

Aspirin, tylenol may decrease effectiveness of vaccines

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With flu season in full swing and the threat of H1N1 looming, demand for vaccines is at an all-time high. Although those vaccines are expected to be effective, University of Missouri researchers have found further evidence that some over-the-counter drugs, such as aspirin and Tylenol, that inhibit certain enzymes could impact the effectiveness of vaccines.

"If you're taking [aspirin](#) regularly, which many people do for cardiovascular treatment, or acetaminophen ([Tylenol](#)) for pain and fever and get a flu shot, there is a good chance that you won't have a good antibody response," said Charles Brown, associate professor of veterinary pathobiology in the MU College of Veterinary Medicine. "These drugs block the enzyme COX-1, which works in tissues throughout the body. We have found that if you block COX-1, you might be decreasing the amount of [antibodies](#) your body is producing, and you need high amounts of antibodies to be protected."

COX enzymes play important roles in the regulation of the immune system. The role of these enzymes is not yet understood completely, and medications that inhibit them may have adverse side effects. Recent research has discovered that drugs that inhibit COX enzymes, such as COX-2, have an impact on the effectiveness of vaccines. Brown's research indicates that inhibiting COX-1, which is present in tissues throughout the body, such as the brain or kidneys, could also impact vaccines' effectiveness.

These MU researchers also are studying the regulation of inflammation

and how that leads to the development or prevention of disease. Many diseases, such as arthritis, cardiovascular disease and diabetes, are all chronic inflammatory diseases. Contrary to previous beliefs, inflammation is generally a good thing that helps protect individuals from infection. Many of the non-steroidal drugs that treat [inflammatory conditions](#) reduce antibody responses, which are necessary for treating infections.

"So far, we've tested this on an [animal model](#) and have found that these non-steroidal drugs do inhibit vaccines, but the next step is to test it on humans," Brown said. "If our results show that COX-1 inhibitors affect vaccines, the takeaway might be to not take drugs, such as aspirin, Tylenol and ibuprofen, for a couple weeks before and after you get a [vaccine](#)."

More information: Brown's research, "Cyclooxygenase-1 Orchestrates Germinal Center Formation and Antibody Class-Switch via Regulation of IL-17," has been published in *The Journal of Immunology*.

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