BIOSYNTHESIS OF VITAMIN K1 (PHYLLOQUINONE) IN *LEISHMANIA (L.) AMAZONENSIS*

JOSÉ MÁRIO DE FREITAS BALANCO[1], GABRIEL CÂNDIDO MOURA[2], RODRIGO ANTONIO CESCHINI SUSSMANN[3], ALEJANDRO MIGUEL KATZIN[1].
[1]DEPARTMENT OF PARASITOLOGY, INSTITUTE OF BIOMEDICAL SCIENCES, UNIVERSITY OF SÃO PAULO, SÃO PAULO, BRAZIL.
[2]JUNDIAÍ MEDICAL SCHOOL (FMJ), JUNDIAÍ, SÃO PAULO, BRAZIL.
[3]INSTITUTE OF HUMANITIES, ARTS AND SCIENCES (IHAC), FEDERAL UNIVERSITY OF SOUTHERN BAHIA (UFSB), PORTO SEGURO, BAHIA, BRAZIL.

Leishmaniasis is one of the main neglected diseases in Brazil and worldwide. Study of the biology and biochemistry of the parasite and the search for new targets for the development of antileishmanial drugs are necessary. New metabolic pathways of the parasite, such as the Mevalonate pathway, has proven to be an alternative for the development of new drugs. It is important to better understand the physiology and survival mechanisms used by this parasite. The biosynthesis of isoprenoids in *Leishmania* spp. has not yet been well studied. The aim of this study was to investigate whether Vitamin K1 biosynthesis occurs in promastigote forms of *Leishmania (L.) amazonensis (L. amazonensis*), and whether this pathway could be a good target for the development of new drugs. Vitamin K1, also known as phylloquinone, is the most common form of Vitamin K. It is found in green leafy vegetables, such as spinach, collard greens, and broccoli. The main function of vitamin K1, in the human host, is to assist in blood coagulation. The presence of Vitamin K1 in promastigote forms of *L. amazonensis* was identified by the RP-HPLC technique using radioactive precursors [1-(n)-3H]-phytol. We confirmed the presence of vitamin K1 in the parasite by gas chromatography-mass spectrometry. Treatment with Warfarin, a drug that inhibits the VKOR enzyme, was able to inhibit the growth of the parasites at a concentration in the micromolar range and induced the production of *ROS* (reactive oxygen species) in promastigotes of *L.* amazonensis. The presence of exogenous phylloquinone reduced the production of ROS, indicating a possible antioxidant function of phylloquinone, and was able to recover the parasites treated with Warfarin. We describe a "putative" sequence of the VKOR enzyme of *L. amazonensis*, as well as the identification of the active site. This study presented evidence of Vitamin K1 biosynthesis in *L. amazonensis* and suggests that inhibitors of the VKOR enzyme may be a leishmanicidal drug.
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