design of more effective aspirin-like drugs for the treatment of diseases such as cancer,” Professor Williams said.

A copy of the paper is available at: <http://www.jbc.org/cgi/reprint/282/14/10164>

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