

Based on our core expertise of adhesion and coating technologies, we will continue to create various functional products.

Opening of a New Facility for R&D and Cultivation of Human Resources, Spring 2016

We will establish a new facility known as *inovas* at the Ibaraki Plant, where research and development and cultivation of human resources will be conducted in an integrated manner. The four-story facility, with a total floor space of approximately 20,000 m<sup>2</sup>, will be completed in October 2015, and will open in the spring of 2016.

Aiming to create future value for our customers, *inovas* will be tasked with encouraging interaction and exchange between people and technologies. It will be a workplace for approximately 350 employees in such sectors as research and development and intellectual property, and will also be

an analysis center and a human resources education center. With accelerating research and development in the environment (Green), energy (Clean), life sciences (Fine) and core technology (Basic) fields providing opportunities for dialog with not only customers, but also other people inside and outside the company, we will strengthen development of new products.

The name of the facility was chosen from submissions made by members of the Nitto Group. *Nova*, whose meaning in Latin is 'new', also means 'new star', depicting a sudden burst of light. As Nitto has adopted "Innovation for Customers" as our brand slogan, we are determined to be a base producing thousands of '*nova*' through innovative activities, just as the name *inovas* suggests.

An artist's impression of the facility



Gallery accommodating more than four hundred people



Future Center hosting a productive dialog with people from inside and outside of the company

R&D fields in which the Nitto Group is investing its energies

<p><b>Green</b></p> <p><b>Developments in Agribusiness</b> Controlling growing conditions to produce higher crop yields</p>	<p><b>Clean</b></p> <p><b>Energy Management</b> Providing new solutions for society with new ideas and technologies</p>
<p><b>Fine</b></p> <p><b>Preparing for a super-aging society</b> Contributing to prevention, diagnosis and treatment</p>	<p><b>Basic</b></p> <p><b>Providing customer value with core technologies</b> Providing customer value by harnessing our cultivated adhesion</p>

Accelerating Creation of New Themes in China

The Nitto Group has established a global R&D system spanning four key global sites in Japan, the U.S., Switzerland and Singapore, promoting a locally-led global R&D structure making use of the unique characteristics of each area.

To ensure the further growth of our existing businesses and to create future value in the Chinese market, which will become increasingly important in the coming years, Nitto recently concluded an agreement with the Qingdao Municipal Science and Technology Commission, and established Nitto (Qingdao) Technology Research Institute, Co., Ltd. It is our fifth overseas research center and the first in China, and will ultimately employ about thirty personnel.

The new research institute will carry out R&D, focusing on wavelength conversion materials, photocatalyst materials and nanomaterials, and will create new products for use in sectors related to agriculture, energy and the environment.



Building exterior, Nitto (Qingdao) Technology Research Institute



An exhibition room

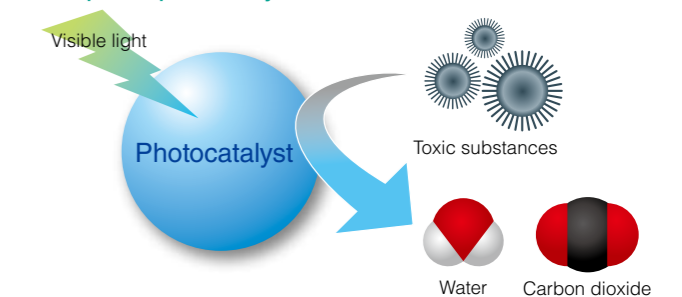
Development of Visible-Light Responsive Photocatalyst

By radiating light, photocatalysts generate strong oxidation power on their surfaces, which enables the decomposition and removal of toxic substances such as gases and

odorous components. As such intermediary substances are ultimately converted into harmless substances such as carbon dioxide and water, photocatalysts are attracting interest for their applications in environmental cleanup technologies.

Nitto is improving conventional photocatalysts which respond only to sunlight, including ultraviolet light and UV lamps, and is developing photocatalysts responsive to visible light, too. This will lead to the use of LEDs as a light source, resulting in an expansion in the range of prospective applications, from preserving the freshness of fruit and vegetables in refrigerators, to removing odors from the interior of automobiles.

Principles of photocatalysts



Filters supporting Nitto's photocatalysts

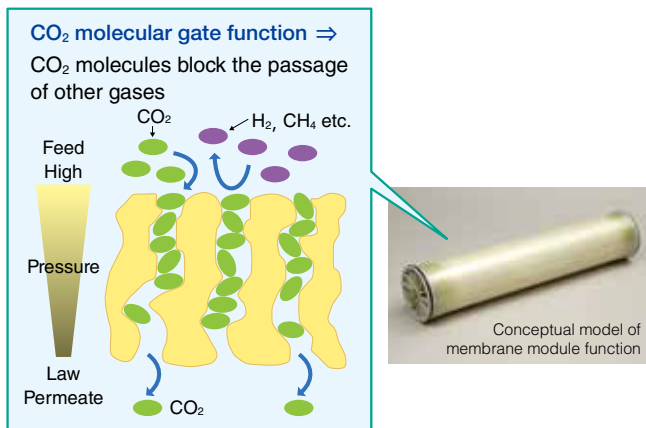
Toward Prevention of Global Warming - Participating in the Development of CO<sub>2</sub> Separation Membrane Modules

On commission from the Ministry of Economy, Trade and Industry, Nitto is promoting a CO<sub>2</sub> Separation Membrane Module R&D Project as a member of Molecular Gate Membrane Module Technology Research Association, whose members also include Research Institute of Innovative Technology for the Earth, Kuraray Co., Ltd., and Nippon Steel and Sumikin Engineering Co., Ltd., and was established in 2011. In this project, we are developing a

molecular gate membrane module actualizing CO<sub>2</sub> recovery at a cost of 1,500 yen/t-CO<sub>2</sub>.

The ultimate purpose of the project is the application to CO<sub>2</sub> capture and storage (CCS), in which CO<sub>2</sub> separated and collected from pre-combustion emissions in integrated coal gasification combined cycle (IGCC) is sealed deep in the ground. Its chief advantage over other CO<sub>2</sub> separation and collection methods is its ability to curb costs.

### Structure of membrane separation



In membrane separation, amino groups contained in a membrane take CO<sub>2</sub> molecules from emissions and allow them to penetrate the membrane. There is no heating requirement, so there is no need for additional energy. It follows that we can separate gases at low cost. Nitto has charge of membrane modules, contributing to the project by utilizing our technology cultivated in water treatment.

From 2015, we plan to improve research of the practical use of membrane separation using live gas. When fully applied to CCS, it is expected to be a strong measure contributing to the prevention of global warming.

### Development of Anti-fibrosis Drug with Molecular Targeting DDS Technology Platform Clinical studies ongoing

Since 2008, Nitto has been tackling the development of a drug for treating liver and other organ fibrosis. In June 2013 we initiated clinical studies of the drug (evaluation on human subjects) in the US, and have verified a high level of safety in healthy volunteers. The studies will be followed in the next stage by verification of the safety of the drug in patients. In fiscal 2015, clinical studies will be launched in Japan, too.

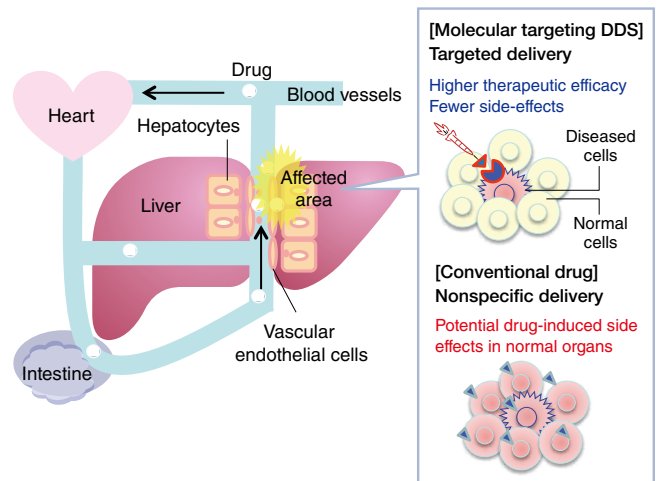
Liver cirrhosis is considered to result when the liver is chronically inflamed. Collagen secreted by hepatic stellate

cells is deposited in the liver in excess and consequently, function of the liver is impaired.

Nitto has developed a safe drug which leads to resolution of fibrosis by combining the concepts of targeted delivery to hepatic stellate cells by Professor Yoshiro Niitsu of Sapporo Medical University and Nitto's drug delivery system (DDS) technologies, with the technical collaboration of Hokkaido University. In order to suppress collagen synthesis, we employed siRNA (oligonucleotide), inhibiting the function of a specific RNA (ribonucleic acid), as a medical agent. Furthermore, in order to facilitate delivery of the highly-degradable siRNA to the hepatic stellate cells, we have designed a unique drug formation using a special carrier protecting the medical agent and a targeting agent targeting the hepatic stellate cells.

Patents for this new drug, covering all of its active medical agents, drug formulation, and therapeutic delivery, are currently being assessed in the U.S. and other countries. In order to provide this new drug to the six million patients suffering from liver cirrhosis, we are diligently working to ensure early approval. We also expect our DDS platform to be applicable to other intractable diseases such as cancer, so further research is ongoing.

### Molecular targeting DDS technology



### Drug formulation

