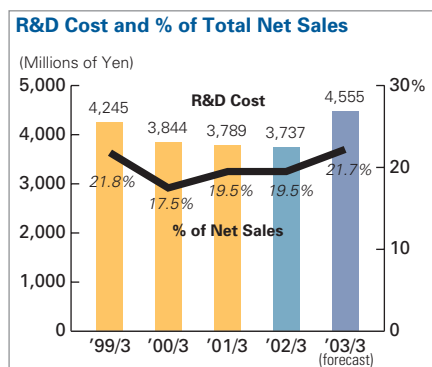


R&D Activities and Production Facilities

R&D Activities and Production Facilities



New Product Development

Seikagaku has always specialized in research and development based on glycoconjugates. It is now apparent that human biological mechanisms cannot be understood purely on the basis of genetics, and interest is shifting to the role of glycoconjugates—hybrid macromolecules comprising carbohydrates in conjunction with other molecules, such as proteins and lipids.

Recent findings point to the central role of glycoconjugates in many forthcoming medical breakthroughs that increase the probability of new product developments.

It is impossible for us to comprehensively cover the entire field of study. Seikagaku has therefore identified Glycosaminoglycans (GAG) as its main focus among the glycoconjugates. On the other hand, based on our extensive experience with ARTZ®, we plan also to

continue to develop new products for joint diseases. We will thus focus our resources on these two research themes. (see the chart on p.1)

Research Tie-ups

Since its establishment in 1947, Seikagaku has encouraged and supported glycoconjugate research. Our Central Research Laboratories work closely with the glycoconjugate and glycogene researchers in universities, corporations and other organizations. These include the work of Aichi Medical University's Institute for Molecular Science of Medicine, which it has assisted for over a decade, the Compound Glycoscience Research Circle and the Glycoengineering Joint Research Project. These collaborations are integral to our long-term success.

An estimated 200 genes process sugar chains, and Japan is a leader in research into genes relating to the enzymes that attach sugars to proteins, or remove or cut them. Seikagaku is heavily involved in national projects that are already under way as the New Energy and Industrial Technology Development Organization (NEDO) builds a national infrastructure for carbohydrate research. Seikagaku plays a defining role in many of these initiatives and in the glycogene library project of the



The Glycoforum was established as a project to mark the 50th anniversary of Seikagaku's establishment. It has been developed as an information site dedicated to carbohydrate research, and it has achieved considerable success in that role. <http://www.glycoforum.gr.jp/>

National Institute of Advanced Industrial Science and Technology (AIST).

New Collaboration Agreements

In August 2002, Seikagaku and the biotech startup AnGes MG, Inc. agreed to cooperate in the joint development of NFκB Decoy, a product to combat articular rheumatism and osteoarthritis. Seikagaku will receive exclusive manufacturing rights in Japan upon successful completion of the development.

At the same time, Seikagaku began working on co-development of SI-7201 (see R&D Pipeline chart) with Nippon Shinyaku Co., Ltd., who will also handle exclusive sales responsibilities in Japan.

Advanced Production Goes Online

The Third Production Building at the Takahagi Plant, Seikagaku's main production site in Japan, began shipments in August 2001. The new facility features the latest automated process technology and improved efficiency, while complying with GMP requirements, which are growing increasingly stringent. The facility also meets the wide range of packaging requirements for overseas markets.

R&D Pipeline

	Indication:	Dev. Stage	Launching	Profile:
SI-4404 (HA medical device)	Endoscopic surgical aid	P III (Japan)	2005	Aid for endoscopic mucosal resection
SI-7201 (HA medical device)	Treatment for interstitial cystitis	P III (U.S.A.)	2006	Improvement of defective bladder-protective GAG layers
SI-3401 (Anti-CD23 antibodies)	Anti-allergy	P I/II (U.S.A.)	2007	Reduction of antigen-specific IgE production
SI-6604 (Additional indication for ARTZ®)	Treatment for meniscus injury	P II (Japan)	2008	Repair and regeneration of meniscal tears
SI-6603 (Chondroitinase ABC)	Treatment for herniated lumbar discs	P I/II (Japan)	2010	Specific digestion of chondroitin sulfate (Chemonucleolysis)
Fungitec®G test for U.S. market	Diagnostic for invasive fungal infections	Clinical trials (U.S.A.)	2003	First diagnostics for mycosis in the U.S.