

Bucher Biotec AG • Viaduktstrasse 42 • 4051 Basel • Phone 061 269 1111 • www.bucher.ch

March 2018



Introducing
the **AVATAR™ Cell Control System**

**Accelerate your
Immuno-Oncology and
Stem Cell Research with AVATAR™.**

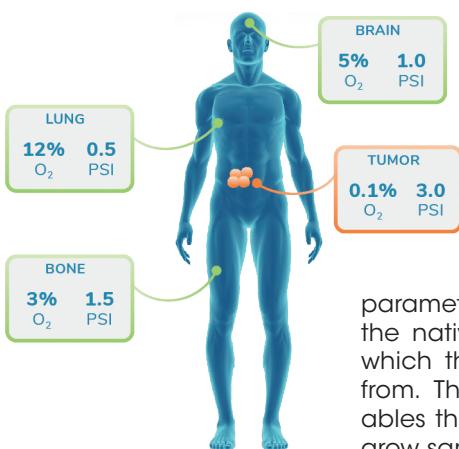
Primary cells are the future.



Introducing the AVATAR™ Cell Control System

You Control Your Cells!

The human body is made up of diverse microenvironments that influence the behavior and molecular profiles of cells. When raising primary cells or differentiating stem cells, it is therefore critical to mimic the bodily environment as close as possible to avoid selection for arbitrary conditions.

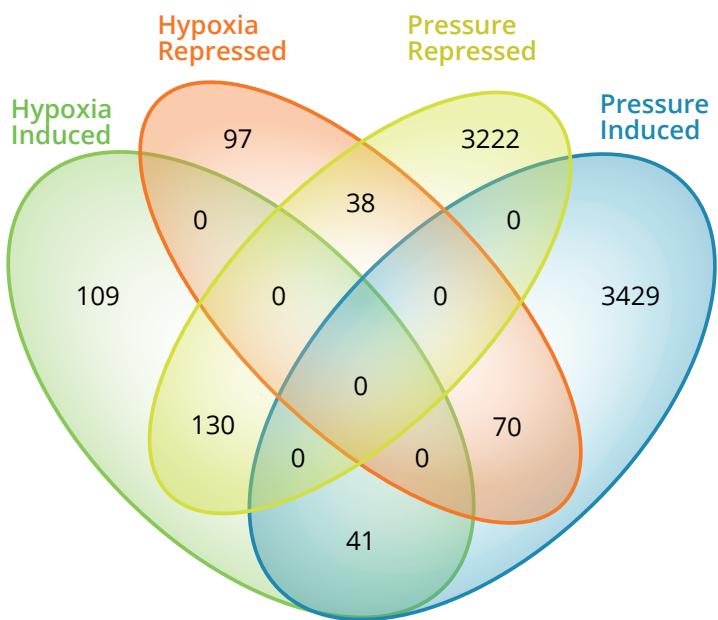


The AVATAR helps you to define and stabilize the most suitable environment specific to your cell type by regulating pressure, O₂, CO₂, and temperature. With these four parameters you can recreate the native *in vivo* conditions in which the sample was derived from. The AVATAR therefore enables the culturing of difficult to grow samples, from stem cells to patient tumor cells to primary immune cells.

- TRANSFECT
- EXPAND
- CONTROL

- Increase transfection efficiency up to 5X with high cell viability — even with difficult to transfect cells
- Expand cells faster — get up to 8X the cells in the same time it would take with standard systems and cut reagent costs in the process
- Target the cell population you want — tune your cell's microenvironment to control differentiation or maintain current state reliably and precisely
- Work with any cell type you need — primary immune cells under non-activating conditions, stem cells, tumor cells, organoids and even rare, precious cells you've never been able to expand before

Oxygen and pressure have distinct physiological effects and both play important but independent roles in the cellular microenvironment. Under hypoxic and pressurized culturing conditions, changes are seen in cell morphology, gene and protein expression. It is hence intuitive that taking cells out of the bodily context will make



Venn diagram showing the number of induced and repressed transcripts in each RNA-seq transcriptome produced in response to iPSCs exposed to hypoxia, pressure, or both.

it difficult or even impossible to have cellular functions, phenotype and metabolism remain unchanged under atmospheric culturing conditions.

The AVATAR is the only system that empowers you to control both oxygen and pressure and is hence ideal to mimic bodily environment.

In order to schedule an appointment and an onsite demo simply contact us either by phone (061 269 1111) or by email (info@bucher.ch).



xcellbio

Xcell Biosciences' AVATAR™ AD Cell Control System

Streamline your biopharmaceutical discovery and cell line development workflow like never before

Sphere Fluidics Cyto-Mine® – Single Cell Analysis and Monoclonality Assurance System

Streamline your biopharmaceutical discovery and cell line development workflow like never before

SphereFluidics' next-generation platform Cyto-Mine® is set to transform biopharmaceutical discovery and cell line development workflows, and is specifically designed to automatically perform:

- High-throughput single cell encapsulation
- Incubation followed by protein secretion assays
- Rapid cell sorting
- Dispensing of "hit" single cells into microplates
- Visual monoclonality verification

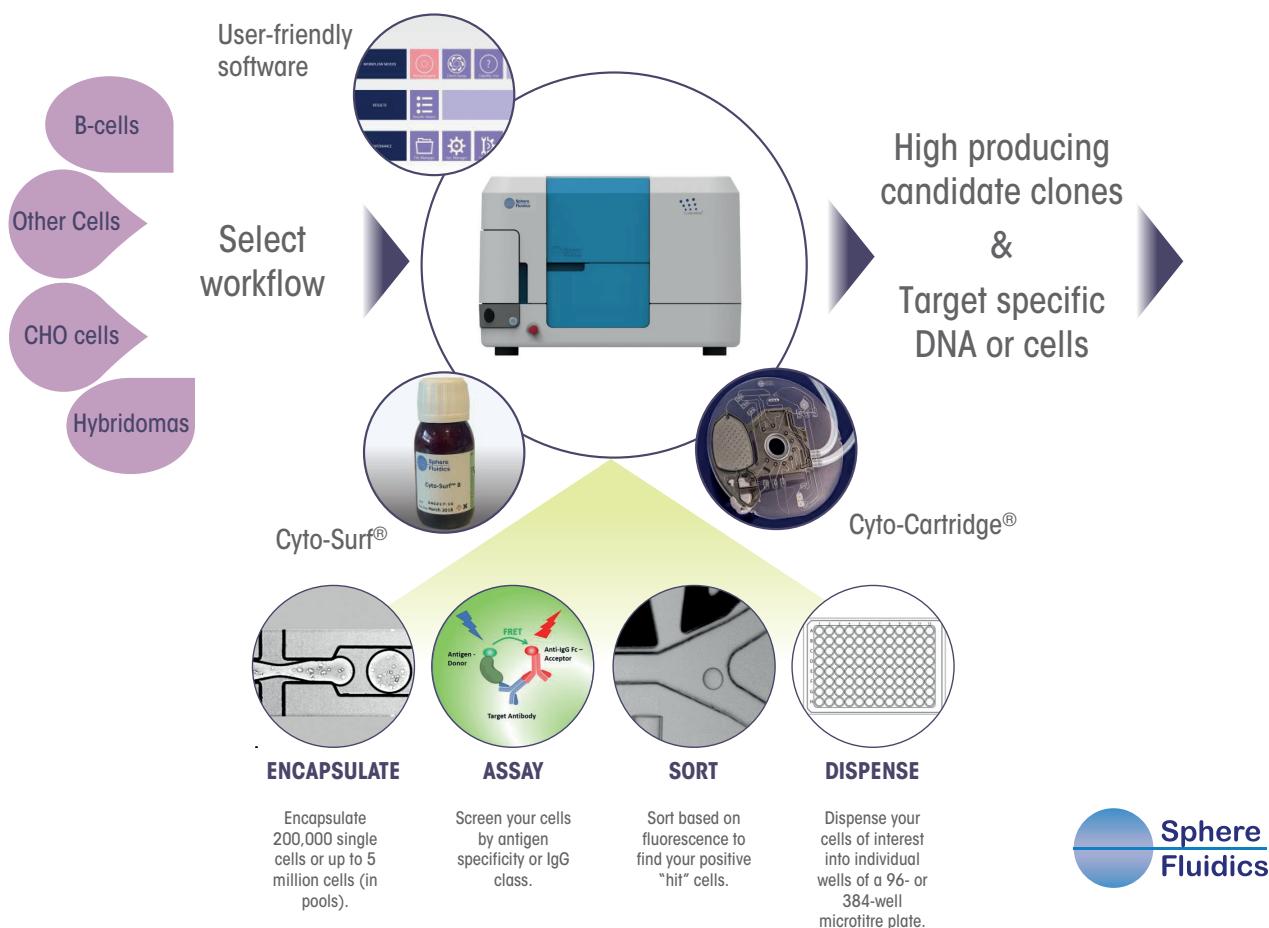
Encapsulate from 10,000 to up to 5 million transfected cells. Screen your cells for target specificity, antibody titers & IgG class or analyze cell lines to detect early onset of potential genetic drift. Sort your cells based on

fluorescence to find your positive "hit" cells. And finally dispense your single cells of interest into individual wells of a 96- or 384-well plate with monoclonality assurance.

Cyto-Mine® is the first integrated device enabling to automatically perform all of these crucial techniques in a single compact system using the integrated Cyto-Cartridge. This high-throughput instrument uses picodroplet technology and microfluidics to process around 1 million heterogeneous mammalian cells in less than a day. Each cell is encapsulated in a picodroplet containing growth media, which acts as a bioreactor to compartmentalise the cell and let it grow. And eventually trapping hit molecules such as antibodies, based on specificity and titer. This unique workflow enables selective screening of single cells to find rare lead candidates.

Please give us a call (061 269 1111). We are happy to discuss with you your specific requirements.

Accelerate your biologics discovery and cell line development workflows



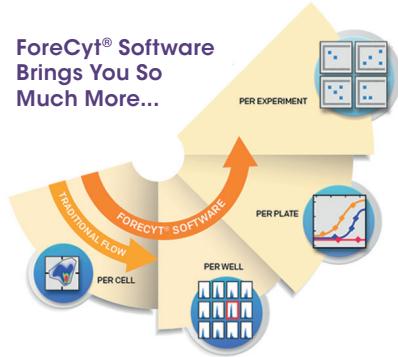
What if time, cell number or reagent costs would no longer limit your research?



IntelliCyt iQue® Screener PLUS

The iQue Screener converts flow cytometry into a truly high-throughput method by sampling only microliters from each well analyzing 96-well plates in as little as 5 minutes and 384-well plates in 20 minutes. By reducing sample volumes to a few microliters, the iQue Screener is saving reagent costs and conserving precious samples.

ForeCyt® Software Brings You So Much More...



ForeCyt® Software's Panorama Algorithm

The ONLY way to analyze multiple plates across your experiment at a glance.

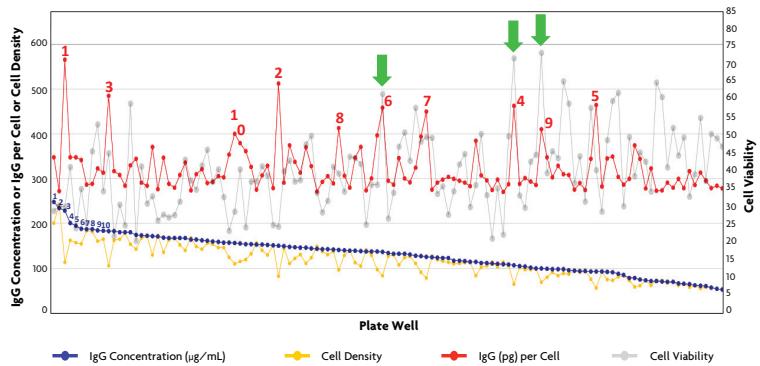
High throughput screening needs rapid acquisition with reduced sample volumes but also demands pairing with an easy-to-use software that allows for quick decision making.

- Compare heat maps across multiple plates
- Identify wells of interest using multiple criteria
- Rank wells by any metric with line graphs

Designed from a screening perspective, ForeCyt Software provides plate level annotation, analytics, and

results visualization tools not found in traditional flow-based analysis software packages. ForeCyt® offers you to take your analysis well data and use it to identify and rank "hits" over multiple plates.

Optimize, Analyze, Visualize, Realize...Faster!



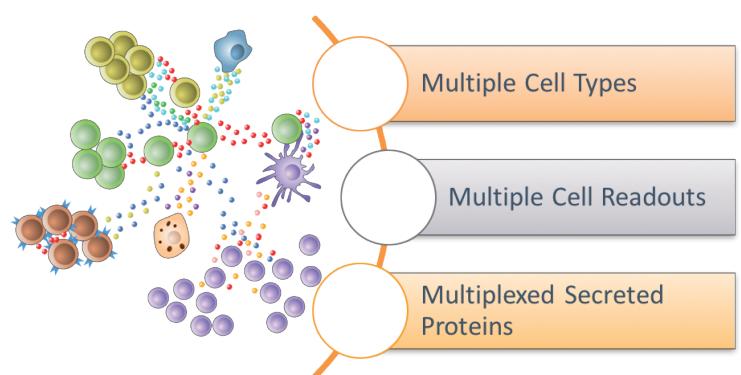
Rethink Possible with the new ForeCyt® Panorama The Fastest Way to identify and rank your hits

With its high resolution and 15 parameter analysis, the iQue is ideal for multiplexing and allows sensitive cell analysis and bead based quantification of up to 30 secreted proteins. All at the same time in the same sample.

Reducing sample volumes and subsequently event numbers empowers screening approaches even on small or precious cell samples like primary cells from patient samples. With conventional ELISA assays, binding analysis of an antibody is restricted to only one antigen per condition. Using fluorescent barcoding beads allows to combine up to 30 antigens in one condition. Even several cell types can be combined and analyzed. Together, the iQue Screener platform empowers you to quantify cytokine secretion while performing cell killing assays all at once in a single well.

IntelliCyt makes the difference!

Call us for a discussion or a demo in your lab (061 269 1111)!



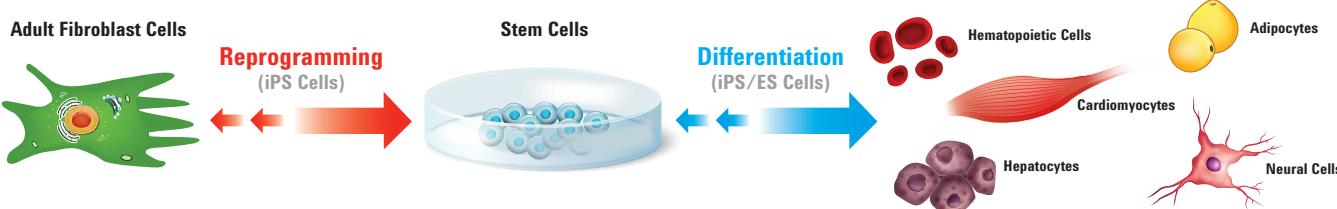
Agilent Seahorse XF Live-Cell Metabolism Solutions for STEM CELL RESEARCH



Seahorse XF Technology

- Measures distinct metabolic signatures
- Characterizes cellular phenotypes at each stage
- Enables routine and reliable stem cell phenotyping
- Facilitates the discovery of new standards and benchmarks

Improve Differentiation and Reprogramming Outcomes



Reveal the potential of your stem cells. Agilent Seahorse XF technology measures discrete changes in cellular bioenergetics in real-time, enabling researchers to predict the ability of somatic cells to reprogram, confirm pluripotency and monitor cell phenotype from pluripotency to differentiation. Achieve a new level of cell characterization, control and efficiency through label-free, real-time analysis.

Cellular age and origin, in addition to donor variability, protocol differences, growth rates and media choices all contribute to inconsistent reprogramming and/or differentiation efficiencies. Metabolic energy utilization, characterized before and after cell fate changes occur, identifies the metabolic phenotype and enables researchers to predict and confirm cell function, revealing actionable reprogramming and differentiation potential. Cellular metabolic phenotyping measures the cell's energy requirement and pathway preference for readying the transition between undifferentiated and differentiated states. Metabolic switching occurs rapidly as cells transition from quiescent to pluripotent and/or from pluripotent to differentiated.

With over 20,000 genes, 200,000 proteins and thousands of pathways, you can't measure everything in a cell at once, but you can measure what provides the energy that drives them—metabolism. Agilent Seahorse XF technology detects changes in cell bioenergetics — mitochondrial respiration and glycolysis — in real-time, providing a window into the critical functions driving cell signaling, proliferation, activation, toxicity and biosynthesis. Move beyond analyzing what your cells are, and reveal a clearer picture of what they do.

Ask us for a detailed discussion on how to optimally implement functional metabolism in your own research.

Please contact us by phone (061 269 1111) in order to receive your copy of the new Agilent Seahorse XF Stem Cell Research Brochure and learn about the latest Stem Cell webinars.

Promotion of Georg Kienzle

We are pleased to inform you about the appointment of Dr. Georg Kienzle as our **Director of Sales and Support**.

Georg joined our company 18 years ago as a Support Scientist. He gradually took over sales responsibilities without detaching from certain support functions. Over the years he has gained a solid foundation of knowledge of life sciences research equipment and technologies.



With his team Georg will strive to continue to provide the high level of support to our highly esteemed customers which you became accustomed to from Bucher Biotec over the last 40 years.

Please join us in wishing Georg continued success.

High Performance Flow Cytometry for Everyone

ACEA Biosciences NovoCyte Benchtop Flow Cytometer

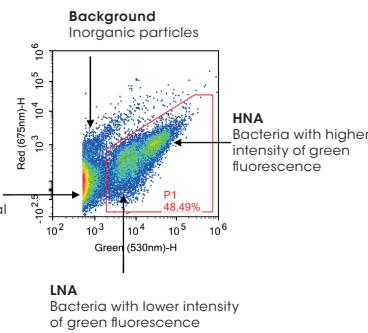


Address the full range of current and future multi-parameter analysis research needs with the NovoCyte flow cytometer. ACEA brings researchers high performance flow cytometry at a low investment cost with the NovoCyte platform.

Whether you are measuring cells, bacteria, vesicles, beads, or a combination of all of those, the NovoCyte is a real asset to any laboratory.

- **Powerful** – up to 15 colors & FSC/SSC detection with enhanced sensitivity and resolution.
- **Intuitive** – automated instrument maintenance functions and advanced data analysis capabilities for greater usability.
- **Customizable** – 1 to 3 laser options, exchangeable filters, multiple sampling options, and flexible analysis formats.

Other important features enhance usability, such as fixed optical alignment, 24-bit detection dynamic ranges with no need for PMT voltage adjustment, accurate volumetric-based cell counting, pressure sensors to monitor fluidic status in real-time, and automatic cleaning and decontamination processes.

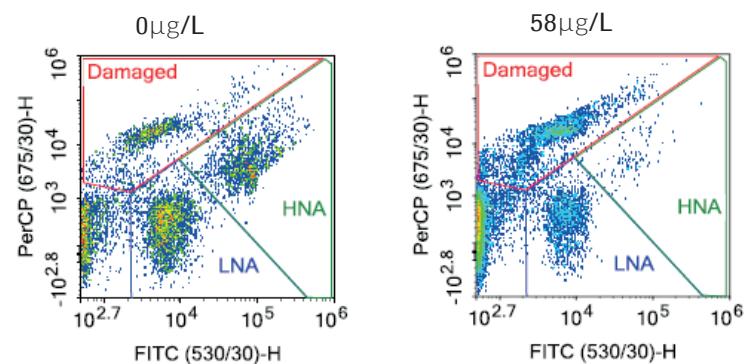


Water	TCC (total cell count (cells/ μ l))
0.1um filtered deionized water	<1
Bottle water	<1
Tap water	195
Mountain stream	206
Spring	784
Lake 1	3,655
Lake 2	7,893
Wetland	9,200

Detection of bacteria in natural waters. Fresh natural water was stained with SYBR Green I. High nucleic acid content (HNA) was separated from low nucleic acid content (LNA) by the intensity of green fluorescence. Absolute counts were obtained automatically in each sample.

Enable. Disrupt. Science.
NovoCyte is the right tool.

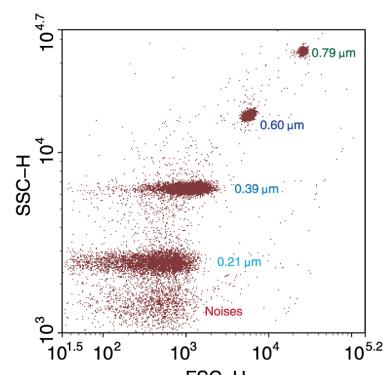
App. Note No. 12:
Detection of Bacteria in Environmental Waters using the NovoCyte Flow Cytometer



Total count and viability of SYBR Green/PI stained bacteria of spring water untreated (left) and after chlorine treatment (right).

NovoExpress® software facilitates intuitive and easy sample acquisition and analysis. It allows switching to analysis while still in the process of acquiring other samples. **Never worry again about software stability!**

Flexible analysis templates and plotting tools offer enhanced data analysis efficiency.



Bangs Laboratories NIST Traceable Particle Size Standards

Request your copy of the **NovoCyte Application Note Nr. 12** by contacting us via info@bucher.ch

Please contact us in order to discuss your specific projects and/or to arrange for a demo at your lab (phone 061 269 1111).

Rapid and Accurate Single Bacteria Cell Quantification

Logos Biosystems' QUANTOM Tx™ Microbial Cell Counter

The QUANTOM Tx™ Microbial Cell Counter is an image-based, automated cell counter that can count individual bacterial cells in mere minutes. The sophisticated QUANTOM™ cell counting algorithm is the first of its kind, capable of detecting individual bacterial cells regardless of their diverse morphologies and arrangements. Multiple images of fluorescence-stained cells are captured and analyzed automatically for rapid and accurate bacterial cell counts.

Rapid

- Minutes to results
- No culturing required

Accurate

- Objective and no user-to-user variability
- No estimating based on colony forming units or turbidity

Single bacterium detection

- Regardless of cell shape, size, or arrangement
- Sophisticated bacterial cell counting software

Declustering algorithm

Bacterial cells often exist in dense clusters, making cell detection a challenging feat. Colony counting is a

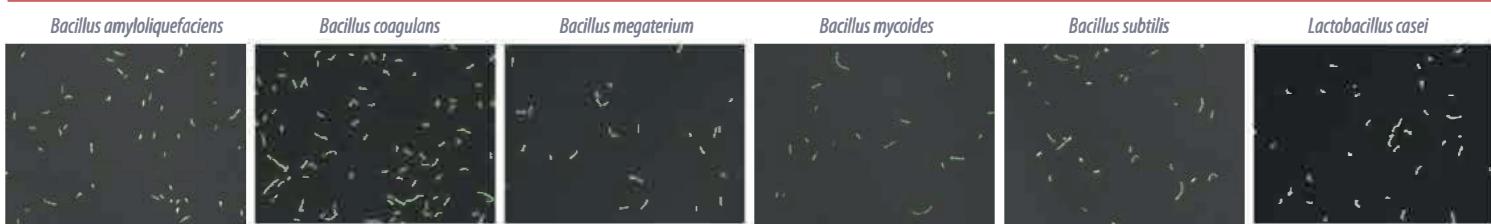


highly variable and unreliable counting method, as it is only an estimate of the viable cells present. A colony could arise from a single cell or a thousand cells. Even expensive flow cytometers and laser scanning cytometers register each particle, single or clustered, as a single event. In principle, individual cells in clusters can only be distinguished and counted with image-based counting methods. The QUANTOM Tx™ has a novel cell detection and declustering algorithm that can accurately count individual bacterial cells in even the tightest clusters.

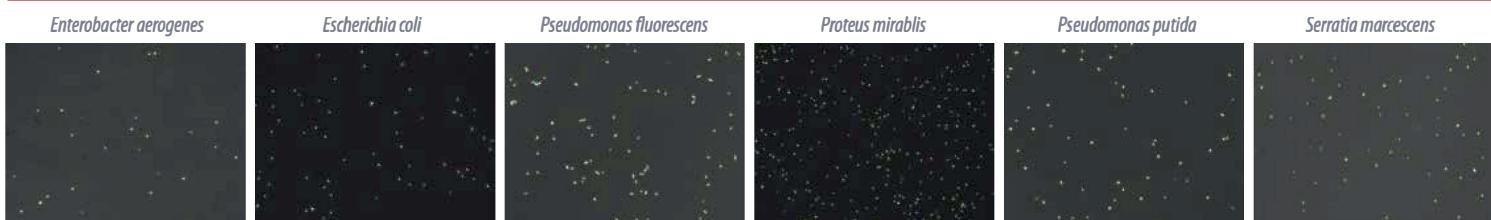
In order to discuss your specific needs simply give us a call (061 269 1111).

Bacteria Validated on the QUANTOM Tx™

Gram positive

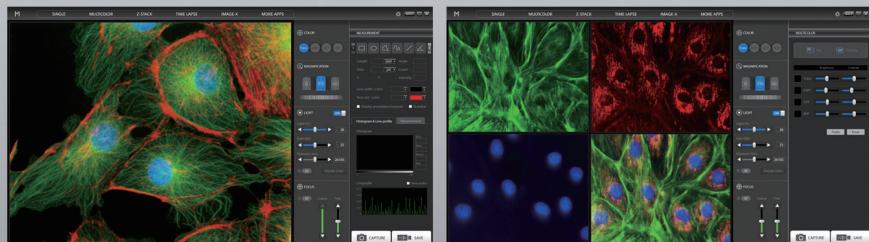


Gram negative



This is a partial list of bacteria tested on the QUANTOM Tx™.

Imaging to Data Analysis with One Single Device, in One Sitting!



CELENA™ S
DIGITAL IMAGING SYSTEM



CELENA™ S High Performance Digital Imaging System

The CELENA® S is a comprehensive solution for capturing publication-quality fluorescence, brightfield and phase contrast images. Sophisticated software accommodates a wide range of imaging applications such as image capture and analysis, live cell imaging, and even automated cell counting. Capture amazing detail with a few clicks of your mouse.

The CELENA® S is a small and powerful digital imaging system that simplifies imaging and data analysis. Integrating advanced precision optics, a highly sensitive scientific grade CMOS camera, and a computer with user-friendly software, the CELENA® S allows researchers to capture vivid, publication quality images with ease. Interchangeable objectives and filter cubes accommodate a wide range of imaging needs. Researchers can use the CELENA® S for multiple applications, such as capturing and analyzing multicolor fluorescence images, live cell imaging, and automated cell counting.

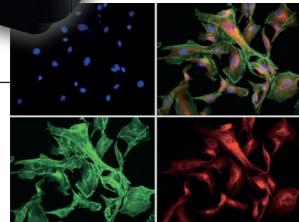
Are you curious to see the system or even better to see your cells or samples right on the system?

We are looking forward to provide more information and arranging for an onsite demo of the CELENA® S.



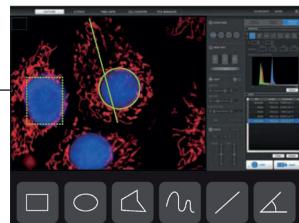
Multicolor Fluorescence and Brightfield Imaging

Long-lasting LEDs and hard-coated optical filters ensure robust fluorescence imaging. Adjustable LEDs allow precise control over the gain and intensity of transmitted light.



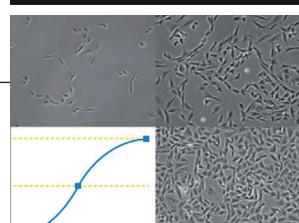
Onboard Data Analysis

Analyze your images immediately upon capture. Save measurement data to a USB drive.



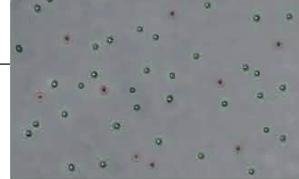
Live Cell Monitoring

Monitor live cells with the time lapse function or the growth monitor. Attach the on-stage incubator to control the temperature, humidity, and CO₂/O₂ levels.



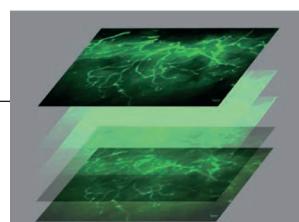
Automated Cell Count and Viability Analysis

Check cell counts and viability with the onboard cell counter



Z-stack Imaging

Capture multiple images along the Z-axis with the Z-stack function.



Upcoming Events

Please visit us at anyone of these events:

- **WIRM 2018**
World Immune Regulation Meeting
Davos, 14. - 17. March 2018
- **Wyss Center - Light Sheet Workshop**
Campus Biotech Geneva, 20. March 2018
- **Bucher Seminar on Immuno Oncology**
Olten, 19. April 2018
- **Bucher Seminar on Stem Cells**
Olten, 16. May 2018
- **Basel Life / MipTec 2018**
Congress Center Basel, 12. - 14. September 2018

Imagine a New Dimension of Tissue Imaging

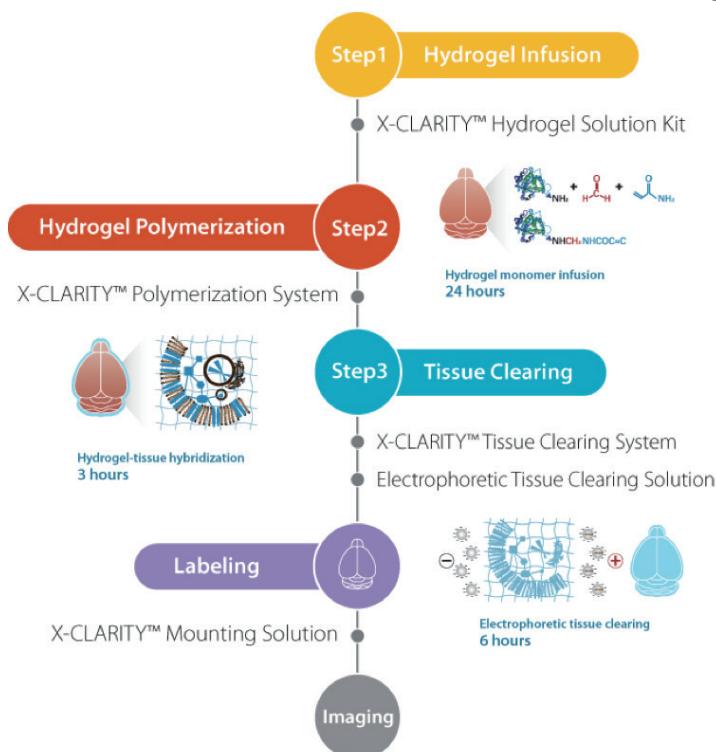
Logos Biosystems' X-CLARITY™ Tissue Clearing System



Time is your most valuable asset in research. Imagine the time you spend preparing, sectioning, labeling, mounting, imaging, reconstructing, and analyzing hundreds upon thousands of ultra-thin slices. Now imagine never having to section again. Keep your samples whole and acquire high-resolution volumetric images with X-CLARITY™, your ultimate solution for Clarity electrophoretic tissue clearing.



CLARITY™ is a tissue clearing method that produces structurally sound and transparent whole tissues, preserving fluorescent reporter proteins and ready for multiple rounds of antibody labeling and imaging. The method has opened up a world of possibilities, from tracing



neural circuitry to exploring the relationship between structure and function or the study of solid tumor spread in organs.

This novel technology produces transparent tissues by forming a hydrogel network that supports the ultrastructure while allowing for the removal of lipids.

Unlike other tissue clearing methods, CLARITY™ uniquely maintains endogenous fluorescence reporter and enables the efficient labeling of tissues with macromolecules such as antibodies and nucleic acids, making high resolution imaging possible.

CLARITY™ is the trademark of Stanford University. Logos Biosystems licensed and independently developed the original CLARITY™ technology to make significant improvements for tissue clearing efficiency and reproducibility.

Tissue clearing has never been faster or simpler.

The X-CLARITY™ Tissue Clearing System can clarify a whole adult mouse brain in under 8 hours! The X-CLARITY™ Systems have been used to clear a variety of tissues, including heart, liver, spleen, muscle, lung, kidney or even plants.

To learn more about tissue clearing in general and the various applications for the X-CLARITY™ Tissue Clearing System please have a look at this illuminating and comprehensive publication:

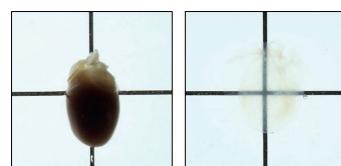
ACT-PRESTO: Rapid and consistent tissue clearing and labeling method for 3-dimensional (3D) imaging

Request your copy today!

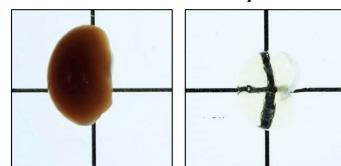
The X-CLARITY™ system with the new polymerization station and the ready-to-use reagents from Logos Biosystems have been developed to standardize, simplify and accelerate each step of the tissue clearing process.

X-CLARITY™ Samples

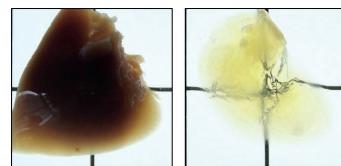
Mouse Heart



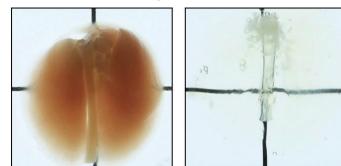
Mouse Kidney



Mouse Liver



Mouse Lungs and Trachea



Before

After

SCIENTIFIC REPORTS



Nature Scientific Reports
Eunsoo Lee et al.
6:18631 (2016)

Accelerate your research with X-CLARITY™!

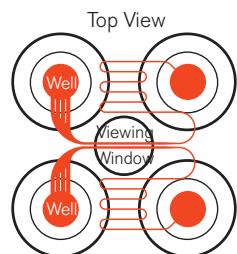
In order to schedule an appointment and an onsite demo simply contact us either by phone (061 269 1111) or by email (info@bucher.ch).

Bringing Physiological Flow To Live Cell Assays

Hematology

Fluxion BioFlux™

The BioFlux system delivers a complete solution for functional live cell assays **under controlled laminar shear flow**. Well Plate Micro Fluidics™ combines the ease of use of well plate assays with the data quality and relevance of shear flow experiments.



Schematic of BioFlux channels. Two independent channels are shown. This pattern is repeated to form up to 24 identical channels in one device.

With the BioFlux system, you have full control of flow rates and temperature while working with a closed microtiterplate. In this unique design, all fluids will remain within the well plate at all times, hence, reducing volumes as well as tedious liquid handling. Applying pneumatic pressure allows for a stable and highly reproducible shear even at low flow rates. The flow chambers are then imaged with time-lapsed microscopy.

Platelet adhesion and aggregation

Analysis of platelet function under flow is requisite to understanding the complex biological relationships contributing to hemostasis and thrombosis. The function of platelet receptors and the eventual biological outcome are strongly influenced by fluid shear stress generated by the partially laminar flow of blood in the circulation.

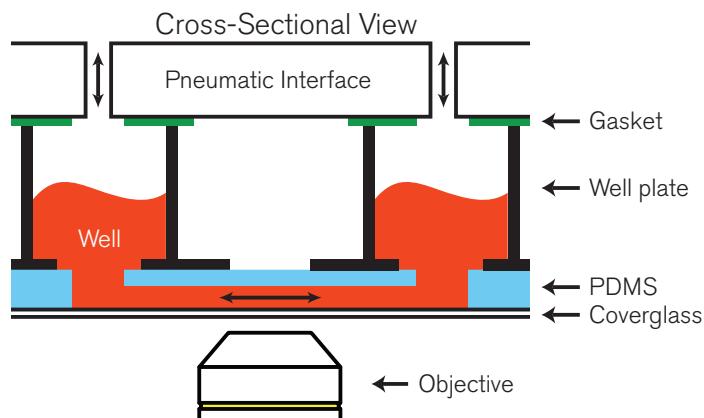
With traditional parallel plate flow chambers (PPFC) a large blood volume is required and the experimental throughput is especially low (1-2 conditions per hour) which precludes any studies with murine blood and comparison assay of blood from a single donor. In contrast to PPFC, the BioFlux offers higher throughput, enhanced real-time microscopy data, reduced sample volume requirements, and easier setup procedures.



100µm

100µm

Fig 1: Platelet adhesion and aggregation on Fibronectin (top) and sheared Collagen I (bottom). As expected, platelets from whole blood perfused over the Fibronectin substrate formed unstable, partially reversible small aggregates with an average aggregate size of 95 µm². In contrast, Collagen I exposure leads to rapid formation of large stable platelet aggregates within 2-3 min with an average size of 2000 µm².



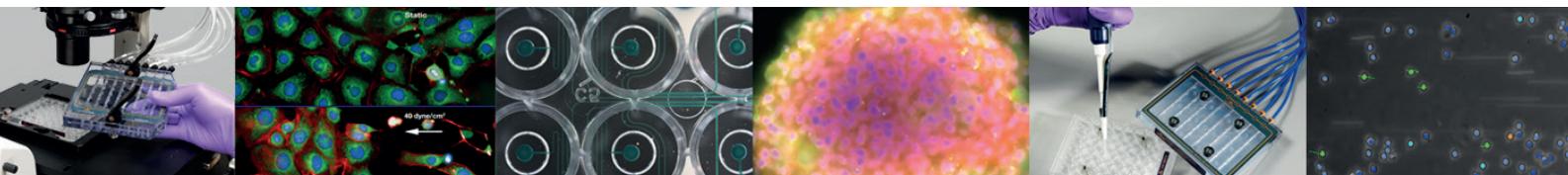
An airtight interface is attached to the BioFlux plate to allow tight pneumatic flow control with the BioFlux controller

Fig 1 shows an example of platelet adhesion to a cellular monolayer using whole blood and comparing the effect of Fibronectin to Collagen I in thrombus formation. The cell monolayer can be grown *in situ*, the blood is added under perfusion directly to the cells, and shown is the end-point of the time-lapse imaging. Note that the aggregation kinetics but also the average aggregate size can be determined using the BioFlux set-up.

BioFlux Highlights:

- Very low sample volume required, enables murine, pediatric and single draw same donor studies over several parameters
- Rapid assembly enables maximum throughput, up to 144 conditions per hour. Easy to use, no device assembly or preparation required
- Flexible format allows use of extracellular matrix, purified proteins, or cellular monolayers as binding substrates
- *In vitro* models can include human endothelial cells and human blood donors
- Up to 24 parallel conditions can be assessed with a single blood draw
- Covers a wide shear range to emulate physiological and pathological conditions
- Allows use of whole blood or purified platelets
- Enables tunable pulsatile flow

In order to discuss your specific requirements simply give us a call (061 269 1111).



Safe the Date! Invitation to our Seminar Days on Immuno-Oncology and Stem Cells



Olten, April 19 2018

We would like to invite you to our upcoming Seminar Days. Further information will be distributed in the next few weeks. We are looking forward to welcome you in Olten!

Speakers:

- Roger Geiger, PhD, IRB Bellinzona
- Svetoslav Kalaydijev, PhD, Agilent-Seahorse
- Brecht Hoedemaekers, PhD, ImmunXperts
- Janette Phi, Xcell Biosciences
- Alessandro Prigione, PhD, Max-Delbrueck-Center Berlin
- Ned Jastromb, Agilent-Seahorse
- Giusy Di Conza, PhD (Lab Prof. Ping-Chih Ho) Univ. of Lausanne Amgen iQue Integration into Liquid Handling Automation
- Kathrin Pieles, PhD, Bucher Biotec AG
- Sylvie Rusakiewicz, PhD, Univ. of Lausanne

Participation is free of charge!

Simply give us a call (061 269 1111) or send us an email (seminar@bucher.ch) in order to register for either one or both of these events!



Olten, May 16 2018

World's Most Sensitive Microvolume Spectrophotometer

DeNovix DS-11 FX+ Spectrophotometer / Fluorometer

The DeNovix DS-11 FX Series offers your choice of combined UV-Vis and Fluorometer modes in one space-saving unit. Pre-installed EasyApps® and an intuitive Android operating system make it easy to rapidly quantify samples. DeNovix instruments are calibrated for life.

Just pipette and measure. **It's that simple!**



Microvolume UV-Vis
0.75 - 37,500 ng/µL dsDNA
Calibration-Free SmartPath® Technology

Integrated Fluorescence
0.0005 - 4,000 ng/µL dsDNA
UV, Blue, Green, Red channels

Cuvette UV-Vis
0.04 - 75 ng/µL dsDNA
OD600, Kinetics, Colorimetrics

Best-in-Class Performance and Features

When comparing the DeNovix DS-11 Series vs. other nanodroplet spectrophotometers, scientists consistently rate the DS-11 Five Stars on independent review sites!

- Most Sensitive 1µL UV-Vis available
- Broadest Dynamic Range
- Stand-Alone (no PC required)
- Maintenance and Calibration Free

Would you like to convince yourself? We are so certain you will find DeNovix products easy-to-use and just right for your lab that we will send you the instrument to try for a week with no obligation.

Just let us know! We are ready to act quickly.



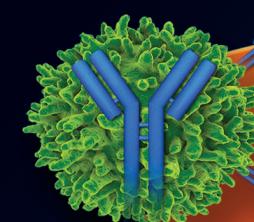
Combined Absorbance and Fluorescence
= Quantification over 7 orders of magnitude



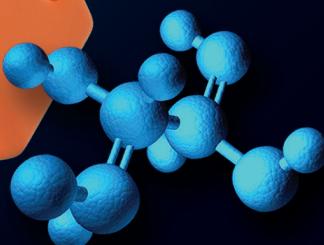
Screen Suspension Cells FAST for Function and Phenotype

IMMUNO-ONCOLOGY

ANTIBODY
DISCOVERY



IMMUNE
TARGETS



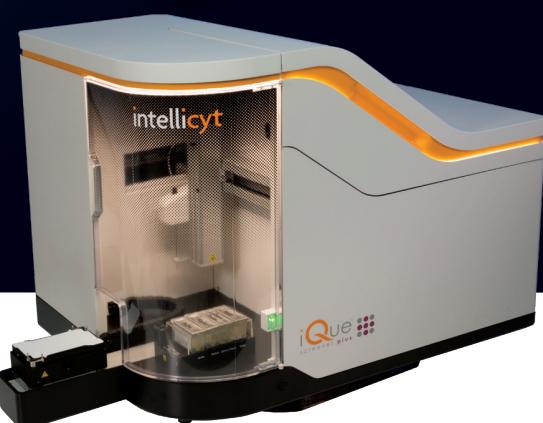
The fastest high-content suspension
cell screener just got better!

Now with
multiple laser
configurations
for maximum
assay flexibility.

The IntelliCyt Advantage delivers more of
what matters when profiling single cells
for functional and phenotypic endpoints:

- More answers in less time.
- More data from less sample.
- More user-friendly.
- More cost savings.
- More insight for better decisions.

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