Genepoint

CASE STUDY

Building a Research-Ready Marine Biobank

How LOFSRI and Genepoint built an automated cryogenic platform that keeps valuable marine biospecimens protected, traceable, and ready for research.

> Marine germplasm preservation is not simply a storage challenge. It is an infrastructure challenge: every sample must remain viable, identifiable, and accessible over the long term.

PROJECT AT A GLANCE

CUSTOMER	Liaoning Ocean and Fisheries Science Research Institute (LOFSRI)
INDUSTRY	Marine Research & Aquatic Germplasm Conservation
SOLUTION	Genepoint Automated Cryogenic Sample Storage Systems
PRODUCT INSTALLED	Hatch-Lite; Crest Premuim
PROJECT COMPLETION	August, 2022

CUSTOMER

A research program built for long-term impact

Liaoning Ocean and Fisheries Science Research Institute (LOFSRI) has decades of experience in aquatic germplasm conservation, breeding, and applied aquaculture. Its work spans live-resource backup, cellular collections, molecular breeding, and practical use of genetic resources. The institute introduced the Yesso scallop to China in 1980 and has since developed eight new varieties or breeding lines.

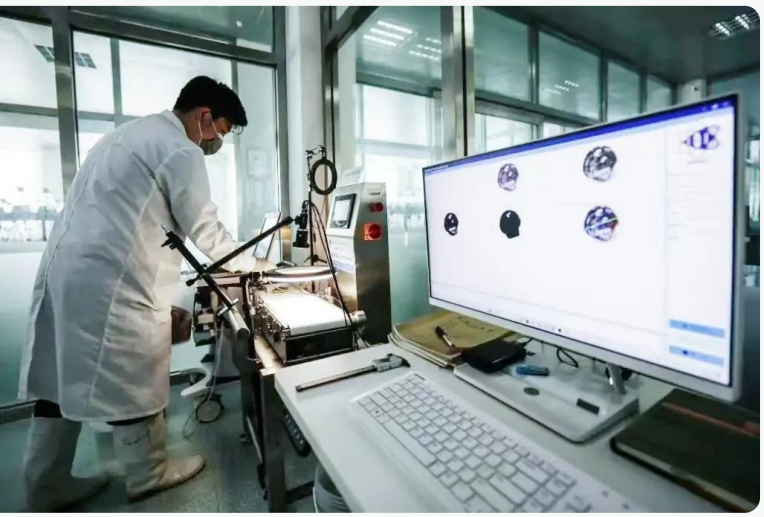
That scientific track record created a growing operational need: preserve valuable reproductive and cellular material in a way that supports both long-term conservation and routine research. LOFSRI partnered with Genepoint to connect cryogenic preservation with accurate inventory, controlled sample handling, and future breeding work.

CHALLENGE

Preserve viability while keeping samples usable

Marine reproductive materials can be highly sensitive to temperature change and handling. As collections expand, manual storage, tube picking, retrieval, and recordkeeping become harder to standardize. LOFSRI needed a platform designed around three practical priorities:

- **Continuous, controlled handling.** Maintain stable conditions and repeatable operations throughout storage, picking, and retrieval.
- **Accurate tracking.** Keep physical samples and digital records aligned.
- **Research-ready scale.** Support routine access and growth in sample volume, species diversity, and scientific value.



Researchers performing health assessments on scallops at LOFSRI

The workflow links biological protocols, storage hardware, and sample records in three practical stages:

- **Store under stable conditions.** Samples enter an organized cryogenic environment designed for long-term preservation.
- **Pick and retrieve with control.** Automated operations take place within the -150°C environment, limiting avoidable temperature fluctuation.
- **Return information to research.** Digital sample management supports identification, traceability, and future use in breeding and germplasm studies.

THE SOLUTION

A full-process automated cryogenic cell bank

LOFSRI and Genepoint configured a complementary cryogenic workflow around Hatch-Lite Automated Cryogenic Repository System and Crest Cryogenic Repository System. Hatch-Lite provides automated rack access under cryogenic conditions, while Crest combines high-capacity liquid-nitrogen storage with assisted rack positioning and access.

Digital sample information connects both storage layers to the research workflow, turning each request into a controlled physical operation.

Hatch-Lite

automated rack access under cryogenic conditions

Designed for rack-level automation, Hatch-Lite identifies and handles the requested rack inside a picking environment at or below -150°C. This reduces room-temperature exposure, manual searching, and unnecessary handling. Hatch-Lite's intelligent sample management software safeguards samples through role-based access control and provides end-to-end data tracking and documentation for every sample operation.

Crest

high-capacity storage with assisted retrieval

Crest provides the long-term safe storage. For access, automatic rack rotation positions the target rack, and the hoist supports box-level placement or retrieval without fully removing the rack.

Uniform Cryogenic Environment

Automated Sample Handling

Complete Sample Traceability

Intelligent Laboratory Automation

Long-Term Operational Reliability

RESULTS

A stronger foundation for marine breeding and conservation

The collaboration established China's first fully automated, high-throughput cellular preservation and utilization platform for marine aquatic species. The facility also became the China's largest existing marine-species sperm bank by collection scale and species diversity.

For LOFSRI's research teams, the value is both operational and strategic. The platform supports more standardized workflows, more accurate sample information, richer genetic-resource data, and a scalable foundation for future variety improvement.

Operationally, controlled access helps limit unnecessary temperature changes; digital records improve visibility; and preserved samples remain connected to research workflows as the collection grows.

Genepoint's Hatch-Lite and Crest systems at LOFSRI

Its most transferable lessons are straight forward:

- **Protect continuity during handling.** Storage performance matters, but so do the conditions maintained during picking and retrieval.
- **Connect samples with information.** Physical security and digital traceability should operate as one system.
- **Design for use and growth.** A collection creates more value when researchers can reliably find, retrieve, and apply material as volume and diversity increase.

GLOBAL RELEVANCE

A model that translates across aquatic research

Aquaculture organizations around the world face the same core question: how to increase productivity and quality while protecting biodiversity and genetic resources. LOFSRI's experience shows that a germplasm bank can serve as an innovation platform, not merely an archive.

The project is relevant to fisheries institutes, breeding centers, conservation programs, agricultural biobanks, and other organizations managing sensitive biological samples.

> The central lesson is simple: the most effective cryogenic systems protect samples and make them more useful. Preservation, automation, informatics, and research access must be designed together.

About Organizations

Liaoning Ocean and Fisheries Science Research Institute

LOFSRI. Founded in 1950 and affiliated with Liaoning Academy of Agricultural Sciences, the institute conducts marine research in germplasm conservation, breeding, aquaculture technology, and practical application.

Genepoint

Genepoint. Founded in 2015, Genepoint specializes in automated cryogenic and ULT sample storage and management solutions. With more than 400 automated storage systems delivered worldwide, Genepoint now supports the automated management of over 10 million samples.