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Australia to develop non-opioid painkillers for treating chronic pain

09 September 2021 | News

Chronic pain remains a widespread global health burden with lack of current therapeutic options

Australia's Monash University researchers have made a breakthrough discovery that could pave the way for the development of novel non-opioid painkillers (analgesics) to safely and effectively treat neuropathic pain.

Neuropathic pain is a type of chronic pain that can occur if your nervous system is damaged or not working correctly, and can be caused by injury, virus infection or cancer treatment, or be a symptom or complication of conditions such as multiple sclerosis and diabetes.

The new study, led by drug researchers from the Monash Institute of Pharmaceutical Sciences (MIPS) and the Monash Biomedicine Discovery Institute (BDI), has demonstrated a new mode of targeting the adenosine A1 receptor protein, which has long been recognised as a promising therapeutic target for non-opioid painkillers to treat neuropathic pain but for which the development of painkillers had failed due to a lack of sufficient on-target selectivity, as well as undesirable adverse effects.

Another breakthrough in the study was facilitated by the application of cryo electron microscopy (cryoEM) to solve the high-resolution structure of the A1 receptor bound to both its natural activator, adenosine, and an analgesic PAM, thus providing the first atomic level snapshot of where these drugs bind.

The new Monash discovery provides the opportunity for researchers to develop non-opioid drugs that lack side effects such as respiratory depression and addiction.