

## **POLYMERIZATION BASED AMPLIFICATION AS A TOOL FOR MALARIA DIAGNOSTICS**

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### **ABSTRACT**

Although the incidence of malaria has been reversed during the last fifteen years, further developments in the diagnostic field are required to eradicate the disease. Because of habituation in endemic regions, asymptomatic carriers are reservoirs for the parasites. Dormant parasitic stage causes low level of parasitemia and are thus difficult to detect. Human reservoirs have to be identified in a systematic way and efficiently cured to achieve a complete eradication of the parasite. A sensitive and accurate diagnostic applicable at a large scale is therefore needed.

Our group is developing a highly sensitive assay based on the properties of a pan malarial biomarker called hemozoin. Under conditions of atom transfer radical polymerization, hemozoin can catalyze the polymerization of N-isopropylacrylamide (NIPAM). Conducting the polymerization at 37 °C causes the precipitation of poly(NIPAM) which can be monitored by turbidity measurements. We have shown that the increase in turbidity is proportional to the hemozoin concentration and thus can be correlated to the level of parasitemia. With the aim to optimize and miniaturize the assay, a 96 well plate format of the assay was developed. It allows to screen reaction parameters in order to increase sensitivity and decrease assay time.

**Acknowledgement:** Novartis Stiftung für medizinisch-biologische Forschung

### **References:**

Silva, T. B.; Spulber, M.; Kocik, M. K.; Seidi, F.; Charan, H.; Rother, M.; Sigg, S. J.; Renggli, K.; Kali, G.; Bruns, N., *Biomacromolecules* **2013**, *14*, 2703-2712.