ORT_31 - Unveiling the Host-Parasite Lipid Interplay: Lipid Metabolic Alterations in *Leishmania (L.) amazonensis*-Infected Macrophages

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Introduction: Leishmaniasis, a group of neglected tropical diseases, is caused by protozoa belonging to the genus *Leishmania*. The success of *Leishmania* infection within the vertebrate host hinges on the subversion of macrophages and the proliferation of the parasite. Macrophages lack complete lipid biosynthesis and degradation pathways, necessitating the acquisition of these molecules from the host. We hypothesized that *Leishmania (L.) amazonensis* infection induces lipid biosynthesis in macrophages, leading to lipid accumulation.

Objectives: This study aimed to characterize alterations in the lipid profile of human macrophages induced by *Leishmania (L.) amazonensis* infection.

Methodology: Changes in lipid metabolism were investigated by comparing THP-1 uninfected control cells with cells infected for up to 48 hours. Lipids were extracted from cell lysates and separated into different classes using high-performance thin layer chromatography (HPTLC). Additionally, control and infected macrophages were labeled with a synthetic fluorescent marker for lipid droplets (BODIPY). The uptake of lipids from the supernatant was assessed by incubating cells with various lipid precursors.

Results: Infected macrophages exhibited increased levels of storage lipids, including glycerolipids (triacylglycerols, diacylglycerols, monoacylglycerols), sterols (cholesterol, esterified cholesterol, oxysterol), and fatty acids. Exogenous palmitate incorporation was similar in both conditions, while control macrophages showed higher uptake of LDL-^{3}H and HDL-^{3}H compared to infected ones. Fluorescence microscopy revealed heightened lipid body intensity in infected macrophages.

Conclusion: Our findings suggest heightened lipid synthesis during *Leishmania* infection at the expense of uptake from the culture medium. The accumulation of lipids and their storage in lipid droplets indicate *Leishmania (L.) amazonensis* ability to manipulate macrophage lipid biosynthesis for its survival, differentiation, and proliferation within the host.

Keywords: *Leishmaniasis*; Lipids; Host-parasite