Our Challenges 2

Innovations Starting from Networking

Coming together as “One Kuraray,” we continue to embrace the challenge of creating innovation by connecting people, and technologies with technologies, both within and outside the Company.

Basic Strategy for R&D

The Research and Development Division promotes projects that contribute to Group-wide business expansion and profit growth under our three missions: “creating new business,” “strengthening and expanding existing businesses,” and “establishing and deepening core technologies.” Under “PASSION 2026,” the basic strategies of the Research and Development Division include “resource allocation and development for high priority projects aimed at enhancing new business creation,” “development that contributes to carbon neutrality and a circular economy,” and “promotion of digital-related measures, open innovation, and human resource development,” serving as foundations for the above.
To facilitate the creation of new businesses, the Research and Development Division has teamed up with the Innovation Networking Center (INC) to promote global marketing for high priority projects, collaborative work to speed up development, and the creation of new business ideas. In the priority areas of carbon neutrality and a circular economy, we are focusing on utilization of biomass-derived raw materials and development of alternative technologies to PFAS (polyfluoroalkyl substances). Additionally, we will accelerate R&D through digital-related measures such as robotics and materials informatics (MI), the use of advanced simulation technology, the development of proprietary AI, and the pursuit of open innovation. Through these initiatives, we aim to generate new materials based on unique technologies and create new businesses for the future.

Missions

1 Creating new business 2 Strengthening and expanding existing businesses
3 Establishing and deepening core technologies

Basic strategies under “PASSION 2026”

- Resource allocation and development for high priority projects aimed at enhancing new business creation
- Development that contributes to carbon neutrality and a circular economy
- Promotion of digital-related measures, open innovation, and human resource development,

R&D Framework

Aiming to become a Specialty Chemical Company achieving sustained growth, the Research and Development Division plays a core role in implementing R&D and new business development activities as a corporate organization. We have two facilities, the Kurashiki Research Center and the Tsukuba Research Center, for the purpose of planning, proposing, and promoting R&D themes. In January 2025 we formed a Digital Solutions Department and External Collaboration Group to promote digital-related measures and open innovation which are key strategies of the Research and Development Division. To accelerate creation of new businesses in the life science field, which is one of our high priority projects, we upgraded the Life Innovation Promotion Group, into the Business Promotion Department, thereby fleshing out our global marketing structure. In addition, we established the Tokyo Lab within the Tokyo Women’s Medical University-Waseda University Joint Institution for Advanced Biomedical Sciences (known as TWIns) to promote open innovation in the life science field by enhancing customer solutions and accelerating collaboration between industry and academia.

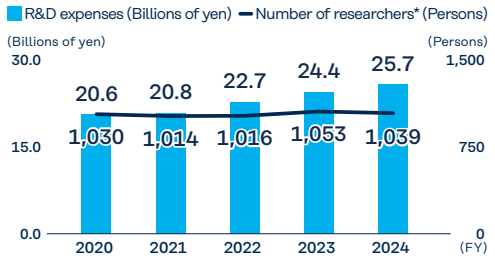
Research and Development Division

Officer in Charge: Toshihiro Omatsu, Managing Executive Officer

General Manager: Nozomu Sugo

- Kurashiki Research Center
  Tsukuba Research Center
- Life Innovation Business Promotion Department
- Digital Solutions Department
- Planning and Administration Department
- External Collaboration Group

R&D Expenses and Number of Researchers



* Includes researchers in business divisions

R&D

Strategy and Structure of the Innovation Networking Center

The Innovation Networking Center (INC) acts as an accelerator for the Kuraray Group's innovation efforts by promoting internal and external networking.

This unique organization operates globally with around 40 core members from diverse backgrounds. In cooperation with the Research and Development Division and other divisions, the INC aims to create new business opportunities over the longer term by leveraging Kuraray Group's diverse human resources and unique technological capabilities as well as the customer relationships and market approaches that have been cultivated over the years.

Wide range of activities

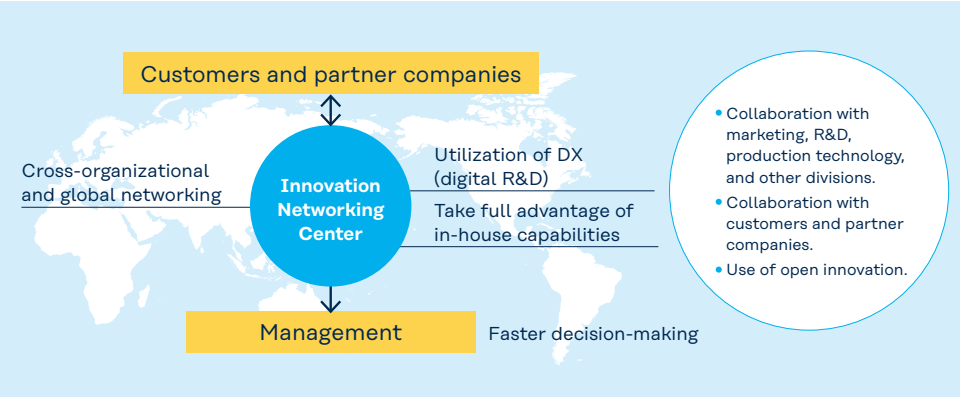
Operating segment teams with target markets

INC operates segment teams with target markets including Automotive, Paper & Packaging, Architecture & Construction, and so on. These teams are responsible for identifying and generating new business opportunities by promoting collaboration with customers and partner companies.

Enhancing platform convenience

We are working to strengthen networking through the Core Technology Platform (CTP), which shares information on the Kuraray Group's comprehensive strengths, including core technologies and human resources, and the Technical Equipment Platform (TEP), which shares information on equipment prototypes. To enhance the convenience of these platforms, we developed and launched a mobile app and AI-powered search function in 2024 to address customer needs more promptly.

Networking Led by Innovation Networking Center



Priority Fields and Examples of Key Strategies

Priority field		Aim
	Sustainable Feedstock	Substitute conventional feedstocks with more sustainable ones to contribute to the improvement of the global environment
	Lightweight Solutions to Replace Metal	Provide solutions that contribute to weight reduction in mobility, where demand for energy conservation is increasing
	Polymer materials recycling	Secure access to recycled feedstocks and build new value chains to utilize industrial waste or end-of-life products to contribute to the improvement of the global environment

Pursuing new business creation in key areas

In the key areas mentioned above, we work collaborate closely with the Corporate Management Planning Office, the Research and Development Division, and other divisions to generate ideas, formulate business scenarios, and strategically allocate resources. Together, the INC and Research and Development Division are engaged in identifying themes that combine customer-centric and product-driven approaches.

Operating the Kuraray Innovation Pipeline

The INC operates the Kuraray Innovation Pipeline system to prioritize new business development themes on a company-wide scale, aiming to increase the likelihood of successful business outcomes coming to fruition. The INC is currently collaborating with the Research and Development Division to advance six new business themes.

Pursuing open innovation

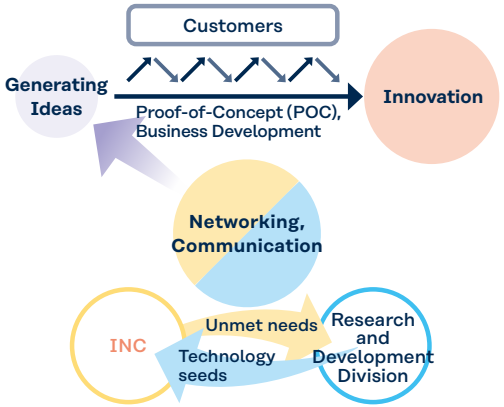
The INC is also pursuing open innovation, including opportunities for collaboration with start-ups. In 2024, the Kuraray Group invested in a venture capital based on the U.S. West Coast, and deployed INC members to commence activities in the Silicon Valley.

Hosting second Kuraray Innovation Days Program

In October 2024, the INC hosted the second Kuraray Innovation Days event in the United States, to generate new project ideas and foster a culture of innovation. This event was voluntarily attended by 24 members from regions around the world, who engaged in intense discussions on three predetermined themes to identify potential new additions to the Kuraray Innovation Pipeline.

New Business Development Based on the Customer Perspective

To continually generate innovation, it is essential in the early stages of development to learn from markets and customers about where they see the value of our materials made using the proprietary technologies, and then implement proof-of-concept (POC) demonstrations. Personnel from the INC's Marketing Department and staff in charge of each R&D theme share information to ensure that product development and POC demonstrations are grounded in a deep familiarity with the market in question. R&D personnel also join the segment team tasked with networking within each market segment such as Automotive, engaging in dialogue with customers with the intention of conceptualizing new R&D themes that address both the challenges faced by customers, and their long-term aspirations.



Messages From Those in Charge
— Accelerating New Business Creation through Collaboration —

Here, we discuss the development of new biomass-derived materials from the standpoint of the INC's global marketers and the Research and Development Division's researchers, who have been working in unison from the idea generation stage to develop materials leveraging our technologies.


Reflecting Customer Feedback

(from left)
Yoyo Chan, Yoshimi Hamano
Marketing Department,
Innovation Networking Center

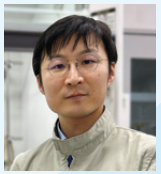
The Kuraray Group's development of new biomass-derived raw materials aligns with market needs, as it is a project born from extensive discussions between marketers and researchers, starting at the idea generation stage. Collaboration proved challenging initially, but thanks to support of project management by a marketer with a background in engineering, the teams were able to connect, and development is progressing smoothly.

From a marketing standpoint we are focusing on areas in which we can demonstrate market leadership, with a particular emphasis on product areas that demand environment consideration. We are leveraging our external networks globally to accelerate POC for customers.

These efforts are supported by global marketers familiar with each target application and region. There is great satisfaction in being able to contribute to development by drawing on individual backgrounds.

We anticipate various challenges as development advances, such as increases in the number of concepts to be tested, and the number of internal and external stakeholders. We are working to strengthen cooperation with development team members to provide better proposals to our customers.

Innovation



Harnessing Unique Technology Seeds to Address Unmet Needs

Masahiro Baba
Polymers Research Laboratory,
Kurashiki Research Center, Research and Development Division

The Research and Development Division possesses numerous technology seeds, including organic/polymer synthesis technology and catalytic chemistry, and aims to bring these to market more rapidly than ever before.

In developing the new biomass-derived raw materials, we worked together with the INC right from the ideation stage, in order to better understand market needs. Through repeated discussions, we identified the points of alignment between our technology seeds and unmet customer needs, leading to the formulation of initial concepts. I believe this approach has helped define the direction of development enabling us to use our limited resources more efficiently.

We expedited both proposals to customers and customer deliberations by creating samples that demonstrate only the essential characteristics. I feel that this has positioned us better to elicit specific requests from customers, facilitating accelerated development.

Harnessing our own technology seeds to address unmet needs truly embodies our mission of "For people and planet." Together, the INC and Research and Development Division will continue tackling the challenge of creating new businesses.

Resource Allocation and Development for High Priority Projects Aimed at Enhancing New Business Creation

In our efforts to create new businesses, we are committed to exploring business opportunities in the field of cell culture, and especially in regenerative medicine, which promises significant growth. We developed SCAPOVA™, the world's first PVA microcarriers for regenerative medicine, which we released in Japan in March 2024 for limited physical and chemical applications. SCAPOVA™ is distinguished by its high cell culture efficiency and low risk of contamination. In September 2024, we established Tokyo Lab, a new laboratory with enhanced bioassay* capabilities, within the Tokyo Women's Medical University-Waseda University Joint Institution for Advanced Biomedical Sciences (known as TWIns), to support open innovation in this field. In this manner we are working closely with academia, which we see as a repository for the knowledge required to enter this field.

In January 2025, we also upgraded the Life Innovation Promotion Group, which played a key role in the development of SCAPOVA™, into the Life Innovation Business Promotion Department, thereby fleshing out our global marketing structure. Going forward, we plan to diversify our product grades and pursue a global rollout commencing in the United States.

The Kuraray Group aims to create a future in which Kuraray's functional products flourish in various settings that interface with biomedicine. We see SCAPOVA™ as a technological bridgehead toward the creation of a new cell culture solution business.

* A method of assessing biological responses and measuring effects using cultured cells and other biological materials.

Microscopic image of cells cultured on PVA microcarriers

Tokyo Women's Medical University-Waseda University Joint Institution for Advanced Biomedical Sciences (TWIns), home to the Tokyo Lab

Development That Contributes to Carbon Neutrality and a Circular Economy

The Research and Development Division is focused on the creation of new materials and technologies that will enhance our medium- to long-term competitiveness by contributing to sustainability, and the creation of technologies and processes that address social concerns by helping to reduce GHG emissions. We consider carbon neutrality and a circular economy to be important themes, within which we are focusing our R&D efforts on four areas in particular: (1) raw material substitution, (2) reduction in environmental impact (via response to environmental regulations and opportunities), (3) recycling, and (4) reduction in GHG emissions.

We have been developing biomass based materials utilizing polysaccharide conversion and formulation technologies, also developing vinyl acetate polymers that combine biodegradability with a high level of functionality and new biodegradable polymers that can be derived from our C4 raw materials. In our response to regulations surrounding PFAS, we are also engaged in developing new high-performance polymers with potential to be used in place of fluoropolymers. Furthermore, we are developing processes that we expect will significantly reduce GHG emissions.

Seizing the challenge of sustainability as an opportunity, the Kuraray Group will develop materials that contribute to improving the natural and living environments to deliver solutions to the world.

TOPICS

New High-Performance Materials Using 100% Biomass-Derived Raw Materials

We have developed a new high-performance film and a high-performance carbon material using 100% biomass-derived raw materials, leveraging our advanced polymer synthesis and molding technologies and carbon material structural engineering technologies. We are developing the film mainly to harness its water solubility in addressing the needs we have identified in the packaging materials market. The new carbon material has proven highly effective as cathode additive for lithium-ion batteries due to its unique pore structure. We expect this material to enhance input/output performance in applications such as EVs and plug-in hybrid vehicles (PHEVs) and facilitate fast charging in cold climates, and we have shipped some samples for customer evaluation.