Toyama Medical-Bio Cluster

Toyama/Takaoka (Fiscal Year 2003-2007)

Life Sciences IT Environment Nanotech/Materials

Creating New Bio-based Industries by Combining Regional Technologies

Core Organization

Toyama New Industry Organization (TONIO)

Participating Research Organizations (Bold: Core Research Organization)

Industry…INTEC Systems Institute, Inc., SC World, Inc., Kracie Holdings, Ltd., Kokando Co.,Ltd., Cosel Co., Ltd., SAITO MFG. CO., LTD, Sugino Machine,Ltd., Daiichi Fine Chemical Co.,Ltd., Daiichi Sankyo Co.,Ltd., Takagiseiko Co., Tateyama Kagaku Industry Co.,Ltd., Tateyama Machine Co.,Ltd., Teika Pharmaceutical Co.,Ltd., Toyokako co.,Ltd.,Toyama Chemical Co.,Ltd., Nissan Chemical Industries,Ltd., Nippon Gene Co.,Ltd., Nippon Genetech Co.,Ltd., Fuji Chemical Industry Co.,Ltd., Hokuto Scientific Industry, Co.,Ltd, Richell Corp., NS Materials Corp., NTT Advanced Technology Corp.,Kyowa Kako Co.,Ltd., Kyowa Medex Co.,Ltd., Kyowa Hakko Kirin Co.,Ltd., Sapporo Immuno Diagnostic Laboratory, Suntory Holdings Ltd., Shionogi & Co.,Ltd., Taiyo Kagaku Co.,Ltd., Tsumura & Co., Toyo Kohan Co.,Ltd., Tokiwa Phytochemical Co., Ltd., NanoSystem Solutions,inc., Hioki E.E. Co., Hitachi Software Engineering Co.,Ltd., VentureLabo Inc.,

Academia…**University of Toyama, Toyama Prefectural University, Japan Advanced Institute of Science and Technology (JAIST),** Osaka University, Nagoya University, Tokyo University of Pharmacy and Life Sciences, Chiba University, Mahidol University(Thailand)

Government…**Toyama Industrial Technology Center,** Toyama Institute of Health ,Toyama Prefectural Institute for Pharmaceutical Research, Toyama Prefecture International Health Complex(International Research Center for Traditional Medicine), Toyama Prefectural Central Hospital, Advanced Industrial Science and Technology (AIST),Kazusa DNA Research Institute, Hiroshima Industrial Promotion Organization, National Institute of Biomedical Innovation

Project Overview

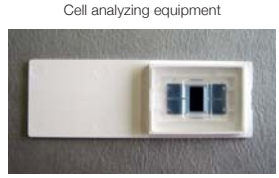
Universities and public research institutes in the region and industries from both inside and outside the prefecture collaborated in two areas: the development of diagnostic and treatment systems based on human immune functions and the development of traditional medicine (Kanpo)-based systems for customized diagnosis and treatment in accordance with each patient's unique constitution. We advanced the technology transfer of research outcomes, also the activities of business developments. We promoted an international exchange with the overseas cluster.

1. We developed highly-functional cell chip devices using micromachining technology and antibody screening systems using these chip devices to identify lymphocytes responding to viruses. These developments, in turn, are fostering the development of diagnostic systems and antibody medicines.
2. Progress was made on the development of systems to support customized traditional medicine (Kanpo) regimen diagnoses and treatment. These developments are based on proteome analyses of factors, such as proteins in a patient's blood, that have an impact on changes in condition according to traditional Chinese medicine. We have also tied our research to the development of natural herbs and remedies.
3. We planned to develop enzyme chips for the early diagnosis of genetic congenital disorders in newborns and planned to develop technologies to modify and synthesize useful enzymes as part of pharmaceutical synthesis.
4. Practical applications planned by this cluster include: DNA chip systems and measurement tools that can detect genetic predispositions for diabetes and other lifestyle-related diseases and next-generation cellular chips that can diagnose and treat immune system functions.

Main Results

1. Evolution of the antibody development business in the bio-venture
   "SC World Inc.," a biotech venture company that develops antibodies through cellular chip technology that treats individual cells, was established. Our venture, which possesses an adequate share of cellular chip technology, is expected to direct us towards new applications relevant to the wide field of medical equipment and medical discovery.
2. Successful development of a commercial cell screening system
   We have successfully developed a commercial cell screening system that uses a cellular chip that can be loaded with several hundred thousand individual cells and screens for individual antigen-specific B-lymphocyte cells. In the near future, we will be able to develop a system in which cells can be comprehensively analyzed.
3. Development of a Micro flow chip in various fields
   Richell Corp., which participated in the development of the high functionality resin chip by injection molding, also have the Microchip Development Dept., with new business that widely develops this resin chip in fields of biotechnology and energy.
4. Successful development of a methionine-based hydrogen evaporating enzyme and practical use of the diagnostic kit
   We have developed a methionine hydrogen evaporating enzyme (often utilized in the diagnosis of homocystinuria) that can be used in the diagnosis of 4 different hereditary metabolic disorders. We would work to establish a system that can simultaneously diagnose all those disorders with this enzyme.
5. Successful development of diagnostic methods according to traditional medicine (Kanpo) using proteome analysis
   We have successfully developed a way to diagnose patients based on their specific patterns and a way to evaluate the effectiveness of traditional medicine (Kanpo) prescriptions through blood plasma proteome analysis of rheumatic patients who have been diagnosed with "oketsu" [blood stasis/stagnation] according to traditional medicine.

Cell analyzing equipment


Cell Chip

Cell Chip automatic collection equipment