



Automating cell biology processes

When it comes to automated cell solutions, thousands of laboratories can't be wrong

Tecan's automation, sample management and detection solutions cover your complete workflow

Whether it's for the production of cell-derived biomolecules, or to provide cells for research, the process of manually manipulating cells is a time consuming, laborious and error-prone undertaking. Tecan offers solutions for automating all

typical cell-related processes. Tecan's modular cell processing solutions are based on the Freedom EVO® platform, in combination with appropriate Tecan or 3rd party devices, and controlled by powerful software packages.

1

Cloning and construct generation

Nucleic acid purification

Tecan solutions can purify DNA/RNA for a wide range of downstream applications, using kits from all major vendors as well as traditional techniques.



Nucleic acid normalization

Quantitation, dilution and normalization of DNA or RNA based on a software normalization wizard, in combination with an Infinite® series microplate reader or concentration data imported from quantitative PCR.



Prepare and clean post-PCR

Precise low volume pipetting, and integration of a sealer, thermocycler or separation device onto the Freedom EVO platform, allows full automation and complete process control.

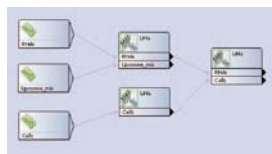


2

Cell transfection and synthesis

Lipofection

All process steps are automated, from the preparation of cells and transfection mixes, to incubation of the transfection plates.



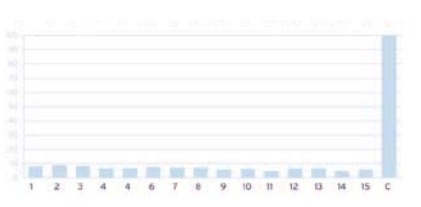
Nucleofection®

High throughput transfection of primary cells (e.g. T cells) and difficult-to-transfect cell lines (e.g. Jurkat cells) using Lonza® nucleofection technology.



siRNA transfection

Tecan's automated solutions ensure identical conditions and scheduling for each experiment minimizing your process risk and ensuring valuable material is not lost.



3

Cell identification and selection

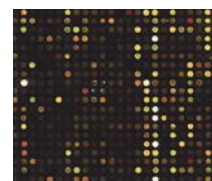
Clone selection

Automated clone selection can be performed by combining a Freedom EVO with an automated imaging platform, such as the Cellavista system from Roche Innovatis.



Expression screening

Tecan offers proven solutions for RNA, DNA or protein expression analysis, using array scanners and hybridization stations in microplate or microscope slide format.



Automated ELISA

High throughput ELISA is, in many cases, the method of choice for the quantification of clone-specific expression patterns. Tecan can offer both plate washing and detection solutions from a single supplier.



Tecan offers cell-based solutions for a wide range of applications and markets:

Cell-based assays

Stem cell research

Antibody research

Regenerative medicine

Cell line development

Bioprocess development

Process analytical technology (PAT)

4

Culture expansion
and maintenance

5

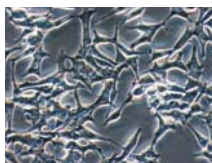
Cell-based assays

6

Results

Cell maintenance

Automating routine cell culture maintenance helps to ensure consistent timings and culture conditions, decreasing hands-on time and ensuring well-documented processes.



Cell suspension culturing

Automated culturing of cell suspensions is based on the Freedom EVO workstation, incorporating modules such as a centrifuge or a cell counter.



Cell expansion with Cellerity™

Cellerity is Tecan's solution for automating cell culture processes. It allows fully automated cell maintenance and expansion, and produces cells ready for downstream processes.



High throughput screening

Tecan's solutions for high throughput screening span the complete range from sample management and assay preparation to detection solutions.



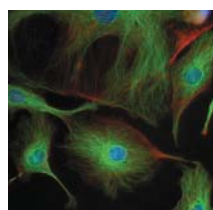
Assay kit automation

Tecan works with leading providers of test kits to provide you with automated solutions for microplate-based detection assays, including the latest biomolecular assays for primary and secondary screening.



High content screening

Individual cellular response to a stimulus is often highly dependent on sample or cell culture preparation. Automation of high content screening processes helps to reduce variability between samples and users.



Repeatable results

Automating laboratory processes can improve the repeatability of your assay results.



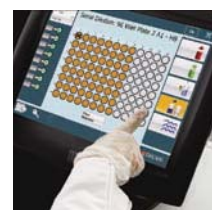
Data security

Sample tracking, barcode readers, checksum protected log files, automated report generation, or user management are just a few features that support complete data traceability.



Increased walkaway time

Automating routine laboratory processes can improve working efficiency by reducing hands-on time.



Cell transfection

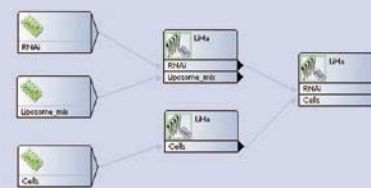
Do you care about experimental repeatability?

Tecan automation solutions improve process repeatability in high throughput transfection experiments.

Tecan offers a range of cell transfection systems to automate the time-consuming and laborious processes of transfecting different cell types. All process steps are automated, including cell preparation, mixing of transfection solutions and incubation of the transfection plates.

Complete process automation

- Ensures data traceability and decreases hands-on time.
- Easy and repeatable scheduling with Freedom EVOware® Plus process control software.



Lipofection and/or nucleofection®

- Fully automated nucleofection protocols by combining the Lonza 96-well Shuttle® with a Freedom EVO® workstation.
- Standard methods and 'difficult-to-transfect' protocols can be performed on the same instrument.



Scalable solutions

- Identical processes for different throughput requirements
- High throughput solutions allow whole genome knockdown studies to be performed in triplicate, including controls, within days.



Cell identification and selection

In search of the perfect clone?

Successful clone identification using orthogonal selection strategies

Selecting optimal clones from a pool of randomly generated cell lines is the most critical and variable step for creating stable producing cell lines for research and production. Automation can decrease development time, and helps to fulfill the regulatory requirements on data and process documentation.

Automation can be applied to limited-dilution plating, plate replication, assessing single cell clone origin, clone picking, expression screening using ELISA, protein quantitation and a range of protein characterization methods.



Optical clone selection and identification

Identify clones with useful attributes from a large number of clones generated, and ascertain monoclonality by integrating a Roche Innovatis Cellavista cell imaging platform into the Freedom EVO workstation.



Hit picking

The Freedom EVOware Hit Picking wizard is a powerful tool for the automation of clone picking and generation of daughter plates.



Software to keep track of your cell lines

Web-based cryobanking software – CryoStock – keeps track of master and working cell banks, and even the position of your cryotubes in liquid nitrogen storage tanks.



Cell maintenance

Is routine cell maintenance your laboratory chore?

Gain time for more valuable tasks by letting robots do the routine work.

Cell maintenance workstations automate the major bottlenecks of cell-based assays, such as media exchange, cell plating, incubation and assay preparation.

The modular concept of the Freedom EVO® platform allows implementation of solutions to fit the specific requirements of your assay protocol.

Modular solutions

Modular set-up, with washable steel tips and/or disposable tips, allows a choice of labware, e.g. tubes, low and high density microplates, and insert plates from all major suppliers. Modules support specific processes, such as stirring, heating, cooling, incubation or harvesting.

Processing filter insert plates for easy separation of stem cells from feeder cells



The tilting rack allows you to completely remove residual liquid from large volume wells, for example, for exchanging growth media or transferring cell suspensions



Stirrers keep cells in suspension



Maintain culture integrity

Disposable tips, stringent in-process cleaning procedures for re-usable tips, clean bench or biosafety cabinet enclosure all support long-term cell maintenance without contamination.



Cell suspension culturing

Need to work with more than just one cell type?

Tecan solutions automate processes for bacterial, yeast, hybridoma, insect, mammalian, primary and stable cell lines and stem cells.

Tecan has a wealth of experience in all kinds of cell cultures, and it is possible to process, for instance, both adherent or suspension cell cultures on a single instrument. Using either microplate or tube format, cell suspension culturing and processing can be performed with cultures of up to 50 ml in volume.

Several cell lines can be kept in parallel on the same instrument, for instance, hybridoma cultures for antibody development and production.



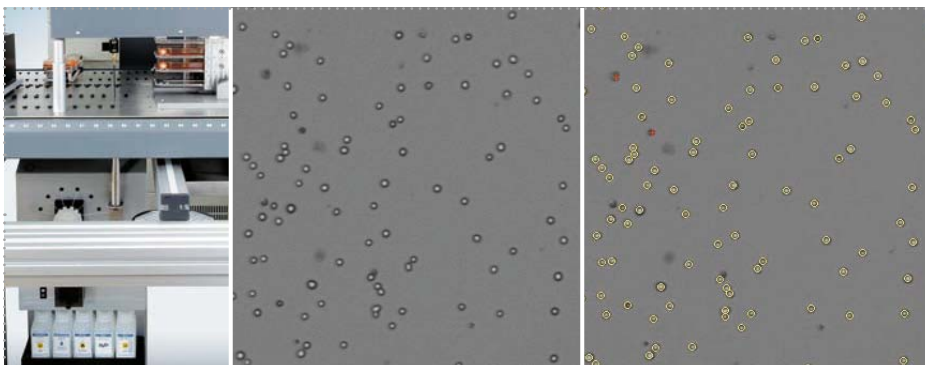
Suspension and adherent cell culturing on the same platform



Integrated centrifuge to separate cells from used media



Automated cell counting (e.g. Roche Innovatis Cedex system) allows precise sub-culturing protocols



Cellerity™ – automated cell culture maintenance, expansion and cell-based assay plate preparation

Are you ready to start your screen on Monday morning?

Automated cell culture gives you cells when you need them.

Cellerity is Tecan's solution for automating cell culture processes. It allows fully automated cell maintenance and expansion, and produces cells ready for downstream processes.

Cells – made to order

The CellGEM™ (**C**ell **G**rowth **E**xpansion and **M**aintenance) software package guides users through all cell culturing processes and maintenance actions.

CellGEM has been designed for users not familiar with robotics who prefer interacting with software based on common language and processes.

The CellGEM cell culture software is made to:

- allow true walkaway operation
- order cells for downstream applications in the required format
- remotely check the status of cell production requests
- keep track and provide audit trails for cells and processes including digital images
- provide real-time feedback by e-mail.



Cells in assay-ready plates

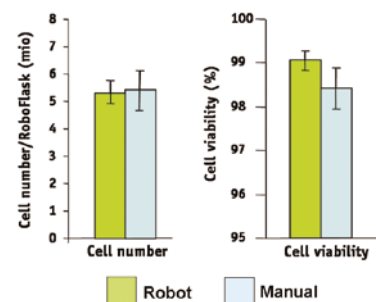
If you need cells in tubes or multiwell plates, Cellerity can deliver them in the format you want. Cellerity also allows you to:

- perform transfections of cells in flasks or plates
- add dyes to your cells
- distribute multiple cell lines across a single plate
- perform quality tests on the cell plate
- retrieve your plates ready-to-use on a predetermined date and time



Your manual results – automatically

Cellerity treats and processes your cell cultures very much like you would manually. Tests to compare the efficiency of automated harvesting and the quality of harvested cells have shown no statistically relevant differences. Tests were performed with weakly and strongly adhering cell lines as well as with strongly aggregating cells.



Process and sample information acquisition and retrieval for documentation are a key aspect of an automated cell culture system. CellGEM software provides a host of tools giving you an effective overview of the cell culture history.

- Request status of maintenance and production requests
- System load calendar including monthly and weekly view
- Consumable status report
- Incubator inventory
- Report of all scheduled tasks
- Vessel report
- Audit trails for cell line, user, maintenance and production requests.

Labware Report

Labware identifier: RF00019604

Go Print

Vessel Report for barcode:RF00019604, Corning(004) - 2006-04-13 12:41

Barcode	Identifier	Location	Position
	Corning(004)	AutoloadHolder	1,1,4
	Corning(004)	AutoloadHolder	1,1,4
RF00019604	Corning(004)	StoreX	1,1,4
RF00019604	Corning(004)	StoreX	1,1,4
RF00019604	Corning(004)	StoreX	1,1,4
RF00019604	Corning(004)	StoreX	1,1,4

Logistics helps to cut hands-on time

Cellerity is configured to store and supply consumables and liquids to allow unattended running over weekends.

- Several days worth of flasks are stored in the AutoLoader™.
- Troughs can be refilled from bulk storage to extend unattended operation.
- CellGEM software tracks and pre-calculates consumable consumption.
- Simple wizard-assisted re-filling of consumables, media and additives.



Automated cell processing

Do you want to establish new protocols? Cellerity™ treats your cells just like you would

You do not need to re-invent new protocols because Cellerity, combined with CellGEM™ software, is so flexible that it can mimic your existing manual processes. Your cells will be treated just like they were before, giving you identical results.

Check-in cells

Incubation

Harvesting into
collection vessel

Count cells



Flask storage



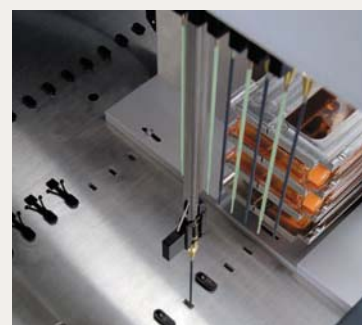
Barcode reading



Transport



Pipetting



An automated, Trypan Blue exclusion-based Cedex cell analyzer from Roche Innovatis is integrated into the Cellerity to:

- automatically calculate the dilution factor of the cell suspension after harvesting
- calculate the cell growth rate
- determine the viability of the cell culture
- document additional parameters such as cell aggregation rate, cell size and cell morphology.

Healthy cells with robotic cell incubation

A robotic incubator controls and monitors the temperature and optionally also the atmospheric CO₂, N₂ and/or O₂ content. It can:

- hold and process microplate-sized cell culture flasks
- handle lidded microplates and lidded insert plates
- use microplate-sized troughs
- read barcodes on all consumables
- generate incubator inventories
- hold up to 1,000 standard microplates.



Shaking, tapping



To incubator

**Cellerity works with robotic
cell culture flasks (shown is the
RoboFlask™ from Corning®)**

Cellerity allows you to:

- maintain and automatically expand multiple cell lines in parallel
- document your cell lines and production schedule
- reliably produce assay-ready cells for your downstream processes
- prepare cells during out-of-office hours to be ready for assays during working hours
- dramatically reduce hands-on time used for routine cell culture processes
- track each step in the generation of the cells.

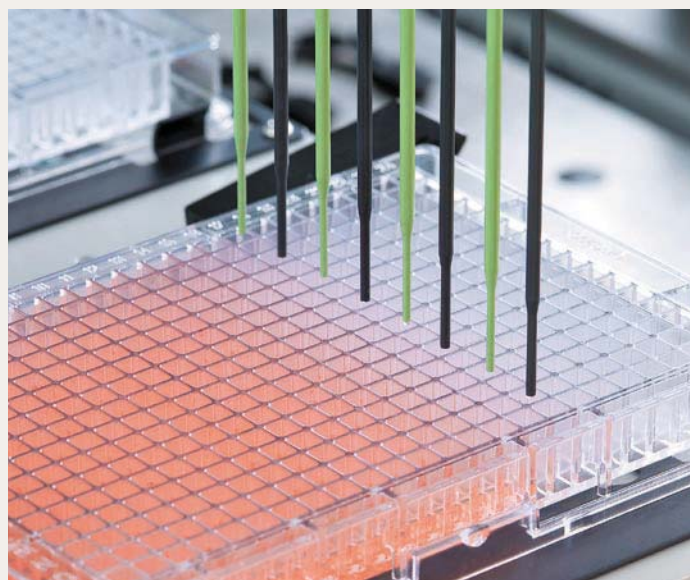
Seeding new flasks

Dilution of
cell suspension

Plating

Incubation

Retrieval



Precise large and small volume liquid handling

The Cellerity liquid handling system is capable of both rapid bulk media dispensing and precise small volume pipetting for valuable reagents.

Cellerity is equipped with steel tips to pierce through septa and reduce consumables usage. Tecan offers a two-step washing process to effectively clean the tips inside and out.

Cell-based screening

Are robust assays at the core of your research?

Tecan automation and detection solutions support your research.

Tecan offers solutions for all steps of automated cell-based screening. The flexibility of the Freedom EVO® platform, including an integrated reader configured for bottom reading or with injectors for kinetic assays, is ideally suited to a wide range of cell-based assays, allowing one instrument to run both assay development and routine production assays.



Infinite® series

Tecan's Infinite series is a family of modern multimode microplate readers with modular design and upgradeable detection modalities. There is a choice between filter-based and monochromator-based optical designs to reflect various user preferences, like sensitivity for dedicated routine applications or flexibility and scanning capability for assay development. All Infinite readers are fully compatible with Tecan's Freedom EVO platform for full integration into your automated liquid handling workstation.

Robotic loading of plates onto an Infinite reader



Validated assays for drug discovery

The Infinite F500 and Infinite M1000 have been validated for use in a number of drug discovery-relevant assays by the corresponding reagent kit providers as listed below:

- granted LanthaScreen® Certified Plus Status by Invitrogen Corporation
- passed HTRF® compatible* validation program managed by Cisbio Bioassays
- Transcreener® Far Red FP validated by BellBrook Labs
- met Promega®'s acceptance criteria for being certified as DLReady™ in Promega's corresponding validation program.

* the Infinite M1000 is HTRF compatible in white plates

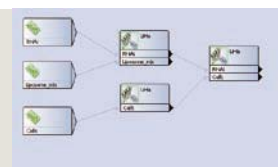


siRNA screening

Tecan offers solutions to automate all steps of siRNA studies on the Freedom EVO liquid handling workstation, in combination with specialized modules and detection devices, so that you can implement your optimized protocols or those of kit or reagent suppliers. Published studies using Tecan instruments include:

- screening for infectious virus entry into mammalian cells
- protein expression knockdown in human T-cells
- identification of primary cancers.

Freedom EVOware® Plus scheduling of siRNA transfection process



Cooling of nucleic acids and warming of media and cell suspensions



ADME assays

Freedom EVO-based systems are specifically designed to perform the most common assays encountered in today's ADME laboratories.

The Cell Permeability Workstation has been configured for Caco-2 or MDCK cell assays. It is also suitable for artificial membrane permeability and active transport assays, as well as compound efflux measurements.

The Drug Metabolism Workstation performs *in vitro* assays, such as metabolic stability, cytochrome P450 inhibitions, isoform identification, metabolite identification, protein binding and cytochrome P450 induction assays.

Multichannel head allows high throughput absorption screening



Integration of incubators allows cells to be maintained for live cell assays

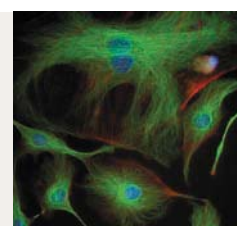


High content screening

High content screening allows rapid assessment of individual cellular responses to external stimuli, which are often very small and highly dependent on sample or cell culture preparation. Tecan offers a range of solutions for the automation of high content screening experiments to help reduce variability. These include:

- integration of users' choice of high content reader into the Freedom EVO platform
- repeatable, scheduled timings for all processes.
- integration into LIMS
- professional project management by an experienced team.

High content screening has become an established research strategy



A Cellomics ArrayScan® is combined with Freedom EVO for high content assays of live cells



High throughput screening

High throughput screening (HTS) is well established as a key tool in drug discovery. Time and cost pressures make it essential to screen large compound collections, and the ability to cherry-pick sub-sets is an important part of the overall process, combining sample management with automated liquid handling and detection.

The combination of a REMP Small-Size Store™ and a Freedom EVO with detection capabilities makes for a complete screening suite



Multichannel pipetting enables high throughput screening



Tecan workstations are in use on a daily basis in thousands of laboratories around the world

Hear what Tecan automation users have to say:

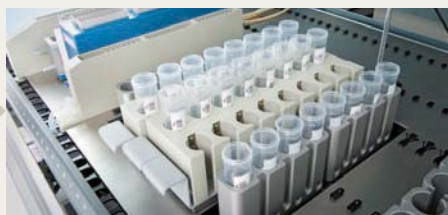
The Monash Antibody Technologies Facility

Antibody generation and production

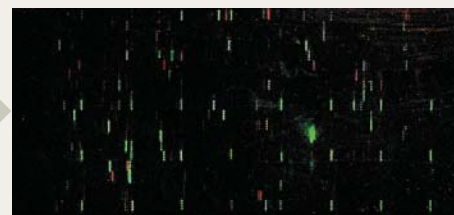
The MATF is one of the very few high throughput production facilities in the world offering custom-made, high-affinity monoclonal antibodies. The automated system increased the production capacity at MATF manyfold, helping to alleviate the bottleneck of antibody supply experienced by many researchers working on protein function and physiological processes.



Small automated sample store for antigen storage



Cell fusion is performed in 50 ml tubes



Antibody microarray (AMA) workstation for selecting high-producing clones

Leibniz-Institut für Molekulare Pharmakologie, FMP

Automated sample management, cell culture, high content and siRNA screening

The Leibniz-Institut für Molekulare Pharmakologie is using several Tecan Freedom EVO® workstations for systematic high throughput screening of bioactive small molecule libraries for potential research tools and targets for drug development. These systems form the hub of ChemBioNet's screening activities, providing an interdisciplinary open access platform in support of academic research projects exploring biological function.



Dr Jens Peter von Kries, Head of the Screening Unit, explained: "Each of our systems was carefully designed to meet our requirements, and the team at Tecan have worked hard to make sure that the final configuration represents the best possible solution available. Tecan takes a keen interest in its customers' projects, and our staff are trained by Tecan to a high standard to ensure we are able to maximize the potential of both our platforms and software. We enjoy a very good working relationship with Tecan's automation engineers, receiving immediate expert support for all our projects. Our work here at the FMP undoubtedly benefits from this close partnership. We encourage visitors to come to the Institute and see the set-up for themselves."

www.chembionet.info



MATF Director Michael Spiegel commented on the project implementation:
 “Tecan’s involvement on this project has far exceeded a simple supplier/client relationship. They have embraced this challenging project becoming a fundamental partner, contributing innovative project design, competent expertise and a flexible working attitude.”

www.matf.monash.org/



Culture expansion from
384- to 6-well plates



Complete process including manual
steps scheduled in laboratory control
workflow software

Zurich University of Applied Sciences, Research Group Tissue Engineering and Human Cell Culture Technology

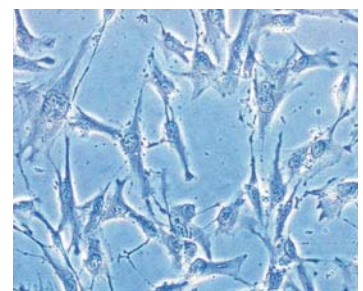
Advancing regenerative medicine with an automated, quality-controlled cell culturing system

Regenerative medicine therapies need automated cell isolation and propagation techniques, so that consistency and reproducibility meet commercial and regulatory requirements. Tecan is collaborating with tissue engineering researchers at the Zurich University of Applied Sciences to develop a novel, automated system for propagation of quality-controlled cells that will be suitable for use in regenerative medicine therapy research.



Professor Ursula Graf-Hausner, Head of the research group Tissue Engineering and Human Cell Culture Technology at the Zurich University of Applied Sciences, commented:
 “The collaboration we have with Tecan is very close and we have really been able to share our knowledge and experiences. The automated procedure we have developed together introduces cell quality control and safety into the production of cells for research purposes. The benefits for regenerative medicine and cell therapy in general could be enormous, significantly reducing costs and drastically reducing operator-dependent work.”

www.icbc.zhaw.ch



Project management

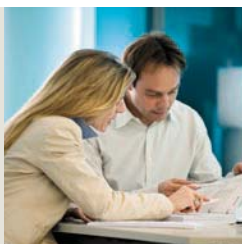
When do you need your automated system up and running? The most experienced project teams get you there faster.

Scientific research often needs tailor-made systems to ensure optimum performance and efficiency. To achieve the required results in a specific application, novel processes and approaches may be needed that are adapted specifically for the individual scientific challenge. We understand your application needs which allows us to be responsive to your requirements and provide the best solution, from new hardware modules to fully integrated systems.



Consulting

Experienced staff, many with a scientific background themselves, support you in defining your system specifications. You cannot go wrong working with Tecan, the most practiced partner in the market, with more than 500 successfully installed large projects around the world.



Engineering

Tecan's customized systems are tailored to your specific requirements that may not be met by standard, off-the-shelf modules. You are closely involved with our team of integration experts and engineers throughout the whole project, from defining the first requirements to the system's completion.



Service and Support

Our product support services can be tailored according to your needs, either as part of our Te-Care™ Service Contracts or provided on demand.

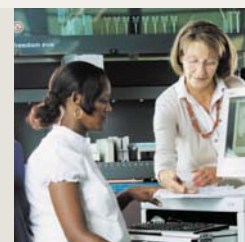
We provide:

- installation
- upgrades
- calibration and validation services
- repair services
- preventive maintenance
- helpdesk



Training

Tecan offers a comprehensive training program to provide our customers the skills needed to optimize the productivity and performance of their Tecan instrument.



Austria +43 62 46 89 33 **Belgium** +32 15 42 13 19 **China** +86 21 28 98 63 33 **Denmark** +45 70 23 44 50 **France** +33 4 72 76 04 80 **Germany** +49 79 51 94 170
Italy +39 02 92 44 790 **Japan** +81 44 556 73 11 **Netherlands** +31 18 34 48 174 **Portugal** +351 21 000 82 16 **Singapore** +65 644 41 886 **Spain** +34 93 490 01 74
Sweden +46 31 75 44 000 **Switzerland** +41 44 922 89 22 **UK** +44 118 9300 300 **USA** +1 919 361 5200 **ROW** +43 62 46 89 33

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