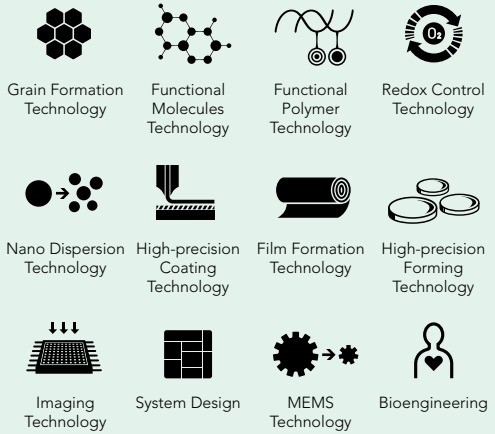
Refining Unique Technologies and Creating New Value

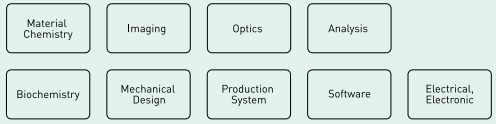
Based on the fundamental technologies that underpin its businesses, the Fujifilm Group has been refining its core technologies that differentiate itself to create new products and value and that are the driving force behind its business diversification.

Here we present some examples of products that have been created by combining these technologies.

Core Technologies



Fundamental Technologies



Supporting Efficient Water Usage

Ion Exchange Membranes

Fujifilm is developing ion exchange membranes that allow selective ion permeation. In addition to use in such processes as the extraction of salt from seawater, the treatment of wastewater, the production of ultrapure water, and the desalination of seawater, it is expected that ion exchange membranes will be used in household equipment in Europe and the United States to soften hard water. At the present time, many types of water-softening equipment use ion exchange resins in a method that absorbs and removes ions. However, as this equipment requires periodic renewal work with agents or salt and the replacement of resin, in terms of maintenance and cost, there is growing demand for equipment that utilizes ion exchange membranes. Fujifilm is responding to this demand by drawing on its proprietary technologies that enable the stable volume production of high-quality ion exchange membrane products.

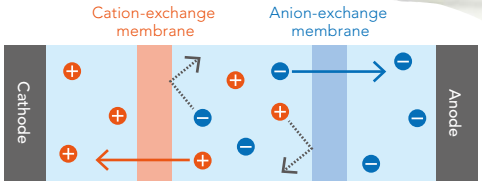
Core Technologies

Film Formation Technology | High-precision Coating Technology | Functional Polymer Technology | Functional Molecules Technology

Fundamental Technology

Material Chemistry

Diagram illustrating ion separation using ion exchange membranes



Making Possible the Miniaturization of Semiconductor Circuit Patterns

Negative Tone Imaging Process

Fujifilm is making possible the miniature circuit patterns necessary for higher performance in semiconductors. To this end, we have developed the negative tone imaging (NTI) process. In the case of negative developing, by which the exposed portion of the photoresist remains on the silicon wafer, since the area of light passing through the photomask can be greater than in positive developing, even existing exposure systems can form finer patterns. Fujifilm developed a proprietary photoresist and organic solvent developer to overcome the technological issues presented by the NTI process, which has been adopted by many semiconductor manufacturers. Furthermore, the achievements related to the development of the NTI process have been highly acclaimed and received awards at the 63rd Chemical Society of Japan Awards (Chemical Technology Award) and the 47th Japan Chemical Industry Association Technology Awards (General Award).

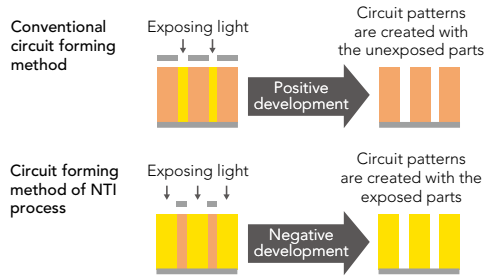
Core Technologies

Grain Formation Technology | Functional Molecules Technology | Functional Polymer Technology | Redox Control Technology | Nano Dispersion Technology

Fundamental Technologies

Material Chemistry | Optics

Differences in circuit pattern formation methods



New Way of Administering Drugs with Less Pain

Micro-Needle Array

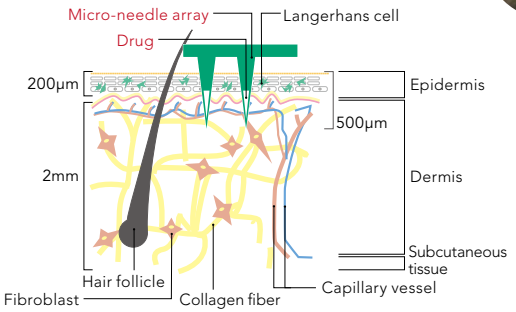
Fujifilm developed a micro-needle array that enables the administering of drugs in the same manner as a regular injection simply by attaching an array onto the skin. A micro-needle array is a sheet arranged with projections made of polysaccharides of 100 micrometers to 2,000 micrometers. When placed on the skin, the projections dissolve into the skin within minutes and deliver into the body the drug with which the projections have been filled. Furthermore, as the projections are extremely fine, the pain level is reduced compared with a regular injection.

Incorporating high-precision processing technologies developed through the manufacturing of photographic films, it is possible to design the array with projections of any desired length or form to administer drugs in a reliable manner.

Core Technology: High-precision Forming Technology

Fundamental Technology: Material Chemistry

Drug administration mechanism



Contributing to the Development of Regenerative Medicine

Recombinant Peptide

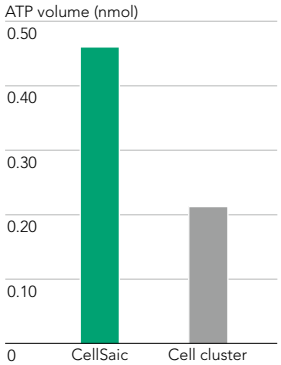
Fujifilm has developed the micro-sized petaloid pieces of the recombinant peptide (RCP) scaffold material necessary in cell cultivation and transplantation for regenerative medicine. Fujifilm verified that combining the petaloid pieces with cells and transplanting them as a three-dimensional "CellSaic" mosaic cell structure substantially increases the survival rate of the cells when compared with cell-only transplantation.

Utilizing the collagen technologies accumulated over many years of research into photographic film, Fujifilm was able to work on the development of RCP that does not include any animal-derived components and features excellent biocompatibility. Going forward, Fujifilm will accelerate its initiatives toward the practical application of regenerative medicine.

Core Technologies: Functional Polymer Technology; Functional Molecules Technology; Bioengineering

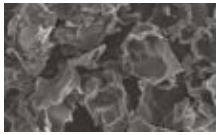
Fundamental Technology: Material Chemistry

Comparison of cell survival



The petaloid pieces were made with the same RCP scaffold material, and cell activity was measured with an ATP* assay. Combining the RCP petaloid pieces more than doubled the survival rate of the cells when compared with cell-only transplantation.

* ATP stands for adenosine triphosphate, the energy molecule for cells. Quantitative measurement of ATP in live cells determines the level of their survival activity.



Magnified petaloid pieces

Enabling the Early Detection of Influenza

FUJI DRI-CHEM IMMUNO AG1

The *FUJI DRI-CHEM IMMUNO AG1* is an immunodiagnostic system capable of detecting the influenza virus with a high degree of sensitivity. The conventional test for influenza presented an issue since the decision whether a person had been infected required some time after the onset of symptoms, allowing the virus to multiply. Drawing on its silver amplification technologies gained from photo development, Fujifilm precipitated silver around a virus label (gold colloid) and succeeded in making the label approximately 100 times larger and thus more easily visible. This endeavor has improved the detection sensitivity for the influenza virus and enabled the early detection of even the smallest amount of virus at the first sign of symptoms.

Core Technologies: Functional Polymer Technology; Functional Molecules Technology; High-precision Forming Technology; Bioengineering

Fundamental Technology: Material Chemistry

Mechanism for detecting viruses with high degree of sensitivity