

*e-ASIA Joint Research Program
Progress Report*

1. Project Title: Development of an innovative diagnostic system against liver fluke infection in Southeast Asian countries

2. Joint Research Period: June 1, 2015 to March 1, 2019

3. Principal Investigators:

Country 1: Hisashi Narimatsu, Principal research manager,
Glycoscience and Glycotechnology Research Group, Biotechnology
Research Institute for Drug Discovery, National Institute of Advanced
Industrial Science and Technology (AIST), Japan
Planned Funding Period: June 1, 2015 to March 1, 2019

Country 2: Sopit Wongkham, Professor
Faculty of Medicine, Department of Biochemistry, Khon Kaen University
(KKU), Thai
Planned Funding Period: June 1, 2015 to March 1, 2018

Country 3: Bounthome Samounthy, Vice dean
Faculty of Basic Sciences, University of Health Science, Laos
Planned Funding Period: June 1, 2015 to March 1, 2018

4. Summary of the Progress of the Joint Research:

This collaborative research aims to develop and provide innovative diagnostic system for quantitative and low invasive evaluation of the progress or risk of cholangiocarcinoma (CCA) caused by liver fluke infection using leading glycoscience technologies in collaboration among the Japanese, Thai and Lao researchers.

Based on the preliminary study in FY2015 and early FY2016, effectivity of Marker candidate 1 (developed by AIST) was suggested in serum samples collected from both Japan and Thai CCA patients. Marker candidates 2 and 3 (developed by KKU and Kumamoto Univ.) were effective in Thai samples but could not distinguish between benign disease and CCA patients in Japan samples. Moreover, it was found out that Markers 2 and 3 are not applicable to the automated assay without modification. Since Marker 1 and Markers 2/3 have different specificity and characteristics, feasibility of the combination assay system using these markers (1 and 2/3) was strongly suggested.

Owing to the contribution of the Thai team, an automated enzyme immunoassay system (gratuitous lease from the collaborative company) was installed in the Assay Hub established in KKU. Marker 1 was measured in about

350 Thai samples collected this year, in which similar tendency as shown in the preliminary study was confirmed. Moreover, Marker 1 was advantageous compared to currently available cancer marker CA19-9, and effectivity in periportal fibrosis was also suggested. To confirm its significance, further verification using more samples is planned as the main activity of the following year.

In November 25 and 26, all members from the three countries gathered in Kobe, Japan for the second annual meeting. The progress was reported and the technical workshop of the automated assay machine was held. Prof. Samounry of Laos gave a lecture regarding the healthcare system in Lao PDR. As a subsequent step to provide innovative diagnostic system using combination of biomarkers, we need to develop an automated system as Marker 1. To adopt Markers 2/3 for the same system, we modified Marker 2 this year. These markers will be verified in the next fiscal year, and combination assay using all markers will be tested using more samples to be recruited in Thai and Laos. The results of the project will be summarized and published in journals by all members in the coming year.

5. Outstanding Results and Achievements (Training, Workshop, Publication, etc, if any):

5-1. Training

November 7, 2016:	Assay hub installation (Automated machine handling training)
March 11-25, 2017:	Invited training for transferring techniques to young researchers from Thai at AIST

5-2. Workshop

November 25, 26 2016: The second annual meeting in Kobe, Japan (with participation by all members)
Automated enzyme immunoassay system
Healthcare system in Lao PDR (Prof. Bounthome Samounry)

5-3. Publication

None

5-4. Oral Presentation

None

5-5. Patent,

None

5-6. Award

None

6. Future Goals and Plan of Activities within and after the project period:

In this international collaboration, for the first time we can analyze CCA caused by different origins or risks using different markers. The current study confirmed effectiveness of each marker and suggested combination of both markers for precise diagnosis of CCA. Thus, our approach will increase the feasibility, reduce the developmental cost, and shorten the development time. This project will focus on the clinical study for clarification of the clinical significance and target of the different diagnosis procedures through close mutual cooperation of the Japanese, Thai and Lao researchers. The early diagnosis of CCA by reliable biomarkers, hopefully from this international collaboration, will lead patients to early treatment and personalized medicine, which benefits by increasing the QOL of patients and reducing the social economic burden.

Collaborative development and clinical research by the three countries are the key throughout the project. Through the collaborative clinical study in the relevant area with the Thai and Lao researchers, knowledge and countermeasures, as well as research processes toward prevention of cancer would be shared. Japanese researchers will transfer the leading technologies and the actual process from the development to verification of the product to the young researchers of the Thai and Lao teams. Interactive benefits for all countries will bring further collaborative opportunities from this project near future.

7. Recommendations and Comments to the Program (if any):

(ex. Any support to request from the Program in order to achieve item 6.)