Research, money and the fight against disease: this is the power of the antibody

In 2014, global sales for monoclonal antibodies (mAbs) and mAb-derived products reached $75 billion dollars, which according to US BioProcess Technology Consultants, comprised more than half of the total biopharmaceutical market. It's not just about the money, as **Eppendorf** has shown the value of mAbs in treating disease and carrying out diagnostics and research.

Since the 1980s, hybridoma cells generating mAbs have been commonly accepted as an effective tool in cancer treatment. As an alternative, the recombinant production of antibody fragments using phage display is a growing segment of the market. The first therapeutic products using this technology have been approved already, and development steps include host cell, expression vector, transfection and selection methods during cell line development. The subsequent process optimisation efforts focus on media and feed strategy, process control and scale up.

Keeping it pure

Initial steps often comprise molecular techniques where safety and precision are essential. The special purity grades of Eppendorf consumables, as well as the unique ep Dualfilter T.I.P.S. for contamination-free pipetting, guarantee the highest product safety standards. Eppendorf cyclers from the Mastercycler family ensure fast, flexible and precise PCR runs which translate to accurate amplification of DNA.

Incubate a stable cell line

Cell line development begins with the construction of expression vectors and transfection. A broad range of Eppendorf thermocyclers help to verify the construct. The epMotion offers convenience in automated pipetting. In order to incubate the cells, different formats of cell culture consumables and incubators are also available.

Develop a process and scale it up

Once the optimum cell line is identified, the perfect growth conditions need to be evaluated. These include medium composition and feeding. The parallel DASbox mini bioreactor system is perfect for medium optimisation under closely monitored and production-like conditions. A range of bench scale bioprocess solutions means control strategies for pH, DO and temperature can be optimised easily.

The comprehensive bioprocess software DASware· supports precise monitoring and control, interconnectivity of bioreactors with external lab-devices, comprehensive data and information management, design of experiments (DoE) and remote control of bioprocesses. It can be used with any Eppendorf benchtop bioreactor solution as well as selected third-party bioreactor controllers. For those who want to benefit from single-use technologies, Eppendorf offers a broad range of rigid-walled BioBLU single-use vessels with working volumes of up to 40L. They combine the advantages of single-use technology with a traditional stirred-tank design and are easy to scale up.

Robust processes of antibody production in cutting-edge laboratories.

Produce the antibody

With a robust process for antibody production defined in the laboratory scale, the process is then transferred to pilot scale to produce material for preclinical studies. Then it moves to a larger scale for manufacturing. Eppendorf offers CelliGen stainless steel production-scale bioreactors with working volumes of up to 520L.

Contribution to our future

Biopharmaceuticals, as with most new biological entities with innovative mechanisms of action, are growing exponentially in the pharmaceutical industry. Monoclonal antibodies especially play a major role in diagnostics and research. Diseases once thought incurable will become treatable as a result of successful developments in the production of therapeutically relevant proteins. Eppendorf offers a variety of comprehensive and scalable hardware and software solutions supporting research and development, as well as the production of new drugs and biosimilars in biopharmaceutical companies all over the world.

Further information
Eppendorf
www.eppendorf.com/antibody-production