Beat: Miscellaneous

New research could pave the way to safer treatments for arthritis

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USPA News - The increased risk of heart attack or stroke associated with many arthritis drugs may be avoidable, according to a new international study published on Thursday. It indicates that additional research will lead to safer treatments over the next decade.

Drugs such as Vioxx, diclofenac, ibuprofen and Celebrex operate by blocking an enzyme known as COX-2, whose presence in blood vessels has up until now been held responsible for these side effects. New research carried out on mice has revealed that COX-2 is largely absent from the major blood vessels and instead found in the brain, gut, and kidney as well as the thymus gland in the chest. Now that researchers know where in the body the drug is acting, they can begin to develop safer, more targeted drugs for patients with arthritis as well as cancer. The study was co-authored by researchers at Imperial College London and was funded by the UK-based Wellcome Trust. Arthritis drugs have long been associated with potentially fatal cardiovascular side-effects in patients. Health concerns led to the anti-inflammatory Vioxx being withdrawn from the market in 2004, and this week medical regulators have advised some patients to stop using the painkiller diclofenac. Researchers have always believed that COX-2 was found in the blood vessels where it was central to preventing the formation of clots, meaning that any drug that inhibited the enzyme was thought to lead to an increased risk of clotting. The new study, published in the journal PLOS ONE, reveals that COX-2 is largely absent from the major blood vessels. Instead, COX-2 appears to be present in the brain, kidney, thymus and gut, where it may well be affecting the cardiovascular health. The new research suggests future development of COX-2 inhibitors that carry reduced risk of stroke or heart attack may be possible. "Now we know the true sites of COX-2, we can begin to develop new ideas that will lead to better drugs for arthritis and cancer with fewer side effects," said lead author Professor Jane Mitchell of Imperial`s Faculty of Medicine. Professor Mitchell added: "This study does not provide all the answers, but once we understand exactly how COX-2 affects the cardiovascular system we will be in a position to design new therapies. This will not be easy but all the tools are available and we could be looking at new leads within five to ten years." In order to accurately measure concentrations of COX-2 within the body, the researchers used mice whose COX-2 gene had been replaced with a gene called luciferase, which gives fireflies their distinctive glow. This allowed researchers to create detailed images of the distribution of COX-2 throughout the body. "This study is the first to use such sophisticated techniques to determine the locations of COX-2 within the body," said Professor Anna Nicolaou, a co-author, now at the University of Manchester. "The use of mass spectrometry and genetically modified mice in this way represents a significant advance in the field." This was echoed by Professor Tim Warner, a co-author from Queen Mary, University of London, who said: "These cutting edge techniques are at last supplying us with the definitive answers we need to understand the side effects of arthritis drugs. This could help improve therapy for many millions of patients worldwide."

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