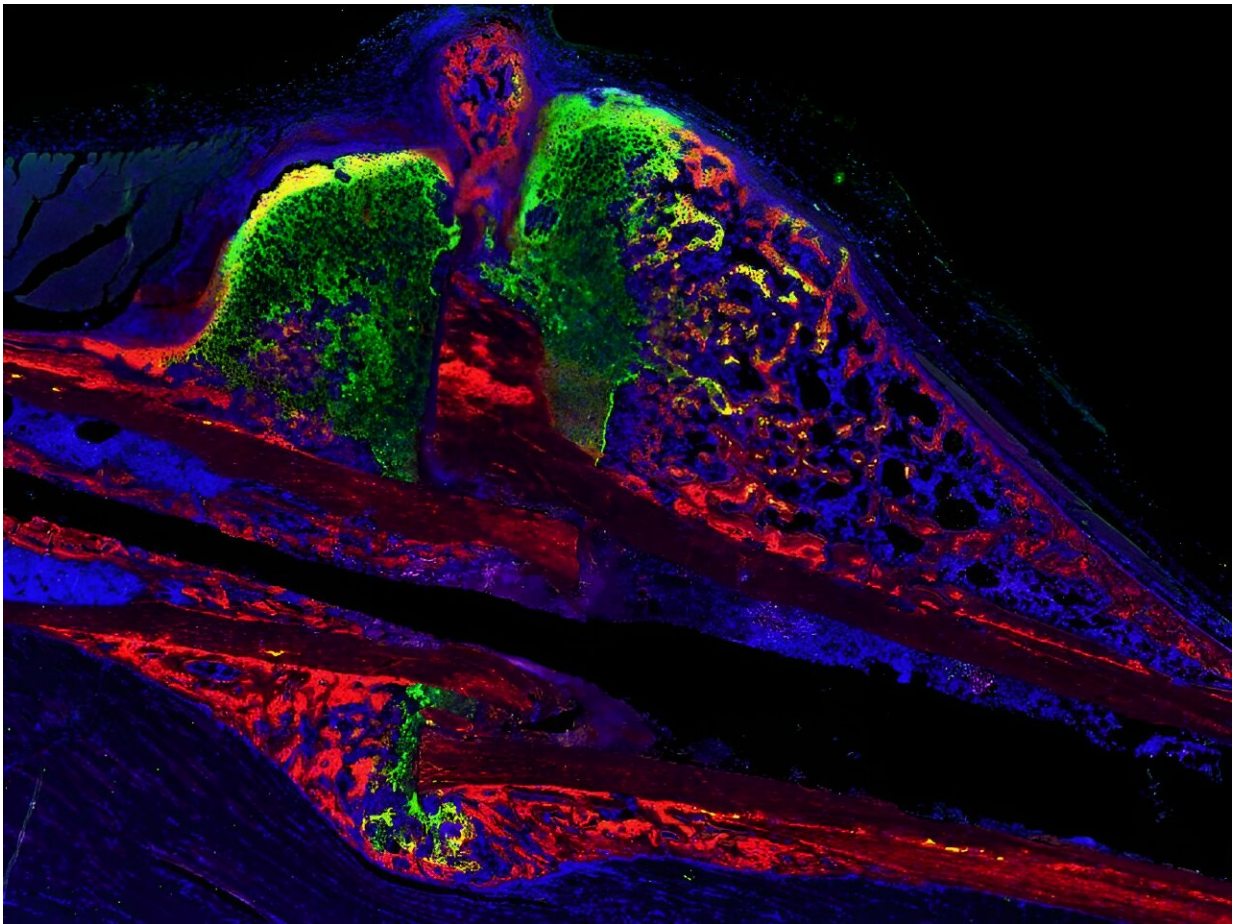


# CBD and CBG may promote bone fracture healing, manage pain

October 26 2023, by Zachary Sweger

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Penn State College of Medicine researchers are studying how cannabinoids may manage pain and promote bone healing in bone fractures. Fluorescence microscopy reveals how periosteal bone progenitors, which later develop into specialized bone cells that help bone tissue for, appear in healing tissue. Credit: Reyad Elbarbary/Penn State

Cannabidiol (CBD) and cannabigerol (CBG) might someday help bone fracture patients manage their pain, according to a Penn State study. In a study in mice, the researchers unexpectedly found that the cannabinoids also promoted fracture healing.

The results were published in the [\*Journal of Bone and Mineral Research\*](#).

Scientists estimate that more than 178 million people suffer from [bone](#) fracture injuries annually around the globe. According to corresponding author Reyad Elbarbary, associate professor of orthopedics and rehabilitation at Penn State College of Medicine, current methods for managing [pain](#), often nonsteroidal anti-inflammatory drugs (NSAIDS) like aspirin, are not optimal.

"NSAIDS may help patients manage pain, but they also reduce inflammation, which is a crucial first step in [fracture healing](#)," Elbarbary said. "An alternative for pain management is needed that does not prevent inflammation from occurring."

Elbarbary and his team's primary goal was to measure CBD and CBG's separate abilities to alleviate pain in mice. The team, in what they called the first study to analyze [cannabinoids](#) in the context of fracture [healing](#) and [pain management](#), found that the cannabinoids were comparable to the NSAIDS in their ability to manage pain. But they said they were also surprised to find that CBD and CBG helped with the fracture healing process.

With immunofluorescence microscopy, microcomputer tomography imaging and biomechanical testing, the researchers studied the fracture healing process—everything from [bone density](#) and bone strength to the expression of genes that are necessary for the progression of fracture healing.

In the early phase of treatment, the cannabinoids were associated with an increase in the abundance of periosteal bone progenitors, which later develop into specialized bone cells that help bone tissue form. During the later phase of healing, CBD and CBG accelerated the process by which the body absorbs minerals to strengthen newly formed bone.

"Both treatments led to higher bone volume fraction and mineral density than with NSAID treatments, which leads to a functional and healthy newly formed bone," Elbarbary said. "We still have a lot to learn about the biological mechanisms behind what we observed."

According to Elbarbary, future research will focus on defining the cellular and molecular processes behind the cannabinoids' role in early and late stages of fracture healing, as well as developing a clinical formulation for use in adult fracture patients. While CBD is already approved by the Federal Drug Administration to treat seizures in children, finding a formulation, or dose, that is suitable for adults in the context of bone fractures will be a critical next step, Elbarbary said.

"There is already robust safety information gathered on CBD," Elbarbary explained. "CBG is more investigational at this stage. It's more likely that CBD would be repurposed for treating fractures once a formulation is found and its efficacy for treatment in the context of bone fractures is determined."

**More information:** Deepak Kumar Khajuria et al, Cannabidiol and Cannabigerol, Nonpsychotropic Cannabinoids, as Analgesics that Effectively Manage Bone Fracture Pain and Promote Healing in Mice, *Journal of Bone and Mineral Research* (2023). [DOI: 10.1002/jbmr.4902](https://doi.org/10.1002/jbmr.4902)

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