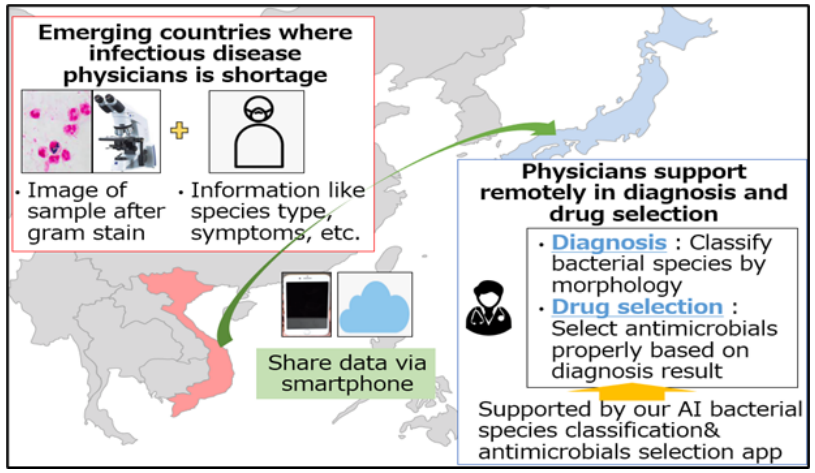
CarbGeM Inc.

Development of an AI-assisted online bacteria identification support platform aimed at promoting DX in the field of infectious disease in Vietnam

Object of the project

This project aims to promote DX in the field of bacterial infections in Vietnam by building a remote causative bacteria identification support platform (product name: CarbConnect).

Our company focuses on empirical antimicrobial drug prescription, which is one of the causes of the antimicrobial resistance (AMR) problem, and aims to solve the AMR problem by utilizing digital and biotechnology. Infectious diseases still occur frequently in emerging countries such as Vietnam and appropriate diagnosis is not possible due to the lack and uneven distribution of specialists. By using the CarbConnect, medical institutions and medical specialists can be connected in a cloud format, enabling remote image diagnosis.



Cooperation with local companies/governments

In implementing this project, the system was developed with the cooperation of Bach Mai Hospital in Vietnam.

Bach Mai Hospital is a leading central-level public medical institution representing Vietnam and one of the three major public hospitals. Established in 1911, Bach Mai Hospital provides medical services, as well as medical education, regional community guidance, and international cooperation.

Targeted economic/social issues

AMR is called a “silent pandemic,” and more than 750,000 people die from drug-resistant bacterial infections each year. In order to solve the AMR problem, the WHO General Assembly in 2015 adopted the Global Action Plan on AMR, requiring each country to formulate an action plan on AMR.

While AMR actions are progressing in developed countries, the AMR problem is still serious in emerging countries. Among them, Vietnam has a large amount of antibiotic use, and about 42% of the population are carriers of antibiotic-resistant bacteria.

Gram staining is useful in the initial diagnosis of bacterial infections, and is also recommended in Japan MHLW’s "AMR Action Plan". However, the accuracy of causative bacterium estimation based on microscopic images of Gram-stained images differs depending on years of experience. In Vietnam, due to the shortage and maldistribution of specialists, the performance of Gram staining and the results of differential diagnosis are not improving.

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Details of demonstration

In establishing the CarbConnect, this project mainly implemented the following development items.

● Formulation of development plans through interviews and gap analysis: After conducting interviews with collaborating organizations, system design documents, etc. were prepared.

● System development: CarbConnect was developed over a period of about one year.

●Evaluation of usefulness: Evaluation of the usefulness of the system was carried out in cooperation with cooperating organizations.

● System test/modification: We performed system modification/testing in response to opinions collected from clinical sites.

In addition to the development, the following activities were carried out for the product launch.

●Research on the Vietnamese medical device market: Through literature research, we obtained information on Vietnam's medical economy and the size of the medical device market.

●Visit to local medical facilities: Visits to four medical facilities including Bach Mai Hospital further deepened our understanding of the current situation and needs of clinical sites.

●Investigation of medical device regulations: We consulted investigative and advisory organizations regarding the applicability of CarbConnect as a medical device in Japan and Vietnam.

Project outcome / Future plans

The project outcome is as follows:

●CarbConnect, a remote support platform for identifying causative bacteria, was developed.

●Additional development of chat function was completed, reflecting the opinions of clinical sites.

The consideration on this project is as follows:

●CarbConnect can also be used for requesting and answering the interpretation of Gram-stained images between doctors and technologists at the same facility, not remotely.

●In addition, if equipped with functions such as bacterial species estimation by AI and an image library for self-study, the system will be more easily introduced to medical facilities.

Future activities are expected to include the following:

● Improving and developing products continuously while collecting opinions on UI/UX from clinical sites in Vietnam.

● Aiming to expand the business horizontally to emerging countries where the drug resistance problem is becoming more serious, such as Indonesia and India, in addition to Vietnam.