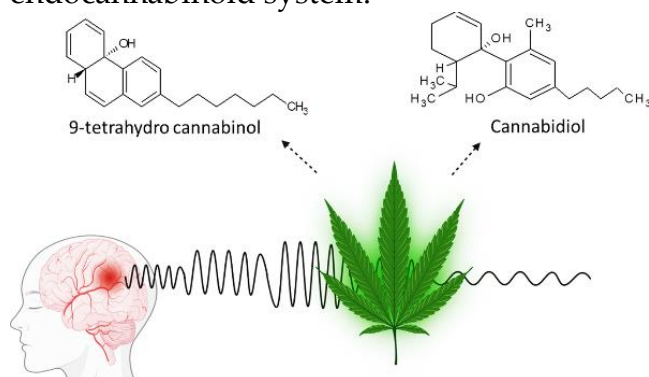


DOI: doi.org/10.55627/mmc.001.01.0055-0066**Editor's Choice****Editor's Selection of the Important Research Investigations in the Field of Molecular Medicine Communications from Around the World****Editorial Staff**

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Targeting the Endocannabinoid System
(doi.org/10.55627/mmc.001.01.0065)

Metabolism, inflammation, neural development, neuronal excitation, and cell division are some of the many biochemical functions in which the endocannabinoid system is significantly involved. 9-tetrahydrocannabinol (THC) and cannabidiol (CBD), important phytochemicals found in *Cannabis sativa*, have demonstrated the ability to target the endocannabinoid system.

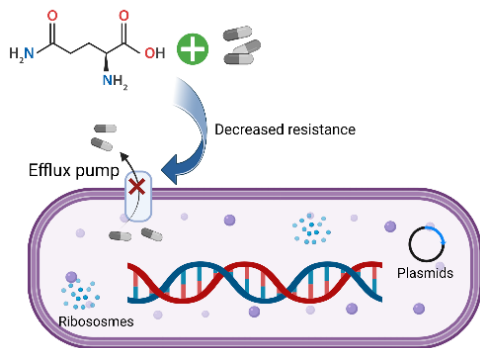


The potential therapeutic applications of both phyto- and synthetic cannabinoids as well as their mechanism, have been explained in a study by Keimpema and colleagues. Even though there are promising results for endocannabinoid modulation in certain kinds of epilepsy, there is

significantly more that has to be perceived about the potential role of phytocannabinoids and their targets before they can be considered efficacious and safe therapeutics. *Science*. 2021 Dec 17;374(6574):1449-1450.

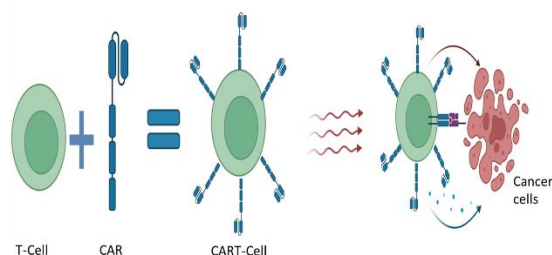
Metabolite Mitigates Resistance
(doi.org/10.55627/mmc.001.01.0063)

A growing problem yet to be adequately addressed is the conferment of antibiotic resistance. Zhao et al. showed that in pathogenic Gram-negative bacteria, increased influx and efficacy of antibiotics was seen with the use of glutamine. The mechanism involves alteration of the metabolism of nucleotides causing the bacterial membrane to have increased non-selective permeability in bacterial strains possessing diverse resistance mechanisms. Furthermore, in mouse models with systemic or biofilm infections, enhanced antibiotic efficacy was seen with glutamine supplementation, further strengthening its potential use. *Sci Transl Med*. 2021 Dec 22;13(625):eabj0716.



Chimeric Co-stimulation (doi.org/10.55627/mmc.001.01.0066)

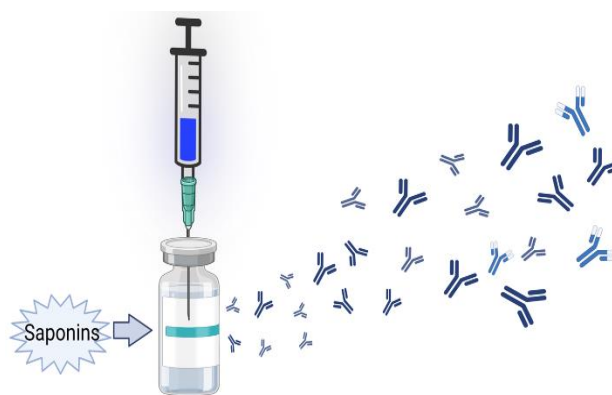
To prevent relapse of hematological cancers, improvements must be made in chimeric antigen receptor (CAR) T-cell therapy. Katsarou et al., in an attempt to tackle conventional relapse mediators, designed chimeric costimulatory receptors that aid CAR T-cell activation via intracellular signaling by attaching to a second tumor-associated antigen. As a result, the investigators noticed enhanced killing of tumor cells *in vitro* and *in vivo*, even against cancer cells with exceptionally low antigen density. This was associated with improved CAR T cell persistence. *Sci Transl Med*. 2021 Dec 8;13(623): eabh1962.



Boosting Adjuvant Activity (doi.org/10.55627/mmc.001.01.0064)

Despite a limited stock approved for clinical application, adjuvants remain a vital

component of vaccines due to their ability to enhance responses against antigens bearing poor immunogenicity. Silva and his colleagues synthesized a novel adjuvant consisting of saponin-bearing detergent-like properties and a monophosphoryl lipid A (MPLA) that serves as a Toll-like receptor 4 agonist encapsulated in nanoparticle structures. The novel adjuvant formulation invoked increased antibody and germinal center responses compared to an assortment of already available adjuvants in both mice and rhesus macaques post inoculation of an HIV antigen that had poor immunogenic characteristics. In addition, in a mast cell-dependent fashion, increased lymphatic flow was observed with saponin-MPLA nanoparticles. Furthermore, lymph nodes also had an enhanced antigen load, indicating the mechanisms by which saponin consisting adjuvants improve humoral immune responses. *Sci Immunol*. 2021 Dec 3;6(66):eabf1152.



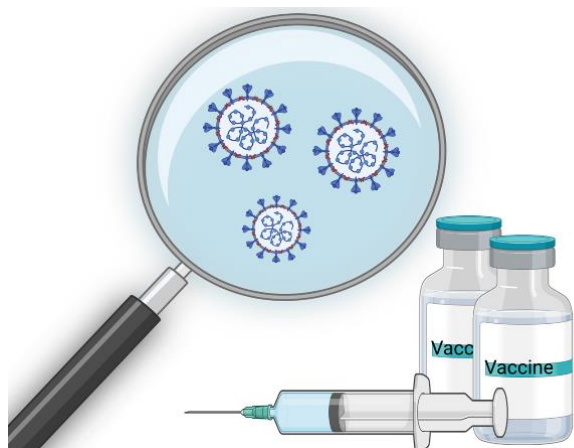
Path to Another Drug Against COVID-19 (doi.org/10.55627/mmc.001.01.0055)

One of the crucial components in the fight against the SARS-CoV2 pandemic has been the speedy development of vaccines. However, a lack of board access, the rise of

variants, and breakthrough infections are some of the many challenges yet to be addressed completely. Henceforth, it is incumbent that anaphylactic anti-viral agents against Covid be developed sooner rather than later. Although compounds acting against RNA-dependent-RNA polymerase have entered clinical trials, other viral enzymes have been identified as viable candidates for inhibition by chemical agents. Owen et al. discovered and characterized a novel drug compound that acts against the pivotal protease, which catalyzes the breakage of the viral polyprotein integral in the replication of viruses. In mouse models, the drug candidate named PF-07321332, which is administered orally, has exhibited high selectivity, safety, and conferred protection against Covid infections.

demonstrating its potential as a possible addition to the anti-viral drug arsenal. *Science*. 2021 Dec 24;374(6575):1586-1593.

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In vitro studies showed that the drug reached sufficient levels to inhibit the virus, which was also observed in Phase 1 clinical trials. Severe acute respiratory syndrome coronavirus 1 and Middle East respiratory syndrome coronavirus and a few other coronaviruses were also inhibited,