

## ANTIPROLIFERATIVE EFFECT OF CANNABINOIDS IN HUMAN CELL LINES

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**BACKGROUND:** The biological effects of cannabinoids, the main constituents of *Cannabis sativa*, are mediated by the activation of G protein coupled receptors, CB1 and CB2, mainly expressed in the central nervous system and in the peripheral nervous system respectively [1]. For a long time, the psychoactive effects of delta-9-tetrahydrocannabinol (THC) have limited the use of Cannabis in therapy, but in recent years the therapeutic potential of cannabinoids has become increasingly evident, particularly in neurodegenerative diseases [2]. We studied the antiproliferative effect of cannabidiol (CDB) and THC on two cell lines: SH-SY5Y, a neuroblastoma cell line, and THP-1, a human monocyte cell line. These two cell lines were chosen since in literature the neuroprotective effects of cannabinoids have been correlated not only to neuronal activity, but also to effects on immune system.

**METHODS:** The two phytocannabinoids have been tested alone or in association, in the same ratio in which they are present in Cannabis FM-2, for times ranging from 24 to 72h. Furthermore, the activity of the individual phytocannabinoids was compared with extracts produced in the laboratory of Organic Chemistry of Prof. Barge. The anti-proliferative effect was assessed using the Cell-Titer Glo (Promega) assay. In addition, the ability of CBD and THC, alone or in combination, to reduce the

cytotoxicity induced by 6-hydroxydopamine (6-OHDA) in SH-SY5Y, Parkinson model in vitro, was evaluated [3].

**RESULTS:** CBD is more cytotoxic than THC in SH-SY5Y cell line, with an evident effect after 24 hours of treatment. The combination has a similar effect to CBD, which however tends to increase with the prolongation of the treatment. Nonetheless in THP-1 cell line the cytotoxicity induced by CBD and THC is comparable; the CDB + THC association is able to inhibit cell proliferation at a lower concentration. None of the tested compounds are shown to reduce 6-OHDA-induced cytotoxicity, when administered 30 minutes after 6-OHDA.

**CONCLUSIONS:** The effects of CBD and THC is cell type dependent, with a very similar effect in THP-1, while in SH-SY5Y CBD is more cytotoxic. In the future, times of treatment will be modulated and different ratios of CBD and THC will be tested, even in an in vitro Alzheimer model.

### REFERENCES:

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