Leishmania (Leishmania) infantum infection alters the lipidome of human macrophage

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Leishmaniases represent neglected diseases caused by parasites of the genus *Leishmania*. *Leishmania (Leishmania) infantum*, in the Americas, is responsible for - Visceral Leishmaniasis (VL). VL can result in death if not adequately treated. In addition to the typical systemic symptoms of VL, changes in the plasma lipid profile are noted in humans as well as in dogs and mice. These lipid changes are characterized by increased levels of triglycerides (TG) and very low-density lipoproteins (VLDL) and a reduction of high-density lipoproteins (HDL). In human infections, we previously identified a correlation between high levels of TG and VLDL and a greater risk toward active disease development. In our recent study, a change in the expression of genes related to lipid metabolism was demonstrated in *L. infantum* infected-THP-1 macrophages. The aim of the present study was to identify the alterations in the lipidome of human macrophages during infection by *L. infantum*. The monocytic THP-1 cell line was differentiated using 20 ng/mL of PMA for 24 hours and maintained for 48 hours in RPMI 1640 medium with 5% heat-inactivated fetal bovine serum, at 37˚C and 5% CO2. The THP-1 macrophage was infected with stationary phase *L. infantum* promastigotes for 6 hours at the beginning of the experiment, and then evaluated at time zero and 24 hours post-infection. The untargeted lipidomic analysis revealed an increase in lipid species of lysophosphatidylcholine (2), lysophosphatidylglycerol (1), phosphatidylinositol (1), phosphatidylcholine (9), phosphatidylethanolamine (3), fatty acids (3), sphingolipids (3), and cholesterol ester (1) in infected macrophages compared with control or uninfected macrophages. Thus, we may conclude that the interaction between *Leishmania* and macrophages leads to alterations in the lipid profile of host cells during the first 24 hours of infection. These findings suggest a crucial role of lipid changes in the pathogenesis of VL. Understanding these pathophysiological mechanisms may contribute for the development of new therapeutic strategies. Additionally, the identification of specific lipid biomarkers may be useful for early diagnosis and monitoring the progression of VL.

Keywords
Visceral Leishmaniasis; *Leishmania (L.) infantum*; Lipidomics; Human macrophage; Lipids

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