Introduction: Malaria is one of the major global health concern. Prompt proliferation of drug resistant malaria parasites and finite available drugs - increase the urgency to develop novel antimalarial compounds. Hemozoin formation through heme detoxification is an escape mechanism of blood stage malaria parasite and considered as promising target for antimalarial drugs. Previously 9,600 compounds with various structural diversity from >200,000 compounds at University of Tokyo library were screened where 224 compounds were identified as hemozoin inhibitors after an initial in vitro anti-hemozoin high throughput screening. In this research, we advanced our anti-hemozoin based antimalarial drug development.

Materials and Methods: In vitro blood stage assay were performed to screen positive hit compounds exhibiting inhibitory efficacy at 10 µM using the Chloroquine/Mefloquine Plasmodium falciparum (Pf) drug sensitive (3D7A) and resistant (Dd2) strains followed by measuring 50% inhibitory concentration (IC₅₀). SYBR Green I assay was performed for parasite detection and cytotoxicity was measured at 20 µM using HepG2 cells.

Result: Finally, 6 compounds were chosen as potential "Hit compounds". Afterwards using 'Tanimoto similarity measure', 1,313 analogues from University of Tokyo were chosen for further analysis. So far, 47 analogues were identified exhibiting ≥50% inhibitory activity on 3D7A at 2 µM.

Conclusion: At present, in vitro dose response and cytotoxicity assay of 47 analogues are ongoing. These results will strongly contribute in novel antimalarial drug development.