Preliminary Identification of Paramagnetic Extracellular Vesicles in Plasmodium Falciparum-Infected Erythrocytes

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New evidences have revealed that the protozoan parasite Plasmodium falciparum uses a communication net based on the releasing extracellular vesicles from infected red blood cells. The content of the exosomes includes proteins, lipids and nucleic acids that are used in the parasite-parasite signaling interaction during Malaria infection. However, several approaches remain to be performed to understand completely the biological implications regarding the process of communication in one of the most lethal infectious diseases in the world. Hence, based on the well known paramagnetic property of the hemozoin biocrystals which are synthetized from the heme group by P. falciparum, we found evidence that those extracellular vesicles released by infected red blood cell can also carry a content with paramagnetic properties in P. falciparum in vitro culture, suggesting that hemozoin might be used as a signal for the regulation of biological events. To achieve this study we cultivated P. falciparum W2 strain using RPMI medium plus 10% human serum. Once the synchronized mature trophozoite stage culture reached a parasitemia of 15%, the supernatant was collected to isolate the paramagnetic exosomes by centrifugation, filtration, attachment to magnetic column and ultracentrifugation. Then, the exosomes were analyzed by immunofluorescence microscopy and UV-vis spectrometry to determine the presence of extracellular vesicles and hemozoin, respectively. In conclusion, we suggest that extracellular vesicles released from infected red blood cells have paramagnetic properties, although more specific and sensitive approaches need to be performed in order to confirm our findings.

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