



Haier Biomedical

Intelligent Protection of Life Science

Case Study

Shaping the future of biomanufacturing through chloroplast expression

Bright Biotech is a start-up pioneering the use of chloroplast-based protein expression systems to produce high-value proteins at scale. The company integrates recombinant genes into the chloroplast genome of plants to produce high-quality growth factors for research and emerging therapeutic applications. Dr Ahmad Sobri leads Bright Biotech's protein extraction and purification efforts to ensure the quality of products, optimise downstream processes and accelerate the Manchester-based company's research.



BRIGHT BIOTECH NEEDS

- Reliable cold storage at +4 °C, -20 °C, -80 °C and -150 °C
- Scalable cold storage and centrifugation options
- Alarm systems for temperature monitoring
- Sustainable, cost-effective lab solutions

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Dr Ahmad Sobri

Sustainable plant-based protein production

Bright Biotech uses a chloroplast-based protein expression system that supports stable integration of recombinant genes into the plant's own genome. Once transformed, the plant and its seeds carry the gene, allowing proteins to be produced automatically during photosynthesis. This approach is highly sustainable, environmentally friendly and capable of generating high protein yields. While the production cycle currently takes around six weeks – which is longer than *E. coli* or mammalian systems – efforts are underway to shorten this to four weeks. One of the first applications being explored for this technology is the expression of growth factors, which have potential uses in wound healing, hair regrowth and other areas of regenerative medicine.



A full array of reliable cold storage

Bright Biotech needed to equip its new lab with a full suite of cold storage systems to support its growing operations, including fridges and standard, ultra-low temperature (ULT) and cryogenic freezers, and a centrifuge. The company chose to purchase from Haier Biomedical because of its strong reputation for reliable, affordable and sustainable cooling solutions. Fridges and freezers – especially ULT and cryogenic freezers – are among the most energy-intensive equipment in the lab, so choosing models that are designed to be as efficient as possible can have a significant impact on the environment. Ahmad explained:

“Sustainability is one of our core values. Using chloroplasts for protein expression is not only efficient, but also environmentally friendly, and we aim to reflect that ethos in everything we do, including the suppliers we work with and equipment we buy. We chose Haier for its reputation in cooling, and found the equipment good value, energy efficient and dependable, which is ideal for a growing start-up like ours. These units are central to our workflows; they support everything from sample preparation to long-term storage. We use the +4 °C fridges for holding intermediate samples during purification, especially for overnight steps. The -20 °C freezers are for short-term storage of components – including DNA and PCR reagents – while the -80 °C units store purified proteins, *E. coli* cells and plant material. The -150 °C freezer is used instead of liquid nitrogen for long-term storage of our production cell lines – it’s become a vital part of our set-up.”

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The Haier Biomedical equipment chosen by Bright Biotech has a number of practical features which are particularly useful to the lab, including the alarms and monitoring systems.

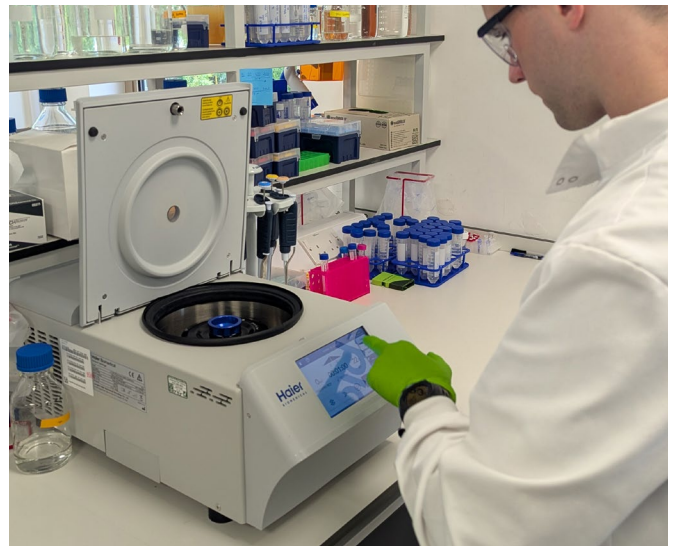
“The built-in alarms have been really effective; we had an instance when our -150 °C freezer temperature fluctuated, and the alerts helped us to catch it early, preventing product loss. The internal monitoring systems work well and, while we’re not yet using the access control features, we know they’ll be valuable as we scale. Overall, the equipment is practical, dependable and suits the needs of our growing lab. The relationship with Haier has been very positive; the sales team is responsive, easy to work with, and always follows up.”

PROJECT OUTCOMES

- Improved sample security
- Support for core workflows
- Smoother day-to-day operations in a growing lab
- Alignment with sustainability goals

Conclusion

Bright Biotech’s work with chloroplast-based protein expression offers a sustainable alternative to traditional systems, supporting the production of high-value growth factors for use in areas such as wound healing and regenerative medicine. This focus on sustainability also shapes their operational choices, including the selection of energy-efficient cold storage solutions from Haier Biomedical. This equipment supports a range of workflows, from sample preparation to long-term storage, and features like built-in alarms have proven useful in day-to-day lab management. As the company continues to grow, this reliable infrastructure – and environmentally-conscious practices – will remain central to its approach.



View our cryogenic freezers here:



Haier Biomedical UK Ltd, Ocean House, 121 Harris Way, Sunbury, Surrey, TW16 7EL, United Kingdom.
T: +44 (0)1932 780 070 W: www.haierbiomedical.co.uk
E: sales@haierbiomedical.co.uk
Company Registration Number: 07694265