



MedBank Co., Ltd.

The project on the development of an AI system for supporting pathological diagnosis of lung cancer

Purpose of the Project

- This project aims to progress the development of an AI-supported lung cancer pathological diagnosis system and improve diagnostic accuracy and reduce the burden on pathologists by utilizing AI technology. Lung cancer is one of the cancers with the highest mortality rates in the world, and since it is often discovered after it has progressed, it has a low survival rate. In Japan, lung cancer is also one of the leading causes of cancer death, and early diagnosis and prompt treatment are the keys to improving survival rates. There is a demand for improved accuracy in early detection and diagnosis, while the shortage of pathologists is also a serious problem.
- It is predicted that AI technology will be able to quickly and accurately detect subtle abnormalities and changes that are often overlooked using conventional diagnostic methods in pathological diagnosis of lung cancer and other conditions.



Analog (Microscope)

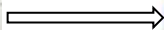


Image Digital

Details of Demonstration

- This project was carried out in collaboration with a research group centered on the Pathology Diagnostic Center at Juntendo University Hospital. Juntendo University provided a collection of lung cancer pathology data (adenocarcinoma, squamous cell carcinoma, small cell carcinoma, benign) essential for developing the AI model, which was used to do training for the lung cancer diagnosis support AI system. By combining the extensive expertise and diagnostic technology of the Pathology Diagnostic Center with MedBank's strength in medical image AI diagnostic technology, we aimed to improve AI-based diagnosis.
- In July 2024, we began full-scale joint research meetings with specialists from Juntendo University, and in October, we formed a research pathologist team. In December 2024, we began full-scale training using deep learning of lung cancer pathology data, and the pathology diagnosis support AI system was completed in January 2025.
- The AI system was determined to be capable of analyzing pathology images quickly, accurately, and consistently, thereby providing diagnostic support. It was confirmed that the AI system is a very promising diagnostic support tool for pathologists in the future.



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Project Outcome

- **Consistency:** Human pathologists can vary in their diagnoses due to fatigue or experience, but AI always makes its decisions based on consistent standards and algorithms, so it maintains a consistent high level of accuracy, providing highly reliable results with no variation in diagnostic results.
- **Reduced diagnosis time:** It was confirmed that the diagnosis work time can be reduced by more than half compared to conventional diagnosis methods. In particular, for complex cases or minute lesions, human pathologists may need longer time to make a diagnosis, but the AI system was able to make a diagnosis within a certain amount of time.
- **24-hour diagnostic system:** With an AI system operating 24 hours a day, diagnostic work can be carried out without delay, even at night or on weekends, speeding up diagnosis.
- **Standardization and automation:** Rapid reporting and diagnostic support are possible. By building a model that incorporates the knowledge of specialists around the world, the same quality of diagnosis can be achieved in any region or facility.

Challenges and Solutions

- Although it was confirmed that this system is very promising as a diagnostic support tool for pathologists, it is still a proof-of-concept (PoC) system that was developed using limited data and demonstrated high accuracy under certain conditions. Given this, further performance improvements and reliability verification are required for the system to be implemented in a wider range of clinical settings.

Future Plans

- The application of this AI technology is not limited to lung cancer, but is also intended to be expanded to other types of cancer, such as pancreatic cancer, uterine cancer, cervical cancer, breast cancer, prostate cancer, gastric cancer, and colorectal cancer, and to PD-L1 testing as well.
- According to WHO statistics, there is a shortage of approximately 20,000 to 75,000 pathologists worldwide. Medical disparities are particularly pronounced in developing countries such as Southeast Asia, India, and China, and we believe that the introduction of an AI pathology system will contribute greatly to society, and are currently planning its deployment.