Doctoral Dissertation Evaluation Review

Degree requested Doctor of Life Science　　Applicant's name Abrha Gebreselema Gebrehiwot

Examiner :

Chief examiner	Professor	Shin-Ichiro Nishimura
Associate examiner	Professor	Toshiaki Koda
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Title of Doctoral Dissertation

Human serum *N*-glycans as highly sensitive cancer biomarkers: Potential benefits and the risks
（高感度がんマーカーとしてのヒト血清 *N*-グリカン：その潜在的な恩恵と危険性）

Results of Evaluation of the Doctoral Dissertation (Report)

In this study, the author performed a research on comprehensive human serum and immunoglobulin G *N*-glycomics of Ethiopian breast cancer patients and matched controls using glycoblotting assisted MALDI-TOF/MS- and HPLC-based quantitative analysis aiming at identifying non-invasive cancer biomarkers. Apart from addressing the glycosylation signatures of native black population for the first time, the study revealed novel glyco-biomarkers with marked overexpression and strong diagnostic ability specifically in early stage cancer patients. In another inter-ethnic serum *N*-glycomic study, informative results emphasized the substantial influence of ethnic difference in human serum *N*-glycome variation; the ignorance of which may provide unclear and imprecise conclusion of the diagnosis by using glycan-related disease biomarkers.

In conclusion, the author has shown the potential of *N*-glycans directly released from patient serum glycoproteins as non-invasive approach by identifying new and specific early stage cancer biomarkers, as well as the need to strictly consider ethnic matching in a population based glyco-biomarker discovery research to avoid inaccurate diagnosis. After submitting two manuscripts to different international journals, the author published the first paper focusing on inter-ethnic serum *N*-glycome variation and its influence on identified cancer glyco-biomarkers while the second paper is under review.

Therefore, we acknowledge that the author is qualified to be granted a Doctorate of Life Science from Hokkaido University.