

Target of Research and Development in the Medical Related Products Division



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1 Changes in the Business Environment of the Life-Science Market

The 21st century has been called the century of the life sciences. As the technology revolution and scientific progress continue their spectacular march forward throughout the globe, our way of life is bound to undergo major changes.

In each of the spheres which are the basics of human existence — health, food, and shelter — we can look forward to new technologies and products emerging in the next few decades which will

enrich the amenity of our lives (Fig. 1).

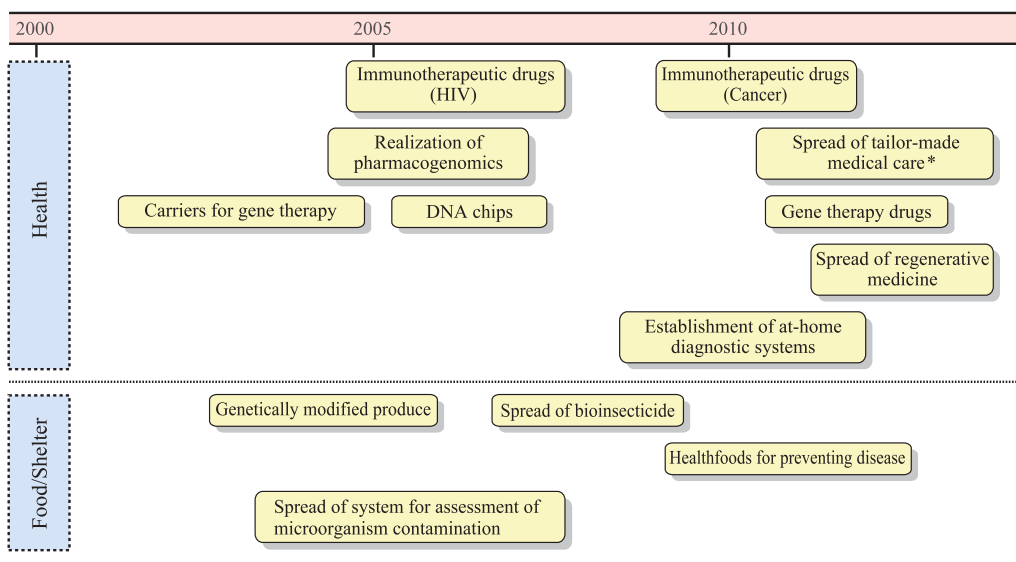
The sphere of health mentioned above covers health and medical care, food refers to nutritional materials, and shelter the environment and energy. Improvement of health, food, and shelter therefore means a real improvement of the quality of life.

To achieve such improvement, the social responsibility and contribution to be expected of companies is crucially important, which implies that only companies which can contribute to improving the quality of life should be acknowledged by the market. Within the life-sci-

ence market of the 21st century, the competitive struggle in which each company's survival is at stake is likely to become more and more intense as time goes on.

2 Technology and Product Development: Present Situation and Future Direction

In the Medical Related Products Division, we have a past record of engaging in technology and product development that contributes to improving the quality of all spheres of human life. Table 1 shows the functions required in



* Tailor-made medical care: drug treatment adapted to the drug sensitivity of individual patients

Fig. 1 Chart of future life sciences

Table 1 Development of products to improve the quality of life

	Needs of society	Development product
Health (medical care)	Treatment and prevention of disease	Transdermal patches Medical devices, medical treatment products In vitro diagnostic reagents
Food (nutrition)	Maintenance and improvement of health, improvement of quality and safety of food	Healthfoods Microbe detection systems
Shelter (environment, energy)	Improvement of environmental safety Reduction of environmental load	Bioinsecticide

each of the spheres of health, food, and shelter and the relevant products which we have developed. **Figure 2** is a technology map showing the connection between the technologies we currently possess and products developed.

Almost all of these products have been created by fusing the original Nitto Denko basic technologies of polymer synthesis and processing technology with technologies from the field of life science.

For instance, the transdermal patch products, which have established a firm market position, were created by a fusion of polymer synthesis and processing technology with adhesive and coating technology and controlled release technology. Our YU-KI BAN products, which have established a strong reputation as surgical tapes which minimize skin irritation, were created by fusing polymer synthesis and processing tech-

nology with applied gel technology and applied adhesive technology. Elsewhere, our various biological test kits were created by fusing our polymer synthesis and processing technology with technology for immobilization of physiologically active substances.

Here, I would like to consider the direction of Nitto Denko's technology and product development for the 21st century. Up to now, we have created new value and contributed to the market by fusing our basic technologies of polymer synthesis and processing technology with technologies from the field of life sciences. Polymer synthesis and processing technology represent a strong platform of technologies owned by Nitto Denko, and in future I expect no change in our approach of conducting technology and product development through addition and fusion of new technologies to this

platform. What kind of technologies to add or fuse is however an important point in business growth.

Figure 3 gives a summary of the changes foreseen in the life-science market and areas of demand in society which can be expected to expand in response. The products which can fulfill these societal needs are products which contribute to improvement of the quality of life in the future; I believe that technology development which allows these products to be created on the basis of our technology platform is the direction which research and development in the Medical Related Products Division should take.

3 Globalization of Research and Development

Especially because of the inequalities that exist, improvement in the quality of

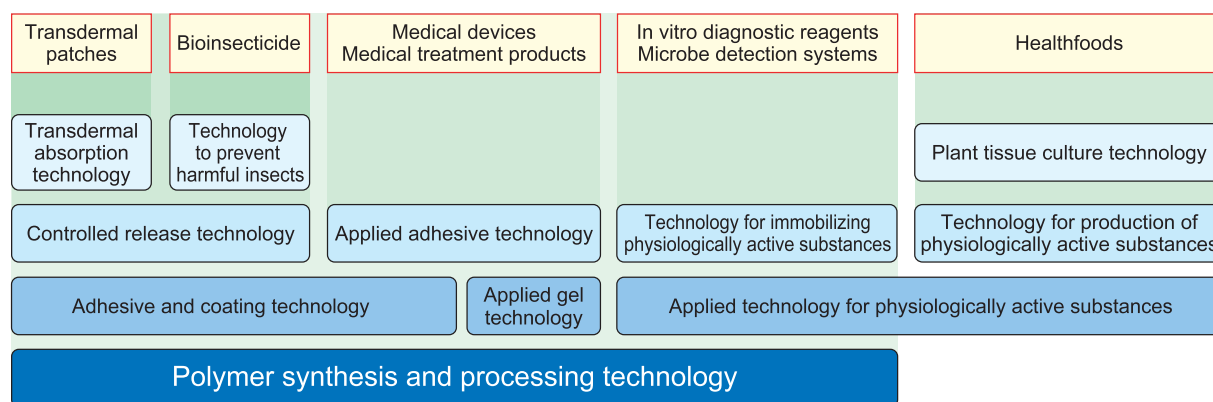


Fig. 2 Technology map and development products

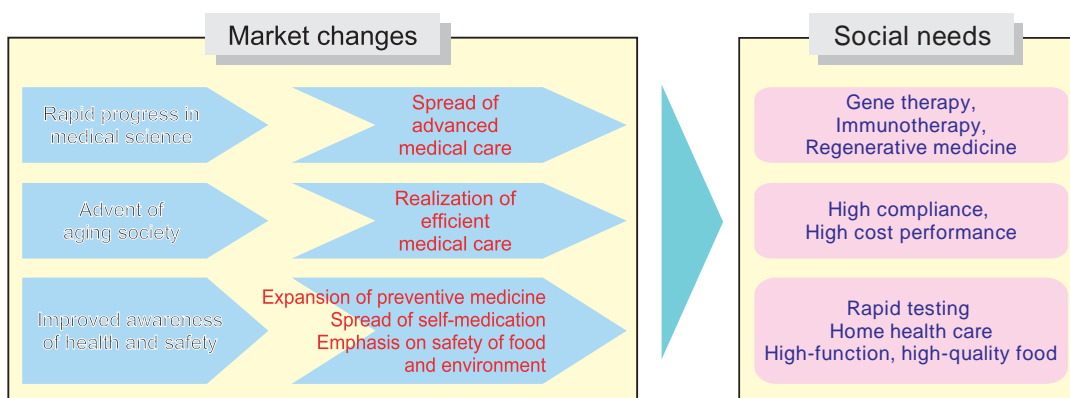


Fig. 3 Changes in life-science market and social needs

life is a common aspiration of all mankind, and the life-science market is expanding worldwide. However, in order to develop on a global basis, we need to overcome two great hurdles which stand in our way. Because human life is at stake in the life sciences, advanced product design is required, to accomplish which obviously presents a technological hurdle. Product development, in terms of function, safety, and other aspects, demands advanced quality, to ensure which naturally requires advanced technological capabilities. The other hurdle is regulation.

Many products in the life-science sector are subject to stringent control by the independent regulatory system of each country, which makes global development difficult even for the most outstanding products. One very important way of overcoming this hurdle is to make use of overseas research and development bases.

One of the advantages of maintaining overseas research and development bases is the strengthened ability to gather global information. It goes without saying that information is an important operational resource, and information gathering within the United States, which is ahead of Japan in the provision of finance and human resources to the life-

science sector, is extremely important for the strengthening of our technological capacity. Also, using overseas research and development bases to develop products in line with the regulatory system of the relevant country is a very efficient way of conducting global development of products in this sector. In particular, product development under United States (FDA) regulation, said to be the strictest in the world, makes subsequent development under the regulatory systems of other countries much easier.

At present, we operate two research and development bases in the life-science sector in the United States. One is the California-based Nitto Denko Technical Corp. and the other the Florida-based Aveva Drug Delivery Systems. Global research and development activity is centered on these two bases.

4 Conclusion

As outlined in the above, we move ahead with research and development activities by predicting changes in the life-science market of the future and drawing up a roadmap of product and technology development adapted to these changes. The policy which underpins our research and development activity is improvement of the quality of life, and

the scope for this activity is at present in the process of expanding globally.

In the following separate articles, we present specific examples of products and technologies where we can look forward to global development on the strength of their contribution to improving the quality of life.