INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student	:	BABINA CHAKMA
Roll Number	:	126106001
Programme of Study	:	Ph.D.

Thesis Title: DEVELOPMENT OF MALARIA DETCTION METHODS USING PLASMODIUM FALCIPARUM HISTIDINE RICH PROTEIN II AS TARGET BIOMARKER.

Name of Thesis Supervisor(s)	:	PROF. PRANAB GOSWAMI
Thesis Submitted to the Department/ Center	:	BIOSCIENCES AND BIOENGINEERING
Date of completion of Thesis Viva-Voce Exam	:	23RD JULY 2018
Key words for description of Thesis Work	:	MALARIA, BIOSENSORS, ANALYTICAL CHEMISTRY, HRP II

SHORT ABSTRACT

The current investigation focuses on the development of chemical and aptamer recognition systems to detect histidine rich protein-II (HRP-II) with an aim of developing efficient diagnostic systems for malaria caused by *P.falciparum*. Based on our investigation we put forwarded three independent proof of concepts which will be further discussed below : (A) development of an indicator displacement based optical detection of malaria for application in point-of-care settings, (B) quantitative detection of histidinerich proteins using silver nanoparticle-based sensitive competitive binding assay following spectroscopic approach and lastly (C) development of a specific aptamer against HRP-II and an electrochemical impedance spectroscopy based aptasensor for malaria using HRP-II as target biomarker. The biomarker HRP-II required for the experiments was sub-cloned, expressed, purified and finally characterized to validate the natural integrity of the protein. The novel ssDNA aptamer against HRP-II namely B4 was generated following a systematic molecular approach starting from SELEX (Systemic evolution of ligands by exponential enrichment), cloning and screening of the enriched candidates and then finally, validated the specificity by analysing the binding affinity using ITC.