Doctoral Dissertation Evaluation Review

Degree requested Doctor of Life Science　　Applicant's name　Pablo Adrian Guillen Poza

Examiner :

Chief examiner	Professor	Shin-Ichiro Nishmura
Associate examiner	Professor	Kenji Monde
Associate examiner	Professor	Hiroshi Hinou
Associate examiner	Visiting Associate Professor	Garcia Martin Fayna Maria

(Faculty of Advanced Life Science)

Title of Doctoral Dissertation

Unnatural MUC1 based glycopeptides in early stage breast cancer biomarkers discovery
（非天然型 MUC1 糖ペプチドによる乳がん早期バイオマーカーの探索）

Results of Evaluation of the Doctoral Dissertation (Report)

Mr. Guillen successfully completed his research project in our laboratory, publishing his results in a high impact factor peer-reviewed journal. He accomplished the proposed objectives stipulated in his research plan.

In many human carcinomas, mucin-1 (MUC1) is overexpressed and aberrantly glycosylated, resulting in the exposure of previously hidden antigens. This generates new patient antibody profiles that can be used in cancer diagnosis. In the present study, we focused on the MUC1-associated Tn antigen (α-O-GalNAc-Ser/Thr) and substituted the GalNAc monosaccharide by a glycomimic to identify MUC1-based glycopeptides with increased antigenicity. Two different glycopeptide libraries presenting the natural Tn antigen or the sp2-iminosugar analogue were synthesized and evaluated with anti-MUC1 monoclonal antibodies in a microarray platform. The most promising candidates were tested with healthy and breast cancer sera aiming for potential autoantibody-based biomarkers. The suitability of sp2-iminosugar glycopeptides to detect anti-MUC1 antibodies was demonstrated, and serological experiments showed stage I breast cancer autoantibodies binding with a specific unnatural glycopeptide with almost no healthy serum interaction. These results will promote further studies on their capabilities as early cancer biomarkers.

For the aforementioned reasons, we acknowledge that Mr. Guillen is qualified to be granted a Doctorate of Life Science from Hokkaido University.