

# Cannabis helps fight resistant bacteria

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Since the discovery of penicillin in 1928 by Sir Alexander Fleming, antibiotics have saved millions of lives from fatal infections world-wide. However, with time bacteria have developed mechanisms to escape the effects of antibiotics—they have become resistant.

With fewer antibiotics available to treat resistant bacterial infections, the possibility of entering a pre-antibiotic era is looming ahead.

Alternative strategies are being explored and helper compounds are attracting attention. Helper compounds are non-antibiotic [compounds](#) with the capability of enhancing the efficacy of antibiotics.

## **How to boost antibiotics**

One such helper compound has been suspected to be cannabidiol (CBD); a cannabinoid from the cannabis plant. Now a research team from University of Southern Denmark, has published a scientific study proving the effect of CBD.

Janne Kudsk Klitgaard is Principal Investigator and corresponding author. First author is Ph.D. student Claes Søndergaard Wassmann. The study is published in the journal *Scientific Reports*.

When we combined CBD and antibiotics, we saw a more powerful effect than when treating with antibiotics alone. So, in order to kill a certain number of [bacteria](#), we needed less antibiotics, they say.

## **Bacteria clones spread globally**

In the study, CBD was used to enhance the effect of the antibiotic bacitracin against *Staphylococcus aureus* bacteria; a major human pathogen that frequently causes community- and hospital-acquired disease.

Multidrug-resistant clones of this pathogen have spread globally. In some countries, treatment of bacterial infections with these resistant bacteria are difficult and the problem is projected to be an ever-larger problem in the future.

According to the researchers, the combination of CBD and antibiotics may be a novel treatment of infections with antibiotic resistant bacteria.

### **How do the bacteria die?**

Three things happened with the *Staphylococcus aureus* bacteria, when the researchers treated them with the combination in their study:

1. The bacteria could no longer divide normally.
2. The expression of certain key genes ([cell division](#) and autolysis genes) in the bacteria was lowered.
3. The bacterial membrane became unstable.

### **Anti-resistance must be stopped**

According to the researchers, overuse of [antibiotics](#) is the main cause of antibiotic resistance.

If we combine an antibiotic with a helper compound, that enhances the effect of the antibiotic, we need less antibiotic to achieve the same effect. This may contribute to the development of fewer resistant bacteria, says Janne Kudsk Klitgaard.

**More information:** Claes Søndergaard Wassmann et al, Cannabidiol is an effective helper compound in combination with bacitracin to kill Gram-positive bacteria, *Scientific Reports* (2020). [DOI: 10.1038/s41598-020-60952-0](#)

Provided by University of Southern Denmark

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