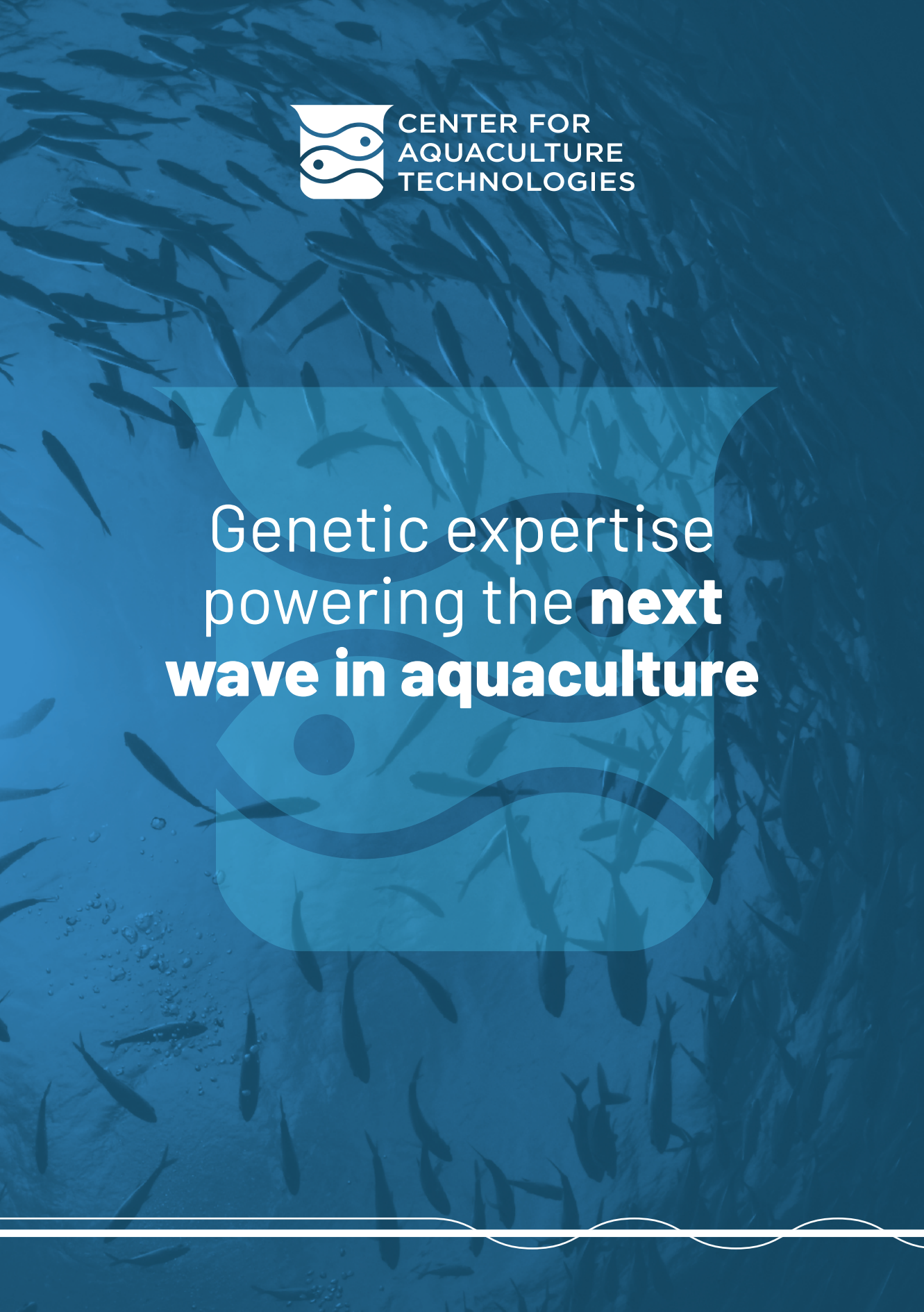

CENTER FOR
AQUACULTURE
TECHNOLOGIES
Genetic expertise
powering the **next**
wave in aquaculture

CAT is at the leading edge of genetic innovation within the aquaculture industry

We offer a range of genetic services including an integrated Next-Gen Breeding™ strategy, to maximize the potential of aquaculture.

1. Genotyping
2. Genetic Analysis
3. Genetic Management
4. Genome Editing
5. Next-Gen Breeding™



We are experts in genetic improvement for aquatic species, committed to delivering tailored solutions that meet the unique needs of our clients. With guaranteed high-quality service and robust internal quality control, we ensure you receive reliable data and actionable results that drive value for your business.

DR. JOHN BUCHANAN, CEO

Genotyping Services

DNA insights for any aquatic species

Genotyping provides critical insights that drive improved genetic management practices, resulting in increased productivity and efficiency.

- AQUAarray® library of SNP panels
- SNP panel development
- Customization of existing panels
- Genotyping
- All sequencing applications

WHY WORK WITH US?

- **Sampling and shipping support**
- **Comprehensive data analysis and guidance**
- **In-house expertise**
- **Client-focused approach**
- **Quality data control**
- **Actionable results**



Sample Stream

Our new client portal for simplified sample collection and shipping guidance

Genotyping Services

Decoding aquatic genomes



AQUA array®

A line of versatile SNP genotyping tools aimed at supporting genetic improvement, management, and conservation efforts.

LD

Low-Density Genotyping

(up to 1,000 SNPs)

LD Panels are used to monitor genetic diversity, determine parentage and establish a broodstock selection program.

MD

Medium-Density Genotyping

(up to 10,000 SNPs)

MD Panels offer a cost-effective, imputable alternative to HD Genotyping for detailed genetic analysis.

HD

High-Density Genotyping

(over 10,000 SNPs)

HD Panels deliver optimal genome-wide marker coverage for a broad range of genetic applications, enabling the implementation of precise genomic selection.

WG

Whole Genome Sequencing

WGS delivers an in-depth genetic profile, enabling precision breeding by accurately mapping markers to genes associated with certain traits.

Find your species in our AQUAarray® catalogue

Genetic Analysis

Excellence through actionable results

Unlocking growth potential, boosting feed efficiency, and enhancing disease resistance in species begins with understanding their genetic makeup. Analyzing the data behind essential traits leads to informed decisions, key to achieving breeding goals.

- Quantitative genetics
- Gene expression studies
- Bioinformatics
- Microbiome
- Genome assembly

WHY WORK WITH US?

Custom study design

Comprehensive data analysis

In-house expertise

Database of genomic resources

Clear reporting

Next-Gen breeding™



Genetic Analysis Essentials

Detailed genetic frameworks for elevated outcomes



GP

Genomic prediction

Powers **genomic selection** using data to accurately choose animals that will best pass on desired traits, speeding up genetic progress and refining breeding choices.

GW

Genome-wide association studies

Searches the entire genome for genetic differences linked to desirable traits, which can be used to select for those traits in offspring more efficiently.

SG

Statistical genetics

Employs Estimated Breeding Values (EBVs) to measure genetic influence on traits, guiding breeders in selecting animals.

GO

Genetic overview

Provides and in-depth examination of the genetic health of a population to understand and manage levels of diversity and relatedness.

PA

Parentage assignment

Helps to determine the parent-offspring relationships, aiding in managing the genetic diversity and establishing the foundation of breeding programs.

* This information offers general advice; strategy may vary based on specific objectives and conditions of operations.

Genetic Management

Genetic improvement with directed support

Genetic management encompasses strategies to sustain and enhance population genetics, including monitoring diversity and selecting individuals for desired outcomes.

- Selective breeding programs
- Conservation programs
- Genetic monitoring programs
- Customized data solutions

WHY WORK WITH US?

Aquatic expertise

Comprehensive data analysis and guidance

Custom program design to achieve your objectives

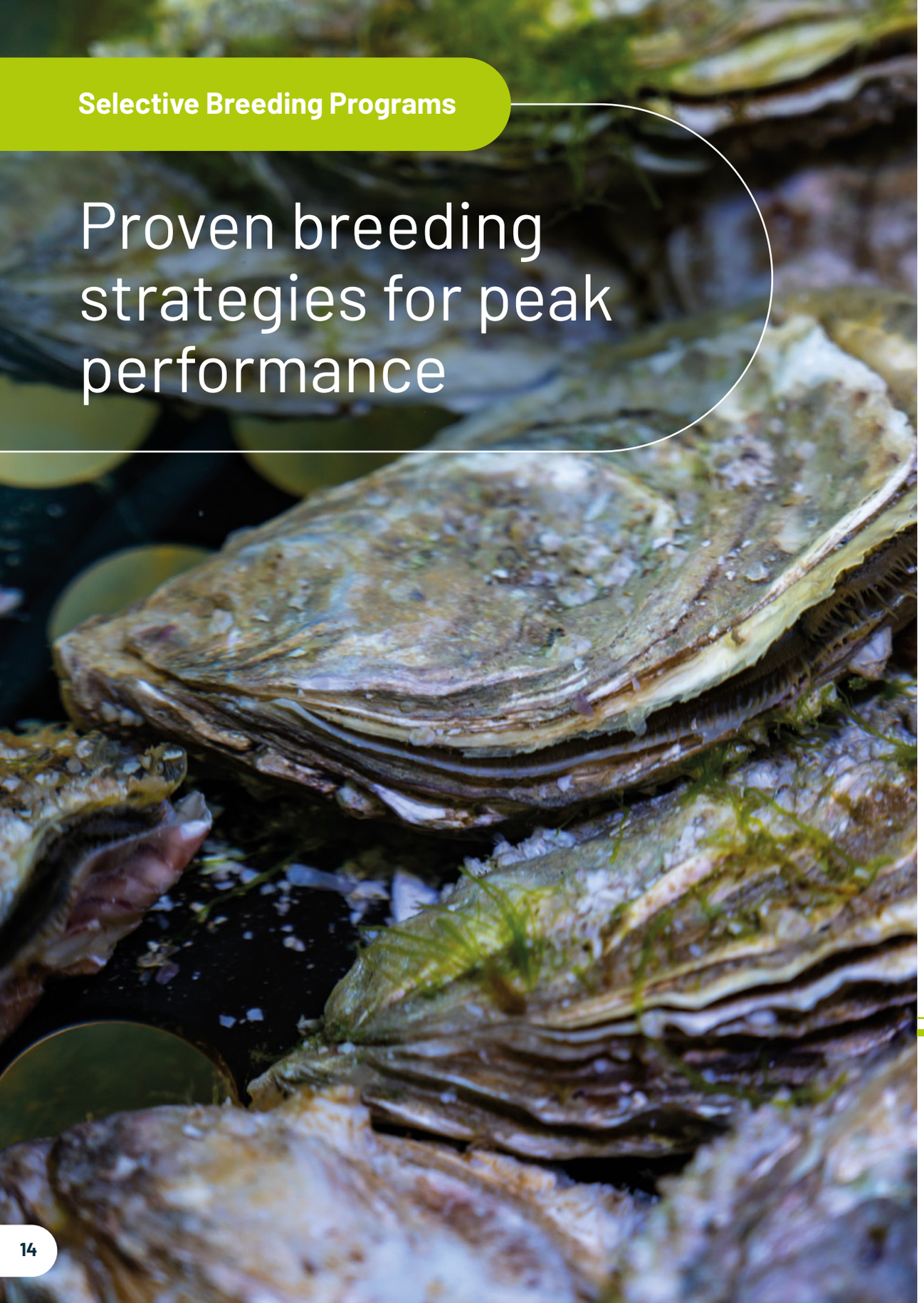
Genetic database and archive

Client-focused approach

Next-Gen breeding™

We work with producers to establish new – or to evolve existing – breeding programs that deliver and accelerate commercial gains for important traits through genetic improvement.





Selective Breeding Programs

Proven breeding strategies for peak performance

Find a program that is right for you

Accuracy of selection

Selection method	What you achieve	Things to think about
GS Genomic Selection **Selects the best individuals for breeding based on detailed genomic profiles**	– Accelerated genetic improvement – Multi-trait improvement – Indirect trait measurement with best accuracy – Typically greatest ROI	– Requires long-term commitment – Highest investment in HD genotypying – Involves tagging of candidates
FS Family Selection **Uses pedigree data to guide breeding strategies and maintain robust genetic lines**	– Control of inbreeding – Multi-trait improvement – Indirect trait measurement	– Family tanks may be needed – Requires LD genotyping for parentage assignment – Involves tagging of candidates
MS Mass Selection **Selecting the best performers based only on visible traits (phenotypes)**	– Lower investment – Easy to implement – Genetic markers help control diversity	– Possible inbreeding and loss of diversity risk – Only for direct traits – Single trait improvement

Not sure what program is best for you?

Scan to speak with our breeding team

Genome Editing

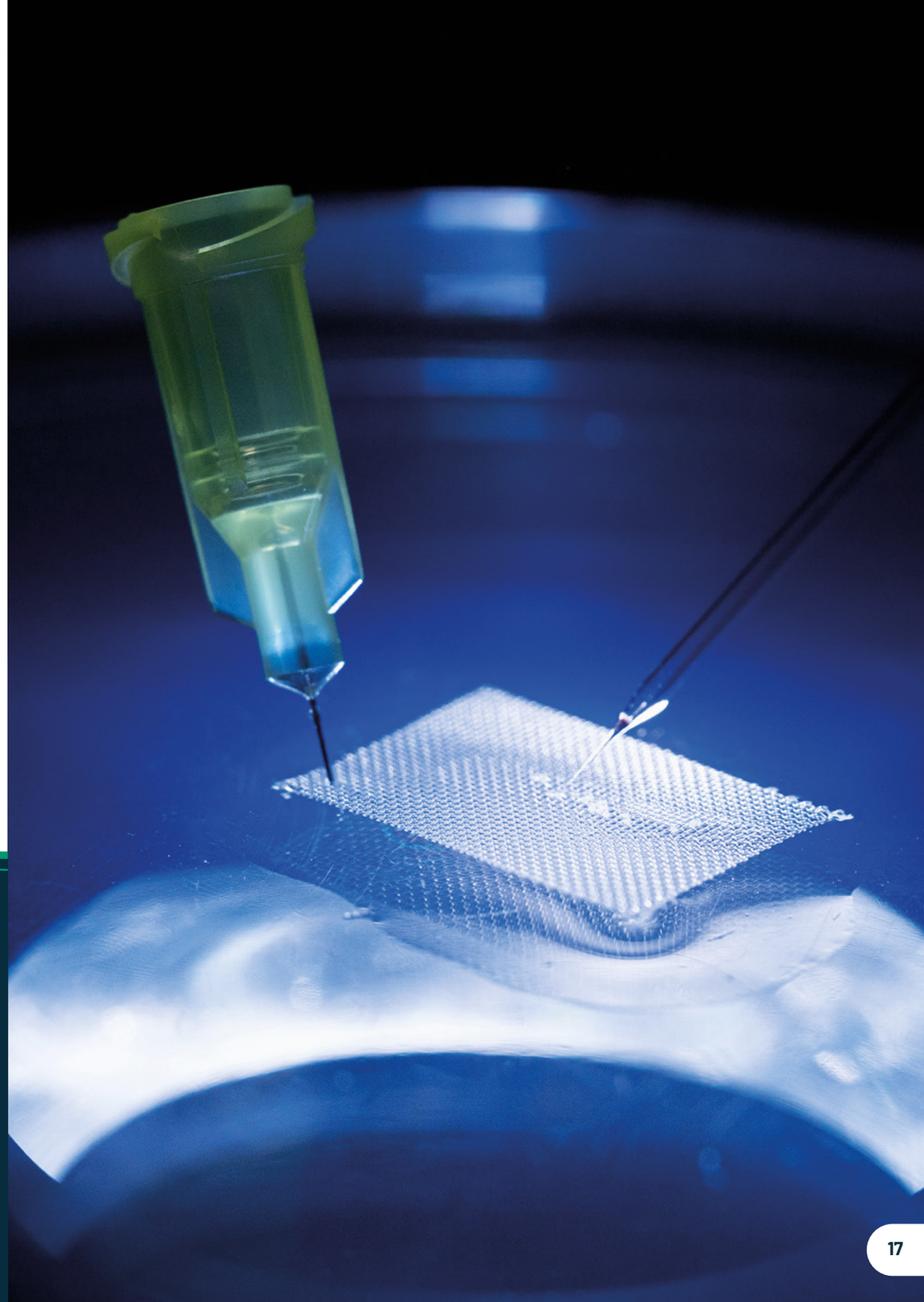
Where genetic expertise meets innovation

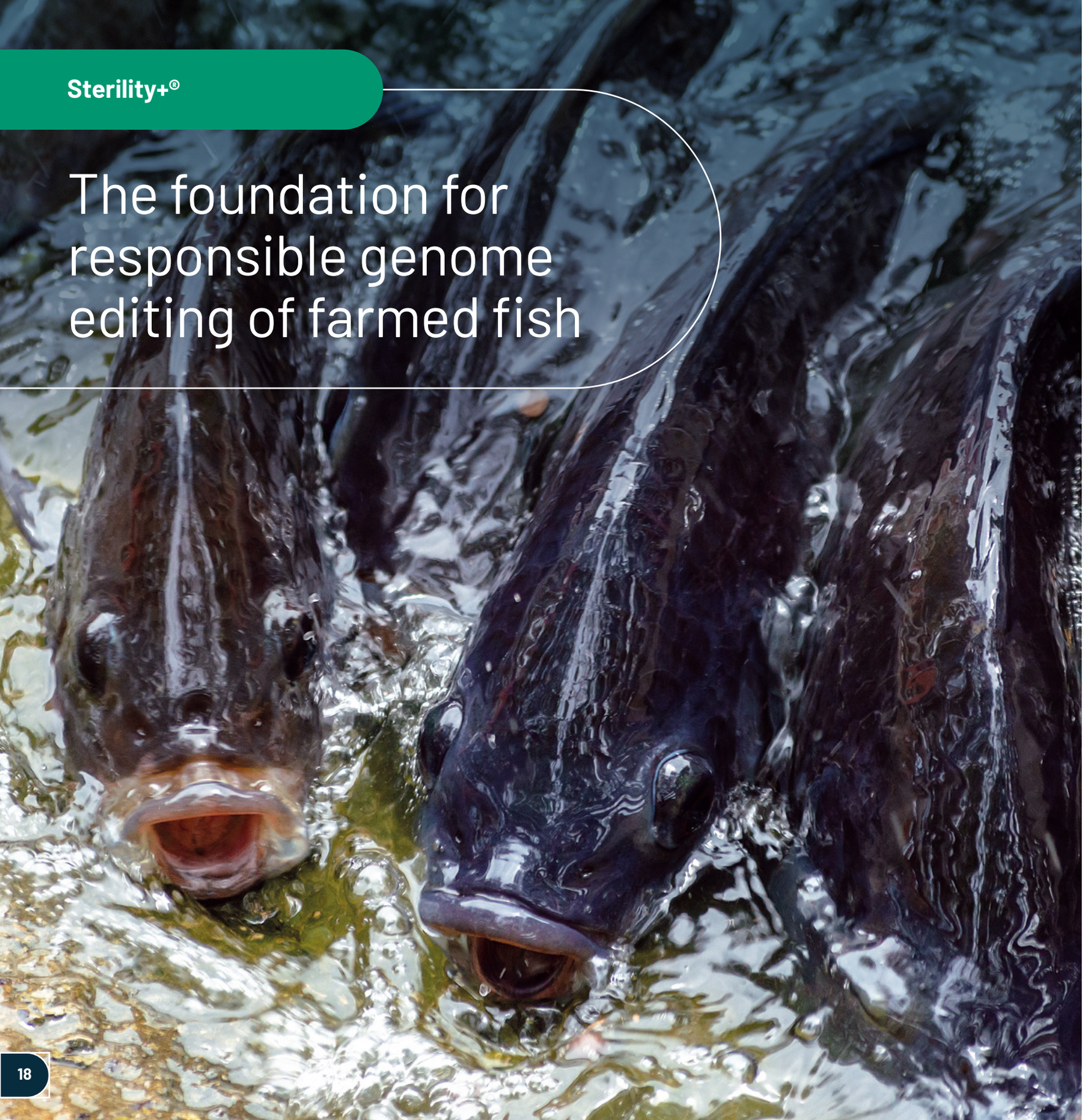
Through precise changes in DNA, Genome Editing accelerates the selection for desirable traits that would typically require many generations. It can enhance animal welfare and performance, delivers quality seafood, and supports the sustainable use of aquatic resources.

- Reproductive sterility
- Single sex
- Disease resistance
- Improved growth
- Improved yield

WHY WORK WITH US?

- **Aquatic expertise**
- **Regulatory support**
- **Economic modelling**
- **Existing breeding program integration**
- **Database of genomic resources**
- **Next-Gen breeding™**





Sterility+®

The foundation for responsible genome editing of farmed fish

Sterility+® delivers 100% sterility in aquatic species. It addresses the ecological challenge of fish escapes and improves growth and performance by reallocating reproductive energy.

- Enhances growth by preventing sexual maturation.
- Guarantees biocontainment by blocking reproduction of escapees.
- Secures genetic investments by safeguarding the proprietary genetics of broodstock.
- Protects the distinctive traits of wild populations, helping them thrive in their native habitat.
- Addresses regulatory concerns about the potential environmental impact of genome edited organisms.
- Paves the way for advancements in biotechnology applications.

Sterility+® allows propagation in the hatchery and sterility on the farm.

Next-Gen Breeding™

Revolutionary genetic improvement for aquaculture

Combining key genetic disciplines, Next-Gen Breeding™ accelerates genetic improvement, advancing aquaculture with efficient, value-driven, and sustainable solutions.

INTEGRATED SERVICE

- Genotyping
- Genetic analysis
- Breeding strategy
- Genome editing

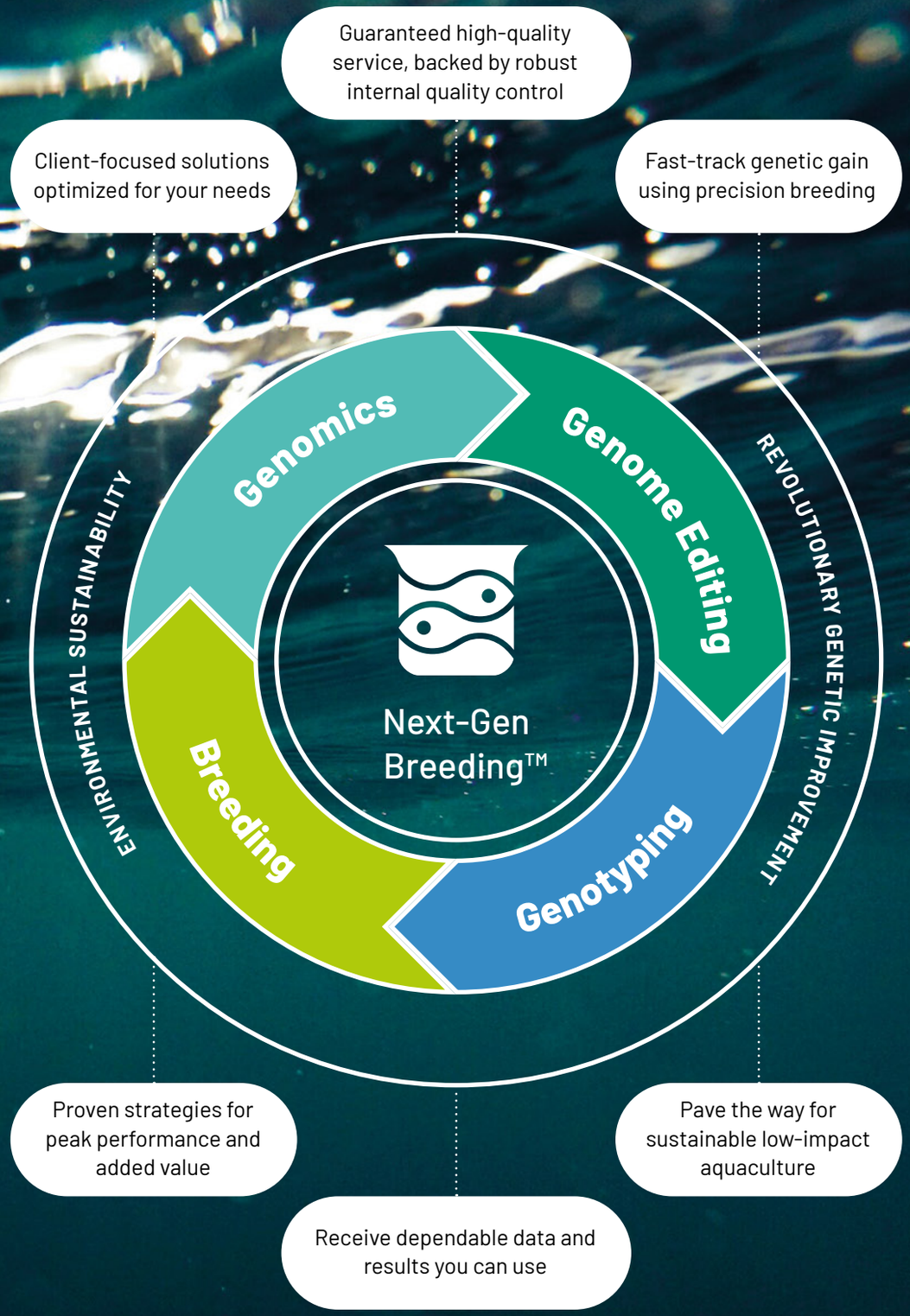
WHY WORK WITH US?

- **Aquatic expertise**
- **Existing breeding program integration**
- **Multiple edited species**
- **Global patent portfolio**
- **Economic modelling**
- **Regulatory support**



Next-Gen Breeding™

Next-Gen Breeding™ is a strategy that combines genotyping, breeding, genomics, and genome editing to enhance productivity, protect genetic assets, and support environmental sustainability.



Leading genetics innovation: **Delivering results you can use**

Start the conversation

UNITED STATES

8445 Camino Santa Fe
Suite 104, San Diego, CA 92121

+1 (858) 450 2972
info@aquatechcenter.com