



DIGITAL RECREATION OF VISUAL IMPRESSIONS OF OBJECTS

Problem – Challenge

Malaria is a life-threatening disease that impacts both the public health and the economy. According to the WHO, there are more than 219 million cases and 400'000 deaths annually. Individuals infected with malaria but display no symptoms act as reservoirs for the parasite, leading to further infections. These individuals need to be identified and cured to stop malaria transmission, and ultimately eradicate the disease. However, rapid diagnostic tests and microscopy have failed to efficiently detect these asymptomatic infections due to their low sensitivity.

Solution

Hemolytics' malaria diagnostic is based on a patented and published amplification of a pan-malarial biomarker, hemozoin. The chemical reaction leverages the catalytic properties of the biomarker to trigger a dual amplification resulting in turbidity that can be optically monitored. This new tool, which detects the biomarker in the bloodstream at extremely small concentrations, could lead to fewer false-positives, subsequently improve treatment protocols for patients, and help reduce healthcare costs, but also fill a market niche in the diagnostic sector. The test is specifically designed to discover asymptomatic carriers at risk of transmitting the disease.

The project stems from research carried out by Prof. Nico Bruns' group at the Adolphe Merkle Institute, in collaboration with the Swiss Tropical and Public Health Institute, and the University of Fribourg's Department of Medicine. The researchers investigated hemozoin, which is generated by the malaria parasite when it digests hemoglobin, a vital oxygen-carrying protein found in red blood cells. To observe the presence of this biomarker, the scientists chose a polymerization reaction. The solution passes from a transparent state to a cloudy one upon formation of the polymer. The speed of the reaction is directly correlated to the concentration of the malarial biomarker.

