



Sartorius PSC Functional  
and Phenotypic  
Characterization Solution

Data Sheet Collection

**SARTORIUS**

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# Introducing the Incucyte® SX5 Live-Cell Analysis System

More Colors. More Insights. More Possibilities.

## Leading the Way With Living Cells

See more information in every sample and explore more applications. Leverage up to 5 different fluorescence channels, up to 3 at a time, for long term timelapse experiments.

## Go Where Your Research Takes You

Study complex immune-tumor cell interactions, synaptic activity in neuronal co-cultures, metabolism in cancer cells, and much more—with a single platform.

## Protect Your Cells

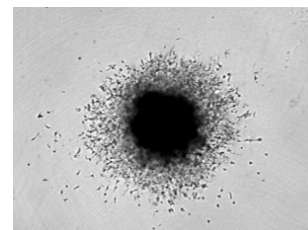
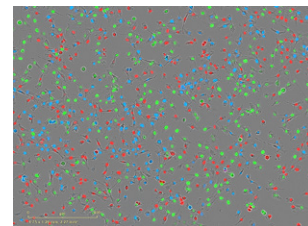
Patent-pending 3-color optical module includes a long wavelength, low phototoxicity Near IR channel and reagents designed for long term live-cell experiments.

## Improve Productivity

Enjoy walk-away convenience as images are automatically acquired and analyzed in microplate format, up to six in parallel.



The Incucyte SX5 Live-Cell Analysis System offers more channels, more reagents and more purpose-built software for more applications—allowing you to derive deeper, physiologically relevant information about your cells. Never miss powerful insights again, with the Incucyte SX5 Live-Cell Analysis System, Software, Reagents, and Consumables.



## Dedicated to Living Cells

- Up to 5 different fluorescence channel options
- Multiplex HD Phase with up to 3 fluorescence channels at a time (Green/Orange/Near IR)
- 4x, 10X, and 20X lenses on an automated turret
- Purpose-built software modules, reagents and consumables for turnkey applications

## Support for Multiple Users

- Support for 3 interchangeable vessel trays and over 600 vessels, up to 6 microplates in parallel
- Remote, networked access with unlimited, free licenses

Learn more at

[www.sartorius.com/incucyte](http://www.sartorius.com/incucyte)

E-Mail orders.US07@sartorius.com

North America: +1 734 769 1600, ext. 3

Europe: +44 7515 947101

APAC: +81 3 5826 4795

See how the Incucyte is driving research forward at [www.essenbio.com/publications](http://www.essenbio.com/publications)

## See What You Can Do With the Incucyte Live-Cell Analysis System!

### Cell Health & Proliferation

Proliferation & Cell Counting  
Cell Cycle  
Apoptosis  
Cytotoxicity  
Viability  
Mitochondrial Membrane Potential NEW!  
ATP Metabolism NEW!

### Cell Function

Immune Cell Killing  
Antibody Internalization  
Immunocytochemistry  
Phagocytosis  
Neurite Dynamics  
Neuronal Activity  
Angiogenesis

### 3D Cell Models

Spheroid Growth & Viability  
Spheroid Invasion

### Cell Movement & Morphology

Chemotaxis Migration & Invasion  
Scratch Wound Migration & Invasion

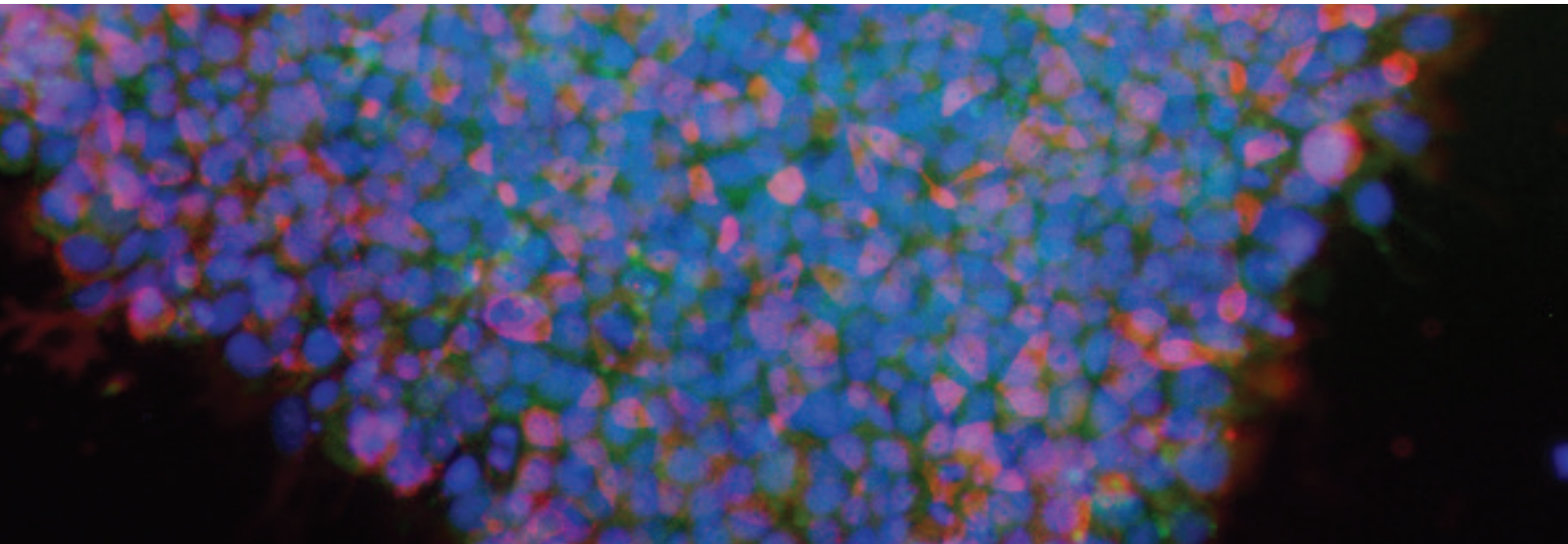
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# NutriStem® hPSC XF Medium

A superior xeno-free, serum-free culture medium for hES and hiPS cells

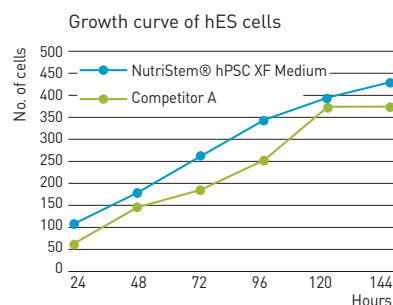


- **Defined, serum-free, xeno-free**
- **Complete, ready-to-use**
- **Superior proliferation of undifferentiated hES and hiPS cells**
- **Stable pluripotency and genotype over long-term culture**
- **Extensively tested and widely referenced**
- **Flexible and compatible with multiple matrices (e.g. Matrigel and laminin)**

## Expanding the culture of excellence

NutriStem® hPSC XF Medium is a defined, xeno-free, serum-free medium designed to support the growth and expansion of human induced pluripotent stem (hiPS) and human embryonic stem (hES) cells in a feeder-free environment. NutriStem® hPSC XF Medium offers the ability to culture human pluripotent cells without the need for high levels of bFGF and other stimulatory growth factors or cytokines. The low-protein formulation contains only the most essential components required for maintenance of hES and hiPS cells, providing a simplified medium and maintaining the cells' full differentiation potential.

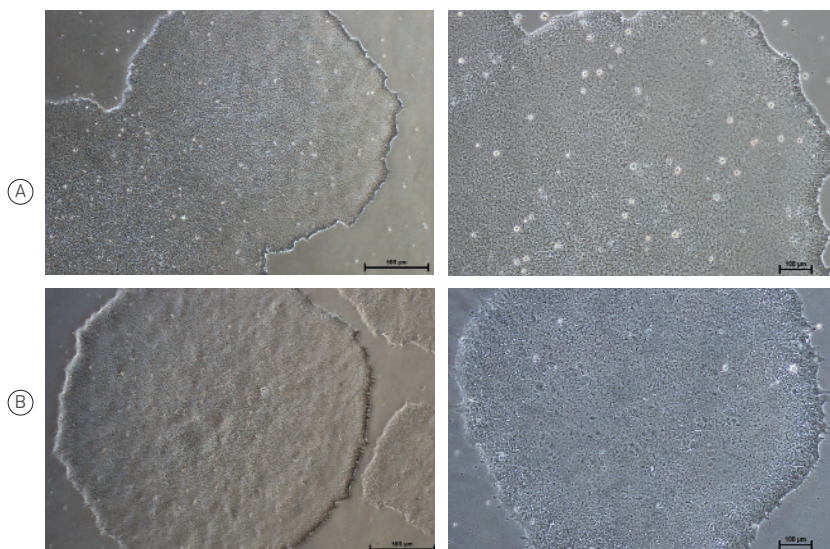
The defined, xeno-free formulation of NutriStem® hPSC XF Medium provides consistent media performance and predictable cellular behavior, as well as increased reproducibility in long-term culture (over 50 passages). In addition, cells cultured in NutriStem® hPSC XF Medium show superior attachment and proliferation rates, making this medium ideal for high-throughput screening applications.



**Figure 1:** NutriStem® hPSC XF Medium enables excellent proliferation of undifferentiated hES and hiPS cells. Proliferation of H1 hES cells cultured in Matrigel-coated 96-well plates in NutriStem® hPSC XF Medium and the leading competing medium for feeder-free culture. Medium was changed and proliferation was assessed every 24 hours in culture.

## Normal cell morphology and functional assesment of pluripotency

The formation of compact colonies of cells with a high nucleus-to-cytoplasm ratio, prominent nucleoli, and distinct colony borders are characteristic morphology traits of healthy undifferentiated hES and hiPS cells, and can be observed through a phase-contrast microscope (Figure 2). Human pluripotent stem cells hold the potential to differentiate into cell types of all three germ layers, i.e., endoderm, mesoderm, and ectoderm. This differentiation potential is assessed by the spontaneous differentiation within embryoid bodies cultured in vitro (Figure 3) and teratomas formed in vivo (Figure 4).



**Figure 2: Normal Colony Morphology.** H1 hES cells (panel A) and ACS-1014 hiPS cells (panel B) cultured in NutriStem® hPSC XF Medium on Matrigel-coated plates display colony morphologies typical of normal feeder-free hES and hiPS cell cultures, including a uniform colony of tightly compacted cells and distinct colony edges.

### Ordering Information

Cat. #	Product	Qty
05-100-1A	NutriStem® hPSC XF Culture Medium	500 mL
05-100-1B	NutriStem® hPSC XF Culture Medium	100 mL
05-713-1A	NutriFreez™ D10 Cryopreservation Medium	500 mL
05-713-1B	NutriFreez™ D10 Cryopreservation Medium	100 mL
05-713-1C	NutriFreez™ D10 Cryopreservation Medium	20 mL
05-713-1D	NutriFreez™ D10 Cryopreservation Medium	10 mL
05-713-1E	NutriFreez™ D10 Cryopreservation Medium	50 mL
05-753-1F	LaminStem™ 521	1 mL
03-073-1B	Accutase Solution	100 mL
03-079-1B	Recombinant Trypsin-EDTA Solution	100 mL
03-079-1C	Recombinant Trypsin-EDTA Solution	20 mL

### How to Order

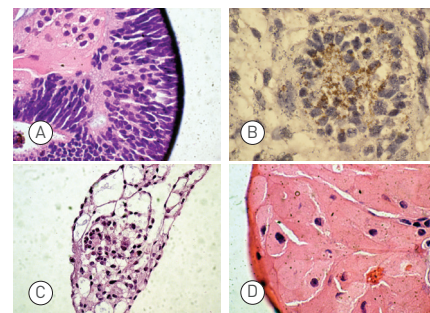
Biological Industries | T. 972-4-996-0595 | F. 972-4-996-8896 | [info@bioind.com](mailto:info@bioind.com)

Biological Industries USA | T. 860.316.2702 | F. 860.269.0596 | [orders@bioindusa.com](mailto:orders@bioindusa.com)

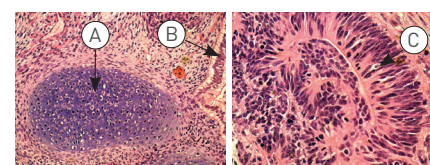
Matrigel is a registered trademark of Corning Incorporated.

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*Culture of Excellence*



**Figure 3: Embryoid Body Formation.** Embryoid bodies (EBs) were generated from H9.2 hES cells cultured for 16 passages in NutriStem® hPSC XF Medium on Matrigel matrix as an evaluation of pluripotency. The pluripotent H9.2 cells were suspended in serum-supplemented medium, where they spontaneously formed EBs containing cells of embryonic germ layers. The following cell types were identified by examination of the histological sections of 14-day-old EBs stained with H&E: (A) neural rosette (ectoderm), (B) neural rosette stained with Tubulin, (C) primitive blood vessels (mesoderm), and (D) megakaryocytes (mesoderm).



**Figure 4: Teratoma Formation.** H9.2 hES cells were cultured for 11 passages in NutriStem® hPSC XF Medium using a human foreskin fibroblast (HFF) feeder layer. The hES cells were subsequently injected into the hind leg muscle of SCID-beige mice for in vitro evaluation of pluripotency. The following tissues from all three germ layers were identified in H&E-stained histological sections of the teratoma 12 weeks post-injection: (A) cartilage (mesoderm), (B) epithelium (endoderm), and (C) neural rosette (ectoderm).

### NutriStem® hPSC XF (GF-free) for Reprogramming

NutriStem® hPSC XF (growth factor free) culture medium (Cat. # 06-5100-01-1A) is an extremely rich complex medium. It contains the essential components required for the short-term maintenance of cells prior to manipulations such as the generation of induced pluripotent stem (iPS) cell colonies. iPSC lines can then be transferred to regular NutriStem® hPSC XF culture medium (Cat. # 05-100-1A) for expansion and long-term maintenance.

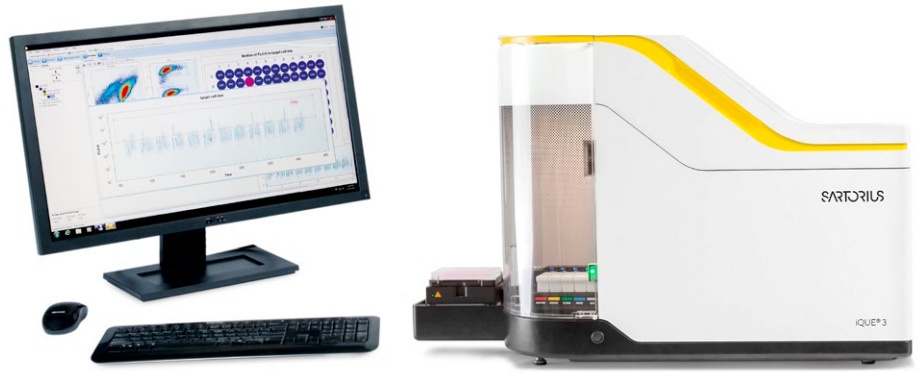


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## iQue® 3

### Faster, Smarter, Flow Cytometry

Advanced High Throughput Flow Cytometry Solution Speeds Up Your Entire Workflow



The iQue® 3 Platform is the most advanced flow cytometry platform—with a focus on speed from setup, to acquisition and analysis. It combines a patented sampling method, which allows for the fastest sample acquisition in the industry. It has the ability to handle 96, 384, or 1536-well plates, and enables continuous plate loading through connection with any automation system. The Enhanced Rinse Station (ERS) provides continuous monitoring of liquid levels to ensure sufficient volumes prior to each run.

When used with the pre-configured iQue® reagent kits, samples can be analyzed instantly through the use of customizable templates following acquisition.

The included iQue Forecyt® Software enables dynamic data visualizations with an ease of use that allows all users to identify samples of interest without having to export to multiple software packages.

## The iQue® Advantage

### Speed



- Faster plate processing, minutes, not hours
- Mix and read samples
- Faster time to results

### Miniaturization



- Consumes less reagents
- Conserves precious cells
- Saves money

### Content



- Rich, multiplexed, per-cell content
- Cell and beads together
- Secreted protein analysis

### Usability



- Automated workflow
- Validated reagents
- Easiest software you will ever love

### Insight



- Link information
- Run scenarios
- Create knowledge
- Make decisions

## iQue® 3 Platform

The iQue® 3 Platform is an integrated instrument, software and reagent system that enables rapid, high content, multiplexed analysis of cells and beads in suspension. Our unique, software-assisted automation and experiment-based analyses deliver the deep insight needed to answer complex biological questions.

The iQue® 3 BR (Blue-Red laser configuration) is a phenotypic screening and profiling workhorse that is ideal for applications that require up to 6-color detection, including antibody and biologics discovery, cell health assessment, secreted protein analysis using iQue® Qbead-based assays, and many more applications. Our platform delivers the iQue Forecyt® Software Workflow Advantage: a single data management workflow from input to output, which means you work faster and work smarter—not harder.

Content is king with the iQue® 3 VBR and VYB (Violet-Blue-Red and Violet-Yellow-Blue laser configurations). Three-laser systems offer up to 13-color detection and are ideal for functional and phenotypic applications that demand more choice and flexibility in experimental design. These systems combine high performance multi-color analysis with the iQue Forecyt® Software Workflow Advantage making them hands-down the choice of scientists in immune-based drug discovery, immuno-oncology, and cell therapy applications.

The iQue® 3 HD (Blue-Red laser configuration) provides the ultimate assay miniaturization and is the only high content, per-cell, 1536-well capable suspension screener available.

# iQue® 3 Technical Specifications

iQue® 3 Configuration		Blue and Red		Violet, Blue and Red			Violet, Yellow and Blue		
Detectors	Lasers	488 nm	640 nm	405 nm	488 nm	640 nm	405 nm	561 nm	488 nm
	445/45 nm			■			■		
	530/30 nm	■		■	■		■		■
	572/28 nm	■		■	■				
	586/20 nm						■	■	
	615/24 nm			■	■				
	615/20 nm						■	■	■
	660/20 nm						■	■	■
	675/30 nm	■	■	■	■	■			
	780/60 nm	■	■	■	■	■	■	■	
	Forward light scatter (relative size)	■			■			■	
	Side light scatter (relative granularity)	■			■			■	
Optical	Fluorescence sensitivity	FITC < 75 MESF; PE < 50 MESF; APC < 20 MESF							
	Minimum particle size detection	0.5 µm							
	Cell detection rate	Up to 35,000/second							
	Dynamic range of detection*	> 7 decades							
* This wide dynamic range and a Zoom function permit operation of the system without user adjustments of the voltage or gain of the detectors.									
Sampling	Plate compatibility	96-well, 384-well or 384-well, 1536-well (iQue® 3 HD BR)							
	Sampling	Continuous air-gap delimited							
	Minimum assay volume requirements	10 µL							
	Minimum sample aspiration	1 µL							
	Minimum plate sampling time*	< 5 minutes   96 wells				< 20 minutes   384 wells			
	Carryover	< 2% for typical no-wash assays. Actual amounts are cell and assay dependent and are easily managed by including interwell rinses to reduce carryover to < 0.1%							
	Automated plate shaker	Up to 3,000 rpm (Up to 5000 rpm on iQue® 3 HD BR)							
Features	<ul style="list-style-type: none"> <li>▪ Foil-sealed plate processing</li> <li>▪ Volumetric cell counting (&lt; 10% CV)</li> </ul>								
* The time required for sampling plates is both sample type and experiment dependent. A range of well-sampling times can be designated from 0.5 seconds–minutes.									
Enhanced Rinse Station	Features	<ul style="list-style-type: none"> <li>▪ Reduces evaporation</li> <li>▪ Monitors fluid levels</li> </ul>			<ul style="list-style-type: none"> <li>▪ Automated QC bead vortexing</li> </ul>				
iQue Forecyt® Software	Features	<ul style="list-style-type: none"> <li>▪ Auto compensation</li> <li>▪ Real-time whole-plate data analysis</li> <li>▪ Dynamic linked gating</li> <li>▪ Interactive heat maps, profile maps</li> </ul>			<ul style="list-style-type: none"> <li>▪ Cross plate analysis</li> <li>▪ Export files in FCS, CSV or iQue Forecyt® formats</li> <li>▪ Customizable PDF data report</li> <li>▪ iQue Forecyt® Enterprise Edition compatible</li> </ul>				
Operational	Computer workstation, Windows compatible	Xeon processor, dual 256 GB SSD (RAID 0), 16 GB RAM, 27" monitor 2560 x 1400							
	Weight (less computer)	205 lbs, 93 kg							
	Dimensions	39" W x 25" D x 26" H   99 cm W x 63 cm D x 66 cm H							
	Power requirements	100   115   230 VAC, 50–60 Hz							
	Environment requirements	Temperature: 15–32° C (59–90° F), Relative humidity: 80% maximum							
Features	<ul style="list-style-type: none"> <li>▪ CE labeled</li> <li>▪ 21 CFR logging option compatible</li> </ul>			<ul style="list-style-type: none"> <li>▪ Robotic integration option compatible</li> <li>▪ iQue® Qmax refill module option compatible</li> </ul>					

iQue® technology is protected by the following patents and other patents pending:

6,890,487, 6,878,556, 7,368,084, 7,842,244, 8,021,872, 8,268,571, 8,637,261, 8,823,943, 9,012,235, D,722,515



# Picus® & Picus® Nxt Electronic Pipettes

The Most Sophisticated  
and Ergonomic Pipettes Ever!

## Product Information

Sartorius Picus® & Picus® Nxt are the most sophisticated and ergonomic electronic pipettes on the market. These exceptionally compact and lightweight pipettes have been specially designed to ease the user's workload and to protect the user from repetitive strain injury (RSI).



## Description

The Picus family pipettes are kind to your hand with unbeatable ergonomic design that ensures reliable and repeatable experiment results. Repeatable pipetting results are guaranteed with the electronic piston control and brake, raising all users to expert level. Picus® Nxt provides distinct advantages for highly regulated laboratories.

## Features

### Picus® & Picus® Nxt

- Highest level of ergonomics provided by the uniquely low weight, light electronic tip ejection and comfortable handle design
- Extensive range of pipetting modes reduces the needed pipetting steps and speeds up work
- Electronic brake and piston control system provide outstanding accuracy and repeatability of pipetting results, independent of the user
- Intuitive user interface in five language options: English, French, German, Russian and Chinese, enables ease of use
- Adjustment wheel offers extremely fast volume setting and menu navigation
- Optiload enables perfect tip sealing for accurate delivery from each channel
- Safe-Cone Filters prevent the risk of contamination cost-effectively
- Microwell plate tracker guides the user to pipette into the correct wells
- Calibration adjustment in 1, 2 or 3 points

### Picus® Nxt

- Certificate of accredited 3-point calibration (per ISO 17025 and ISO 8655) delivered with the product at no extra charge
- User programmable pipetting protocols enable the storage of three frequently needed pipetting workflows; easily activated when needed.
- 2-level password protection for stored programs to prevent unauthorized changes (optional)
- Pipette locking, e.g. in case of contamination, increases lab safety by disabling the pipette from use.
- Service and calibration reminders help the users to remember important service dates.
- Repeated blow-out helps to dispense the last droplets of e.g. viscous liquids

## Applications

- PCR and other DNA/RNA techniques
- ELISA
- Protein analysis
- Cell culture

## Applications

Fully electronic liquid handling in the volume range of 0.2 µL to 10 mL.

## Technical Date

### Technical Specifications

Rechargeable battery	Li-Polymer with protection circuit
Charging time	Approx. 1 hour
Charger	Universal charger with EU, US   JPN, UK, CHN, AUS and KOR plugs
Weight	100 g (1-ch, 300 µL) 160 g (8-ch, 300 µL)
Length	210 mm (1-ch, 300 µL) 216 mm (8-ch, 300 µL)
Number of pipetting cycles	>1,000
Volume range	1-ch: 0.2 – 10,000 µL 8- & 12-ch: 0.2 – 1200 µL
Pipetting modes	Picus®: 8 + 6   Picus® Nxt: 9 + 7
DC-motor concept	Electronic piston control Electronic brake
Memory places	Picus®: 10   Picus® Nxt: 3* + 10
Tip ejection	Electronic
Spring loaded tip cones	Optiload feature in multichannel models
Filters	Safe-Cone Filters in all models >10 µL
Autoclavable lower parts**	121°C, 20 min, 1 bar
Charging Stands, available separately	Charging Stand for 1 pipette, Charging Carousel for 4 pipettes
Warranty	2 years, possibility for 1 year extended warranty

\* For Protocols

\*\* Excluding 1200 µL multichannel models

Pipetting Modes	Advanced Functions
Pipetting	Tracker, Mixing, Counter, Repeated Blow-out*
Reverse Pipetting	Tracker, Counter, Excess Volume Adjustment
Manual Pipetting	Repeated Blow-out*
Multi-Dispensing	Tracker, Excess Volume Adjustment, Auto-Dispensing
Diluting	Mixing, Repeated Blow-out*
Sequential Dispensing	Excess Volume Adjustment
Multi-Aspiration	Repeated Blow-out*
Titrate	Fast Dispensing
Protocol*	All additional modes

\* Advanced function, Repeated Blow-out, and pipetting mode, Protocol, are only available in Picus® Nxt models.

## Ordering Information

Picus® Nxt	Picus®	Channels	Volume Range (µL)	Increment (µL)	Test Volume (µL)	Mode <sup>P/D</sup>	Systematic Error <sup>N</sup>		Random Error <sup>N</sup>	
							Limit ± (%)	(µL)	Limit (%)	(µL)
LH-745021	735021	1	■ 0.2-10	0.01	10	P	1.0	0.100	0.4	0.040
					5	P	1.2	0.060	0.7	0.035
					1	P	3.0	0.030	2.0	0.020
					0.2	P	17.5	0.035	10	0.020
					1	D	6.0	0.060	7.0	0.070
LH-745041	735041	1	■ 5-120	0.10	120	P	0.5	0.60	0.15	0.18
					60	P	0.7	0.42	0.2	0.12
					12	P	2.0	0.24	1.0	0.12
					5	P	5.5	0.275	2.5	0.125
					12	D	4.0	0.48	4.0	0.48
LH-745061	735061	1	■ 10-300	0.20	300	P	0.5	1.50	0.15	0.45
					150	P	0.6	0.90	0.2	0.30
					30	P	1.5	0.45	0.8	0.24
					10	P	5.0	0.50	2.4	0.24
					30	D	3.0	0.90	3.0	0.90
LH-745081	735081	1	■ 50-1,000	1.00	1,000	P	0.45	4.5	0.15	1.5
					500	P	0.6	3.0	0.2	1.0
					100	P	2.0	2.0	0.5	0.5
					50	P	4.0	2.0	1.0	0.5
					100	D	2.5	2.5	2.0	2.0
LH-745101	735101	1	■ 100-5,000	5.00	5,000	P	0.5	25	0.15	7.5
					2,500	P	0.7	17.5	0.2	5
					500	P	1.6	8	0.4	2
					100	P	8.0	8	2.0	2
					500	D	2.4	12	2.4	12
LH-745111	735111	1	■ 500-10,000	10.00	10,000	P	0.6	60	0.2	20
					5,000	P	0.9	45	0.3	15
					1,000	P	3.0	30	0.6	6
					500	P	7.0	35	1.2	6
					1,000	D	4.0	40	2.4	24
LH-745321	735321	8	■ 0.2-10	0.01	10	P	1.2	0.120	0.5	0.050
LH-745421	735421	12			5	P	1.5	0.075	0.8	0.040
					1	P	4.0	0.040	3.0	0.030
					0.2	P	25.0	0.050	15.0	0.030
					1	D	12.0	0.120	15.0	0.150
LH-745341	735341	8	■ 5-120	0.10	120	P	0.6	0.72	0.3	0.36
LH-745441	735441	12			60	P	0.8	0.48	0.4	0.24
					12	P	2.5	0.30	1.67	0.20
					5	P	6.0	0.30	4.0	0.20
			12	D	4.5	0.54	8.0	0.96		
LH-745361	735361	8	■ 10-300	0.20	300	P	0.6	1.80	0.2	0.60
LH-745461	735461	12			150	P	0.8	1.20	0.3	0.45
					30	P	2.33	0.70	1.0	0.30
					10	P	8.0	0.80	3.0	0.30
					30	D	3.33	1.00	6.0	1.80
LH-745391	735391	8	■ 50-1,200	1.00	1,200	P	0.6	7.2	0.2	2.4
LH-745491	735491	12			600	P	1.0	6.0	0.3	1.8
					120	P	2.5	3.0	1.0	1.2
					50	P	8.0	4.0	2.4	1.2
					120	D	3.33	4.0	3.33	4.0

<sup>N</sup> Note: The listed systematic and random error values can be achieved only under strictly controlled conditions during type test per ISO 8655. The best compatibility is achieved when combining Sartorius pipettes and Sartorius tips. The systematic error and random error results, in tests, have been achieved using Sartorius Optifit tips at factory default speed settings. Due to the continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

<sup>P</sup> P = Pipetting Mode

<sup>D</sup> D = Multi-dispensing mode. The listed systematic and random error values are of 10 measurements at 10% of the nominal volume.

All pipettes are supplied with a universal charger (EU, UK, US|JPN, KOR, AUS and CHN plugs)

**Germany**


Sartorius Lab Instruments GmbH & Co. KG  
Otto-Brenner-Strasse 20  
37079 Goettingen  
Phone +49 551 308 0

**USA**

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565 Johnson Avenue  
Bohemia, NY 11716  
Phone +1 631 254 4249  
Toll-free +1 800 635 2906

**Finland & Baltics**

Sartorius Biohit Liquid Handling Oy  
Laippatie 1  
00880 Helsinki  
Phone +358 9 755 951

 For further contacts, visit  
[www.sartorius.com](http://www.sartorius.com)



BI  
Biological Industries

# Vitronectin ACF (Human Recombinant)

Manufactured under animal-free conditions

Catalog# 05-754-0002, 200 µg

## Description

Vitronectin is a secreted glycoprotein that can support cell adhesion through binding to various integrins and proteoglycans. Recombinant vitronectin ACF can function as a chemically-defined matrix component for the attachment of human embryonic stem cell and IPS cells in a feeder-free culture system. Recombinant Vitronectin ACF is a 459 amino acid, single-chain, monomeric protein, which migrates at an apparent molecular weight of 75 kDa by SDS-PAGE under reducing conditions. The calculated molecular weight of Vitronectin ACF is 52.2 kDa.

## Storage & preparation

Vitronectin ACF is a lyophilized protein and should be stored at (-20)°C to (-80)°C up to expiration date. **Preparation of Vitronectin ACF, 0.5mg/ml**

Reconstitution procedure should be performed on ice.

1. Spin down the vial before reconstitution.
2. To the original 0.2mg vial add 0.4ml of sterile tissue culture water. DO NOT VORTEX.
3. Incubate on ice for a few minutes.
4. Gently mix by pipetting up and down.
5. Keep on ice for immediate use (up to 1 week at 2-8°C)

For long-term storage (3 months) aliquot and freeze at (-80)°C. Additional freeze-thaw cycles are not recommended.

## Specifications

Sterile filtered and lyophilized.

**Authenticity:** Verified by N-terminal and Mass Spectrometry analyses.

**Purity:** ≥ 95% by SDS-PAGE gel and HPLC analyses.

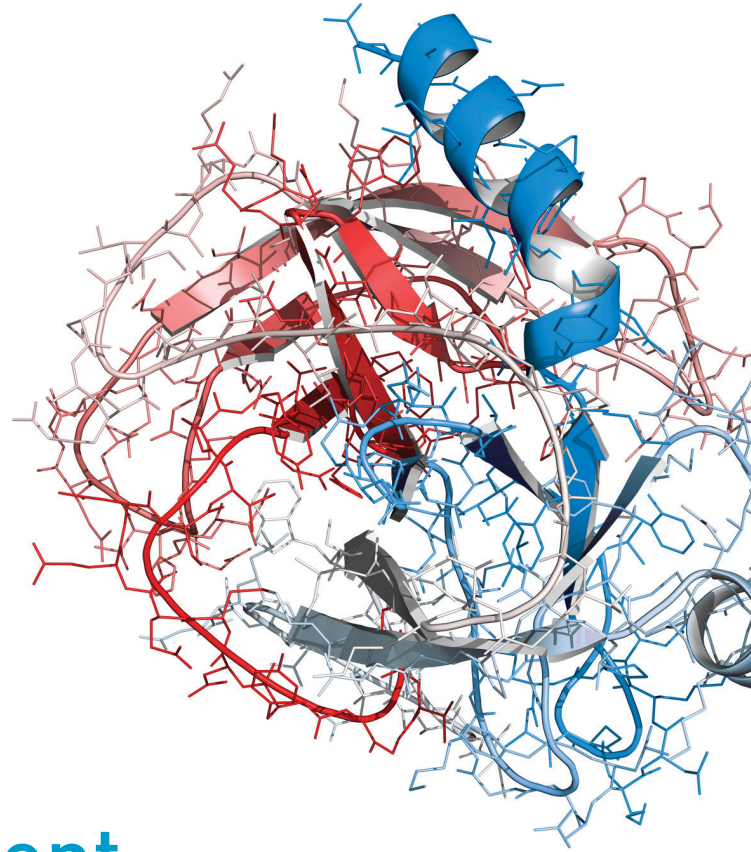
**Endotoxin:** Endotoxin level is < 0.1 EU/µg of protein.

**Protein Content:** Verified by UV Spectroscopy and/or SDS-PAGE gel.

**Biological Activity:** Promotes attachment of hPSC in serum-free conditions.



**BI**  
Biological Industries  
*Culture of Excellence*



Chemical structure of  
trypsin enzyme

All the way with animal  
component-free solutions

# Animal Component- Free (ACF) Recombinant Trypsin Solutions

## Alternative to porcine/bovine trypsin

- **Animal Component-Free (ACF)**

Eliminates the risk of viruses or other potential adventitious agents found in animal derived components.

- **High Purity**

- Pure enzyme solutions increase specificity and eliminate contaminating activities found in lower purity enzymes.
- Free of chymotrypsin, carboxypeptidase-A and other protease contaminants.
- Prevents the toxic effects induced by non-desirable proteases.

- **High Activity**

- Maximizes the yield of functionally viable cells.
- Recombinant Trypsin-EDTA Solution (Cat. No. 03-079-1) accelerates the dissociation phase.
- Results in efficient dissociation of adherent cell types (including primary and sensitive cells) from surfaces and tissues.
- Optimized for hMSCs, from a variety of sources, cultured in both serum-free and serum-containing systems.

- **Enzyme Inhibition**

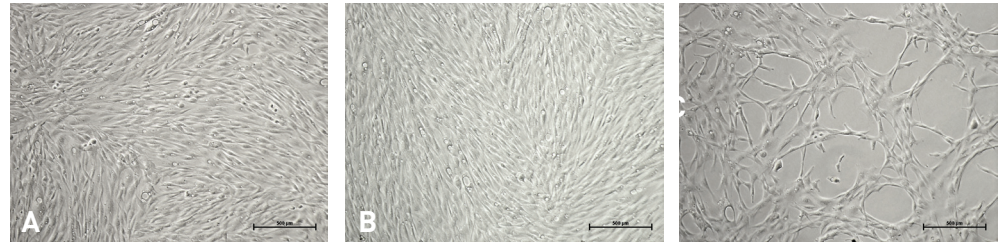
Inactivation with Soybean Trypsin Inhibitor (SBTI, Cat. No. 03-048-1).

- **Ready-to-use**



## Comparison of hMSC Dissociation with Various Trypsin Solutions

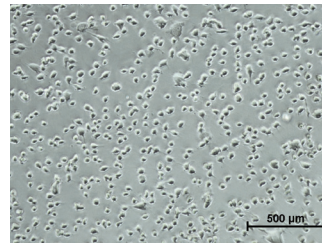
Recovery of hMSC- Adipose Tissue (AT) cultured in MSC NutriStem XF medium after dissociation with three different dissociation solutions



**Figure 1.**

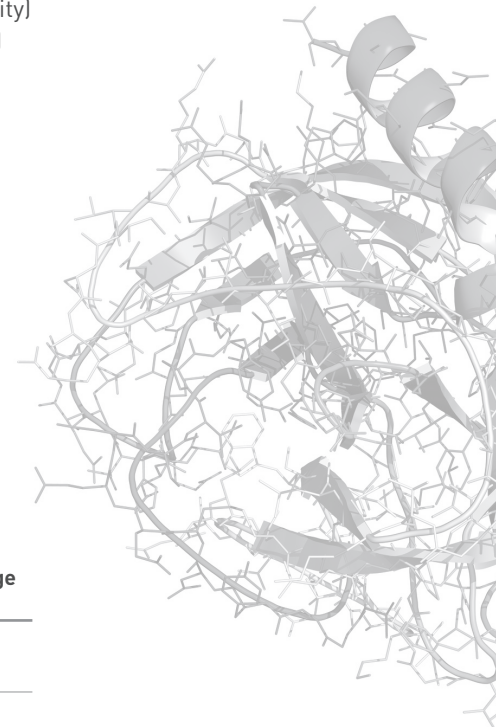
hMSC-AT, 3 days post split I – Cells were equally seeded (5000cells/cm<sup>2</sup>) in MSC NutriStem® XF medium. The dissociation procedure was carried out at 37° using:  
 A. Recombinant Trypsin Solution, without EDTA (BI's Cat. No. 03-078-1)  
 B. Crystalline Trypsin (BI's Cat. No. 03-047-1) (high purity)  
 C. Trypsin sol. C (BI's Cat. No. 03-053-1) (crude trypsin)

## Rapid and Efficient Dislodging of hMSC with Recombinant Trypsin



**Figure 2.**

hMSC-BM cultured in MSC NutriStem® XF medium, were incubated for 2-5 min at 37°. with Recombinant Trypsin Solution (Cat. No. 03-078-1)



## Ordering Information

Product Name	Cat. No.	Unit Size	Storage Temp.
Recombinant Trypsin Solution	03-078-1B	100ml	RT
Recombinant Trypsin-EDTA Solution	03-079-1B	100ml	RT
Soybean Trypsin Inhibitor (SBTI) x50	03-048-1C	20ml	-20°C

### Source of raw material:

The Recombinant Trypsin is produced by submerged fermentation of *Fusarium Oxysporum*.

It is derived from a production process which does not utilize any raw materials and/or processing aids of animal origin.

## Ambr<sup>®</sup> 15 Cell Culture Generation 2



### Technical Specification

#### Scope

Automated high throughput microscale bioreactor system for cell culture applications.

Monitoring and control of 24 or 48 cultures in parallel at 10 - 15 mL working volumes.

Comprising single-use microbioreactor vessels, automated workstation, laptop and software.

### Recommended Working Space

System dimensions excluding laptop computer and system options.  
Refer to Building Services Specification for detailed drawings.

#### Ambr<sup>®</sup> 15 Cell Culture, 24 microbioreactor system

Width (small tip bin)	Width (large tip bin)	Depth	Height
780mm	915 mm	530 mm	665 mm
31"	36"	21"	26"

#### Ambr<sup>®</sup> 15 Cell Culture, 48 microbioreactor system

Width (small tip bin)	Width (large tip bin)	Depth	Height
1270mm	1405 mm	530 mm	665 mm
50"	55"	21"	26"



## System operating parameters

Number of microbioreactors	24 or 48 (2 or 4 stations of 12)
Agitation speed	150 – 2500 rpm
Culture temperature (standard)	33 – 40°C ± 0.5°C (+ 8°C above ambient)
Culture temperature (cooled)	20 – 40°C ± 0.5°C
Temperature shift rate	≥ 5°C per 30 mins
pH set point range	6.5 – 7.5
pH monitoring range	6.0 – 8.0
pH monitoring accuracy	± 0.1 pH units
DO (% air saturation) monitoring range	0 – 200%
DO monitoring accuracy	±2% @ 100%
Maximum air or total gas flow	1 mL/min
Disposable tip sizes	1 mL and 5 mL tips

## Pipette based liquid handling:

1 mL tip	± 5% from 20 µL – 50 µL	± 2% from 50 µL – 900 µL
5 mL tip	± 2% from 0.5 mL – 1 mL	± 1% from 1 mL – 4 mL

## Rapid Vessel Drain operating parameters

Passage culture minimum volume remaining	2.5 mL	
Passage culture precision	± 5% @ 2.5 mL	± 1% @ 6 mL
Rapid vessel drain minimum volume remaining	0 mL	
Rapid vessel drain precision	± 5% @ 2.5 mL	± 1% @ 6 mL

## Labware deck positions

	Flexible	Plate	Cooled plate
Ambr® 15 Cell Culture 24 microbioreactor system	6	2	0
Ambr® 15 Cell Culture 24 microbioreactor system cooled	6	1	1
Ambr® 15 Cell Culture 48 microbioreactor system	9	4	0
Ambr® 15 Cell Culture 48 microbioreactor system cooled	9	2	2

### Deck positions for maximum plates

	24	24C	48	48C
Plate locations	5	4	10	8
Chilled plate locations	0	1	0	2
Plate lids (multiple locations can be defined)	1	1	1	1
1 or 5 mL pipette tip box (5 mL tip box cannot be defined in front of a 1 mL tip box)	1	1	1	1
Tip box lid (multiple locations can be defined)	1	1	1	1

### Deck positions for maximum pipette tips

	24	24C	48	48C
Plate locations	1	1	2	2
Chilled plate locations	0	1	0	2
Plate lids (multiple locations can be defined)	1	1	1	1
1 or 5 mL pipette tip box (5 mL tip box cannot be defined in front of a 1 mL tip box)	5	4	9	7
Tip box lid	1	1	1	1

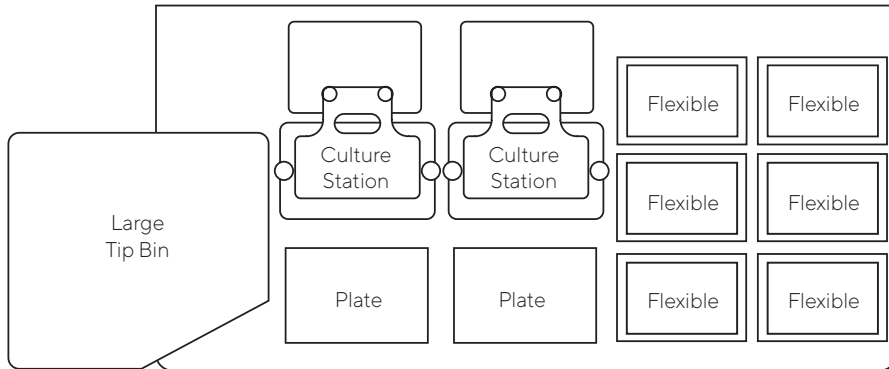
### Microbioreactor vessel

Construction material	Polycarbonate, polyethylene
Internal dimensions (L x W x H)	28.0 x 14.6 x 59.7 mm
Total volume	18 mL
Working volume	10 - 15 mL
pH monitoring technology	Fluorescence based spot
DO monitoring technology	Fluorescence based spot
Impeller type	Pitched blade
Diameter	11.4 mm
Power number	2.15
KLa (sparged vessels, 13 mL DI water, 1500 rpm, gassing @ 1 mL/min)	17.6 per hour

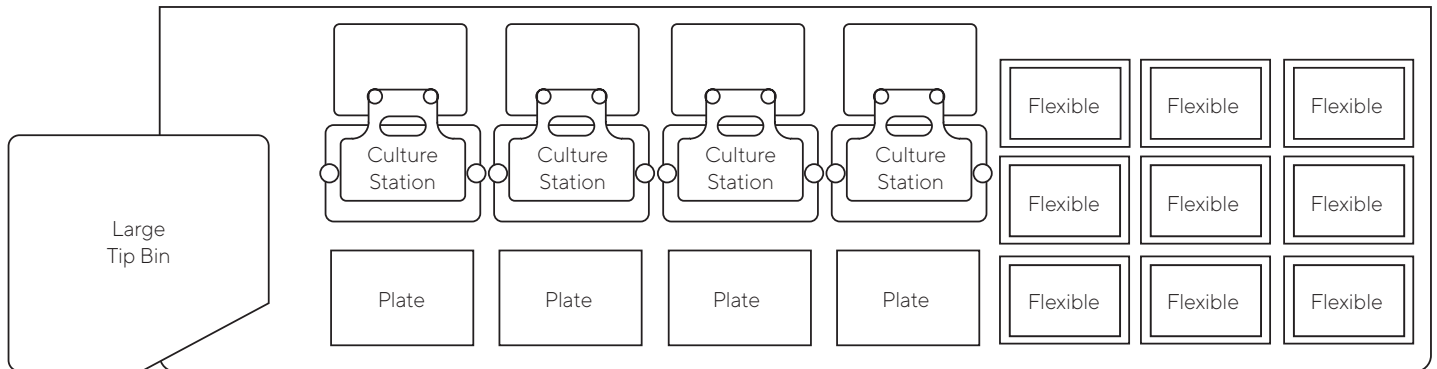
Note: All information is correct at time of publication, but Sartorius reserves the right to make alterations due to technical enhancements or other changes.

# Ambr® 15 Cell Culture Generation 2 Deck Layouts

## Ambr® 15 Cell Culture 24 microbioreactor system



## Ambr® 15 Cell Culture 48 microbioreactor system



## Sales and Service Contacts

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**MODDE<sup>®</sup>**

Design of Experiments solution

Simplifying Progress

**SARTORIUS**

# Create the knowledge you need more efficiently

The more efficient your Design of Experiments (DOE) solution, the faster you can get products to market. MODDE® is an innovative DOE solution from Sartorius Stedim Data Analytics. Its straightforward graphical interface and support for data analytics lets you interpret your results with confidence. With over 30 years of experience in data analytics, MODDE gives you the insight to set up your experiment and get it right from the start.

## What does MODDE offer?

MODDE is a lot more than just DOE software. It also provides a quality analysis on your decisions and looks at the risks - warning you about critical settings and guiding you towards more robust conclusions. It will:

- Reduce the number of required experiments
- Guide you through the set-up of your experiment
- Provide confidence in your data handling
- Help you make better decisions
- Integrate with your systems
- Meet your quality goals

## Who is using MODDE?

MODDE is helping companies in many different industries to design more effective experiments and create more effective strategies for tackling process problems. For instance:

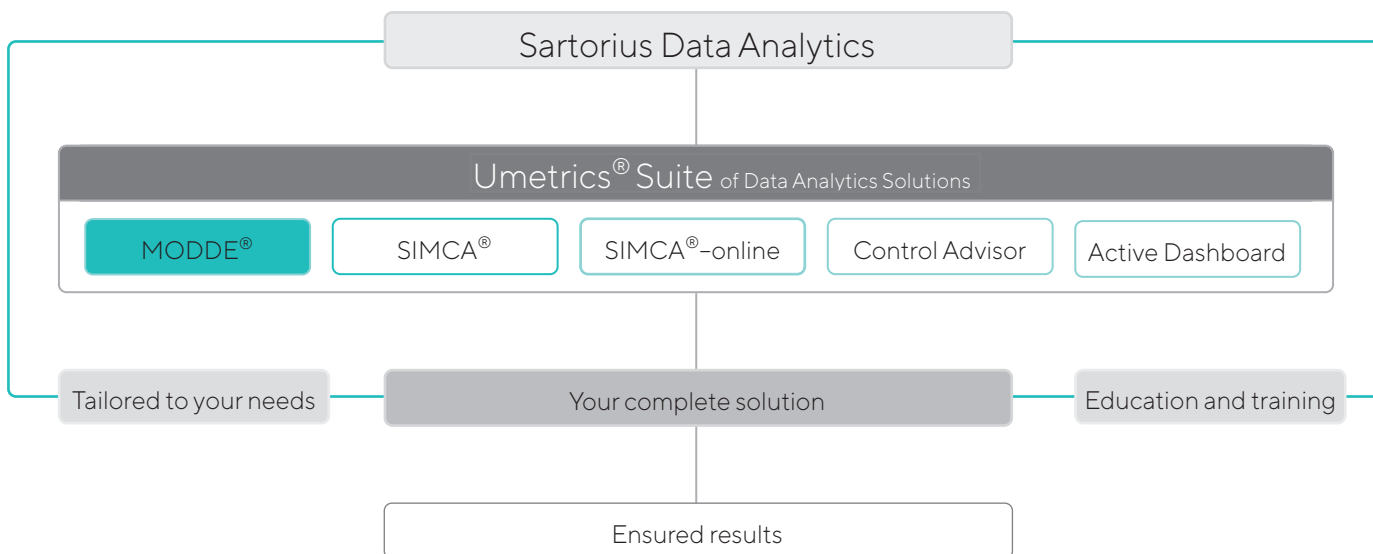
- In pharma and biopharma, there are a wide variety of aspects to consider when determining the correct tablet formulation. These include how the drug dissolves, its hardness and how it is administered, which can now be addressed with MODDE's advanced formulation DOE toolbox.
- In manufacturing there needs to be a careful balance between productivity and quality. MODDE helps producers use DOE to maximize production quality through applications like robust optimization - where MODDE has the best available tools.



## MODDE at a glance:

- Automated analysis wizard
- Robust optimum identification
- Interactive setpoint analysis with risk estimate
- Design Space visualization
- Generalized subset designs
- Stability testing design setup

# More than Software



Our complete solution includes everything you need through the whole process and provides results quickly.

As our customer, you'll have access to supporting documents, templates, training and consultation to address your specific business challenges. Our courses and webinars help over a thousand people every year develop expertise and confidence in data analytics.

“ The Umetrics® Suite simplifies the entire process of handling, analyzing and managing our data.

## A complete suite for business growth

The Umetrics Suite is a family of proven data analytics solutions that work seamlessly together. Other software solutions in the Umetrics Suite are:

- SIMCA®  
Multivariate Data Analysis Solution to help you see what others don't
- SIMCA®-online  
Online – Real-time process monitoring to maintain product quality
- Control Advisor  
Predictive capabilities to be able to forecast the output
- Active Dashboard  
Interactive performance insight

These solutions give you control and confidence in your processes at every stage – from development to manufacturing.



# Sartorius Data Analytics – Change a little. Grow a lot.

We help organizations grow. The Umetrics® Suite of Data Analytics Solutions helps you harness the wealth of data within your organization. Our expertise in data analytics can help you identify vital elements to improve the results of your research, development and manufacturing processes. With improved process understanding and more consistent product quality, you'll be able to reduce risk, get to market faster, and grow your business. Our complete solution encompasses software, training, support and project management. And as part of Sartorius, a global company with more than 7,000 employees, we give you the backing of an international presence.

## **Experience the benefits for your business today**

Find out how our solutions can help your business to grow, whatever industry you are in.

Visit [www.sartorius.com/umetrics](http://www.sartorius.com/umetrics) for details or to download a free 30-day trial.

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◀ [www.sartorius.com/umetrics](http://www.sartorius.com/umetrics)



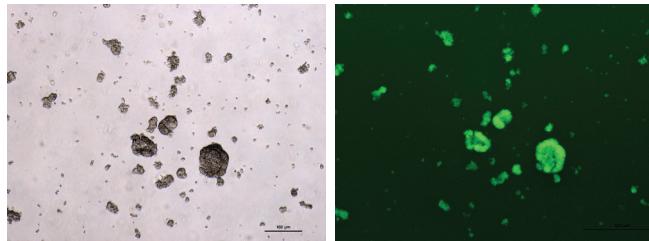
# NutriFreez<sup>®</sup> D10 Cryopreservation Medium

Powerful cryopreservation media optimized for various cells and tissues



NutriFreez<sup>®</sup> D10 Cryopreservation Medium is an optimized freezing solution designed and validated for the cryopreservation of various tissue and cell types, including but not limited to sensitive cell types such as hESCs, iPSCs, and MSCs. NutriFreez<sup>®</sup> D10 Medium maintains defined and animal component-free conditions during cryopreservation, essential to maintaining consistency when culturing cells in a xeno-free system. NutriFreez<sup>®</sup> D10 Medium is ready-to-use and pre-formulated with DMSO, providing a protective environment for cells during the freezing, storage, and thawing process. Cells preserved with NutriFreez<sup>®</sup> D10 Medium show excellent attachment (Figure 1) and maintain proper pluripotency marker expression after thawing, with superior results compared to both serum-containing freezing media, other serum-free solutions, and homebrew formulations<sup>1</sup>.

- High recovery post thaw
- Ready-to-use solution
- Serum-free and protein-free
- Chemically-defined
- cGMP-manufactured



**Figure 1:** BG01V/hOG cells (an Oct4-GFP reporter hES cell line) frozen in NutriFreez<sup>®</sup> D10 Medium and thawed into NutriStem<sup>®</sup> hPSC Medium on Matrigel. Images taken just 1 hour post-thaw show excellent survival and attachment of the hES cells, with high expression of Oct4 (green).

## Applicable Cell Types

- Human Embryonic Stem Cells
- Induced Pluripotent Stem Cells
- Human Mesenchymal Stem Cells
- Peripheral Blood Mononuclear Cells
- Human Endothelial Cells
- T cells, including Chimeric Antigen Receptor (CAR T) Cells and Tumor Infiltrating Lymphocytes (TILs)
- Neuron Cells
- Hybridomas
- CHO Cells
- Vero Cells
- Multiple mammalian cell lines: MRC-5, HEK-293, HepG2, HeLaBSC-1, BGM3T3, MA-10BHK-21

## Ordering Information

Cat. #	Product	Qty
05-713-1A	NutriFreez <sup>®</sup> D10 Cryopreservation Medium	500 mL
05-713-1B		100 mL
05-713-1E		50 mL
05-713-1C		20 mL
05-713-1D		10 mL
05-714-1A	NutriFreez <sup>®</sup> D10 Cryopreservation Medium, w/o phenol red	500 mL
05-714-1B		100 mL

1. Nishishita N, et al. An effective freezing/thawing method for human pluripotent stem cells cultured in chemically-defined and feeder-free conditions. *AJSC* 2015;4(1):38-49.

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## How to Order

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# Microsart® Research Mycoplasma

## Mycoplasma Detection Kit for qPCR

### Benefits

- Easy to use
- Highest flexibility
- Maximum reliability



### Product Information

Microsart® Research Mycoplasma enables a fast and robust detection of Mycoplasma DNA in cell culture supernatants most applicable in research and development. Carefully selected primer | probe combinations are highly specific for a region within the 16 S rRNA gene of at least 110 Mycoplasma species.

## Working Principle

2 µL of sample material, e.g. cell culture supernatant, can be added directly to the PCR reaction tube. For the detection of Mycoplasma DNA a TaqMan® real-time qPCR is used. Depending on the sample matrix the Sartorius spin-column based DNA preparation can be performed prior to PCR analysis to increase sensitivity or prevent inhibition. 200 µL sample volume can be used as starting material for DNA preparation if using the Microsart® AMP Extraction kit. 2 µL of isolated DNA extract are amplified in a qPCR cyclor and the evaluation can be performed with the standard cyclor software.

## Applications

The Microsart® Research Mycoplasma real-time PCR protocol is especially designed for fast and reliable screening of cell culture supernatants most applicable in research and development, e. g. biotech and bio-pharmaceutical research and development, university and governmental research groups. It is used for direct detection of *Mollicutes* (*Mycoplasma*, *Acholeplasma*, *Spiroplasma*) in cell culture, cell culture media components and derived biologicals.

## Fast Result

Microsart® Research Mycoplasma utilizes real-time PCR (qPCR). The kit can be performed with any type of real-time PCR cyclor able to detect the fluorescence dyes FAM™ and ROX™. The detection procedure can be performed within 3 hours.

## Easy Handling

The kit contains all essential components in a ready-to-use master mix.

- Screening with a small sample volume
- Cost saving (in case there is no EP 2.6.7 compliance required)

## TaqMan® Probes

The application of TaqMan® probes adds specificity to the PCR detection system. Highly specific results are already generated during the cycling process – no subsequent melting curve analysis is needed.

## Contamination Prevention

The kit contains dUTP instead of dTTP, so the option is available to degrade amplicons from previous analyses by using uracil-DNA glycosylase (UNG). Thus, the occurrence of false-positive results can be minimized. UNG is not included in the kit.

## Summary

For scientists and lab technicians who need to screen cell culture supernatants for Mycoplasma DNA, Sartorius offers the Microsart® RESEARCH Mycoplasma Detection Kit.

# Technical Specifications

Each kit contains reagents for 25 reactions. The expiry date of the unopened package is specified on the package label. The kit components are stored at +2 to +8°C. After opening and rehydration the components need to be stored below -18°C. The LOT specific Certificate of Analysis can be downloaded from the manufacturer's website ([www.minerva-biolabs.com](http://www.minerva-biolabs.com)).

Kit Component	25 Reactions
Order No.	SMB95-1005
Mycoplasma Mix	1 × lyophilized
Rehydration Buffer	1 × 1.0 mL
Positive Control	1 × lyophilized
PCR grade Water	1 × 1.0 mL

# Ordering Information

## Mycoplasma Kits

Description	Quantity	Order No.
Microsart® Research Mycoplasma	25	SMB95-1005

## Accessories

Description	Quantity	Order No.
Microsart® AMP Extraction	50 extractions	SMB95-2003

## Related Products


Description	Quantity	Order No.
Microsart® AMP Mycoplasma	25	SMB95-1001
Microsart® ATMP Mycoplasma	25	SMB95-1003

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Toll-free +1 800 635 2906

 For further information, visit  
[www.sartorius.com](http://www.sartorius.com)

# Microsart® Research Bacteria

Rapid Detection of Total  
Bacteria Within 2½ hr



## Benefits

- >95% of all known bacteria detected in one test
- Fast: only 2½ hr time-to-result
- Reliable: highly specific TaqMan® probes
- Easy to use
- Less pipetting effort
- No sample preparation mandatory

## Product Information

Microsart® Research Bacteria is used for fast and reliable direct detection of bacterial contamination in cell cultures, cell culture supernatants and cell media components in research and development or whenever there is no need for regulation conform testing (i.e. according to EP | USP | JP).

### Kit Components and Storage

Each kit contains all reagents for 25 or 100 reactions. 4 color-coded tubes, with master mix, buffer, positive control and negative control, make the handling as simple as possible. The expiry date and the storage conditions of the unopened package are noted on the package label. The kit components are stored until use at +2 °C to +8 °C and must be stored after rehydration or opening at <-18 °C. Please note: The master mix, also called Research Bacteria Mix, should be protected from light all the time.

### Test Principle

Microsart® Research Bacteria utilizes real-time PCR. The detection procedure can be performed within 2½ hours, including less than ½ hour hands-on time. In contrast to the detection by cell cultivation method, samples do not need to contain vital bacteria.

The assay can be performed with any type of real-time PCR cycler able to detect the fluorescence dyes FAM™ and ROX™.

Bacteria are specifically detected by amplifying a highly conserved 16S rRNA coding region in the bacterial genome. The amplification is detected at 520 nm (FAM™ channel). The kit includes primer and FAM™ labeled probes which allow the specific detection of more than 95% of all known bacterial species so far described as contaminants of cell cultures and media components. Eukaryotic DNA is not amplified by this primer | probe system.

False negative results due to PCR inhibitors or improper DNA extraction are detected by the internal amplification control which is part of the PCR master mix. The amplification of the internal amplification control is detected at 610 nm (ROX™ channel).

## Ordering Information

Order No.	Description	Quantity
SMB95-1009	Microsart® Research Bacteria	25 reactions
SMB95-1010	Microsart® Research Bacteria	100 reactions

## Related Products

### DNA Extraction Kits

Order No.	Description	Quantity
SMB95-2001	Microsart® Bacteria Extraction	50 extractions
SMB95-2003	Microsart® AMP Extraction (only for Mycoplasma qPCR)	50 extractions

### Detection Kits for qPCR

Order No.	Description	Quantity
SMB95-1001 1002	Microsart® AMP Mycoplasma	25   100 reactions
SMB95-1003 1004	Microsart® ATMP Mycoplasma	25   100 reactions
SMB95-1005 1006	Microsart® Research Mycopl.	25   100 reactions
SMB95-1007 1008	Microsart® ATMP Bacteria	10 patients   100 reactions

**Microsart® Validation Standard according to EP 2.6.1, EP 2.6.7, USP <63> and USP <71>**  
**3 vials each, 10 CFU/vial for Mycoplasma species, <100 CFU/vial for other bacteria.**

Order No.	Description
SMB95-2011	<i>Mycoplasma arginini</i>
SMB95-2012	<i>Mycoplasma orale</i>
SMB95-2013	<i>Mycoplasma gallisepticum</i>
SMB95-2014	<i>Mycoplasma pneumoniae</i>
SMB95-2015	<i>Mycoplasma synoviae</i>
SMB95-2016	<i>Mycoplasma fermentans</i>
SMB95-2017	<i>Mycoplasma hyorhinis</i>
SMB95-2018	<i>Acholeplasma laidlawii</i>
SMB95-2019	<i>Spiroplasma citri</i>
SMB95-2020	<i>Mycoplasma salivarium</i>
SMB95-2005	<i>Bacillus subtilis</i>
SMB95-2006	<i>Pseudomonas aeruginosa</i>
SMB95-2007	<i>Micrococcus luteus</i>   <i>Kocuria rhizophila</i>
SMB95-2008	<i>Clostridium sporogenes</i>
SMB95-2009	<i>Bacteroides vulgatus</i>
SMB95-2010	<i>Staphylococcus aureus</i>

**Microsart® Calibration Reagent, 1 vial, 10<sup>8</sup> genomes/vial**

Order No.	Description
SMB95-2021	<i>Mycoplasma arginini</i>
SMB95-2022	<i>Mycoplasma orale</i>
SMB95-2023	<i>Mycoplasma gallisepticum</i>
SMB95-2024	<i>Mycoplasma pneumoniae</i>
SMB95-2025	<i>Mycoplasma synoviae</i>
SMB95-2026	<i>Mycoplasma fermentans</i>
SMB95-2027	<i>Mycoplasma hyorhinis</i>
SMB95-2028	<i>Acholeplasma laidlawii</i>
SMB95-2029	<i>Spiroplasma citri</i>
SMB95-2030	<i>Bacillus subtilis</i>
SMB95-2031	<i>Pseudomonas aeruginosa</i>
SMB95-2032	<i>Micrococcus luteus</i>   <i>Kocuria rhizophila</i>
SMB95-2033	<i>Clostridium sporogenes</i>
SMB95-2034	<i>Bacteroides vulgatus</i>
SMB95-2035	<i>Staphylococcus aureus</i>
SMB95-2036	<i>Mycoplasma salivarium</i>

For PCR support and recommendation please contact [PCR@Sartorius.com](mailto:PCR@Sartorius.com).

### User-Supplied Equipment and Material

- DNA-free PCR reaction tubes for the specific qPCR device
- Microcentrifuge for 1.5 mL reaction tubes, i.e. Centrisart® A-14, Order No. A-14-1EU
- Pipettes with DNA-free filter tips to prepare and dispense the reaction mix (10, 100 and 1000 µL)
- Optional: For DNA extraction we recommend our Microsart® Bacteria Extraction kit, Order No. SMB95-2001
- qPCR device with filter sets for the detection of the dyes FAM™ and ROX™ and suitable for 25 µl PCR reaction volumes\*

\* Sartorius collaborates with Agilent. In case there is no access given to a qPCR instrument, Agilent provides the AriaMx qPCR System for comprehensive testing of Sartorius' qPCR kits.




AriaMx Real-time PCR System from Agilent

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