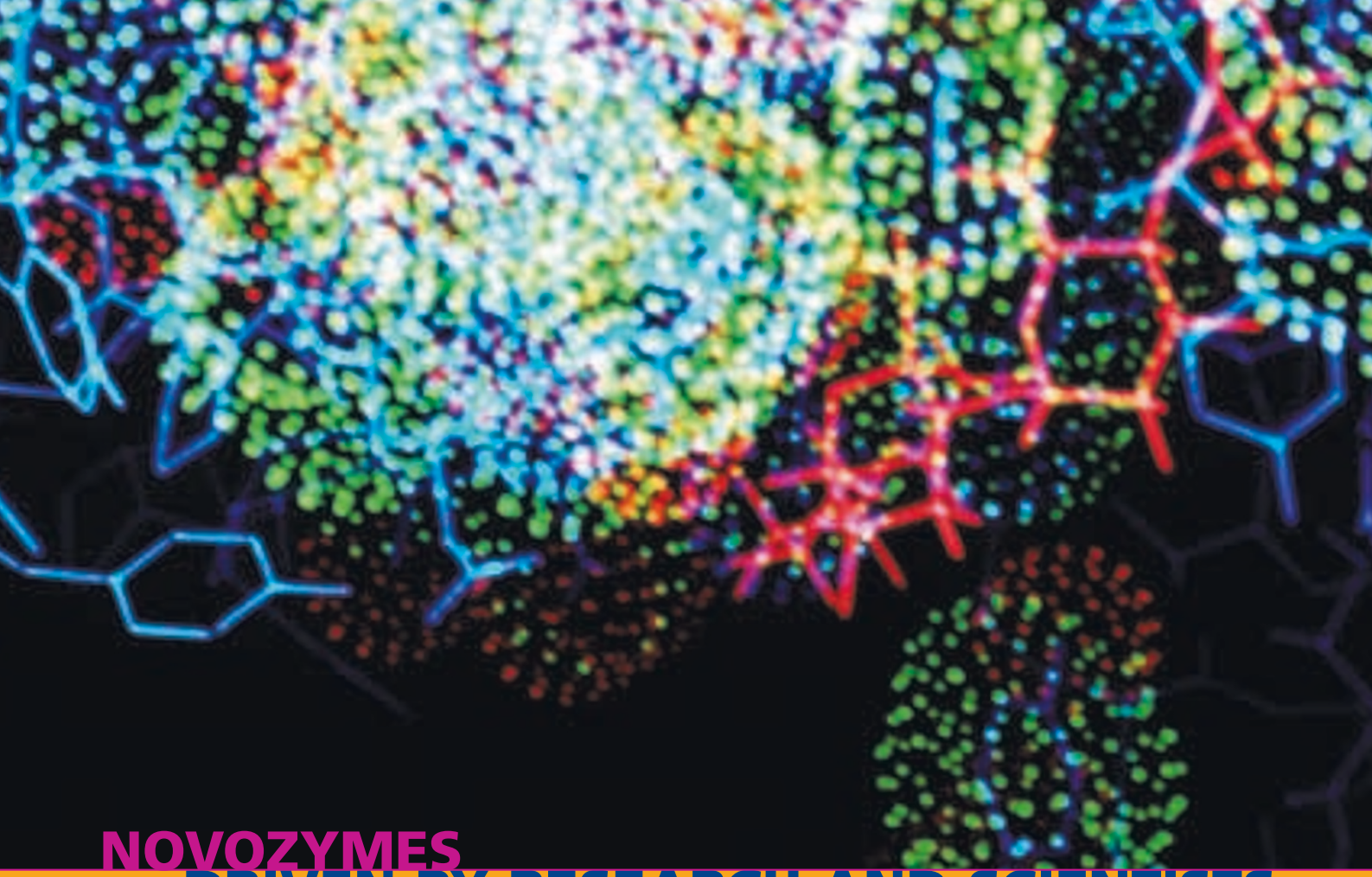

NOVOZYMES
DRIVEN BY RESEARCH AND SCIENTISTS

For 50 years we have consistently demonstrated a deep-rooted commitment to research. By setting the agenda for the industrial application of microbiology and protein chemistry, we have been pioneers in biotechnology and enzymology.

Today, Novozymes is the world's largest manufacturer of industrial enzymes, with over 500 products. We have more than 3,000 employees and close ties to leading research institutions throughout the world.

Research strategy Novozymes' research goal is to build on our leading technological platform in each of the integral biotechnological disciplines needed for the production of proteins. From the identification and development of unique enzymes and viable new enzyme applications, to the efficient expression and manufacture of the products, our research expertise provides the infrastructure to build technological expertise from the ground up – from the initial phases of research through to the product launch.

Formerly part of Novo Nordisk, Novozymes has amassed a collection of 25,000 classified fungal and bacterial cultures. Our strength lies in finding new products by drawing not only on this collection and modern techniques of recombinant DNA and directed molecular evolution, but also on an international network of microbiology centres that supplement and extend our access to Nature in all her diversity.

We have a portfolio of more than 4,000 active patents, patent applications and licensed patents.

Technologies Our business builds on the following technologies:

- Microbiology: assays, screening and mutagenesis, all in an efficient automated set-up
- Bioinformatics: DNA sequencing, in silico biology, DNA microarrays and functional genomics
- Recombinant DNA expression, gene technology: a wide variety of novel bacterial and fungal hosts and tools to ensure efficient yields of secreted proteins
- Protein chemistry: protein structure/-function, mechanistic studies, biochemical characterization and purification from micro scale to large scale
- Directed molecular evolution: site directed and random mutagenesis and gene shuffling for greater diversity generation
- Screening: automated high-throughput facilities for very large libraries

novozymes®

Unlocking the magic of nature

Novozymes – scientific firsts

Novozymes is the world's largest discoverer, manufacturer and marketer of industrial enzymes, with over 500 products. We have more than 3,000 employees and close ties to leading research institutions throughout the world. Our R&D organization is home to 650 highly trained employees, including 280 graduate-level scientists.

With few exceptions we have been the first to launch new enzyme applications and widen the market for industrial enzymes. For example, we introduced proteases and lipases for industrial use, amylases for sweeteners, as well as the industrial application of cellulases and oxidoreductases.

1941	**Trypsin, the first extracted protease**
1952	**Thermozyme® (BAN), the first fermented enzyme from Novozymes**
1963	**Alcalase®, the protease that revolutionized the market for industrial enzymes and established the use of enzymes in the detergent industry**
1973	**Termamyl®, a thermostable alpha-amylase for the starch industry**
1974	**Esperase®, the first extremophilic protease, stable up to a pH of 12**
1974	**Sweetzyme®, the first glucose isomerase**
1984	**Maltogenase®, a maltogenic amylase for the starch industry, the first enzyme produced using genetically modified microorganisms**
1987	**Celluzyme®, a multicomponent enzyme, the first alkaline cellulase for the detergent industry**
1988	**Denimax®, the first alkaline cellulase for stone-washing denim**
1988	**Lipolase®, the first lipolytic detergent enzyme and the first detergent enzyme produced using gene technology**
1991	**Durazym®, a bleach-stable detergent protease developed using computer simulation**
1991	**Carezyme®, the first monocomponent alkaline cellulase for detergents**
1996	**DeniLite®, the first industrial laccase and the first bleaching enzyme acting with the help of a mediator molecule**
1997	**Kannase®, a low-temperature protease produced using directed evolution**
1998	**Lipoprime™, the first detergent lipase developed using molecular evolution**
1999	**BioPrep™, a pectate lyase for the biopreparation of cotton**
1999	**The first microbial peroxidase for bleaching dyes in solution**
2000	**Mannaway™, the first mannanase enzyme for in-wash stain removal**

Today our industrial enzymes can improve the strengths of nature, so we can reduce waste and replace harmful substances.

- Fermentation and recovery: laboratory, pilot and full scale
- Formulation: advanced technologies for both solid and liquid products, including zero dust
- Reduced allergenicity: advanced methods for chemically modifying proteins and determining critical sites for protein-engineering reduced allergenicity into the protein structure

Knowledge and partnerships Focusing on knowledge and partnerships is integral to our business. Examples include broad-based alliances with biotechnology centres throughout the world and cooperation with companies like Maxygen Inc. on gene shuffling and molecular breeding, and Enzon Inc. on minimizing enzyme-induced allergic reactions.

Our pursuit of mutually rewarding partnerships extends further – we also apply our knowledge in close association with customers to develop biotech products.

We are always on the lookout for new partnerships that enable us to use our underlying expertise in novel ways. This means that Novozymes is also keen to employ technologies outside our traditional core business of industrial enzymes.

First with new enzymes Novozymes created the industrial enzyme market. In the last five years alone Novozymes has launched 31 new products, 19 of them containing new enzyme molecules, and we expect to launch an additional 15-25 new products by 2002.

With few exceptions we have been the first to launch new enzyme applications and widen the market for industrial enzymes.

Worldwide Our customers include major players in a wide variety of industries in numerous global markets, the most dominant being the detergent industry. Other important customers include the starch, textile, leather, paper, baking, brewing, wine, juice, alcohol, food and feed industries.

Novozymes has established an impressive worldwide service network together with research centres in Denmark, the USA, China and Japan and production facilities in Denmark, China, Brazil, Switzerland and the USA.

novozymes®

Unlocking the magic of nature