

New Production Plant for Microbial-derived Biopharmaceuticals

a report by

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The biopharmaceutical market is an attractive market that is growing at approximately twice the rate of the pharmaceutical market. Boehringer Ingelheim, one of the world's 20 leading pharmaceutical companies, with headquarters in Ingelheim, Germany, has a long-standing tradition in biotechnology and is considered to be one of the pioneers in biopharmaceuticals. In the early 1960s it began groundbreaking work in interferon (IFN) research. This work was instrumental in establishing the success of Boehringer Ingelheim – the largest privately owned pharmaceutical company in the world. Since it was founded in 1885, the company has been committed to researching, developing, manufacturing and marketing novel products of high therapeutic value for human and veterinary medicine.

In 1998, Boehringer Ingelheim took a decisive strategic step and began contracting the manufacture of biopharmaceuticals, offering its top know-how and years of professional expertise to international clients. In the meantime, Boehringer Ingelheim is recognised as one of the world's premier contract manufacturing organisations offering – as a 'one-stop-shop' – the complete range of services from cell-banking to large-scale good manufacturing practice (GMP) manufacture of drug substances and drug products.

Boehringer Ingelheim has every commitment to expand the biopharmaceutical business and again underlined its dedication through investment into new large-scale plants for both mammalian and microbial-derived products.

The reasons for building a second large-scale microbial facility at its established site, Boehringer Ingelheim Austria GmbH, in Vienna, Austria, are manifold. With the expansion of the EU on 1 May 2004, Vienna found itself at the centre of a market of 450 million people. Due to its historical role and geographic location, the city has excellent connections to international markets. Over the years Vienna has been developing into a biotechnology hub and currently houses a number of innovative and fine biopharmaceutical companies. For Boehringer Ingelheim Austria, which has been operating in Vienna since 1948, Vienna has been a greatly attractive site due to its commitment to high technologies. Boehringer Ingelheim Austria pursues long-term objectives, and to grow its business it is of utmost importance to rely on a stable economical and political environment. In addition, Vienna is an international marketplace with all the required infrastructure, universities and research centres renowned in life sciences and biomedicines.

Furthermore, Boehringer Ingelheim Austria – as the 'regional centre Vienna' responsible for 29 countries in central and eastern Europe – has four business areas established at its Vienna site: oncology research and development (R&D), pharmaceutical business in Austria and Central Eastern Europe, and biopharmaceuticals. Accordingly, there was a synergy to build the biopharmaceutical plants at the same site as all the technical utilities and infrastructure were in place. The new manufacturing plants are 'above state-of-the art' facilities and both batch and fed-batch fermentations can be performed. They are designed for high cell density processes requiring high oxygen demand and high heat removal. In modern recovery and purification units products are highly purified. Columns up to 1.6m and techniques such as adsorption, size exclusion, hydrophobic interaction or ion exchange are applied. Explosion-proof areas allow steps requiring the use of organic solvents or large-scale high performance liquid chromatography (HPLC). The plants are approved 'multi-product' facilities for the manufacture of biopharmaceuticals registered with the Austrian Health Authorities, the European Medicines Agency (EMA) and the US Food and Drug Administration (FDA).

Another asset Boehringer Ingelheim Austria as its location for the new microbial plant was its highly skilled and motivated people who have built the biopharmaceutical business at the Austrian site. The first large-scale fermentation plant, a 3,000L plant, started its operation in 1985. A second 6,000L fermentation plant was established only 10 years later. All plants were dedicated to produce recombinant proteins, plasmid DNA, antibody fragments and protein scaffolds in microbial systems such as *Escherichia coli* and yeast. In addition to a large number of biopharmaceutical products for clinical investigations, such valuable proteins as IFN-gamma (Imukin® and Actimmune®), IFN-beta (Betaferon®) and tumour necrosis factor (TNF)-alpha (Beromun®) are manufactured for the benefit of patients. The group's growing reputation in biopharmaceuticals has led to a number of collaborations and contract manufacturing arrangements with recognised companies worldwide.

'Value through Innovation' – this vision implemented by Boehringer Ingelheim in 1993 has led the strong growth of the group. With its motivated and highly qualified staff, Boehringer Ingelheim Austria in Vienna is dedicated to keeping its premier position in contract development and manufacture through technology innovation, quality and regulatory compliance, and business process excellence. ■