

PHOTOACOUSTIC DETECTION AND SPECTRAL ANALYSIS OF HEMOZOIN IN HUMAN LEUKOCYTES AS AN EARLY INDICATOR OF MALARIA INFECTION

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ABSTRACT

Malaria is a blood borne infection affecting hundreds of millions of people worldwide. Usually, malaria is diagnosed only after a patient presents symptoms, including high fever, nausea, and, in advanced cases, coma and death. While reproducing within the bloodstream of a host, malaria parasites convert hemoglobin into an insoluble crystal, known as hemozoin. These crystals, approximately several hundred nanometers in size, are contained within red blood cells and white blood cells that ingest free hemozoin in the blood. Thus, infected red blood cells and white blood cells contain a unique optical absorber that can be detected in blood samples using photoacoustic detection methods. Our group separated the white blood cells from malaria infected blood and tested it *in vitro* using a photoacoustic set up with a tunable laser system.