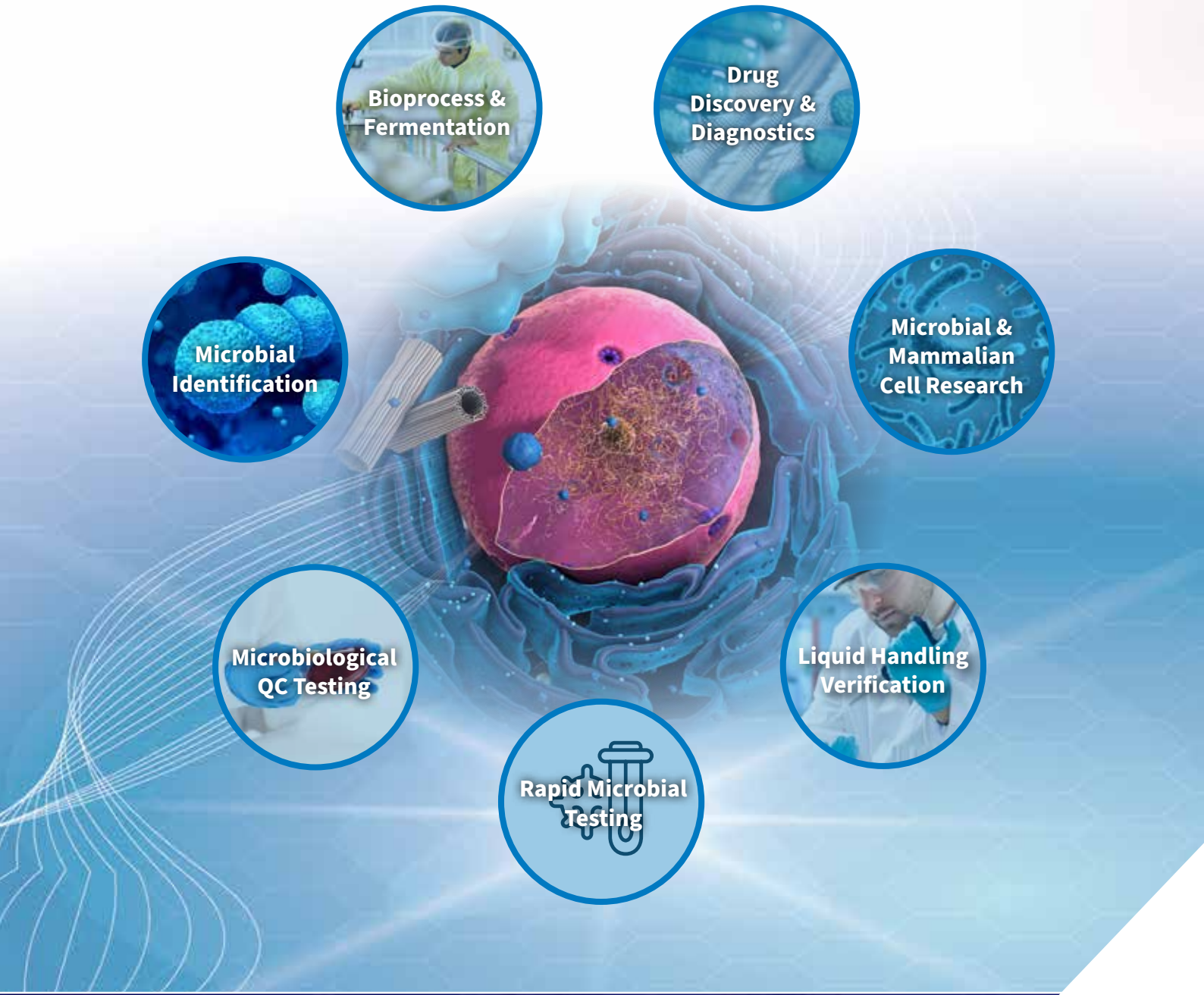
TECHNOPATH

LIFE SCIENCES & RESEARCH



www.techno-path.com

part of DIPLOMA LIFE SCIENCES

SOLUTIONS FOR YOU

DIPLOMA PLC
VALUE-ADD SOLUTIONS

Diploma PLC are a international, dynamic, value-add distribution Group organised across three sectors: Controls, Seals and Life Sciences. Our agile and decentralised businesses operate across North America, UK, Europe and Australia to deliver value-add solutions.

As part of Diploma Life Sciences, the **Technopath** and **Accuscience** businesses deliver the technical expertise, specialist knowledge, and close relationships to deliver the value-add solutions our customers need.
Technopath and Accuscience's product offerings are supported by their combined applications, service and customer support teams.

ACCUSCIENCE

Unit C3, M7 Business Park, Naas,
Co Kildare, W91 XF79, Ireland
www.accuscience.ie

TECHNOPATH

Fort Henry Business Park, Ballina,
Co. Tipperary, V94 N248, Ireland
www.techno-path.com

part of DIPLOMA LIFE SCIENCES

BROUGHT TO YOU BY: TECHNOPATH

OUR PURPOSE

TECHNOPATH Distribution Ltd is a specialised value adding distributor, supplying essential products and services to the IVD, Medical and Scientific (Pharma, Life Sciences & Research and Food/Beverage) Sectors across Ireland and the UK.

Our headquarters is nestled in the scenic location of Ballina Co. Tipperary, from here we are able to locally support our customers all over the UK and Ireland to provide timely delivery, temperature controlled shipping and technical support in all areas of our business.

Our purpose is to deliver exceptional product and service solutions helping our customers achieve outstanding results.

OUR PEOPLE

Superior Customer Service & Support

The customer is at the forefront of everything we do and that is why we source the highest quality products, while providing technical expertise and superior support and service.
We believe that the core strength of our company lies in the level of expertise and technical knowledge evident in our workforce.

TECHNOPATH offers full technical support, applications specialist and field service engineering for each of our product lines.
Our people are all experts in their field and will be able to answer any technical questions you may have.

INTRODUCTION

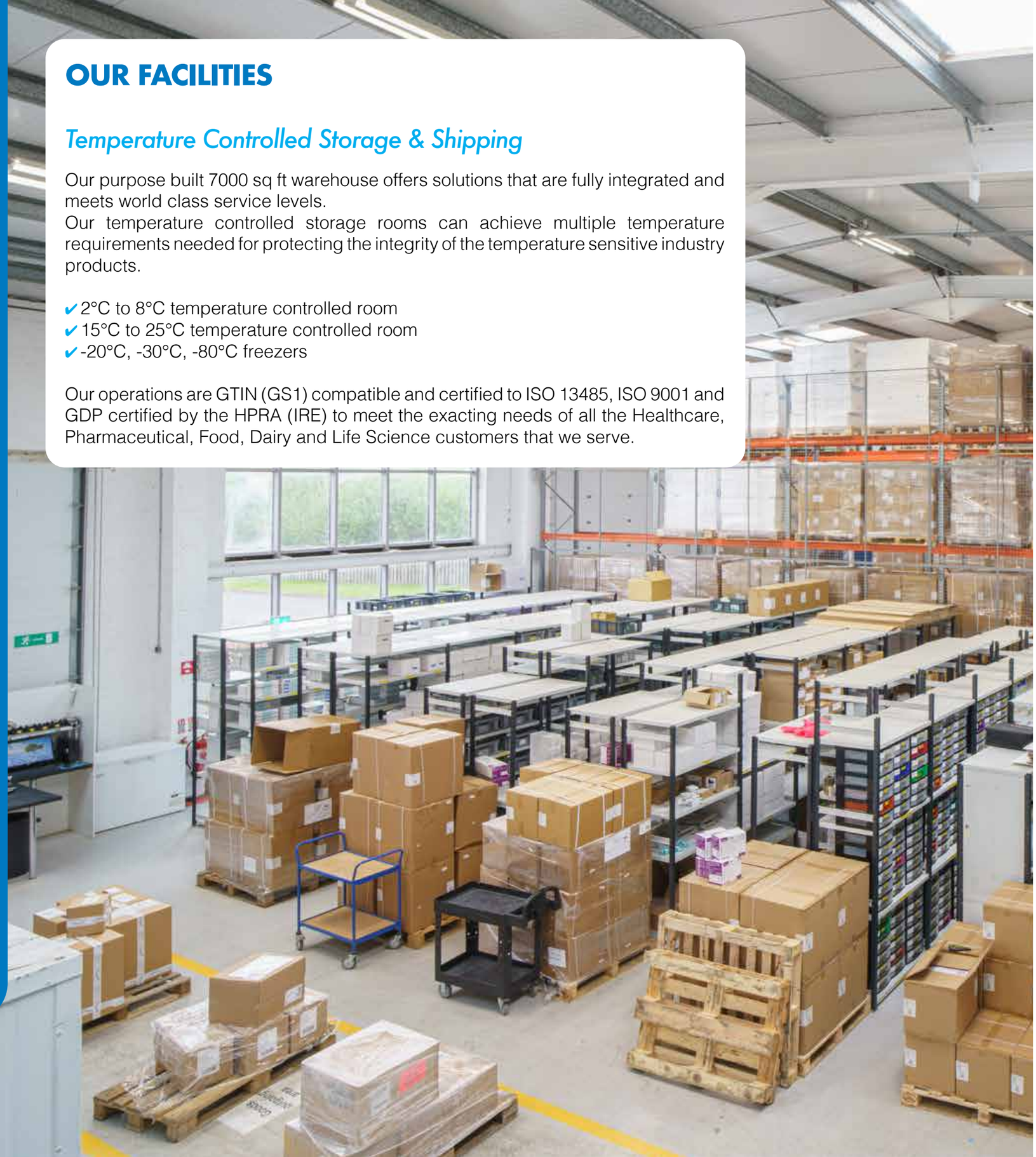
OUR FACILITIES

Temperature Controlled Storage & Shipping

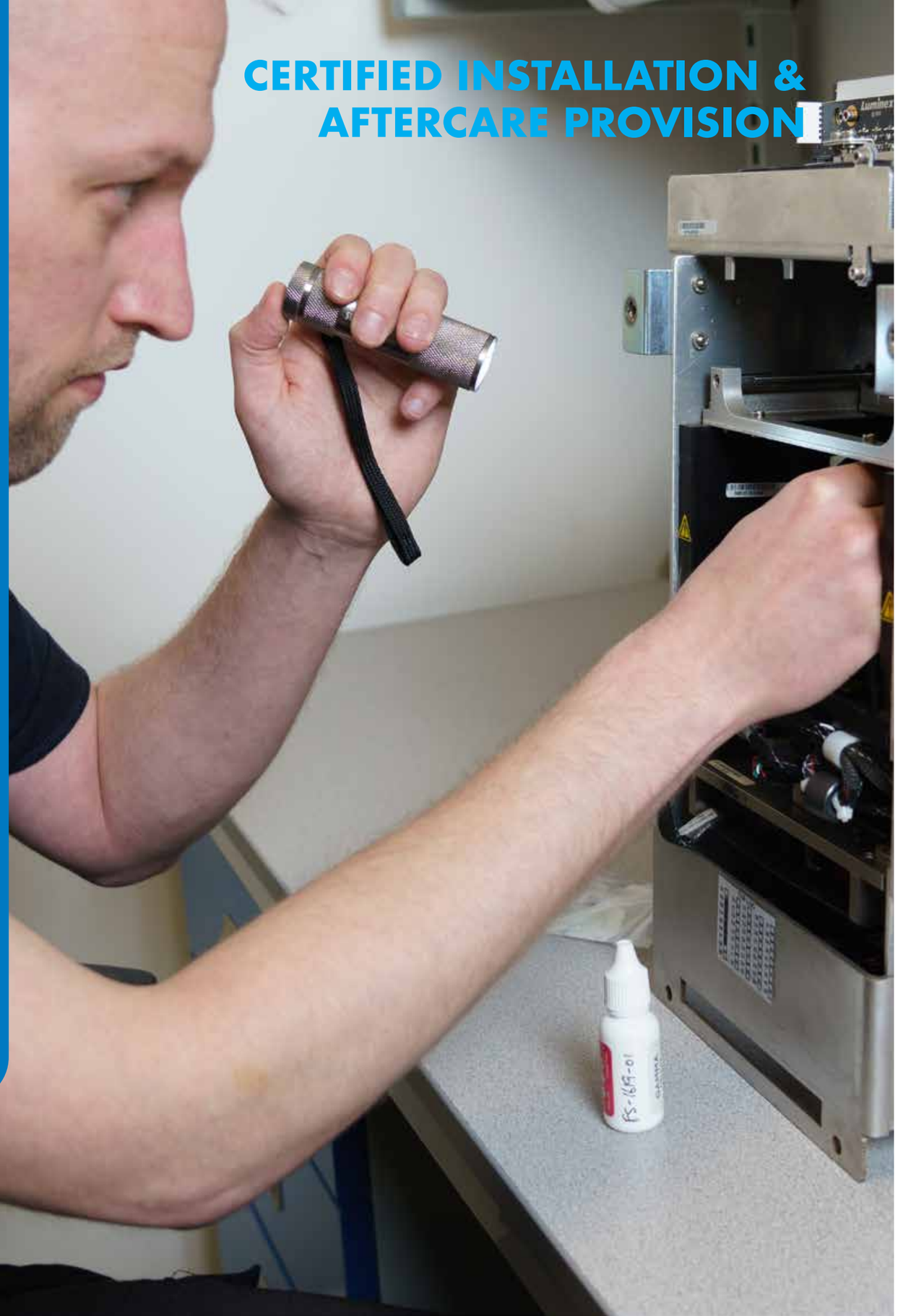
Our purpose built 7000 sq ft warehouse offers solutions that are fully integrated and meets world class service levels.
Our temperature controlled storage rooms can achieve multiple temperature requirements needed for protecting the integrity of the temperature sensitive industry products.

- ✔ 2°C to 8°C temperature controlled room
- ✔ 15°C to 25°C temperature controlled room
- ✔ -20°C, -30°C, -80°C freezers

Our operations are GTIN (GS1) compatible and certified to ISO 13485, ISO 9001 and GDP certified by the HPRA (IRE) to meet the exacting needs of all the Healthcare, Pharmaceutical, Food, Dairy and Life Science customers that we serve.



INTRODUCTION



CERTIFIED INSTALLATION & AFTERCARE PROVISION

Servicing & Technical Support

Certified installation and after sales service provision for all instrumentation

Effective installation and efficient after sales technical support of instrumentation is a key element of the Accuscience and Technopath's combined service offering. We have a dedicated engineering and service management team providing a comprehensive suite of preventative maintenance and repair service offerings covering our complete instrumentation portfolio.

Our team of highly trained engineers is supported by a team of dedicated Service Co-Ordinators who liaise directly with customers to schedule preventative maintenance and repair visits and manage any service related enquires.

Our Services:

- ✔ Site Surveys and installation planning
- ✔ IQ/OQ
- ✔ Suite of preventative maintenance programs
- ✔ Calibration services
- ✔ Breakdown and repair services
- ✔ Technical support and training
- ✔ Nationwide coverage
- ✔ Certified engineers
- ✔ Certified reports, documentation and certification
- ✔ Telephone, in-House and on-site support

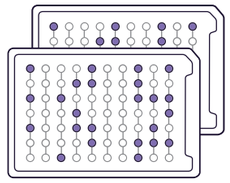
CERTIFIED INSTALLATION & AFTER CARE PROVISION

Biolog for Impactful Insights

Get the functional cellular data you need faster.

Whether you are making discoveries in synthetic biology or breaking ground in sustainable agriculture, Biolog has the solutions to boost the efficacy of your work.
Biolog instruments, software and databases provide the answers you need for environmental monitoring in your quality control routine. Biolog instrumentation and identification panels are used in thousands of labs to identify unknown organisms.

Technopath Distribution Ltd supports this world leading technology with technically knowledgeable and skilled technical applications specialists and service engineering teams ensuring the highest levels of customer support.



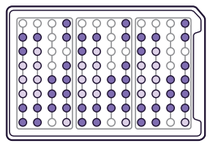
Preplated or Customised Phenotype Microarray Panels and ID Panels

Phenotype MicroArrays™ enable researchers to evaluate nearly 2,000 phenotypes of a **microbial cell** in a single experiment. Biolog also offers Panels for **mammalian cell** and **mitochondrial analysis**.

Biolog's **Microbial ID microplates** rapidly and accurately identify nearly 3,000 species of aerobic and anaerobic bacteria, yeast, and fungi.

ODIN™ Family of Instruments

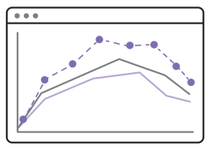
The Odin™ platform is the all-in-one solution for cellular metabolic characterisation, growth kinetics, and identification. Efficiently phenotype your microbes by screening hundreds or even thousands of different substrates and growth conditions in a controlled environment. Load up to 50 plates on **Odin L**, or up to 8 plates on **Odin VIII** and walk away. The **ID Station** allows for microbial ID one plate at a time.



Microbiome Analysis Microplates

The **EcoPlate™** array effectively distinguishes spatial and temporal changes in the metabolism of microbial communities as a result of environmental changes.

The **PreBioM™** line of microplates allows researchers studying human or animal gut microbiome communities to better understand metabolism of prebiotics.



Software Solution

For characterising cell phenotypes, powerful bioinformatics software analyzes kinetic data from thousands of conditions at once. Proven algorithms work in concert with comprehensive databases for rapid strain-level identification of microbes. Backed by security features to ensure data integrity, and provides automatic generation of audit trails.

Applications for Biolog:

Bioprocess & Fermentation

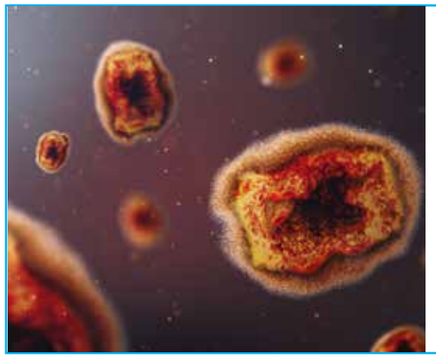
Thoroughly screen for the best strains and the most cost-effective media. Use the same principles to quickly identify the effects of any change in process or changes in your cell lines.

- Sustainable Agriculture
- Synthetic Biology
- Flavours & Fragrances
- Biopharma Manufacturing

Environmental Monitoring & QC

Minimise downtime with robust instrumentation simple enough for anyone to use.

- Pharma QC
- Food & Beverage (Brewing, Probiotics, Nutraceuticals)
- Animal Science
- Ag and Environmental Profiling
- Research



Drug Discovery & Diagnostics

Biolog products have broad applicability in many stages of the drug discovery and development process. Applications for the Phenotype MicroArrays for microbial & mammalian cells and MitoPlates include:

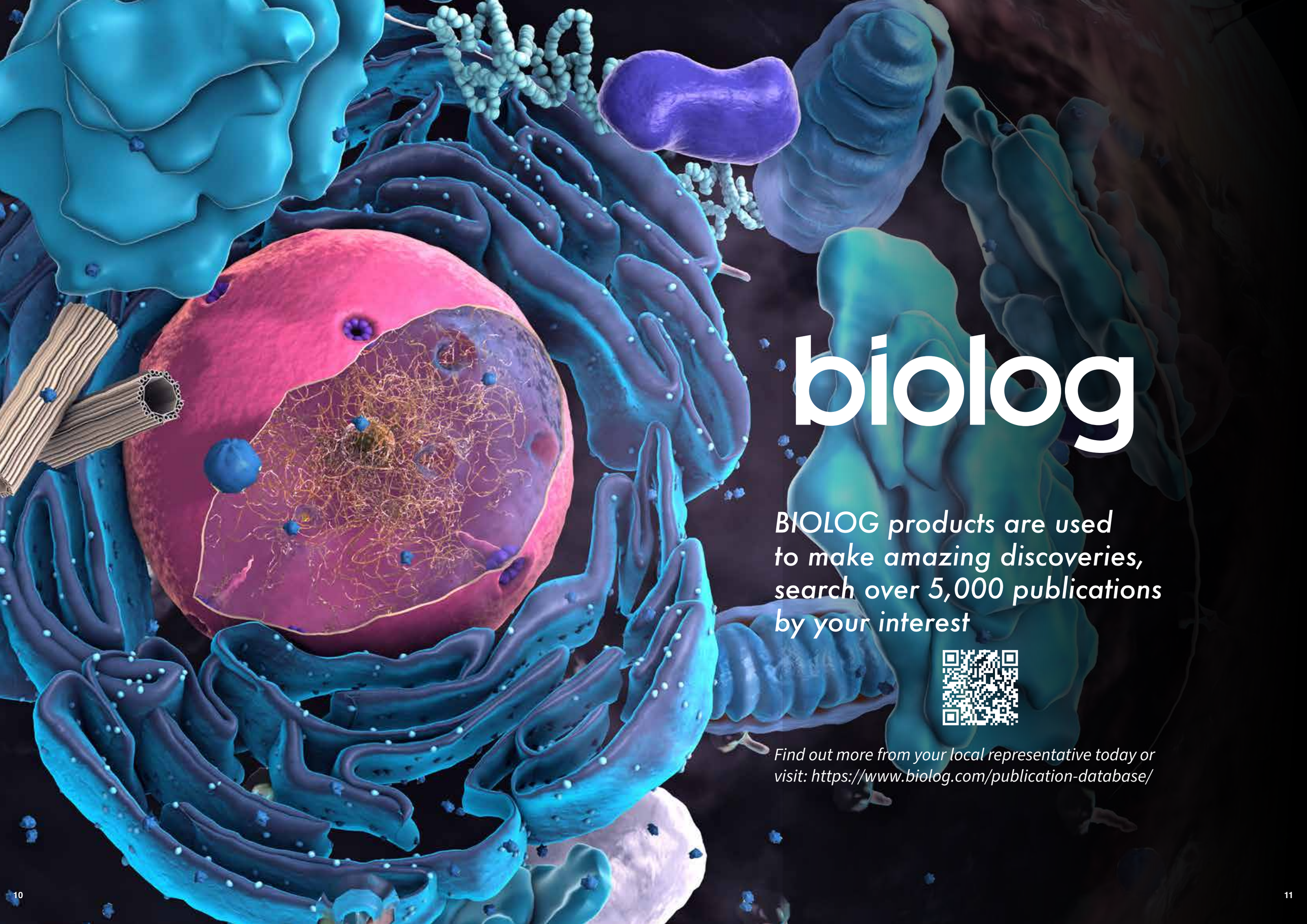
- Confirming efficacy of phage treatments
- Distinguishing metabolic profiles for different cell types
- Performing cell line quality control to monitor for phenotypic drift
- Screening cell culture supplements to improve growth
- Investigating mitochondrial changes impacted by cell differentiation, cancer, metabolic and other disorders
- And more . . .

Research & Education

Biolog data has been published in over 5,000 publications because it provides powerful analysis tools for addressing questions on cellular phenotyping and metabolism.

- Microbial Characterisation
- Microbiome Analysis
- Mammalian Cell Characterisation
- Cancer Research
- Gene Editing

BIOLOG INTRODUCTION



BIOLOG products are used to make amazing discoveries, search over 5,000 publications by your interest

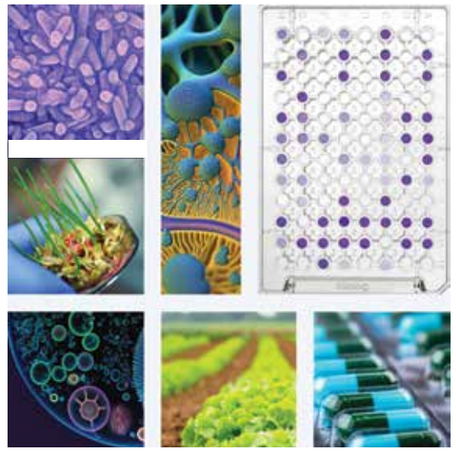
Find out more from your local representative today or visit: https://www.biolog.com/publication-database/

Biolog Solutions for Metabolic Characterisation

Get relevant data you need faster with Phenotype MicroArrays

Phenotype MicroArray™ technology is a proven method of phenotypic cellular screening that is extremely beneficial in a wide range of research applications:

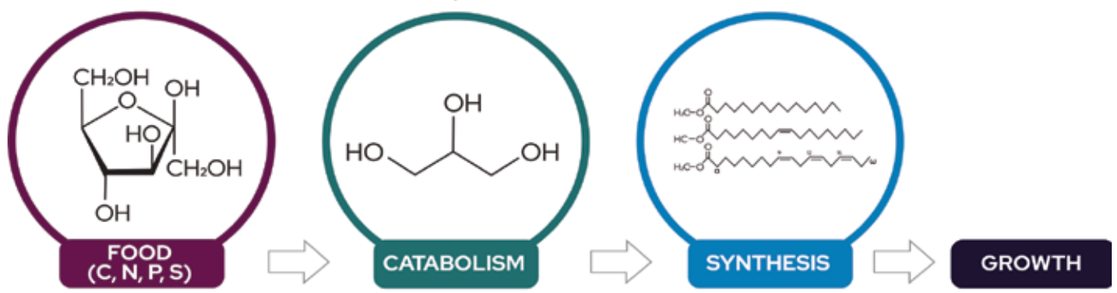
- Uncover functional effects of gene editing
- Measure changes in cell metabolism over time or under different environmental conditions
- Evaluate drug/antibiotic candidates in toxicological profiling and mode of action studies
- Monitor phenotypic drift and QC of cell line passages
- Optimise efficacy in bioprocessing production



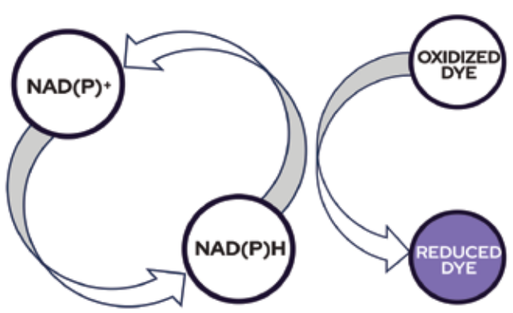
How Phenotype MicroArray Technology Works

Explore nutrient preferences for your cells with pre-plated panels of substrates. The intensity of the redox dye color change reflects how much substrate is consumed. Kinetic measurements establish how quickly substrates are consumed.

Phenotype MicroArrays are preconfigured microplates, each containing up to 95 different small-molecule substrates. Each substrate is intended to interrogate different cellular properties, including metabolic uptake, stress response, drug sensitivity, etc. You can **monitor growth** of your cells under all conditions at once. You can also **monitor cellular respiration** by utilising Biolog's patented redox dye technology, which amplifies the signal from NADPH/NADH production.



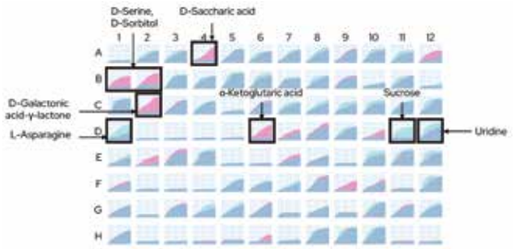
Monitor growth. Understand metabolism.



Phenotyping to measure growth

Effortlessly evaluate multiple conditions simultaneously and determine growth rates.

Phenotype MicroArrays, when used in conjunction with the Odin™ platform, measures optical density at 590 nm (OD 590) over time. The kinetic information can be used to make comparisons between strain differences that may not be readily apparent from a single endpoint read.

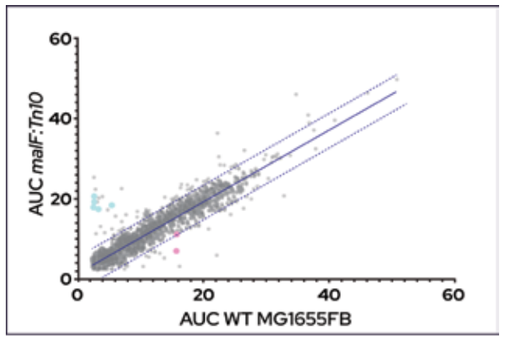


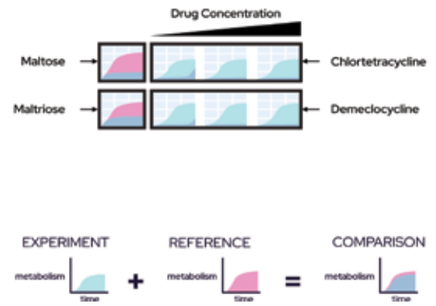
E. coli O157:H7 and CGSC6300 strains are compared on PM1, a carbon source utilisation plate. OD measurements representing metabolic activity are represented on the y-axis, and time (0-24 hours) is represented on the x-axis. O157:H7 shows loss of function for the ability to metabolise several carbon sources including D-saccharic acid, D-serine, D-sorbitol, D-galactonic acid-γ-lactone, α-ketoglutaric acid, and shows a gain of function relative to CGSC6300 for metabolism of D-sucrose.

Phenotyping to understand metabolism

Efficiently compare metabolic differences between two or more strains or cell lines. The Odin™ platform makes it easy to collect and analyse all the data.

By measuring redox dye production, differences in cellular metabolism can also be established.
With Phenotype MicroArrays, it's efficient to screen many conditions at once, and other, unexpected phenotypic changes may be apparent when comparing the conditions.





Phenotypic Analysis with Odin™

When using Phenotype MicroArrays, you need an instrument that will read at the right wavelengths and measure the changes kinetically over time at short intervals. You also need a software package to help you analyse all that data and identify the differences between your samples.

With the Odin™ platform you can characterise phenotypes by monitoring growth curves and cell metabolism kinetics for microbial or mammalian cells for up to 50 plates at the same time. When combined with Phenotype MicroArrays, Odin can analyse up to 4,800 conditions unattended for hours or days.

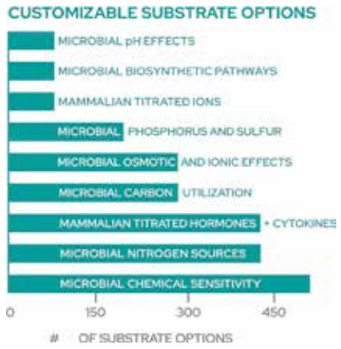
METABOLIC CHRACTERISATION

Biolog for Solutions for Bioprocess & Fermentation

Optimising the Bioprocess Workflow.

Biolog can help:

- Select the best production strain
- Analyse thousands of culture conditions simultaneously to optimise growth medium and maximise product yield
- Develop QC fingerprints for production strains
- Monitor for phenotypic drift across generations of production strains



Preplated or Customised Phenotype MicroArray™ Panels

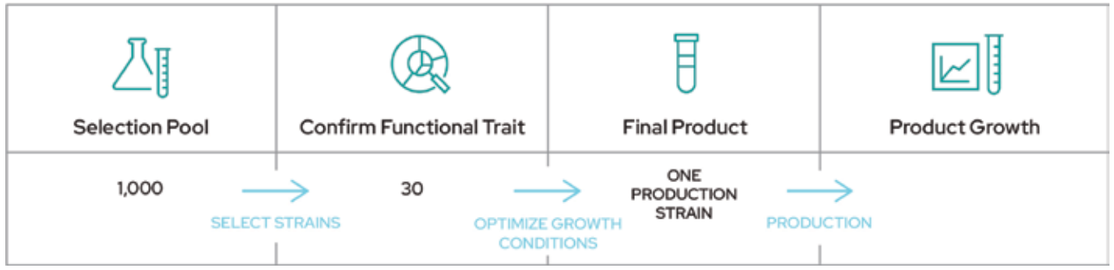
Interrogate microbial cells for sensitivity to salt, pH and chemical inhibitors, including antibiotics and heavy metals. Use preplated or customized Phenotype MicroArray™ panels to test metabolic response to thousands of growth conditions.
Biolog also offers Phenotype MicroArrays for mammalian cell and mitochondrial analysis.

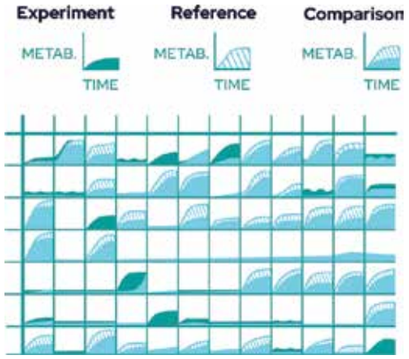
Odin™

The Odin™ system incubates and automatically monitors up to 50 microplates for days at a time. Comprehensive phenotypes are generated by automatic comparison and analysis of up to 4,800 growth conditions in a single experiment.

The Biolog platform advances scientific insights and industrial productivity by interrogating cell metabolism and chemical sensitivity

Biolog Bioprocess Workflow Example





Phenotype MicroArray Technology

Enables comparisons of strains grown in different conditions.
Metabolic kinetics can be monitored automatically. By utilising different substrates in individual wells, you can identify key differences between kinetics across strains. When combined with Odin, a full metabolic profile for up to 1,920 conditions can be determined simultaneously and automatically
analysed for up to 50 plates at a time.

You can also create your own custom arrays for more targeted experiments.

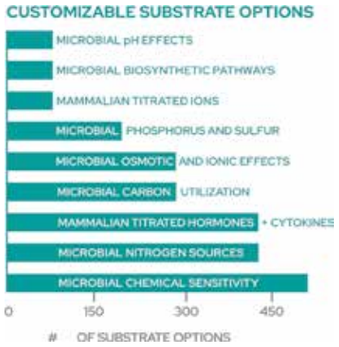
BIOPROCESS & FERMENTATION

Biolog Solutions for Sustainable Agriculture

Optimise your conditions for maximising growth.

Biolog can help:

- Functionally characterise microorganisms and rapidly identify strains that are beneficial to specific soils, environments or crops
- Create microbial products that replace fertiliser and support seed germination
- Optimise manufacturing conditions to maximise microbial growth and product yield
- Assess environmental changes via community-level physiological profiling (CLPP) instrumentation or fast laboratory services

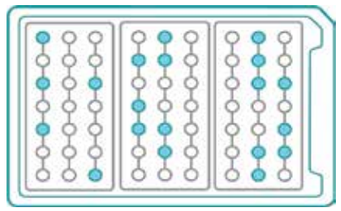


Preplated or Customised Phenotype MicroArray™ Panels

Interrogate metabolic pathways, ionic, osmotic and pH effects, as well as sensitivity to various antimicrobials with different mechanisms of action.

Odin

The Odin™ system incubates and automatically monitors up to 50 microplates for days at a time. Comprehensive phenotypes are generated by automatic comparison and analysis of thousands of growth conditions in a single experiment.

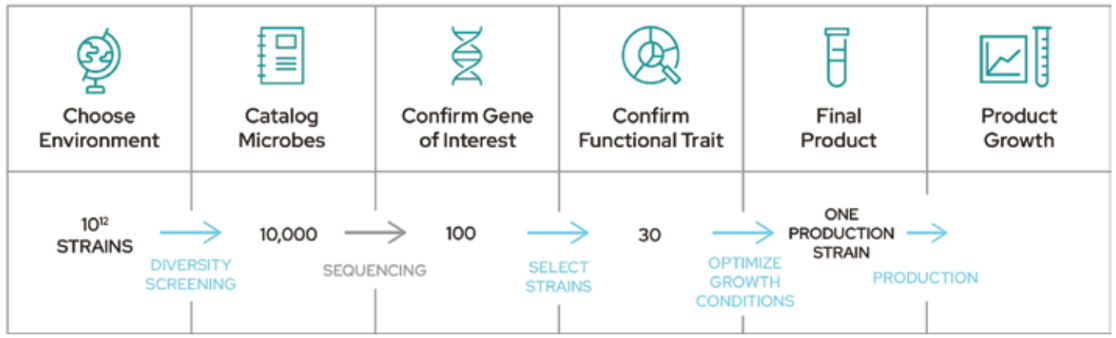


EcoPlate

The EcoPlate™ array effectively distinguishes spatial and temporal changes in the metabolism of microbial communities as a result of environmental changes.

The Biolog platform enables rapid product innovation by interrogating cell metabolism for strain selection, bioproduction, and environmental profiling.

Biolog Sustainable Agriculture Workflow Example



Our customers use Biolog throughout their process, starting with screening for microbial diversity in the environment, confirming phenotypic function in genectically modified organisms, selecting organisms for ideal behaviour such as pH preference, salt sensitivity, nitrogen fixation efficiency, phosphorus solubilisation and more.

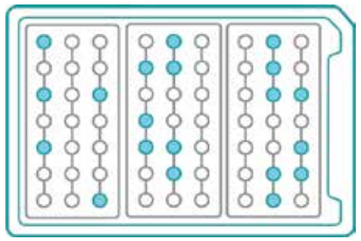
BIOPROCESS & FERMENTATION

Biolog Solutions for Ecological Insights

EcoPlates™ provide a sensitive and reliable index of environmental change. This approach, called community-level physiological profiling (CLPP), effectively distinguishes spatial and temporal changes in the metabolism of microbial communities.

Key applications:

- Community-level physiological profiling (CLPP)
- Monitoring temporal or spatial changes in microbial community activity
- Observing changes before and after perturbation
- Metabolic community fingerprinting
- Screening community diversity / similarity
- Assaying Carbon Source Utilisation Patterns (CSUP)



31 carbon assays in triplicate

EcoPlates contain 3 repeated sets of 31 carbon sources and employ a tetrazolium redox dye as an indicator of microbial metabolism.
As microbes utilise the carbon sources they respire and the tetrazolium reporter dye is reduced to form a visible color.
Communities of microorganisms will exhibit a characteristic reaction pattern, a metabolic fingerprint, that reflects the metabolic properties of the community.

31 Carbon Source Measured Assays:

β-Methyl-D-Glucoside
Pyruvic Acid Methyl Ester
L-Asparagine
2-Hydroxy-Benzoic Acid
D-Mannitol
α-Cyclodextrin
L-Threonine
Itaconic Acid
Glucose-1-Phosphate
α-D-Lactose
Putrescine
D-Galactonic Acid γ-Lactone
D-Xylose
Tween 40
L-Phenylalanine
4-Hydroxy-Benzoic Acid
N-Acetyl-D-Glucosamine
Glycogen
Glycyl-L-Glutamic Acid
α-Keto-Butyric Acid
D,L-α-Glycerol-Phosphate
L-Arginine
D-Galacturonic Acid
i-Erythritol
Tween 80
L-Serine
γ-Amino-Butyric Acid
D-Glucosaminic Acid
D-Cellobiose
Phenylethylamine
D-Malic Acid

The utility of using Biolog technology to analyse microbial communities has been documented in over 500 publications

Visit the bibliography at biolog.com/publication-database/

Typical Procedure

STEP 1:
Environmental samples (as aqueous samples or after suspension) are diluted to a standard cell density and then pipetted direcly into EcoPlates.

STEP 2:
EcoPlates are incubated and the metabolic pattern formation of the community is recorded kinetically.

STEP 3:
The community-level physiological profile is assessed for key characteristics such as pattern stability (similarity), rate of color change in each well (activity), and richness of well response (diversity).

EcoPlates™ can be used in many applications including:

Analysing population changes in soil

Activated sludge, compost & industrial waste testing

Water and wastewater testing

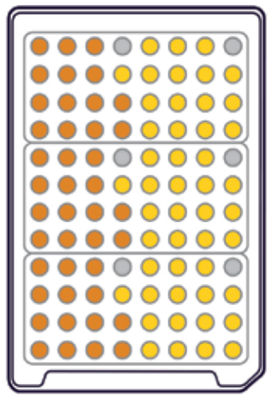
Bioremediation & effects of toxic chemicals

BIOPROCESS & FERMENTATION

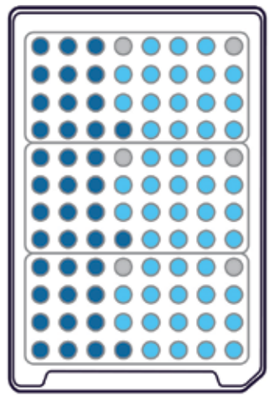
Biolog for Solutions for Microbiome Analysis

Unveiling the power of Prebiotics.

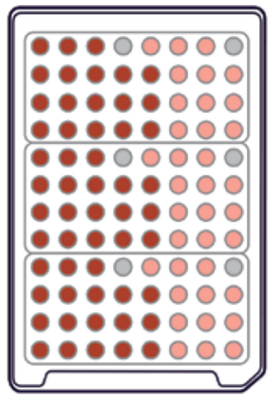
PreBioM™ plates offer a multidimensional phenotype profiling solution based on the impact of prebiotics on microbial function. The three-plate system contains 90 unique prebiotic substrates tailored to investigate the intricate interplay between prebiotics and the microbiome.



Mono/disaccharides
PreBioM1



Poly/oligosaccharides
PreBioM2



Fibers/food extracts
PreBioM3

Each of the PreBioM plates stands alone as a comprehensive tool, containing a selection of prebiotic substrates in triplicate, ranging from simple sugars to dietary fibers. Using the Biolog Odin™ family of instruments, these plates allow you to kinetically characterise aerobic or anaerobic growth as the microbes selectively consume the prebiotic substrates. Alternatively, you can use a redox reporter dye to measure metabolic consumption to accurately profile the function of individual microbes or communities.

PreBioM and Odin

The plates offer key advantages when used in conjunction with the Odin family of instruments and Odin software.

- Kinetic data can be obtained for the entire incubation period, regardless of whether the conditions are aerobic or anaerobic.
- Increased throughput, especially when working with multiple isolates, samples, or conditions.
- Odin software knows what substrates are found in each well, and saves you time by generating streamlined reports.
- Odin software offers Community Analysis features for advanced data analysis to study the diversity of a community, and how it changes over time or under different conditions.

Key Applications:

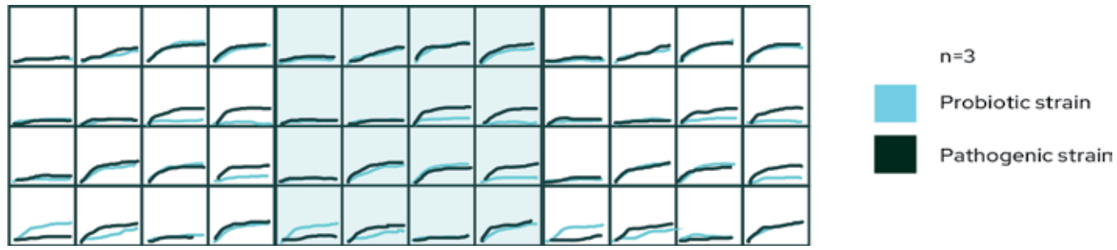
Bioprocess optimization

Microbiome communities

Prebiotics/ Postbiotics

Drug Development

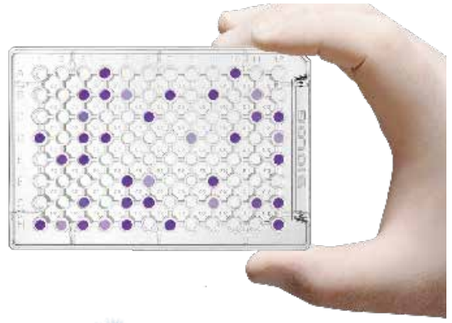
- PreBioM plates' versatile operation accommodates diverse aerobic or anaerobic microbes, enabling exploration of the gut microbiome.
- Mitigate the risk of phenotypic drift of production strains; use of these plates for QC ensures product consistency.
- Drive standardisation of microbiome therapies, ensuring safety and efficacy.
- Optimise bioprocesses to produce synbiotics, probiotics, and postbiotics.
- Test interactions between microbiome community members.



Example use of PreBioM plates to identify substrates that can support better growth and metabolism of a prebiotic strain compared to a pathogenic strain. Kinetic characterization of the plates on Odin provides metabolic rate, lag phase time, log phase duration, and more.

MICROBIOME ANALYSIS

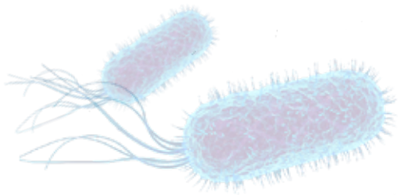
Biolog Solutions for Microbial Identification



Rapidly and accurately identify nearly 3,000 species of aerobic and anaerobic bacteria, yeast, and fungi

Biolog can help:

- Support cGMP requirements in pharmaceutical manufacturing, food processing, or personal care product production
- Monitor your environment for the presence of microorganisms, including tests on raw materials, personnel, air & water systems, or final product
- Minimise downtime with simple SOPs and robust instrumentation or fast laboratory services

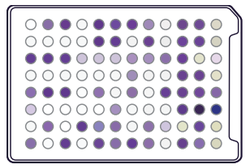


Biolog complete solution includes instruments, consumables, database, and software.

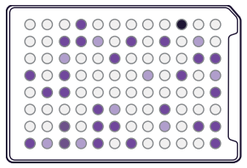
Biolog Microbial ID microplates

Biolog test panels are designed for the phenotypic identification of nearly 3,000 species of microbes, with a range of different microbiologically relevant substrates and inhibitors. When inoculated and grown on the plate, each species generates a distinct metabolic fingerprint based on its ability to metabolise specific substrates, or its sensitivity to specific inhibitors. An algorithm searches the comprehensive database to find the best match.

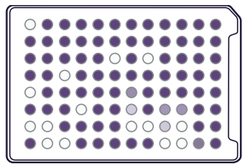
Biolog's database has you covered with the most relevant environmental isolates. If you're working with proprietary strains, we support custom database creation too.



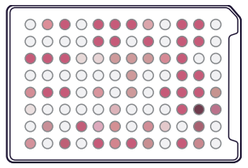
GEN III (Aerobes)
>1,560 species of aerobic bacteria



AN (Anaerobes)
>360 anaerobe species



YT (Yeast)
>260 species of yeast



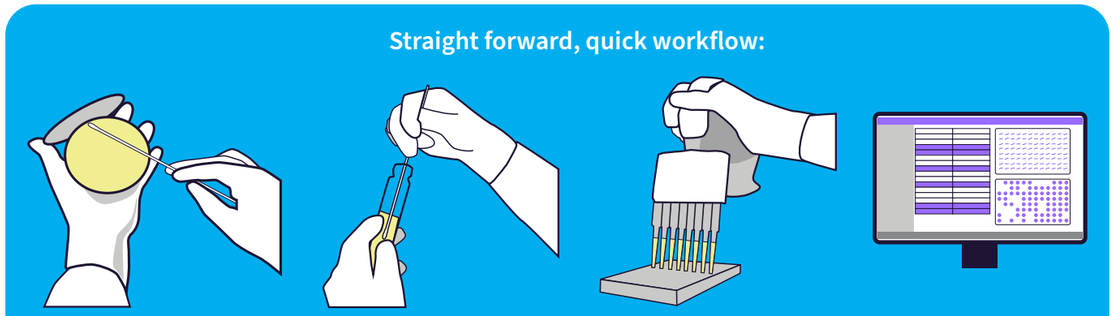
FF (Filamentous Fungi)
>710 species of filamentous fungi

Aerobic & Anaerobic Bacteria

- 94 unique metabolic tests
- ID gram-negative and gram-positive bacteria with a single panel

Yeast and Filamentous Fungi

- 94 carbon sources used by yeast and fungi – 190 total tests
- Plates contain a redox dye and are read at two different wavelengths:
  - Different redox dyes (OD490 or 590) to analyse substrates used for energy
  - Turbidity (OD750) to analyse substrates used for growth



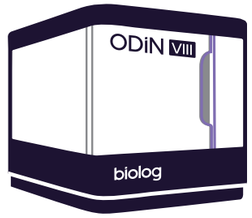
Rapidly and accurately identify different organisms in your own lab with a simple test procedure:

- No pre- or post-tests necessary, including gram stain
- One minute set-up
- Elimination of variables that can affect results

Biolog Systems for Streamlined Microbial Identification

Rapidly and accurately identify nearly 3,000 species of aerobic and anaerobic bacteria, yeast, and fungi, at any level of throughput you need in your lab.

Odin L
Fully automated incubator/ reader for up to 50 plates/run



Odin VIII
Fully automated incubator/ reader for up to 8 plates/run

ID Station
Single plate reader

User-friendly Software

Biolog's software makes the whole microbial identification process easy, from sample input to generation and export of the final report.

All identification results are securely stored in a local database, and an optional package is available to support 21 CFR Part 11 compliance.

MICROBIAL IDENTIFICATION

Biolog Solutions for Drug Discovery & Diagnostics

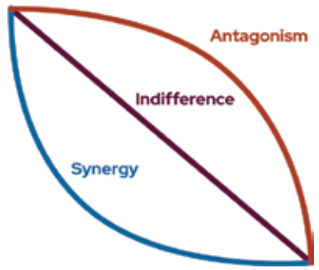
The Biolog platform provides a high-throughput screening method to improve the efficacy of phage therapy.

Biolog can help:

- Quickly home in on candidates that are most effective at killing bacteria.
- Utilise Biolog's patented redox dye to monitor bacterial respiration and assess killing efficiency, or the emergence of resistance.
- Automatically generate growth curves under many conditions at once, to analyse efficacy of phage in combination with other antimicrobials or inhibitors.
- Monitor for specificity against specific bacteria to prevent off target effects that could have detremental effects on the microbiome.

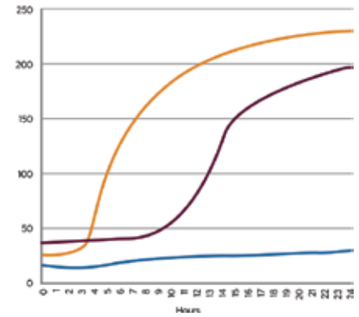
Odin™

The Odin™ system incubates and automatically monitors up to 50 microplates for high-throughput application needs. Comprehensive phenotypes are generated by automatic comparison and analysis of thousands of growth conditions in a single experiment.



Phenotype MicroArray™ Panels

Pre-plated panels provide a streamlined way to test metabolic and growth response of bacteria to thousands of conditions, including sensitivity to salt, pH, antibiotics and heavy metals. Pre-selected conditions can also be tested in combination with a drug to assess interactions, like potential synergies or antagonistic effects.



Next-Level Phage Screening

By generating kinetic data against many conditions at once, Odin can screen for phage that result in complete killing (blue), are ineffective at killing (gold), and identify the emergence of resistance (red).

Rapidly screen for phage killing and resistance.

Engineered phage with antibacterial CRISPR-Cas selectively reduce E. coli burden in mice
GENCAY ET AL. 2023

Screened a library of engineered phage, and identified specific candidates effective against a diverse range of clinically relevant E. coli strains. A candidate is currently in clinical development for treatment of fatal infections.

A Case of In Situ Phage Therapy against Staphylococcus aureus in a Bone Allograft Polymicrobial Biofilm Infection: Outcomes and Phage-Antibiotic Interactions
VAN NIEUWENHUYSE ET AL 2021

Determined the efficacy and specificity of phage therapy for a patient suffering from a chronic polymicrobial infection after tumor resection surgery. Phage targeting one of the four pathogens was administered together with intravenous antibiotics.

Phage Therapy for Limbthreatening Prosthetic Knee Klebsiella pneumoniae Infection: Case Report and In Vitro Characterization of Anti-biofilm Activity
CANO ET AL. 2021

Determined the biofilm activity of phage that was ultimately used to treat a patient suffering from antibiotic-resistant klebsiella infection.

DRUG DISCOVERY & DIAGNOSTICS

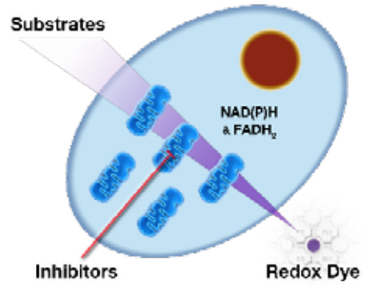
Biolog Solutions for Mitochondrial Analysis

Mitochondrial Function Assays with MitoPlates™

MitoPlates™ are cell-based phenotyping assays used to interrogate and characterise mitochondria. They use 96-well plates pre-loaded with tests designed to measure the effects of a diverse set of substrates and inhibitors on mitochondrial function. Any cell type of interest can be added to the plates along with Biolog's proprietary redox dye. The generation of energy-rich NADH by the cells reduces the redox dye and brings about a color change which can be read and analysed by the Odin™ platform.

MitoPlates can be used to investigate how mitochondria change as a result of processes including:

- Cell differentiation
- Cancer and aging
- Neurological disorders
- Metabolic disorders
- Immune cell activation arrayed in triplicate,
- Bacterial/viral infection
- Innate genetic defects



Interrogate and analyse Mitochondria at higher resolution.

Certain metabolic substrates rely on different transporters to enter the mitochondria and different dehydrogenases to produce NAD(P)H or FADH2. Mitochondria are also sensitive to specific inhibitors. The MitoPlates consist of two panels, a substrate panel and an inhibitor panel.

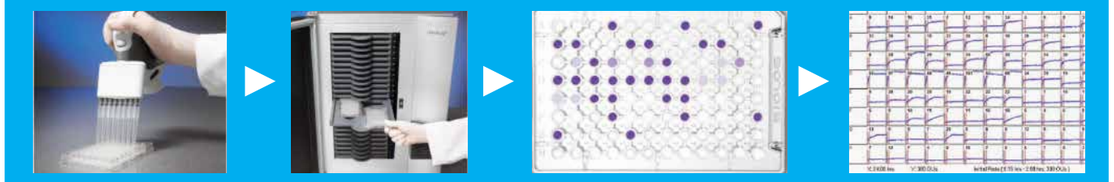
Together these panels can be used to characterise mitochondria in novel ways, including drug sensitivity, rates of metabolism, and effects of mutations in mitochondria-related genes.

Simple Procedure

STEP 1:
Prepare and pipet assay mixture containing cell permeabilising buffer and redox dye into appropriate wells.

STEP 2:
Start the assays by adding 2x cell suspension to all wells.

STEP 3:
Load the MicroPlate into the Odin™ for kinetic reading of the rate of purple color formation.



MitoPlate S-1 with 31 Substrates:

No Substrate Control	D,L-Isocitric Acid	Ala-Gln	Citric Acid
α-D-Glucose	cis-Aconitic Acid	L-Ornithine	Succinic Acid
Glycogen	α-Keto-Glutaric Acid Fumaric	Tryptamine	D,L-β- Hydroxy-Butyric Acid
D-Glucose-1-PO4	Acid	Sparker Malate Control	L-Serine
D-Glucose-6-PO4	L-Malic Acid	Octanoyl-L-Carnitine	Acetyl-L-Carnitine
D,L-α-Glycerol-PO4	α-Keto-Butyric Acid L-Glutamic	Palmitoyl-D,L-Carnitine	ɣ-Amino-Butyric Acid
L-Lactic Acid	Acid	Pyruvic Acid	α-Keto-Isocaproic Acid
Pyruvic Acid	L-Glutamine	D-Gluconate-6-PO4	L-Leucine

MitoPlate I-1 with 22 Inhibitors:

No Substrate Control	No inhibitor Control	Meclizine
Complex I Inhibitor Rotenone	Complex III Inhibitor Myxothiazol	Celastrol
Complex I Inhibitor Pyridaben	Phenformin	Gossypol
Berberine	Uncoupler FCCP	Nordihydro-guaiaretic acid
Complex II Inhibitor Malonate	Uncoupler 2,4-Dinitrophenol	Trifluoperazine
Complex II Inhibitor Carboxin	Diclofenac	Polymyxin B
Alexidine	Ionophore, K Valinomycin	Amitriptyline
Complex III Inhibitor Antimycin A	Calcium / CaCl2	Papaverine

Biolog technology has been used to interrogate and analyse Mitochondria at higher resolution and been documented in a number of publications

Visit the bibliography at biolog.com/publication-database/

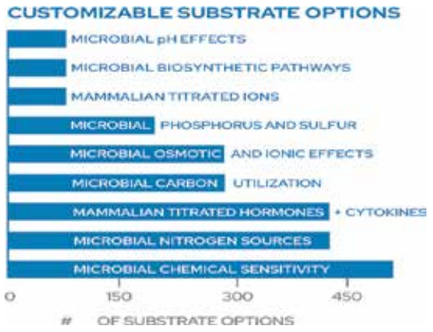
DRUG DISCOVERY & DIAGNOSTICS

Biolog Solutions for Cell Research (Microbial & Mammalian)

Our instruments, software, and reagents advance scientific insights by interrogating cell metabolism.

Biolog can help:

- Collect quality data to guide your research
- Characterise microorganisms under a variety of conditions
- Obtain phenotypic insights into complex metabolic questions using kinetic data with direct links to KEGG for Pathway analysis
- Reach high-impact journals and contribute to a community that has published over
- 5,000 publications, including peer-reviewed journals, textbooks, thesis papers and more



Preplated or Customised Phenotype MicroArray™ Panels

Interrogate metabolic pathways, ionic, osmotic and pH effects, as well as sensitivity to various antimicrobials with different mechanisms of action.

Odin™

The Odin™ systems incubate and automatically monitor up to 50 microplates for high-throughput application needs (Odin L) or 8 microplates for low throughput (Odin VIII). Comprehensive phenotypes are generated by automatic comparison and analysis of thousands of growth conditions in a single experiment.

Phage Therapy for Limb threatening Prosthetic Knee Klebsiella pneumoniae Infection: Case Report and In Vitro Characterization of Anti-biofilm Activity
CANO ET AL. 2020

Used OmniLog® to determine the biofilm activity of phage that was ultimately used to treat a patient suffering from antibiotic-resistant klebsiella infection.

Metagenomic Alterations in Gut Microbiota Precede and Predict Onset of Colitis in the IL10 Gene-Deficient Murine Model
MIYOSHI ET AL. 2021

Performed metagenomic sequencing of bacterial in fecal samples and found alterations in nitrogen metabolism. Confirmed nitrogen utilization alterations from the gut microbiome in colitis-susceptible mice using Phenotype Microarrays on the OmniLog.

Diversity of nitrogen-fixing rhizobacteria associated with sugarcane: a comprehensive study of plant-microbe interactions for growth enhancement in Saccharum spp.
SINGH ET AL. 2020

Isolated nitrogen-fixing microorganisms from the rhizosphere of sugarcane and characterized, using Phenotype Microarrays™ for nitrogen-fixation, plant growth promotion, and biocontrol of pathogens.

Take your research to the next level.

BASIC RESEARCH

Microbiological QC Testing

Culture Collection of Reference Strains from Microbiologics®

Microbiologics® are the leading provider of ready-to-use QC micro-organisms for quality control testing in the clinical, pharmaceutical, food, water and educational industries. With over 900 strains available in a variety of user-friendly formats, we offer the largest and most diverse line of QC micro-organisms including qualitative, quantitative, Certified Reference Material and Parasite suspensions.

All products are manufactured in accordance with the industry's highest standards. We have achieved ISO 13485 certification, as well as ISO 17025 and ISO Guide 34 accreditations.

EZ-Accu Shot Select
Five compendial micro-organism strains in one kit for Growth Promotion Testing.

EZ-CFU One Step
Ready-to-use quantitative lyophilised micro-organism pellets for Growth Promotion Testing.

Custom Solutions
Identification and preservation of environmental in-house isolates.

KWIK-STIK™
Everything you need to grow reference cultures for QC testing is included in this one handy device.

Epower™
One product for media QC - media QC, presence/absence testing to enumeration testing, water testing and disinfectant testing.

EZ-PEC™
Conduct Antimicrobial effectiveness and preservation efficacy testing with convenience and confidence.

Pharmaceutical Test Methods:

- Growth Promotion Testing
- Sterility Assurance Testing
- Antimicrobial Effectiveness Testing
- Media Challenge Testing
- Microbial Enumeration Testing
- Water Testing
- Environmental Testing

Personal Care Product Test Methods:

- Antimicrobial Effectiveness Testing
- Growth Promotion Testing
- Media Testing
- Microbial Challenge Testing

Custom Solutions

Your strain. Your format. Your convenience.

Tracking and trending environmental microbial isolates is a growing concern for pharmaceutical, nutraceutical, medical device, personal care product and food manufacturing laboratories. The FDA continues to issue warning letters and observations regarding inadequate environmental isolate testing. This has prompted many laboratories to include these strains in their compendial testing requirements such as disinfectant efficacy, growth promotion, method suitability and qualification, and antimicrobial effectiveness challenges.

That's where Microbiologics® Custom Solutions comes in. We offer a full menu of services for environmental isolate management. From identification and characterisation, to preservation and storage, and even manufacturing in any of our ready-to-use formats for QC Testing; partner with us to reduce cost, minimise risk and increase confidence in your environmental monitoring program.

SELECT YOUR SOLUTION

CUSTOM SPECIFICATIONS IN A READY-TO-USE FORMAT
After you Isolate is identified, we will preserve and manufacture your strain in a ready-to-use format that best meets your needs.

IDENTIFICATION SERVICES
Found an environmental isolate? We can identify the organism.

ARTEL
BY ADVANCED INSTRUMENTS

Liquid Handling Verification

TECHNOPATH partner with ARTEL by Advanced Instruments for calibration and volume verification systems for hand-held pipettes and automated liquid handlers.

Portable, efficient, and traceable to NIST standards, Artel's PCS® and MVS® instruments are an easy way to ensure data integrity for full confidence in your results.

Meeting regulatory requirements and maintaining quality doesn't have to take up a lot of valuable time. With the PCS® and the MVS® , laboratories can streamline regulatory compliance, maximising productivity.

Artel PCS® Pipette Calibration System

The Artel PCS® provides confidence in data integrity with scheduled pipette calibrations, interim performance verifications, complete documentation and pipette inventory management, even for pipettes calibrated outside of PCS® Software — and it's an ideal tool for standardising pipetting technique and assessing operator competency.

Artel Pipette Calibration Report

Pipette: LC21413

Result: PASSED

Volume	Mean	Std Dev	Uncertainty	Inaccuracy	Tolerance	Imprecision	Tolerance	Result
20.00 µL	19.645 µL	0.158 µL	0.227 µL	-1.78 %	5.00 %	0.86 %	5.00 %	PASSED
50.00 µL	49.881 µL	0.425 µL	0.540 µL	-0.24 %	2.50 %	0.85 %	2.50 %	PASSED
100.00 µL	99.083 µL	0.944 µL	1.190 µL	-0.92 %	2.50 %	0.95 %	2.50 %	PASSED

Artel MVS® Multi-channel Verification System

Understand and manage the performance of your automated liquid handlers, multichannel pipettes, labware, operators, and more. Compatible with virtually all automated liquid handling systems and multichannel hand-held pipettes, the Mobile workstation for portable rapid calibration, verifications and optimisation of dispensed volumes with high precision and accuracy.

Departments where Artel can help:

- ✔ Calibration and volume verification
  - ✔ Single-channel hand-held pipettes
  - ✔ Automated liquid handlers
- ✔ Pipette operator proficiency assessment and training
  - ✔ Between hand-held pipettes and automated liquid handlers
  - ✔ From lab-to-lab and site-to-site across a global organisation
- ✔ Reduce variability by standardising volume transfers
- ✔ Control for lot-to-lot variability from disposable tips
- ✔ Optimise liquid class on automated liquid handlers
- ✔ Optimise processes on automated liquid handlers

Speed up assay automation and ensure performance with streamlined liquid class optimisation

Getting liquid class settings right is a critical, but often neglected aspect of automating an assay that can reduce CVs and improve reproducibility.

QualAssure™ Solutions from Artel:

When optimising your automatic liquid handlers (ALHs), it is best to use liquid types similar to what you use your assay. Indeed, different liquids have different physical properties (density, viscosity, surface tension), and behave differently when handled by your ALHs. Using water as the default liquid class for your volume verification method can lead to biased data and costly errors down the road. To help you with your ALH optimisation.

Artel offers 4 different QualAssure solutions, so you can choose the ones that best mimic your liquid types:

- **Aqueous QualAssure** for a fast and straightforward optimisation process with water-based solutions
- **DMSO QualAssure** to validate your liquid transfers whenever dimethyl sulfoxide solvent is used
- **PCRMix QualAssure** to mimic commercial PCR master mix in any of your molecular assays (qPCR, NGS)
- **SerumSub QualAssure** to mimic various human and animal sera in assays where quantification of serum is of the utmost importance.
- **Stock Solution** to prepare and test your alternative custom solutions

ARTEL
BY ADVANCED INSTRUMENTS

The MVS® System streamlines liquid class optimisation

Optimising liquid classes can seem tedious but with an MVS®, the process is fast and straightforward. Simply set up your assay and use the MVS QualAssure solution that best mimics your liquid. Choose between Aqueous, DMSO, PCRMix, SerumSub or create your own Alternative Solution to best match the liquid being dispensed. You can test different liquid class settings and then use the MVS® to measure how the setting affects liquid handling accuracy and precision.

Optimising liquid classes can improve accuracy and precision, ensuring reproducible results.

Dispense: Starting with the default parameters on the automated liquid handler, dispense Artel SerumSub QualAssure solution and diluent into Artel Verification Plate.

Measure: After mixing on the plate shaker, read the plate on the MVS.

Assess: The system calculates volume accuracy and precision for each well and provides statistics.

Adjust: Based on results, adjust (as needed) parameters such as aspiration speed, dispense speed, delay blowout, speed blowout movement blowout, initial stroke, aspirate height, dispense height and volume offset.

LIQUID HANDLING VERIFICATION

Rapid Microbiological Testing

Microbs IAN® - Ultra-Rapid Microbiological Detection

The 15 minutes microbiology method!
To boost productivity in your microbial QC lab, Microbs is launching IAN®, an Ultra Rapid Microbiological Method allowing an accurate enumeration of bacteria, yeast and mould within minutes, not days!

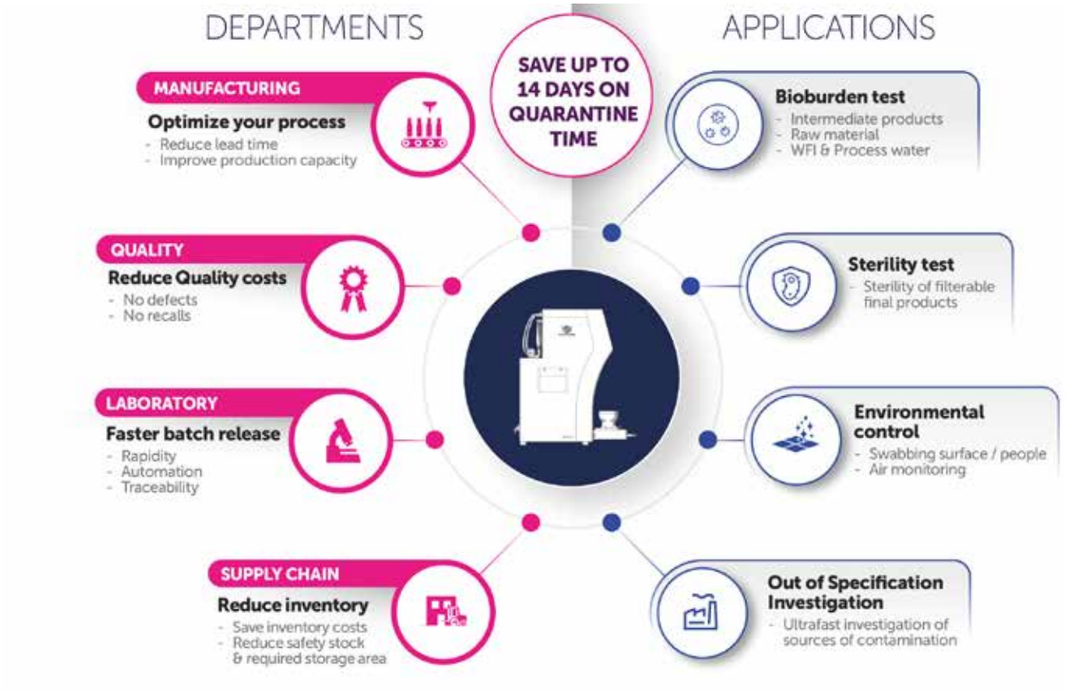
By combining benefits of solid phase cytometry and complex algorithims, Microbs has overtaken the limits of current techniques. Adjusted on more than 40 million events, IAN detects bacteria, yeasts and moulds without the need for incubation or enrichment. At line testing or in your laboratory, this fully automated technology will prevent or reduce the potential risks in the contamination of your products.

MICROBS

Detection in 15 min of a single live microorganism in filterable sample without the need for enrichment or growth.

Produce Safely

- Solid phase cytometry
- Time to result: 15 minutes
- Qualitative & Quantitative
- Objective results – no interpret
- No enrichment needed
- Liquid matrices
- Total aerobic & anaerobic flora
- LOD: 1 microorganism/sample
- Traceability & data integrity: 21 CFR part 11 compliantation needed



Microbs and Cell & Gene Therapy

IAN is an RMM system that can detect and enumerate bacteria, yeast, and mould in less than 1 hour in cell and gene therapy products

After successfully validating the new “cell protocol” on JURKAT and CEM cells, the Microbs R&D Team have now been able to detect an extremely low microbial contamination in 10^5 T2 cells/ml in less than 1 hour.

Microbs R&D Team’s next step: demonstrating that the system can achieve the same performances in 10^6 cells/ml.

Stay tuned for the first results.

Contact us for further details

RAPID MICROBIAL TESTING

CONTACT US

For further information on any of the life science research offerings from TECHNOPATH please contact us on the below details or check out our website: www.techno-path.com

TECHNOPATH

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