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Amine Pharma Research Institute Co., Ltd.

University-Launched Business Creation and Practical Application Research and Development Project/Cerebral Infarction and Renal Failure Biomarker: Acrolein Measurement Kit Development Project

The World's First Practical Application of High-Precision Cerebral Infarction Risk Assessment Through Biomarker Measurement

A University-Launched Venture Develops New Market for Commercial Cerebral Infarction Risk Assessment Through Industry-Academia Collaboration

Cerebral infarction, which causes paralysis, inability to move as well as other aftereffects, prevents patients from performing daily life activities. Thus, it has been hoped that an early detection method would be established in order to improve the quality of life of patients. However, among the three major diseases of cancer, heart disease, and cerebral infarction, the biomarker for cerebral infarction has been the most difficult one to find. This made early diagnosis of the disease difficult.

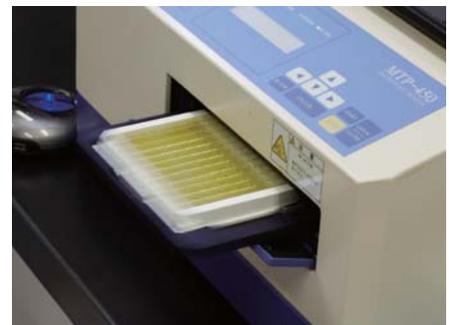
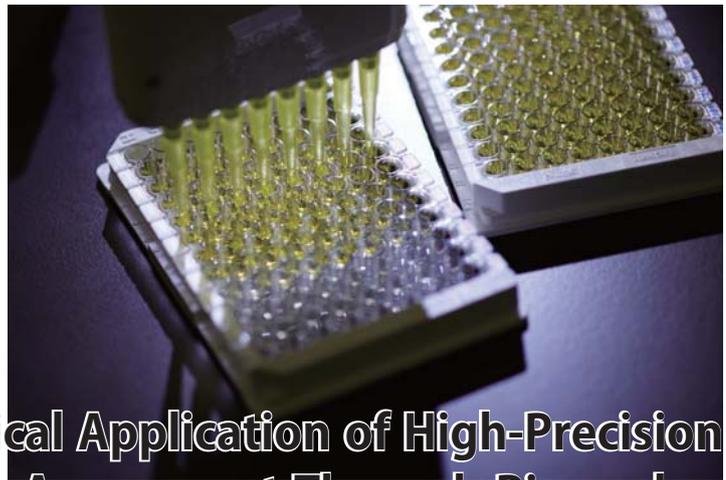
Although magnetic resonance imaging (MRI) is used as a test for the early diagnosis of cerebral infarction, it is difficult to conduct mass screenings because of the relatively high cost and a test time as long as 50 minutes.

Under these circumstances, NEDO decided to aim for practical application of a simple cerebral infarction risk assessment technology. It subsequently supported the development of biomarkers by Professor Kazuei Igarashi of the Graduate School of Pharmaceutical Sciences at Chiba University for three years from 2005 through its University-Launched Business Creation and Practical Application Research and Development Project/Cerebral Infarction and Renal Failure Biomarker: Acrolein Measurement Kit Development Project.

Hoping to use the research results obtained in his university work to benefit society, Professor Igarashi established Amine Pharma Research Institute Co., Ltd. shortly after he left the university in April 2007. It was a university-launched venture, and he took up the post of president. Amine Pharma Research Institute Co., Ltd. applied the results of basic research on the physiological action of polyamine conducted at the Graduate School of Pharmaceutical Sciences at Chiba University and succeeded in developing the world's first practical application of a simple and very precise cerebral infarction risk assessment based on biomarker measurement using a blood test.

Cerebral infarction is a disease in which a blood vessel in the brain is blocked, and thereby surrounding cells are destroyed. Polyamine in the cells leaks out, and the level of acrolein as a metabolite increases in the blood. The increase of acrolein induces IL-6 (interleukin-6) from neurons and macrophages, and then IL-6 induces the production of CRP (C-reactive protein) in the liver. In this way, cerebral infarction causes the levels of acrolein, IL-6, and CRP in the blood to increase. By measuring these levels and using a unique risk calculation method in which the subject's age is considered, it has become possible to assess the risk of cerebral infarction (silent cerebral infarction).

In 2013, 17,000 people used this cerebral infarction risk assessment service, and the total number of users from the introduction of the assessment exceeded 60,000 as of FY2014, allowing profitability to be achieved. This university-launched venture is steadily moving forward and creating a new commercial medical testing market referred to as cerebral infarction risk assessment.



Specimen inserted in measurement system



Amount of acrolein, which is produced when brain cells are destroyed, is measured to assess risk of cerebral infarction



Risk of cerebral infarction assessed with simple blood test (Photos courtesy of Amine Pharma Research Institute Co., Ltd.)

Q. Why did this project start?

The University-Launched Business Creation and Practical Application Research and Development Project is being carried out to encourage private companies to commercialize the results of universities and research institutes by supporting research and other efforts for practical application through collaboration between private companies, universities, and other organizations. When the technical needs of private companies match university seeds and the private companies and other entities offer research funding to a technology licensing organization, NEDO also provides a grant to the technology licensing organization. The project started in FY2002, and grant support has been provided to not only technology licensing organizations but also for research and development based on industry-academia collaboration since FY2007.

Q. What was the aim of the project?

This joint effort based on industry-academia collaboration promotes the utilization of basic research results of universities and other organizations for the benefit of society. It supports their research for practical application, and thereby creates new industries and jobs and also strengthens industrial competitiveness. This particular project was aimed at the development and practical application of an acrolein measurement kit that enables the risk of cerebral infarction to be quickly assessed by applying the results of basic research on polyamine conducted at Chiba University.

Q. What is the role of NEDO?

Through this system, NEDO has supported the construction of a paradigm in which knowledge from universities is efficiently and smoothly used to benefit society and it has also helped with logistics. In this project, human resource development undertaken in the Industrial Technology Fellowship Program contributed significantly to the establishment of a university-launched venture. NEDO worked as a bridge to cross the "Valley of Death" (the hurdle between development and commercialization) by supporting not only the creation of a collaborative framework between industry and academia, but also the process from basic technology to commercialization as well as human resource development.