ESCO VACCIXCELL
ADHERENT BIOPROCESSING SPECIALIST

Designed in Singapore

TideXcell®

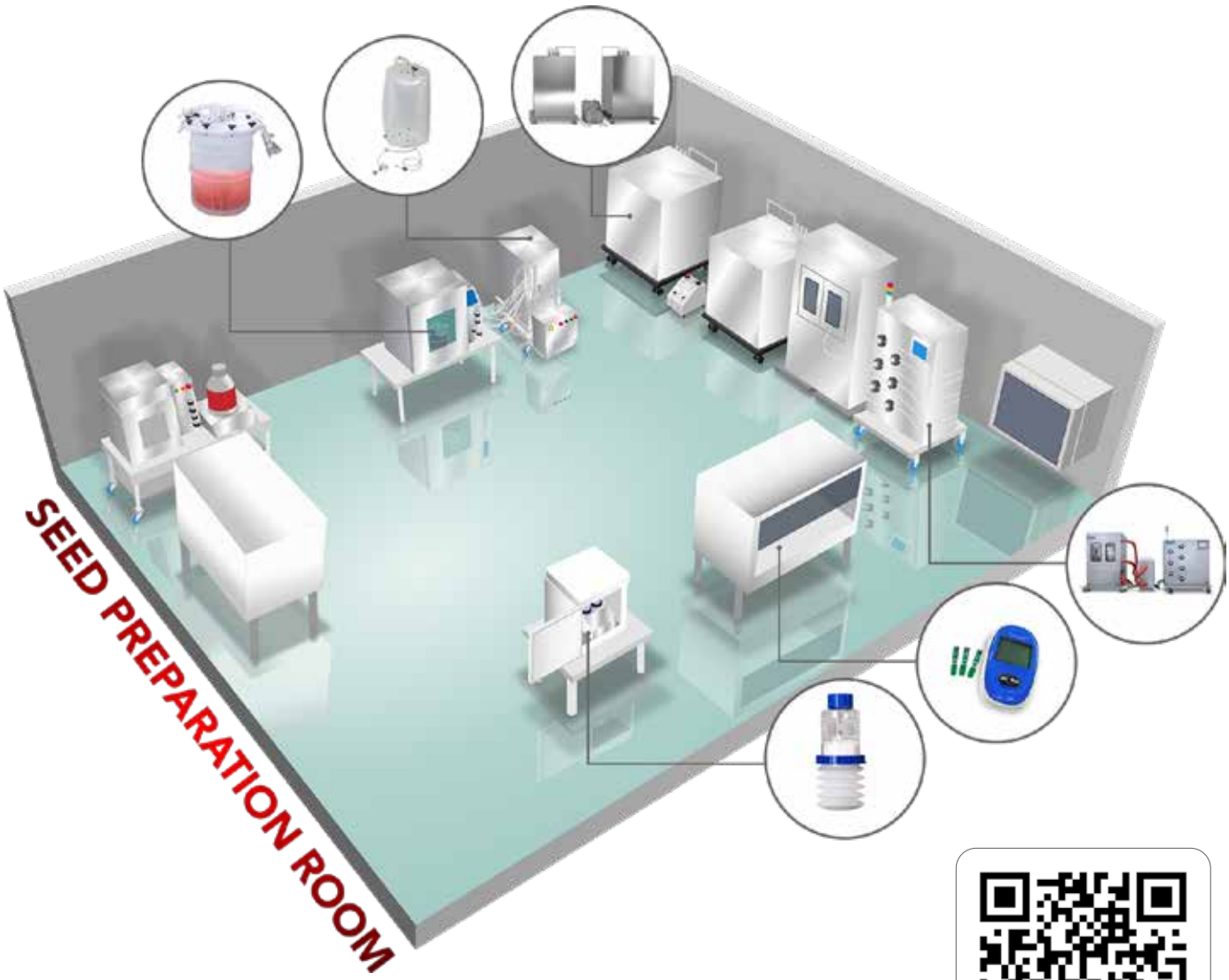
The Gentle Giant of Adherent Bioprocessing

ESCO® Healthcare "Discovery to Delivery"

TideXcell®

The Gentle Giant of Adherent Bioprocessing

TideXcell® is a linearly scalable bioreactor that runs on a patented Tide Motion principle (gentle upward and downward motion of the culture medium) for adherent cell bioprocessing. Single-use or multiple-use vessels of 2 L, 20 L, and 100 L are available. TideXcell® is ideal for biomass expansion of adherent cells or recovery of intracellular virus, equipped with closed cell harvesting system that has a recovery rate of >90%. TideXcell® is integrated with desirable and advanced features such as pH and DO (Dissolved Oxygen) measurement capability, Siemens HMI PLC-based monitoring and control system with optional connection to SCADA (Pcs7/DeltaV/Wonderware). Its compressed air path comes with a double HEPA and VOC (volatile organic chemicals) filters as well as in line UV-C and other optional features such as mass flow controllers.



Watch product video here:
Rolling with the Tide: TideXcell®

Applications

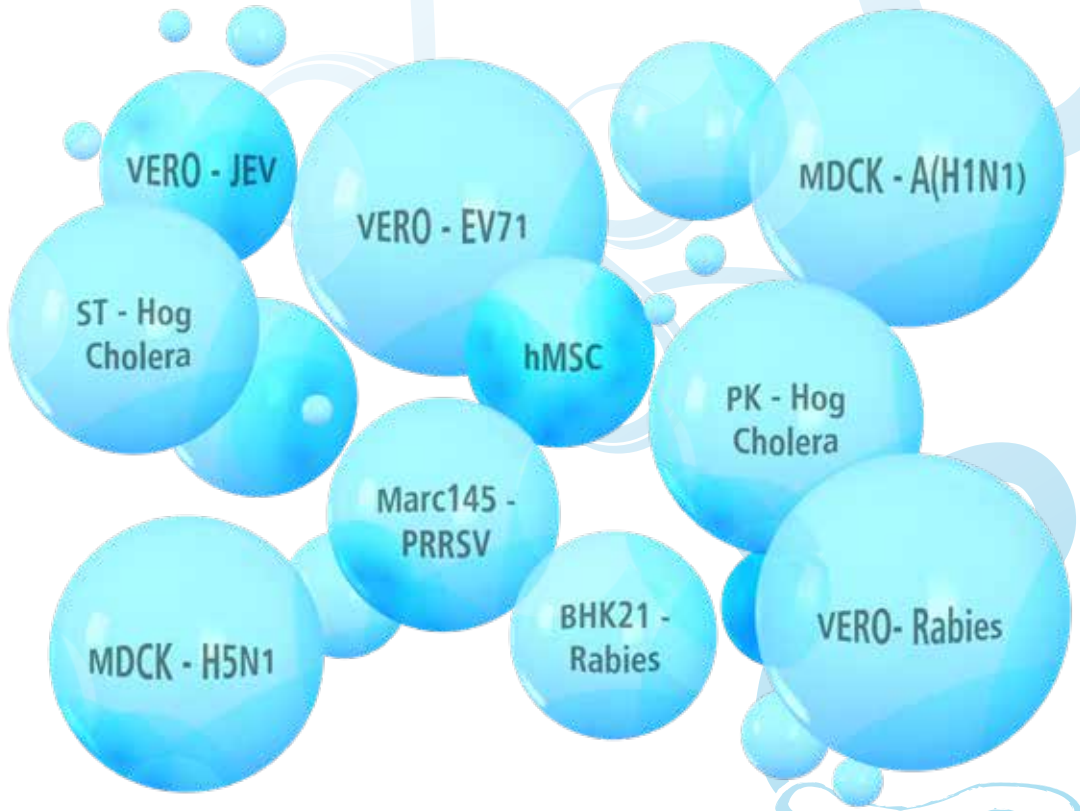
- Culture of anchorage-dependent cells with BioNOC II® macrocarriers
- Transition from 2D roller bottle, multilayer cultureware system to closed 3D system
- Cell mass train
- Continuous bioprocessing
- Vaccine production
- Wild virus production
- Recombinant protein and monoclonal antibody production for diagnostics/ biologics
- Cell therapy
- Biosimilars and biobetters
- Biologics for neglected tropical diseases and orphan diseases

Features

- Can be single-use or multiple-use
- Adherent cell scale-up for up to 5,000 L packed-bed volume (bio-equivalency of 50,000 L in suspension)
- A 100% media exchange system ideal for continuous bioprocessing
- Separation of the matrix and mixing vessel permits dual temperature control process to produce higher virus titers
- CSV 21 CFR Part 11 Compliant GAMP 5 PLC based monitoring system with simple, intuitive touchscreen
- Can be connected to SCADA systems using DeltaV, PCS7, Wonderware, or Mitsubishi or others as per client request
- Optional dual redundant systems for critical components such as PLC and pumps pH/DO sensors between the matrix and mixing vessel
- Equipped with double HEPA and VOC filters and optional germicidal UV-C decontamination for BSL 3/4 applications
- Isolator capability
- cGMP references
- PAT/IPQC

Proven Cell Lines and Indications

TideXcell® has been used for various human and animal commercial vaccines for PICs, EU cGMP, and JIS factories globally as well as vaccines, cell-,gene therapy, viral vectors, oncolytic viruses, exosomes are in various stages of clinical development. See Esco VacciXcell's cell lines and indications below:



Clinical Development → **Commercial**

Key Benefits

Highest Yield

The heart of the TideXcell® system is the BioNOC II®, which is made from 100% polyethylene terephthalate (PET) fibrous culture matrix with stability of up to 5 years. These macrocarriers provide cells with a large surface area for attachment and growth. The 3D matrix closely mimics a cell's *in vivo* environment. In addition, the efficient oxygenation and nutrition exchange in the matrix vessel allow cells to proliferate well and produce high yields of bioproducts. Multiple harvest for secreted viruses can be done (e.g. hog cholera vaccine).

Affordable Cost

Space, utilities, and labour requirements are lowered due to the system's compact and automated design especially when compared to RBs or multi-layered cultureware. The high nutrition and aeration exchange levels of the Tide Motion principle reduces culture media consumption.

Esco TideXcell® concentrates cells within the matrix vessel, reducing total working volume to 1/5~1/25. This simplifies cell harvesting and downstream recovery processes, thereby reducing overall downstream processing cost. In a set-up where matrix cassettes packed inside the matrix vessel, with its concentric cylindrical design even in 100 L, can be separated from the mixing vessel in a closed manner and placed in a freezer for direct freezing and thawing, making cell harvesting simpler and more efficient.

Linearly Scalable Quality

(batch-to-batch consistency is uniform for cell seeding density/viral titer)

TideXcell® is a truly linearly scalable system from laboratory scale to production scale. It employs the same culture principle from seed preparation using the BelloCell™ System to succeeding larger TideXcell® System of up to 100 L packed-bed volume.

It also features the TideXcell Harvesting System (TXLHS), which facilitates in the automated and closed system cell harvesting and seed transfer from one TideXcell® System to another. True linear scalability allows faster and easier technology transfer with minimal bioprocessing time.

TIDEXCELL-002

TideXcell® Incubation and Control System

Compressed air path that comes with a double HEPA and volatile organic chemicals (VOC) filters to maintain ISO Class 5 environment during cell culture.

Optional Esco BioVap™ system can be added which guarantees 6-log bio-decontamination of the internal surface

Matrix Vessel

Houses BioNOC II® (macrocarriers) where cells adhere to

Pressure Gauge

Used to measure and monitor the pressure from gases or liquids of the reactor in the system.

TideXcell® HMI/PLC

User-friendly design and control system can be connected and configured to SCADA systems DeltaV and PCS7 controls. Dual redundant systems are also catered depending on the target requirement.

Power Indicator

Alarm Light

Emergency Stop Button

Mixing Vessel

Vessel for mixing pumped gases, acid, base, feed, and harvest among others

Heating Coil

Responsible for heating the culture medium to its optimum temperature during the process (temperature control).

Mixer Scale

Detects the weight of the mixing vessel and responsible for controlling Tide Motion exchange

Rotameters

Manually controls the amount of air, nitrogen, oxygen, and carbon dioxide inside the incubator or in the mixing system. Optional upgrade for mass flow controllers are available.

Acid Peristaltic Pump

Base Peristaltic Pump

Feed Peristaltic Pump

Harvest Peristaltic Pump

TIDEXCELL-020

TideXcell® Incubation and Control System

Watch our video
"Culturing with TideXcell® System"

Matrix Vessel (20 L SU)

Siemens HMI PLC

Power Indicator

Alarm Light

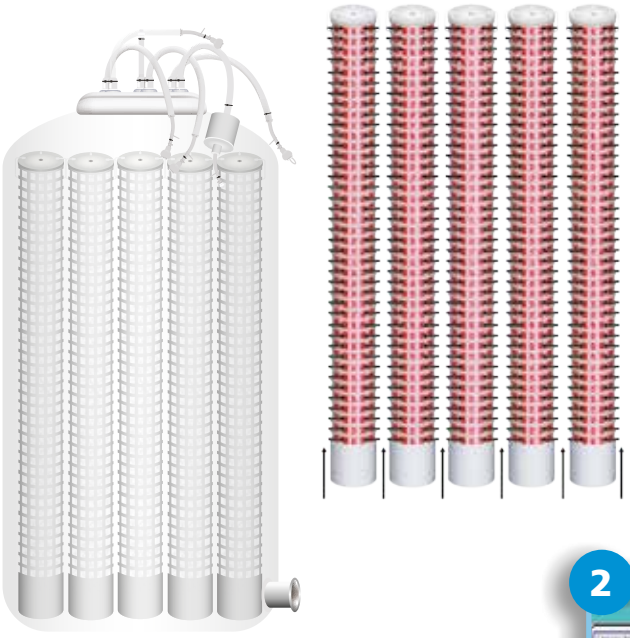
Emergency Stop Button

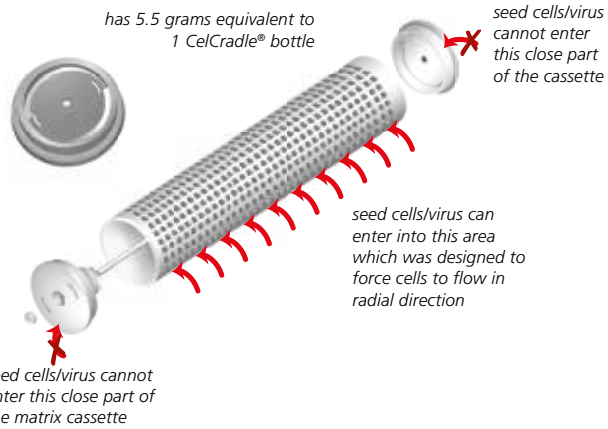
Rotameters

High-functioning Peristaltic Pump

Uniform Seeding Viral Infection/Transfection with Cartridge Matrix

TideXcell® Matrix Bed is designed to cut the area into numerous small sections and force cells to flow in horizontal radial direction instead of vertical direction. The gradient effect during seeding phase could be minimized due to the forced flow of the seed cell/virus into the matrix cassette.





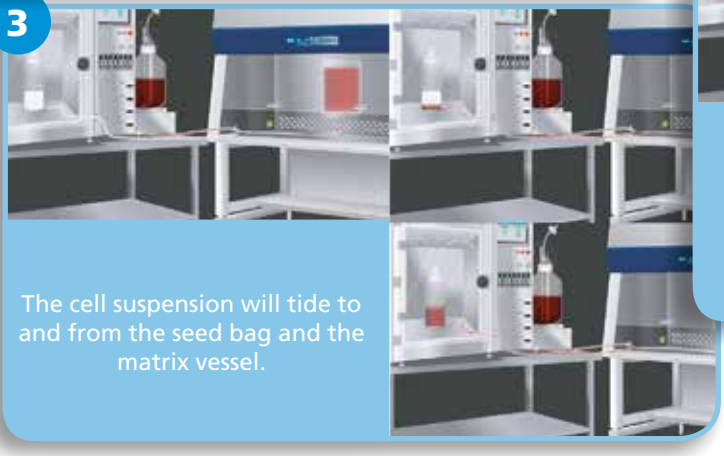
1

Viral seed or seed cells are prepared in a cGMP Grade B cell/viral processing room with installed CO_2 incubators and Grade A biosafety cabinet (BSC) or a Grade A isolator incubator connected directly to TideXcell® in Grade D background.

2

Input the parameters in the TideXcell® system for the inoculation phase and run the program.

3



The cell suspension will tide to and from the seed bag and the matrix vessel.

4

Clamp the tube leading to the seed bag and aseptically disconnect the connector within the BSC.

Sampling

Closed system sampling can be done in the TideXcell® system. Each vessel types have their own corresponding number of sampling port.

For carrier sampling that are to be done more than the provided sampling port, Tide Motion should be stopped and the matrix vessel media level should be set at the lowest possible level. Sampling should be done inside a biological safety cabinet. Optional multi-sampling systems can be configured.

Note: Make sure to clamp the tubing connection from the matrix vessel to the mixing vessel to avoid spillage.

1

Pull out the string from the sampling port.

2

Once the sampling tube had reached the end of the tubing, seal the tube with a sealer.

3

Cut the sealed part tubing and retrieve your matrix sampling basket.

Matrix Vessel-002
1 SAMPLING PORT

Matrix Vessel-020
2 SAMPLING PORTS

Matrix Vessel-100
4 SAMPLING PORTS

TXL Culture Vessels

Different matrix vessels can be used in the same TideXcell® Incubation and Control System. Furthermore, the working volume of the matrix vessel depends on the quantity of BioNOC II® macrocarriers used. These two features provide users with a more flexible production. One of the best examples is the production of a conditioned media.

Culture medium compositions typically include essential amino acids, salts, vitamins, minerals, trace metals, sugars, lipids, and nucleosides. **Conditioned media**, on the other hand, contains many of the original components of the medium used, as well as a variety of cellular metabolites and secreted proteins, including, for example, biologically active growth factors and other extracellular proteins. This conditioned cell culture medium is typically used in culture manipulations such as for vaccine production and cosmetics/cosmeceuticals.

TideXcell® System	TideXcell® System: 2-20 L					TideXcell® System: 100 L	
Matrix Vessel							
	2 L		10 L	20 L		100 L	
	Multiple-Use	Single-Use	Multiple-Use	Multiple-Use	Single-Use	Multiple-Use	Single-Use
Matrix Volume	1-2 L	2-4 L	5-10 L	10-20 L		50-100 L	
Closed Sampling Port No.	0	1	0	0	1-4	0	1-5
Pre-packed carrier (g)	0	110-220	0	0	550-1100	0	2,750-5,500
Material	Glass	PP	Glass/SS	SS	PP	SS	PP
AutoFeeder	Integrated/AF-1200					AF-1200	

Single-use matrix vessel

- Vessel sizes available in 2 L, 20 L, and 100 L
- Gamma-irradiated, ready-to-use and are pre-packed with BioNOC II® macrocarriers
- Features patent pending close sampling ports which consist of a basket immersed within the matrix vessel and connected to sampling port tube on the lid of the matrix vessel

Multiple-use matrix vessel

- Autoclavable matrix vessel available in 2 L, 10 L and 20 L volumes
- Must be refilled with fresh and autoclaved BioNOC II® macrocarriers to which a qualitative test for cells must be done.

Note: This is performed through direct sampling of carriers inside a Biological Safety Cabinet

TXL Mixing Systems

The TideXcell® Mixing System is where the mixing vessel containing the culture medium is continuously mixed, and parameters such as:

- pH
- dissolved oxygen (DO)
- temperature
- batch, fed-batch, perfusion, and 100% media exchange

The separation of the culture medium vessel and culture vessel dramatically decreases problems typically occurring during mixing. It permits dual temperature control for varied cell and viral culture. Cells can be cultured to confluence at 37°C in 1 mixing vessel, after which100% of a fresh medium at a lower temperature in a separate mixing vessel can be used for viral culture after virus seeding.

This dual temperature control process can potentially produce higher virus titers for specific viral strains or aquaculture vaccines than what can be achieved in typical perfusion systems utilizing microcarriers or other packed bed bioreactors which are only able to culture at 1 set temperature.

Sampling ports are also available for medium sampling, and the additional ports can be used to pump in other reagents.

Magnetic Stirrer Mixing System

10 L | 20 L

Vessel Material: Borosilicate Glass

System Material: Stainless Steel 304

Single-use orbital mixer (ideal for HPL media for stem cells that need low agitation)

The in-house magnetic stirrer mixing system uses a stainless steel magnetic stirrer for relatively small-scale mixing. Glass mixing vessel of up to 20 L is placed on the stainless steel magnetic stirrer. The stirrer speed can be set from 100 to 1,500 rpm. The temperature is controlled by a heating jacket which has a maximum temperature of 45°C.

**Single-use mixing system available at additional cost*

Stirred Tank Mixing System

30 L | 50 L | 100 L | 200 L | 500 L | 1000 L

Vessel Material: Stainless Steel 316 and Stainless Steel 304

System Material: Stainless Steel 316

This multiple-use stainless steel mixing system is similar to stirred tank bioreactor for pilot or production scale. The culture medium is continuously agitated by an impeller and parameters such as dissolved oxygen, temperature, and pH are monitored and regulated. The tank consists of 2 impellers which is located on the bottom and at the center of mixing tank allowing media homogenization.

More than ten (10) types of impellers are available. Agitation rate, in general, ranges from 80 to 1000 rpm and temperature control up to 60°C.

The Stirred Tank Mixing System has a built-in automated Sterilization-In-Place (SIP) system, allowing proper sterilization of the mixing tank and the culture medium. SIP (sterilization in place) protocol consists of 5 steps:

- Heating 1
- Heating 2
- Sterilization
- Cooling 1
- Cooling 2

Protocols can be set and automatically runs according to the set value. Other features of this system include motorized tank lid lifter, which enables viewing the internal tank vessel, optional Wash-In-Place (WIP), glass window, and LED light which allows culture observation.

TideXcell®-020

TideXcell®-100

Recirculation Thermostatic Mixing System

50 L | 100 L | 200 L | 500 L | 1000 L

Vessel Material: Plastic

System Material: Stainless Steel 304

Recirculation thermostatic mixing system is designed for relatively larger scale production. This system consists of a rectangular stainless steel which holds a disposable mixing bag.

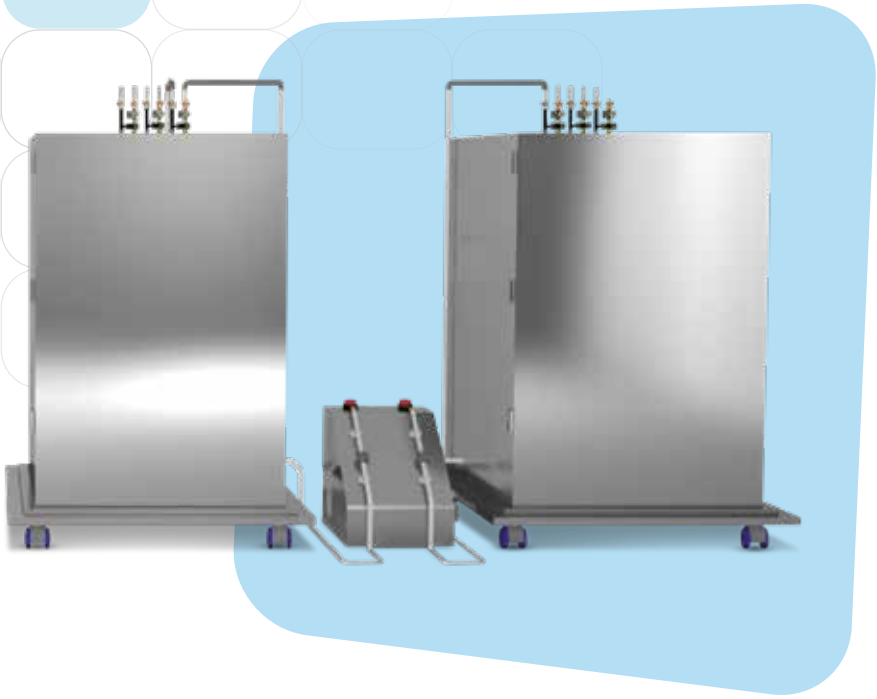
Its key features include:

- Thermostatic panel on each vessel side wall
- Heating of 100-500 L media takes less than 4 hours
- Magnet-driven impeller enabling mixing without housing contact and bearing
- Single-use magnetic pump head mounted to the motor
- 0-21 LPM pump rate
- 0-50°C temperature range
- Autoclavable probe holders (located on the side wall)
- Side door ease for bag removal

TideXcell® ACCESSORIES

Feed/Harvest System Triple Feed/Waste System

The Feed/Harvest system is used for batch, perfusion, and 100% media exchange processes. Waste culture media can be harvested on nth day and will pump in fresh culture media from the feed tank. 100% media exchange ensures high product cell yield and high viral titers at the end of the cell culture production. The system also allows harvest of 100% conditioned media from stem cell culture; harvesting from the mixer to the harvest tank and fed with 100% culture medium afterwards.



AutoSwitch System

The AutoSwitch System is recommended when tanks will be used for feeding or harvesting. This system will be connected in between the tanks and will automatically switch to the other tank once empty (feeding) or filled (harvesting). Individual alarm lights are integrated in the system for tank depletion indication. In addition to this, the autoswitch system includes an inlet and non-invasive bubble detector.

TideXcell® Harvesting System

TideXcell® Harvesting System (TXLHS) is specially designed for TideXcell® high cell density culture system for cell or viral recovery from the cultured from matrix vessel.

1. **Installation:** Mount and fix the TideXcell® Matrix Vessel in the TideXcell® Harvesting System and connect the TideXcell® matrix vessel with tubing manifolds that will serve as path for introducing phosphate buffer saline (PBS) , enzyme (usually TrypLE Select, Accumax, and Collagenase among others), enzyme inhibitor (when using serum-free culture medium), culture medium, and waste container. These six tubings connect with the Matrix Vessel through a manifold.

2. **Rinse:** Rinse the matrices with phosphate buffer saline or equivalent solution to remove serum that could inhibit the enzymatic activity in the following step.

3. **Enzymatic treatment:** Submerge the matrices with a chosen enzyme to digest cells until the cells round up for detachment.

4. **Cell Detachment:** Shake the matrix vessel together with the matrices to shake off cells out of the porous matrixes.

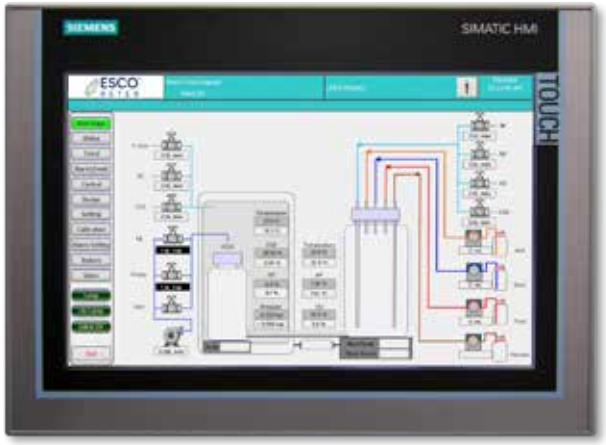
5. **Collection:** Collect the cells by washing the matrices with cell culture medium or equivalent solution and collect the cells into harvest tank.

TXL-MHS

Various optional material handling can be used to allow ergonomic movement of 20 L matrix vessel from TXL to TXLHS.

PLC-based Monitoring and **Control** Structure

Local Control



TideXcell® is controlled by Siemens HMI/ PLC-based monitoring and control structure. This control structure ensures a fast, flexible, and reliable solution for continuous processing. PLC-based monitoring and control system can be connected and configured to SCADA systems that are using DeltaV and PCS7 controls. Dual redundant systems for critical components such as PLC and pumps are catered for at additional costing.

Its features include:

- Real-time vessel display
- Alarm monitoring
- Trend display
- Advanced DO control
- Gas flow control
- Perfusion control
- Sensor calibration
- Controller status indication

The **Wonder** System

SCADA

TideXcell® PLC-based monitoring and control structure runs on WonderWare SCADA. This provides a high-level process supervisory management and data acquisition. This software platform will ensure process control safety, will support control strategy, and will provide a remote method of capturing data and events (alarms) for monitoring the continuous process. SCADA platforms also provide functions for graphical displays, alarms, trends and historical storage of data.

TideXcell® is the core of Esco Aster, a vertically-integrated contract research, development and manufacturing organization (CRDMO) that uses single-use adherent bioreactors in bioprocessing needs. Esco Aster focuses on process development, commercialization of new translational drugs (NTDs) for both humans and animals, orphan drugs, as a CRDMO for partner TideXcell® factories looking to gain access in the ASEAN, ANZ, African region.

TideXcell® Customer Reference

The following table shows cGMP-compliant customers using TideXcell® in their projects. Company identities and some other information are hidden due to non-disclosure agreement (NDA), between the company and Esco VacciXcell.

SECRETED VIRUS						
Country	**Cell Line**	**Virus Strain**	**Cell Density (cells/mL)**	**Viral Titer**	**cGMP**	**SCADA/ DCS**
Taiwan	VERO	Japanese Encephalitis Virus	$4.6x10^7$	10^9 pfu/ml	Yes	-
China	VERO	Rabies Virus	$4.0x10^7$	10^8 $IgLD_{50}$/ml	Yes	-
Taiwan	VERO	Enterovirus type 71	$2.6x10^7$	$10^{7.8}$ $TCID_{50}$/ml	Yes	-
Taiwan	MDCK	H5N1	$2.3x10^7$	HA=1024~2048	Yes	SCADA
Taiwan	MDCK	A(H1N1)	$2.2x10^7$	HA=512~1024	Yes	-
Taiwan	PK	Hog Cholera	$3.7x10^7$	$10^{6.5}$ pfu/ml	Yes	-
China	ST Hog	Cholera	$2x10^7$	2mil. RID/ml	Yes	-
China	BHK-21	Rabies Virus	$4.5x10^7$	$10^{8.5}$ $TCID_{50}$/ml	Yes	-
Japan	MDBK	(NDA) Virus for Bovine Vaccine	$1.29x10^7$	$10^{9.2}$ $TCID_{50}$/ml	Yes	-
China	Marc145	PRRSV	$1.16x10^7$	$10^{8.29}$ $TCID_{50}$/ml	Yes	-
Spain	NDA	(NDA) Virus for Bovine Vaccine	$2.6x10^7$	N/A	Yes	-

NON-SECRETED VIRUS						
Country	**Cell Line**	**Virus Strain**	**Cell Density (cells/mL)**	**Viral Titer**	**cGMP**	**SCADA/ DCS**
Japan	NDA	Hepatitis A	$2x10^{11}$	N/A	Yes	SCADA

TideXcell® Research References:

- *Alan Yung-Chih Hu, "Purification of cell-based influenza H5N1 viruses by liquid chromatography technologies" in "Vaccine Technology IV", Eds, ECI Symposium Series, Volume P17 (2013). http://dc.engconfintl.org/vaccine_iv/46. (Link: http://www.vaccixcell.com/downloads/pdf/Purification of cell-based influenza H5N1 viruses by liquid chrom.pdf)*
- *Chang, K., Wang, Y., Lin, F., Liu, E., Hsieh, S., Weng, T., . . . Chong, P. (n.d.). A Novel Disposable Large Scale Cell Culture System for Influenza H5N1 Vaccine Development. (Link: http://www.vaccixcell.com/downloads/pdf/TideCell H5N1 2008.pdf)*
- *HO, L. (2008). Innovative Disposable Bioreactors for Membrane Protein Production Based on the Tide Principle. BioProcessing Journal, 16-24. Retrieved from www.bioprocessingjournal.com. (Link: http://www.vaccixcell.com/downloads/pdf/J71_Ho_144_032408.pdf)*
- *Lin, W. A Novel Method for Making Pandemic Influenza Vaccines. (Link: http://www.vaccixcell.com/downloads/pdf/Influenza Medigen Wenlii Lin.pdf)*

TideXcell® Product Specification

TideXcell®-002 Incubation and Control Unit

Base Unit		
Construction	External Carcass: 304 stainless steel	
Dimension	125 (W) X 70 (D) X 115 (H) cm	
Weight	240 kg	
Electrical requirements	AC 220V 20A, 50/60 Hz, Single phase UPS (uninterrupted power supply) with 6kVA/ 4.2kW should be prepared by customers	
Control Hardware (2-20 L)	Flexible pc-base/DAQ industrial control interface; Solenoid valves/PID gauges/Pressure-vacuum motor NDIR CO_2 diffusion-type sensor	
Control Hardware (50-100 L)	Siemens HMI/PLC based control structure Solenoid valves/PID gauges/Pressure-vacuum motor NDIR CO_2 diffusion type sensor	
Control Software	Siemens PLC-based control and monitoring structure Siemens HMI with 12.1" touchscreen Developmental environment: TIA Protal V13 SP1	
Incubator	0 – 20% CO_2 PID Control +8°C~27°C Operating Temperature Front view window; LED inside lighting Emergency power-off button	
Connection	CPC nickel-coated brass quick connectors Electric connectors with locking-screw	
Communication	9-pin Dsub RS-485 port : Modbus RTU protocol 2 USB Ports for import firmware / software upgrade and export trend data	
Control Features	Simple user's administration Process page & Date viewer page Data logging/ Parameters logging/ Events logging Individual seed and amp Cultivation conditions setting with default values Automatic switch from seeding stage to cultivation stage up to 300 minutes Automatic air refreshing mechanism	
	Tidal control	800 ~ 1, 800 mL/min
	Gas flow rate	0.8 – 20 LPM (depends on system size)
	Alkaline addition	80 mL/min at 100 rpm
	Perfusion rate	80 mL/min at 100 rpm
	File export	Excel (.xlx)
	pH control	4~10±0.1
	DO control	0%~100%±5%
	CO_2 control	0%~10%±0.3%
Protection	Over pressure protection (max. 1 bar) Liquid leaking protection Over suction protection Over time protection	

TideXcell®-020 Pro Incubation and Control Unit

Base Unit	
Weight	240 kg
Required space (W x H x D)	1250 x 1150 x 700 mm
Power supply	220 VAC 50/60Hz
Housing	304 stainless steel
Working volume	10 ~ 20L, Using disposable or reusable matrix vessel
Operating temperature	18 ~ 27 °C
Maximum relative humidity	80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C, non-condensing environment, non-condensing environment
Tide Motion flow rate	3500 ~ 6000 ml/min
Interfaces	Ethernet for SCADA system USB Aux USB Interface to TideXcell® Thermostatic Mixer-100 XG PT-100 thermometric sensor Interface to TideXcell® Thermostatic Mixer-100 XG load cell Interface to TideXcell® Thermostatic Mixer-100 XG agitation signal Interface to TideXcell® Thermostatic Mixer-100 XG electric heating jacket Interface to TideXcell® Thermostatic Mixer-100 XG pH probe Interface to TideXcell® Thermostatic Mixer-100 XG DO probe Alarm Relay
Ports	Air In for air source N_2 In for N_2 source O_2 In for O_2 source CO_2 In for CO_2 source F.Cir-Out for force circulation function Mix-Gas for gas supplement to TideXcell® Thermostatic Mixer-100 XG

Peristaltic Pump Module	
Quantity	4
Controller	Fixed speed (regulated on|off)
Speed	100 rpm X 2; 250 rpm X 2
Pump head	Watson Marlow 114, Fast Load pump head X 2 Watson Marlow 313, Fast Load pump head X 2
Flow rates	Watson Marlow 114: MasterFlex L/S 25 Silicone tubing ID 3/16": 75 ml/min MasterFlex L/S 16 Silicone tubing ID 1/8": 45 ml/min Watson Marlow 313: MasterFlex L/S 18 Silicone tubing ID 3/8": 1300 ml/min

CO_2 Concentration	
Temperature	Temperature control with Heating coil Temperature control for RT+8 ~ 45.0 °C Display resolution 0.1°C Heating power: 780 W
O_2 Concentration	O_2 Concentration control with Air and N_2 gas injection O_2 Concentration control for 5%~20% Display resolution 0.1°C
CO_2 Concentration	CO_2 Concentration control with CO_2 gas injection CO_2 Concentration control for 0%~10% Display resolution 0.1°C
Perfusion	Weight-based regulation by load cell Digital communication with TideXcell®-020 Pro Range: 2 ~300 L/Day 10-stage continuous control program

CO_2 Concentration (cont'd)	
DO probe, reusable	Polarographic probe Digital communication with TideXcell®-020 Pro Range: 0 –100% Display resolution: 0.1%
pH probe, reusable	Combination electrode Digital communication with TideXcell®-020 Pro Range: 2 – 14 pH Display resolution: 0.01

Aeration Module	
Gas inlet	Gas pressure: 1.2 ~ 1.5 barg Gases: dry, oil and dust-free Gas inlet connections with quick couplers for 4 x 6 mm reinforced tubing
Gas outlet	Gas pressure: max .1 barg Gas outlet connections with quick couplers for 4 x 6 mm reinforced tubing
Aeration control	Continuous and automatic aeration control for: air, O_2, N_2 and CO_2 Gas flow control units with mass flow meter: Total of four; one per gas source Flow rates of the gas flow control units: Air, N_2, and CO_2: 0 ~ 10 L/min | O_2: 0 ~ 5 L/min

TideXcell®-020 Pro Autoclavable Matrix Vessel

Base Unit	10 L	20 L
Material	Borosilicate glass	
Total volume (L)	11.2 L	22.7 L
Working volume (L)	10.0 L	20.0 L
Space requirements (D X H)	290 x 480 mm	320 x 490 mm

TideXcell®-020 Pro Disposable Matrix Vessel

Base Unit	10 L	20 L
Material	Polypropylene (PP)	
Total volume (L)	25.0 L	25.0 L
Working volume (L)	10.0 L	20.0 L
Space requirements (D X H)	280 X 530 mm	280 X 530 mm

TideXcell® Thermostatic Mixer-100 XG Unit

Base Unit	
Weight	220 kg (without Medium)
Required space (W x H x D)	1200(W) x 1100(H) x 680(D)mm
Power supply	220 VAC 50/60Hz
Housing	Tank materials: 304 stainless steel Probe adaptor material: 316 L stainless steel (reusable), Plastics (disposable)
Working volume	30 ~ 100 L, Using disposable mixing bag
Operating temperature	18 ~ 27 °C
Maximum relative humidity	80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C, non-condensing environment, non-condensing environment
Pump	Magnetic coupling pump

Base Unit (cont'd)	
Pump rpm	50 rpm ~ 200 rpm
Probe adaptor	pH/DO sensor port x 4 Temperature sensor port x 1 Air Filter port x 1

Process Control and Measurements	
Temperature	Temperature control with electric heating jacket Electrical filter heating for exhaust air filter Temperature control for RT ~ 40.0 °C ± 0.5 °C Display resolution 0.1 °C Heating power: Mixing system 660W | Filter heater 5W

TideXcell® Thermostatic Mixer-100XG Disposable Mixing Bag

Base Unit	100 L
Material	Multilayer film with LDPE contact layer
Ports	DO sensor port pH sensor port Temperature sensor port Acid port Alkali port Mixed Air port Feed port Harvest port Air vent port Other ports are customizable
Total volume (L)	140.0 L
Working volume (L)	100.0 L

TideXcell® Thermostatic Mixer 200 XG Unit

Base Unit	
Weight	160 kg (without Medium)
Required space (W x H x D)	1580 (W) x 1855 (H) x 880 (D) mm
Power supply	220 VAC 50/60Hz
Housing	Tank materials: 304 stainless steel Probe adaptor material: 316L stainless steel (reusable), Plastics (disposable)
Working volume	120 ~ 200L, Using disposable mixing bag
Operating temperature	18 ~ 27 °C
Maximum relative humidity	80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C, non-condensing environment, non-condensing environment
Pump	Magnetic coupling pump
Pump (rpm)	50 rpm ~ 200 rpm
Probe adaptor	pH/DO sensor port x 4 Temperature sensor port x 1 Air Filter port x 1

Process Control and Measurements	
Temperature	Temperature control with electric heating jacket Electrical filter heating for exhaust air filter Temperature control for RT ~ 40.0 °C ± 0.5 °C Display resolution 0.1 °C Heating power: Mixing system 660W | Filter heater 5W

TideXcell® Product Specification

Item Code		
2231012	TCICS-002	TideXcell®-002 Pro Incubation and Control system + Mixer + Three gas controller. Not necessary feed/harvest scale in case of perfusion system (Control System: Siemens HMI/PLC)
Consumables		
1400027	2 L Single Use Matrix vessel for TideXcell®-002 include 110 g BioNOC II® macrocarrier, 1x sampling port	Single-use, gamma irradiated
1400066	TideXcell® Matrix Vessel 2 L, Autoclavable	Multiple-use, need to change connection tubes
1400028	TideXcell®-002 Mixing Vessel, 10 L	Multiple-use, need to change connection tubes themselves
1400029	TideXcell® Acid/Alkali Bottle 500 mL	Multiple-use, need to change connection tubes
1400030	TideXcell® Seeding Bottle 2 L	Multiple-use, need to change connection tubes
NA (RCBB2006)	50 L Bioprocess Container (MOQ=10) for continuous culture	Single-use, alternative for feed/harvest tank (1400031)
1400031	TideXcell® FEED/HARVEST Tank 50 L (2 pcs)	Multiple-use (need caution when autoclaving)
1400032	TideXcell®-002 Tool Box	Recommended to purchase initially to ensure that all miscellaneous parts are complete and prepared for support. Tubings, luer locks, plugs, etc can be purchased locally.
1400235	TideXcell®-002 Accessories	

Item Code		
2231013	TCICS-020	TideXcell®-020 Pro Incubation and Control System (TCICS-020) (Control System: Siemens HMI/PLC)
Consumables		
1400069	Disposable Bag Thermostatic Mixer-200 L	
1400045	20 L Single-Use Matrix Vessel for TideXcell®-020 include 1100g BioNOC II® macrocarrier, 4x sampling port	Single-use, gamma irradiated
1400077	20 L Autoclavable Matrix Vessel Empty	Multiple-use, need to change connection tubes
1400073	TideXcell® 200 L Mixing Bag with single use pump (MOQ 5pcs)	Single-use
1400060	TideXcell® Acid/Alkali Bottle 10 L	Multiple-use, need to change connection tubes
1400062	TideXcell® Seed Vessel 20 L	Multiple-use, need to change connection tubes
1400065	TideXcell® -020 Tool Box	Recommended to purchase initially to ensure that all miscellaneous parts are complete and prepared for support. Tubings, luer locks, plugs, etc can be purchased locally.
1400235	TideXcell®-020 Accessories	

Item Code	Description	Single-Use or Multiple-Use
1400018	BioNOC II® Cell Culture Macrocarriers (50 g)	Can be autoclaved or gamma irradiated, but not recommended as residues of cells/viruses may remain
1400019	BioNOC II® Cell Culture Macrocarriers (250 g)	
1400020	BioNOC II® Cell Culture Macrocarriers (1,000 g)	

TideXcell®-002

Weight

Incubator	: 239.4kg (512 lbs.)
Scale	: 18.76kg (41.73 lbs.)
Vessel on Scale	: 13.99kg (30.86 lbs.)

TideXcell-020 with Mixer-200

Incubator
Weight: 230kg (507.06lbs.)
Depth: 700 mm

Table width: 705 mm

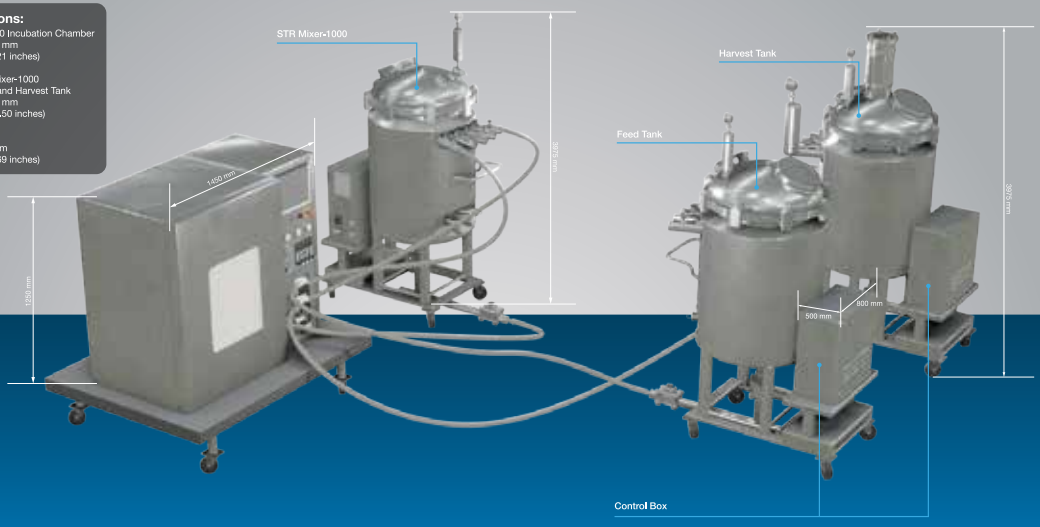
Mixer-200 (without media)
Weight: 160 kg (352.74 lbs.)

100L TideXcell + 1000L Mixing Vessel

Dimensions:
TideXcell-100 Incubation Chamber
1450 x 1250 mm
(57.09 x 49.21 inches)

STR-Tank Mixer-1000
Main, Feed and Harvest Tank
1060 x 3975 mm
(41.73 x 156.50 inches)

Control Box
800 x 500 mm
(31.50 x 19.69 inches)



ESCO LIFESCIENCES GROUP GLOBAL OFFICES

North America

USA

Esco Technologies, Inc.

Life Sciences/Medical
903 Sheehy Drive, Suite F, Horsham,
PA 19044, USA
Toll-Free USA and Canada: 1-877-479-3726
Tel: 215 441 9661
Fax: 484 698 7757
Email: eti.admin@escolifesciences.com
Website: http://escolifesciences.us

Healthcare Division/Factory
2512 Metroprolitan Dr, Suite 120-B
Feasterville-Trevose, PA 19053-6738
Tel: +1 215 322 2155
Email: eti.pharma@escolifesciences.com
Website: www.escopharma.com

Europe

DENMARK

Esco Medical ApS
Kringelled 10, DK-8250 Egaa, Denmark
Tel: +45 5397 3067
Email: medical@escolifesciences.com

UK

Esco GB Ltd
Unit 2 R-Evolution @ Gateway 36,
Kestrel Way, Barnsley S70 5SZ
Tel: +44 (0) 1226 360 799 (Pharma)
+44 (0) 1226 361529 (Lab)
Email: egb.info@escolifesciences.com
Websites: www.escopharma.com
www.escolifesciences.com

GERMANY

Esco Lifesciences GmbH
Straßheimer Straße 17
61169 Friedberg, Germany
Tel: +49 6031 6873447
Email: mail@escolifesciences.com
Website: www.escoglobal.de

RUSSIA

Esco Russia
Building 4, 8, Novovladikinskii proezd
Moscow, Russian Federation 127106
Email: esco.russia@escolifesciences.com
Website: escolifesciences.ru

LITHUANIA

Esco Medical Technologies UAB
Draugystes 19
LT 51230 Kaunas, Lithuania
Email: medical@escolifesciences.com
support-medical@escolifesciences.com
Website: esco-medical.com

Asia Pacific

BANGLADESH

Esco Lifesciences (Bangladesh) Pvt. Ltd.
H # 662 (6th Floor), Apt. # A-6, R # 9
Mirpur DOHS, Mirpur, Dhaka-1216,
Bangladesh
Tel: +8801958541100
Email: ebd.customerservice1@
escolifesciences.com

CHINA

Esco Shanghai Trading Co. Ltd.
Email: mail@escolifesciences.cn
Website: www.escolifesciences.cn

Beijing
Rm. 502, Tower A, Times Fortune,
Sanyuanqiao, Chaoyang District, Beijing,
China 100028
Phone: + 86 (10) 5867 7868
Fax: +86 (10) 5867 9244
Email: dora.miao@escolifesciences.com

Guangzhou
Room 802, Yuanyang Building,
20 Huacheng Avenue, Tianhe District,
Guangzhou
Tel: +86 (20) 3837 3621

Qingdao
Room 1809, Cyberport Flagship Building,
No. 40 Hong Kong Middle Road, Shinan
District, Qingdao,
Shandong Province, China
Email: ailey.wang@escolifesciences.com

Shanghai
Room 1211, Jiahe International Building,
No. 1, Lane 66, Huayuan Road, Hongkou
District, Shanghai, China
Tel: +86-21-60951955

Hong Kong (China)
Esco Technologies (Hong Kong) Limited
Unit 904, Laurels Industrial Centre, No. 32
Tai Yau Street, San Po Kong, Kowloon, Hong
Kong
Tel : +852 3628 3986
Fax : +852 3186 2821
Email: mail@escolifesciences.hk
Website: http://escolifesciences.hk

Taiwan (China)
Esco Lifesciences Taiwan Co., Ltd.
No. 122-2, Wuqing Rd., Dayuan Dist.,
Taoyuan City 337014, Taiwan
Tel: +886 33818837
Fax: +886 33817135
Email: mail@escolifesciences.tw
Website: http://escolifesciences.tw

INDONESIA

PT Esco Utama
Taman Tekno BSD Blok H8 No.1 BSD Sektor
XI, Serpong, Tangerang Selatan 15314
Tel: +6221 30 446 565
Fax: +6221 30 446 566
Email: eucs2@escolifesciences.com
Website: http://escolifesciences.co.id

MALAYSIA

Esco Micro (M) Sdn. Bhd.

Technical Support Hotline:
1 300 88 ESCO (3726)

Selangor
No. 15, Jalan Sungai Buloh 27/101A,
Persiaran Klang, HICOM 27 Industrial Park,
40400 Shah Alam, Selangor, Malaysia
Tel: +603 5103 8480
Fax: +603 5614 3385
Email: malaysia@escolifesciences.com
Website: https://www.escolifesciences.com

Melaka
No 109 & 109-1, Jalan Zapin 1,
Taman Paya Rumput Utama,
75460, Melaka, Malaysia
Tel: 010-2638007
Website: https://www.escolifesciences.com

MYANMAR

Esco Lifesciences Co.,Ltd
04-402B, 3-Mahar Swe Condominium,
Mahar Swe Street, Hlaing Township, Yangon,
Myanmar
Tel: +959 961 456 426
+959 954 438 399
Email: ingyin.haymarn@escolifesciences.com
emm.csis@escolifesciences.com

PHILIPPINES

Esco Philippines, Inc.

Manila
Unit 707E, 7th floor, East Tower Four E-com
Bldg, Block 22 Seaside Cor Diokno Ave.
MOA
Complex, Pasay City 1300
Direct Line: +63 (02) 8828 1527
Trunkline: +63 (02) 8478 0384
Email: philippines@escolifesciences.com
Website: https://www.escolifesciences.com

Cebu
Blk 3 Lot 13 Mutual Homes Subd.
Pajac, Lapu-Lapu City, Cebu 6015
Tel : +63 (32) 232 5826

Davao
71-C Lupo Diaz St. cor Nicasio Torres St.,
Bo. Obrero, Davao City 8000
Tel : +63 (082) 234-0997

SINGAPORE

Esco Micro Pte Ltd
21 Changi South Street 1
Singapore 486777
Tel: +65 65420833
Fax: +65 65426920
Email: mail@escolifesciences.com
Website: https://www.escolifesciences.com

SOUTH KOREA

Esco Korea Micro Pte Ltd
2F, 845, Geumo-ro, Gwangmyeong-si,
Gyeonggi-do,
Republic of Korea (14297)
Tel: +82 2 830 0482
Fax: +82 2 830 0491
Email: info@escoglobal.co.kr
Website: http://www.escoglobal.co.kr

THAILAND

Esco Lifesciences (Thailand) Co.,Ltd.
8/3 Soi Rimthangduan 2, Sukhumvit Road,
Bangchak,
Phrakanong , Bangkok 10260
Tel: 02 082 2029
Fax: 02 117 3746
Email: csts.th.sales1@escolifesciences.com
Official Line: @escothailand
Website: http://escolifesciences.co.th/

VIETNAM

Esco Vietnam Company Ltd.,
Email: vietnam@escolifesciences.com
Website: vn.escoglobal.com

Hanoi
7th Floor, No. 8, Alley 15,
Trung Kinh Street,
Trung Hoa Ward, Cau Giay District,
Hanoi, Vietnam
Tel: +84 24 6269 1460
+84 24 6269 1461

Ho Chi Minh
No. 14 - Lot G3, Street No. 53,
Tan Quy Dong Settlements,
Tan Phong Ward, District 7, HCMC,
Vietnam
Tel: +84 28 3776 0363

Middle East

DUBAI

Esco Lifesciences Trading LLC
Showroom 2 SW2 Gate 1 Jadaf 1 Dubai, UAE
P.O Box: 182099
Tel.: +971 (4) 5461137
Email: alvin.heah@escolifesciences.com

Africa

SOUTH AFRICA

Esco Technologies Pty Ltd

Centurion
Unit 2 Landsmark Park,
17 Landmarks Avenue,
Kosmosdal Extension 11,
Centurion 0157 South Africa
Tel : +27 (0) 11 314 3184
Mobile: +27 (0) 82 853 9655
Email : sonja.strydom@escolifesciences.com
Website: https://www.escolifesciences.com

Cape Town
Office 31, Ground Floor Liesbeek House,
River Park Gloucester Road Mowbray, 7700
Tel : +27 (0) 21 680 5061

Kwazulu-Natal:
Office 009, 3rd Floor, Regus Business Centre,
Westway Office Park, 18 The Boulevard,
Westville, Durban, 3630
Tel: +2731 003 3225

ESCO® Healthcare

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For queries and comments, please contact Esco VacciXcell Technical Support team.

21 Changi South Street 1 • Singapore 486777
Tel +65 6251 9361 • mail@escovaccixcell.com
www.escovaccixcell.com

CDMO Services:

Esco Aster Fermentation (Plasmids)
21 Changi South Street 1
Singapore 486777
Tel +65 6542 0833

Esco AsterTide PD-Phase 2 CTM (Cells/Viruses/EVs)
#02-04 Blk 67 Ayer Rajah Crescent
Singapore 139950
Tel +65 6251 9361

Esco AsterMavors Cellular Agriculture and Alternative Proteins (Food)
#03-20 Blk 71 Ayer Rajah Crescent
Singapore 139951
Tel +65 6251 9361