

Case Study

Haier Biomedical delivers colossal cryogenic storage system to support multiple myeloma research

The Botnar Institute for Musculoskeletal Sciences is the largest research centre investigating the causes, pathways and treatment of musculoskeletal conditions in Europe. It forms part of the Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences at the University of Oxford, an internationally recognised institute where scientists work alongside clinicians to enhance translational research. The centre's multidisciplinary team is composed of around 350 staff and postgraduate students, who have access to state-of-the-art facilities – from expansive laboratories to GMP-compliant clean rooms – that help them make meaningful advances in therapies to transform the lives of patients.



BOTNAR NEEDS

- Extend existing cryogenic facility
- Storage for at least 80,000 cryovials
- Prompt and secure installation
- Minimal temperature fluctuations to maintain sample integrity
- Compliance with Human Tissue Authority regulations

"We needed a solution that could hold at least 80,000 cryovials, ensuring we didn't need to extend our capacity further as the project matured. We also wanted it relatively quickly, and it had to fit in with our existing equipment. In theory, there were a few suppliers that fitted these criteria, but we already had some experience with Haier Biomedical – plus a colleague had used its ultra-low temperature freezers in a previous position – and so the company quickly became the obvious choice."

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Part of the world-class infrastructure at the Botnar Research Centre is its cryogenic storage facility, which allows the various research groups to store their biological samples and cell lines. This proved highly attractive to the Oxford Centre for Translational Myeloma Research, which was searching for a central point to store all of its tissue samples. This newly launched research group aims to undertake 'internationally competitive research into the processes underlying multiple myeloma and related plasma cell diseases', and is backed by numerous stakeholders, including the National Institute for Health and Care Research (NIHR), the NHS, patient organisations, and various national and international public academic institutions and private companies.

Alan Bateman, a senior laboratory technician at the Botnar Research Centre, was tasked with the job to extend the existing cryogenic facility to support the new project, which required a significant increase in capacity. Alan explained: "We needed a solution that could hold at least 80,000 cryovials, ensuring we didn't need to extend our capacity further as the project matured. We also wanted it relatively quickly, and it had to fit in with our existing equipment. In theory, there were a few suppliers that fitted these criteria, but we already had some experience with Haier Biomedical – plus a colleague had used its ultra-low temperature freezers in a previous position – and so the company quickly became the obvious choice."

Alan and his team purchased Haier Biomedical's Liquid Nitrogen Container – Biobank Series YDD-1800-635, which has a capacity of over 94,000 standard 2 ml cryovials, well above the requirements of the new project. Alan elaborated: "Quite a few suppliers offered tanks that can store up to 80,000 cryovials, but the one we purchased from Haier Biomedical is enormous, while also neatly integrating into our lab, so we couldn't be happier. It can seem like

a daunting undertaking, but Haier Biomedical took complete control of the installation, including engaging a third party to extend our liquid nitrogen delivery line. The company's engineers also checked whether we needed extra ventilation – which we didn't – to ensure our teams were working in a safe environment. The after-sales support has been equally incredible, with Haier Biomedical making several visits to check whether we need anything."



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The Biobank Series from Haier Biomedical is designed for large-scale storage of biological samples, meeting the rigorous demands of busy laboratories working in strictly regulated environments. All instruments benefit from advanced vacuum and superinsulation technologies to ensure minimal temperature fluctuations within the storage area, with temperatures as low as -190°C even on the top shelf during vapour stage storage. They are also equipped with capacitive sensors capable of detecting even minuscule changes in temperature and liquid levels, offering complete visibility and control of conditions inside the storage area. Alan continued: "Everything has worked perfectly since it has been up and running, from the autofill and carousel to the one-touch defogging feature. Importantly, we are confident that sample integrity is all but guaranteed, with effortless 24/7 monitoring via the touchscreen user interface. It has certainly been a step up from the old-fashioned push button instruments we are used to. There is also better security, with the Authority Management function on the controller, only certain individuals can change vital parameters – such as fill rate and level, and temperature – meaning most researchers can only access samples. This is especially important in helping us comply with the requirements stipulated by the Human Tissue Authority, UK's independent regulator of human tissue and organ donations."



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"The system also has a number of 'nice-to-have' features; little details that make life much easier. For example, the racks are excellent quality, with clear labelling that is easy to read amidst the liquid nitrogen mist, something we've previously had issues with. The handles are another feature we really like, as they don't fold completely flat, making them easy to grip when wearing big, clumsy cryogenic gloves. It might sound trivial, but it's actually a big deal, and really shows all the little details were thought of during development. It's an efficient piece of kit too; although it has more than doubled our storage capacity, our liquid nitrogen use has gone up very little – maybe 20 per cent – highlighting the technological advances in newer systems. Overall, the Oxford Centre for Translational Myeloma Research team has been really pleased. It's exclusively for them at the moment but, when the project finishes, our wider team will hopefully have the opportunity to use it as well!" Alan concluded.

PROJECT OUTCOMES

- Huge increase in storage capacity, above requirements
- New instrument seamlessly incorporated with existing lab equipment
- Reliable and precise temperature control for peace of mind
- Effortless monitoring of storage conditions
- Increased security compared to previous solutions
- Enhanced user experience with additional features
- Improved energy efficiency because of new technology



View our portfolio of liquid nitrogen
storage solutions here:



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