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Biotransformation study of the synthetic cannabinoid JWH-007

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The cannabinoid substances group can be subdivided into three subgroups called: phytocannabinoids, endogen cannabinoids and synthetic cannabinoids. All of these have the ability of modulate the activity of the receptors CB1 and CB2, which are part of the physiological endocannabinoid system. Research on synthetic cannabinoids has had different scopes, focusing primarily on the understanding of the physiological function of the CB1 receptor. However, some of these compounds have started to be used as psychoactive substances, so the focus of their study has been channeled towards their toxic effects, their pharmacokinetics and how they can be detected in users. In this study, we present an approach to phase I-biotransformation of the compound JWH-007, which is a strong agonist of the CB1 receptors and it is reported by its use as a psychoactive substance due to the effects caused by its administration. In that sense, we first synthesized the compound with an alkylation reaction SN2 followed by an acylation reaction Friedel-Crafts. Once purified and chemically characterized, an *in vitro* biotransformation study was carried out in a controlled system that includes CYP2C9, and the subsequent determination of the chemical structures of the products generated by Mass Spectroscopy. Our data suggests that some of these Phase I-metabolites retain their biological activity, since they have an important affinity for the CB1 receptor. In that way, the determination of the kinetic parameters of the enzymatic process allows to conclude the chemical structures of the main Phase I-metabolites and their catalysis speed. The chosen *in vitro* biotransformation system is ideal for the initial study of the metabolism of compounds of biological interest. This, in turn, opens can lead to later research in more complex system such as cell lines or animals. The knowledge of the key points in the biotransformation of the compound is essential in the pharmacological study of CB receptors, which are still being explored as a therapeutically alternative and more recently because of their value as molecular targets of new drugs.

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