

New study reveals how cannabis suppresses immune functions

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An international team of immunologists studying the effects of cannabis have discovered how smoking marijuana can trigger a suppression of the body's immune functions. The research, published in the *European Journal of Immunology*, reveals why cannabis users are more susceptible to certain types of cancers and infections.

The team, led by Dr Prakash Nagarkatti from the University of South Carolina, focused their research on cannabinoids, a group of compounds found inside the cannabis plant, including THC (delta-9 tetrahydrocannabinol) which is already used for medical purposes such as pain relief.

"Cannabis is one of the most widely used drugs of abuse worldwide and it is already believed to suppress immune functions making the user more susceptible to infections and some types of cancer," said Dr Nagarkatti. "We believe the key to this suppression is a unique type of immune cell, which has only recently been identified by immunologists, called myeloid-derived suppressor cells, MDSCs."

While most immune cells fight against infections and cancers to protect the host, MDSCs actively suppress the immune system. The presence of these cells is known to increase in cancer patients and it is believed that MDSCs may suppress the immune system against [cancer therapy](#), actually promoting cancer growth.

Dr Nagarkatti's team demonstrated that cannabinoids can trigger a

massive number of MDSCs through activation of cannabinoid receptors. This research reveals, for the first time, that [marijuana](#) cannabinoids may suppress the immune system by activating these unique cells.

"These results raise interesting questions on whether increased susceptibility to certain types of cancers or infections caused from smoking marijuana results from induction of MDSCs," said Nagarkatti. "MDSCs seem to be unique and important cells that may be triggered by inappropriate production of certain growth factors by cancer cells or other chemical agents such as cannabinoids, which lead to a suppression of the immune system's response."

In a related study, also published in the European journal of Immunology, Dr Christian Voshenrich from the Institut Pasteur in Paris, reveals that when cancer cells grow they produce a molecule called interleukin-1 β (IL-1 β), which also triggers MDSCs. This study identifies how MDSCs produced during [cancer growth](#) also weaken the ability of [immune cells](#) to kill [cancer cells](#).

"Marijuana cannabinoids present us with a double edged sword," concluded Dr Nagarkatti. "On one hand, due to their immunosuppressive nature, they can cause increased susceptibility to cancer and infections. However, further research of these compounds could provide opportunities to treat a large number of clinical disorders where suppressing the immune response is actually beneficial."

More information: Hedge. V, Nargarkatti. M, Nargarkatti. P, "Cannabinoid receptor activation leads to massive mobilization of myeloid-derived suppressor cells with potent immunosuppressive properties" European Journal of Immunology, November 2010. [DOI:10.1002/eji.201040667](https://doi.org/10.1002/eji.201040667)

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