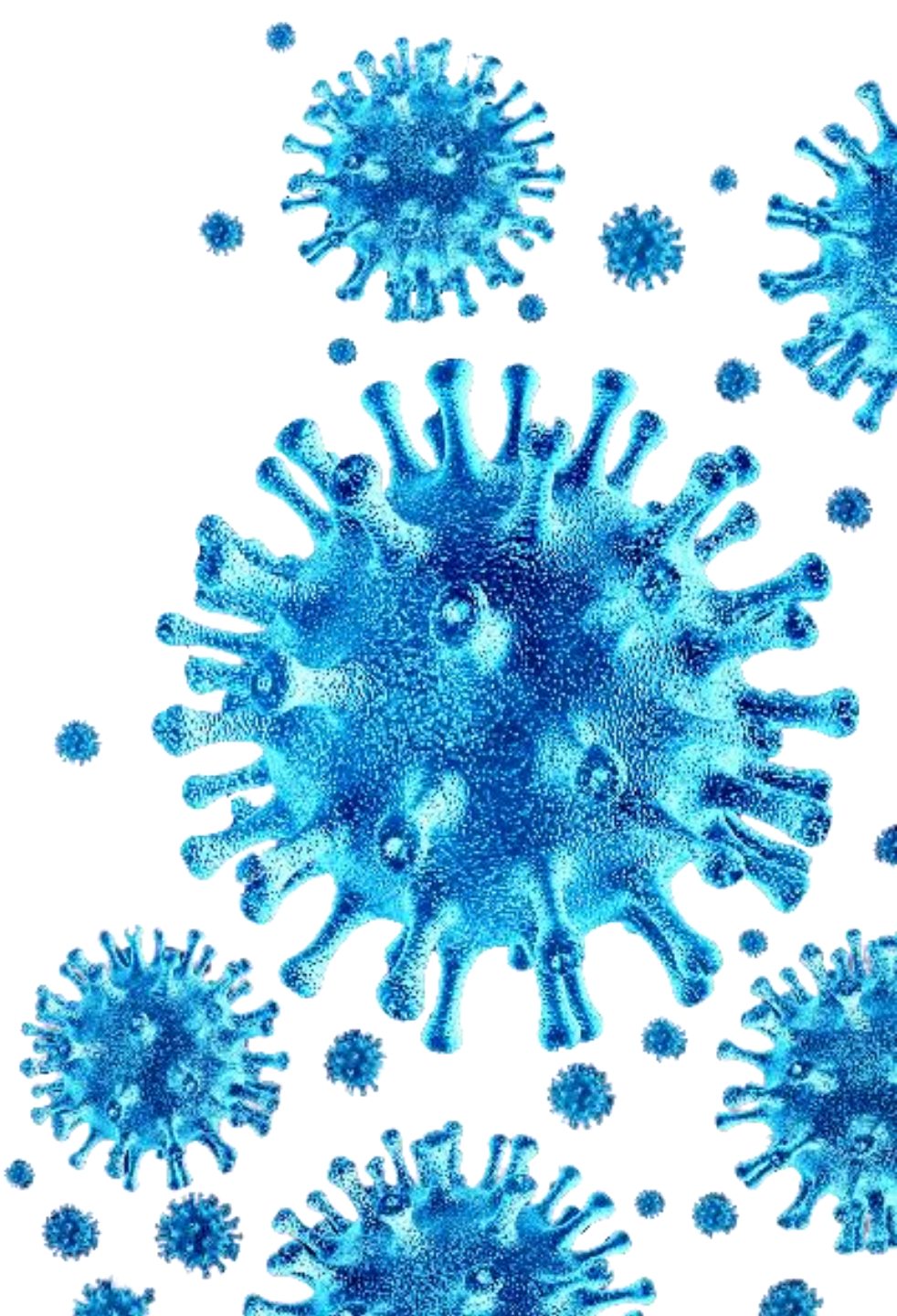
Greiner Bio-One
präsentiert Produkte zur COVID-19 Forschung, Diagnostik und Impfstoffherstellung

HUBERLAB. AG
Ihr Partner im Labor

zuverlässig ■ persönlich ■ schnell

HUBERLAB.
committed to science



Greiner Bio-One

Ist der verlässliche Partner in der Pandemie-Zeit

Da die Welt dringend global zugängliche COVID-19-Impfstoffe und -Behandlungen benötigt, haben zahlreiche Forschungseinrichtungen und Pharmaunternehmen ihre Forschung auf SARS-CoV-2 konzentriert.

Greiner Bio-One bietet ein umfassendes Sortiment an hochwertigen Laborartikeln für den allgemeinen Gebrauch sowie spezifische, wertschöpfende Lösungen für die COVID-19-Forschung, Diagnostik und zukünftige Impfstoffproduktion.

Die Konzentration auf sichere Lieferketten, eine unterbrechungsfreie Produktion und die entsprechende Priorisierung von Produkten mit erhöhter Nachfrage machen Greiner Bio-One heute zu einem zuverlässigen und stabilen Lieferanten von entscheidenden Laborprodukten.

Info: Die folgende Präsentation ist auf Englisch verfasst.

Contents

1. SARS-COV-2 DIAGNOSTICS & VIRUS DETECTION

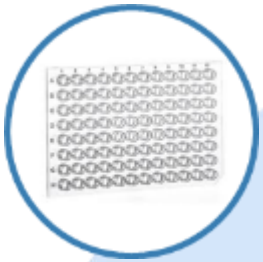
1.1 Products for SARS-CoV-2 Diagnostics & Virus Detection

HUBERLAB. committed to science

greiner BIO-ONE

- Virus detection in individual or pooled patient samples
- Storage of patient samples for corona diagnostics
- Liquid handling steps
- Media and buffer preparation, centrifugation steps

Sapphire
PCR Plates and Tubes



Small Volume Tubes
Cryo.s™ and Reaction Tubes

Sapphire
Filter Pipet Tips and Pipettes

CELLSTAR®
Centrifugation Tubes

1.2 PCR Products

HUBERLAB. committed to science

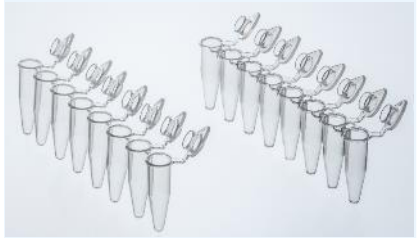
greiner BIO-ONE

- Full range of PCR reaction vessels and microplates for all major PCR applications such as virus DNA detection in any sample type

PCR reaction vessels

PCR Tubes:

PCR 8-Tube Stripes:



PCR Plates:

Design & function

- Thin-walled design for optimal heat transfer
- Low profile-design for FAST PCR
- Comprehensive thermal cycler compatibility
- Broad range of compatible sealers and caps:
  - SILVERseal™
  - VIEWseal™
  - AMPLIseal™
  - 8-cap strips

Quality & certification

- Endotoxins-free
- Free of human DNA, DNase and RNase
- Manufactured from medical-grade polypropylene with low additive-content
- Real-time PCR cap strips with flat and highly transparent lid

Available versions

- PCR Tubes 0.2 ml / 0.5 ml
- PCR 8-tube Strips 0.2 ml
- 8-tube Strips with individually attached caps 0.2 ml
- Low Profile 8-Tube Strips 0.1 ml
- Various versions of 96 and 384 well microplates:
  - No skirt
  - Half-skirt
  - Full-skirt

Detection limits apply

1.3 Cryo.s™ Cryogenic Tubes

HUBERLAB. committed to science

greiner BIO-ONE

- Cryogenic storage and transport of diagnostic patient specimens
- Barcoded tubes for unambiguous retained sample identification in diagnostics

Cryo.s™

Classic Tube Design:

Barcoded Tubes:

Design & function

- Automation-suitable design with star-foot base and decapper-suitable screw cap
- Classic design with writing area and graduation
- Barcoded version with linear barcode, datamatrix code and human readable code representation

Quality & certification

- Endotoxins-free
- Free of human DNA, DNase and RNase
- TSE/BSE-free
- Class-1 medical product (CE, FDA)
- USP class VI certified, medical grade tube material
- Sterile (SAL 10^{-6}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Airfreight approved

Detection limits apply

Available versions

- Multiple working volumes 1.0 to 4.5 ml
- Five cap colors for coding of sample type
- Internal and external thread versions
- Customized and ‘off-the-shelf’ barcoding option
- Triple-packed versions

2. SARS-COV-2 ANTIBODY DETECTION & CLINICAL STUDIES

2.1 Products for SARS-CoV-2 Antibody Detection & Clinical Studies

ELISA
Plates & break Strips

- Enzyme-linked immunosorbent assay for quantitation of antibodies in human sera

Small Volume Tubes
Biobanking & Reaction Tubes

- Storage and transportation of patient specimens and clinical study samples

Sapphire
Filter Tips / Pipettes

- Liquid handling steps

Leucosep™
Tubes

- PBMC isolation for immune cell profiling of COVID-19 patients in the recovery

2.2 ELISA Plates

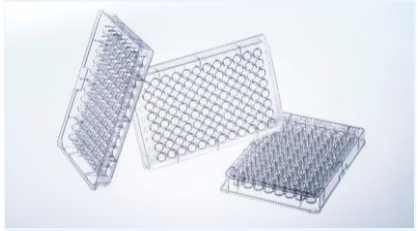
HUBERLAB. committed to science

greiner BIO-ONE

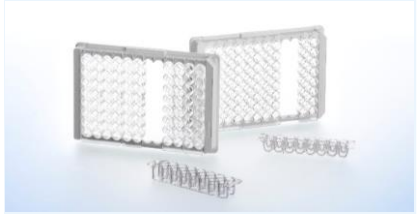
- Microplates providing optimal solutions for the quantitation of antibodies in human sera in Enzyme-Linked Immunosorbent Assays

ELISA plates

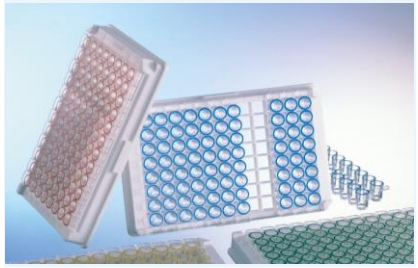
96 well ELISA Microplates:



96 well ELISA Strip Plates:



Single-break Strip Plates:



Design & function

- Standard microplate format for full automation compatibility
- Medium and high binding surfaces
- Multiple designs for maximum flexibility:

Design	Number of parallel analyses
Full 96 well plate	96
Strip plate	Multiples of 8
Single break strip	1 – 96

Quality & certification

- Routine testing of incoming raw materials with immunoassays
- Consistent surface properties and minimum variation:
  - Well-to-well
  - Plate-to plate
  - Batch-to-batch
- Free of detectable endotoxins, human DNA, DNase/RNase
- Non-pyrogenic

Available versions

Bottom/ well shape	Full 96 well plate	Strip plate	Single break strip
U	Clear/ black/ white	8-strip clear 16-strip clear	
V	Clear/ black/ white		
F	Clear/ black/ white	8-strip clear/ white/ black 16-strip clear	
Half area	Clear/ black/ white		
C			8-strip clear*

* Color coding option

Detection limits apply

2.3 Cryo.s™ Biobanking Tubes

HUBERLAB. committed to science

greiner BIO-ONE

- Automation-friendly storage of retained samples in virus diagnostics, especially when positive tests of pooled sampled need to be traced back to individuals

Cryo.s™

Biobanking Tubes:

Handheld Decapper:

Design & function

- Automation-friendly, high throughput-suitable tube and rack design
- Datamatrix coding and human readable features on tube and rack bottom for unambiguous sample tracking
- Height-reduced internally thread tube design saving up to 30% storage space

Quality & certification

- Class-1 medical product (CE, FDA)
- USP class VI certified, medical grade tube material
- Sterile (SAL 10^{-6}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Free of detectable endotoxins, human DNA, DNase/RNase
- IATA-conform certification for air-shipment of samples

Available versions

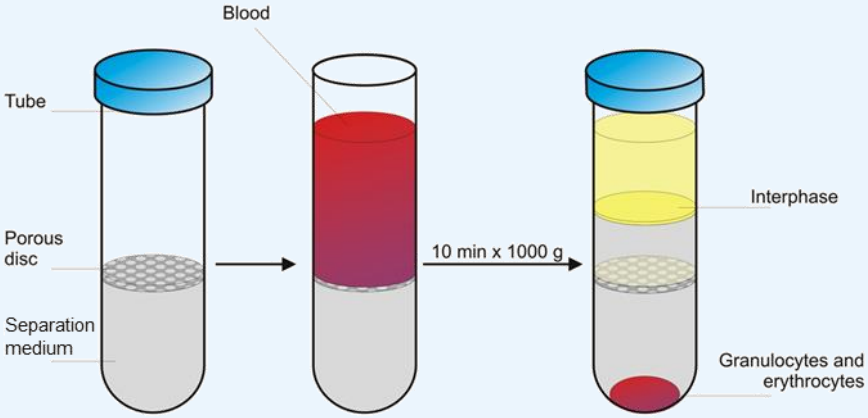
- Multiple working volumes ranging from 235 to 975 µl
- Eight cap colors for coding of sample type
- Customized and ‘off-the-shelf’ barcoding option
- Accessory handheld decapper for convenient tube opening and re-closure

Detection limits apply

2.4 Leucosep™ Tubes

- Density-gradient based isolation of PBMCs from whole blood or buffy coats for immune cell profiling of COVID-19 patients in the recovery

Leucosep™ workflow



Interphase contains peripheral mononuclear cells.

Leucosep™ Tubes

50 ml version:

12 ml version:

Design & function

- Porous disc:
  - No mixing of blood and separation medium
  - No carry-over of granulocytes and erythrocytes during harvesting

Quality & certification

- Non-pyrogenic
- Non-cytotoxic (ISO 10993-5 conform)
- Non-prefilled, sterilized versions with SAL 10^{-6} (ISO 11137 conform)
- Pre-filled versions produced under aseptic conditions

Available versions

- 12 and 50 ml versions
- Non-filled option for flexible selection of separation medium
- Pre-filled option containing polysucrose-based medium

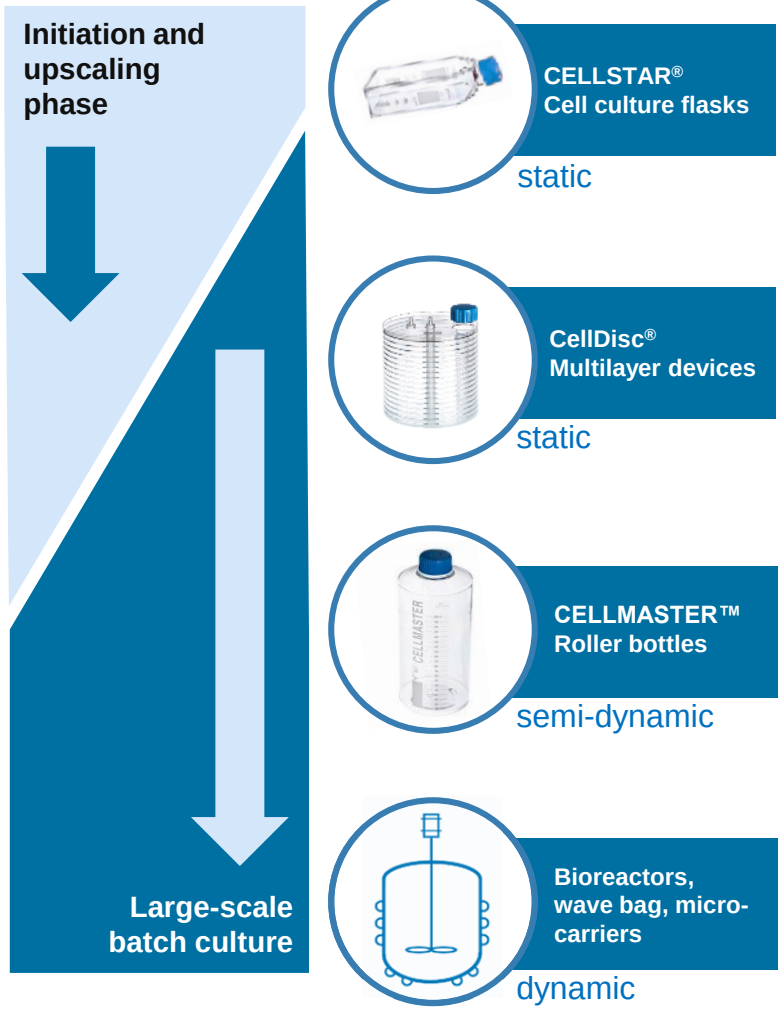
Detection limits apply

3. VIRAL VACCINE PRODUCTION – WORKFLOW & PRODUCTS

3.1 Viral Vaccine Production – Workflow & Products

	Viral stock / Cell stock	Infection / Cell expansion	Upscaling and high-density adherent cell culture	Bulk harvesting and testing	Down-stream processes	Formulation and batch release
 Cryo.s™ Cryogenic tubes	✓					
 CELLSTAR® Cell culture flasks, tubes, pipettes		✓				
 CELLMASTER™ Roller bottles			✓			
CellDisc® Multilayer devices			✓			
 CtyoInspect™ Mycoplasma detection kit	✓		✓	✓		✓

3.2 Adherent Cell Culture for Viral Vaccine Production



Devices (exemplified)	Growth area	Potential yield
CELLSTAR® flask T25 version	25 cm^2	5 x 10^6 cells/device
CELLSTAR® cell culture flask T75 version	75 cm^2	5 x 10^6 – 2 x 10^7 cells/device
CELLSTAR® cell culture flask T175 version	175 cm^2	1 x 10^7 – 5 x 10^7 cells/device
CellDisc™ multilayer system 1-layer version	250 cm^2	2 x 10^7 – 7 x 10^7 cells/device
CellDisc™ multilayer system 4-layer version	1000 cm^2	8 x 10^7 – 3 x 10^8 cells/device
CellDisc™ multilayer system 16-layer version	4000 cm^2	3 x 10^8 – 1.2 x 10^9 cells/device
PS CELLMASTER™ roller bottle 1X version, smooth	850 cm^2	6 x 10^7 – 2 x 10^8 cells/device
PS CELLMASTER™ roller bottle 2.5X version, ribbed	2125 cm^2	1.4 x 10^8 – 6 x 10^8 cells/device
PS CELLMASTER™ roller bottle 5XL version, ribbed	4250 cm^2	3 x 10^8 – 1.2 x 10^9 cells/device

3.5 CellDisc™ Multi-layer Systems

- Compact single-use cell culture device for virus or vaccine production
- Suitable for basic research as well as industrial production

CELLdisc™

Product versions:

Design & function

- Predictable scale up within one format, 250 cm^2 – 10.000 cm^2
- Simplified workflow: fill, tilt and turn
- Reduced number of steps in workflow
- Reduced risk of contamination
- TC and Advanced TC surface treatments for optimum cell attachment
- Ideal ventilation through central gas support channel

Quality & certification

- FDA class-1 medical product
- USP class VI certified
- Sterile (SAL 10^{-6}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Free of endotoxins, human DNA, DNase/RNase
- Lot number and best before date on each CELLdisc™

Available versions

- 1-, 4-, 8-, 12-, 16-, 24- and 40-layer versions
- Each version obtainable with TC surface (red screw cap) and Advanced TC surface (blue screw cap)
- Also available with external filters and triple-packed for clean room applications

CELLdisc™
EXF Versions

Detection limits apply

3.6 CellDisc™ Closed Filling Cap

HUBERLAB. committed to science

greiner BIO-ONE

- Compact, closed system and single-use cell culture device for virus or vaccine production in GMP-regulated environments

CELLdisc™

Closed Filling Cap Variants:

CF1:

CF2:

Design & function

- Closed system for safe fluid transfer
- Maximally reduced risk of contamination
- Screw cap with silicone hose and easy-to-use MPC plug system
- Preassembled, ready-to-use design
- All versions triple-packed for clean room applications

Quality & certification

- FDA class-1 medical product
- USP class VI certified
- Sterile (SAL 10^{-6}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Free of endotoxins, human DNA, DNase/RNase
- Lot number and best before date on each CELLdisc™

Available versions

- 1-, 4-, 8-, 12-, 16-, 24- and 40-layer versions
- Available with TC or Advanced TC surface treatment
- Two screw cap versions:
  - CF1 with single tubing (emptying by gravity)
  - CF2 with double tubing including a Dip-In-Tube fluid transfer via pump

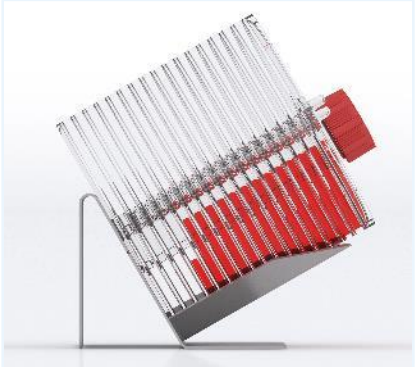
Detection limits apply

3.7 CellDisc™ Accessories I/II

HUBERLAB. committed to science

greiner BIO-ONE

- Accessories for efficient and easy CELLdisc™ handling

CELLdisc™	Design & function	Quality & certification	Available versions
CELLstage Filling Accessory: 	▪ Optimal CELLdisc™ positioning during filling process ▪ Two-version: 30°-angle and 40°-angle for CELLdiscs™ 4-24 and 40, respectively	▪ Made from stainless steel ▪ Allows for multiple sterilisation methods	▪ Two optimized CELLstage versions available: - For 4 to 24-layer CELLdisc™ - For 40-layer CELLdisc™
CELLevator Stacking Device: 	▪ Easy and secure stacking of CELLdisc™ ▪ Space-saving utilization of incubator space ▪ Maximum loading capacity 8 kg	▪ Made from polypropylene ▪ Autoclavable (120°C, 2 bar, maximum 3 times)	

3.8 CellDisc™ Accessories II/II

Accessories for efficient and easy CELLdisc™ handling

CELLdisc™
CELLring Levelling Ring:

Design, function & quality

- Ensures exact planar positioning of CELLdisc™
- Guarantees consistent distribution in every single layer
- With integrated spirit level
- Made of stainless steel

CELLhandle Gripper:

- Gripping device for easy lifting and emptying of CELLdisc™
- Enables single-hand use
- Made of aluminium

3.9 CELLMASTER™ Roller Bottles

HUBERLAB. committed to science

greiner BIO-ONE

- Roller bottle variants for easy upscaling and adherent high-density cell culture in viral vaccine production

Roller bottles

PS Roller Bottles:

PET Roller Bottles:

Design & function

- PS roller bottles with physical surface treatment for excellent cell adhesion
- PET material with high impact resistance
- Safety screw cap for contamination-free cultivation
- High stability and clarity
- Seamless design preventing risk of leakage

Quality & certification

- Sterile (SAL 10^{-3} or 10^{-6}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Free of endotoxins, human DNA, DNase/RNase
- USP Class VI tested and certified end product

Available versions

- PS and PET
- Standard and filter screw caps for PS roller bottles
- Available growth areas:
  - 850 cm²
  - 1700 cm²
  - 2125 cm²
  - 4250 cm²
- Ribbed surface option for growth area expansion
- Double-bag bulk packaging (suited for clean room use)

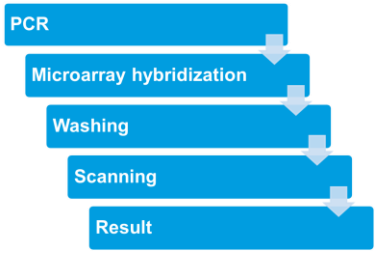
Detection limits apply

3.10 CytoInspect™ Mycoplasma Detection

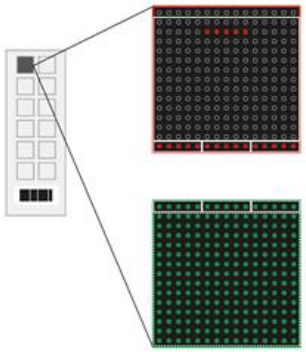
- Mycoplasma absence testing in the quality control for vaccine production
- NAT-based test kit for rapid detection and identification of mycoplasma

CytoInspect™

Mycoplasma detection workflows:



Microarray design:



Features

- Identification of 41 mycoplasma species
- PCR/microarray based
- Validated sensitivity < 10 CFU/mL, highly robust and specific
- Comprehensive on-chip control system
- Applicable for a broad range of sample material

Quality & certification

- Validated according to ICH Q2 (R1) guideline
- Validation in compliance with Ph. Eur (2.6.7, 2.6.21), Ph. Jap and USP
- Comprehensive internal and external validation
- Software developed in accordance with FDA electronic records regulations (21 CFR part 11)

Available versions

- CytoInspect™ Assay System consisting of:
  - CytoInspect™ Test Kit (10 or 60 analyses)
  - CytoInspect™ DNA Extraction Kit
  - CheckScanner
  - CheckReport Software

4. SARS-COV-2 RESEARCH – UNDERSTANDING THE VIRUS AND ITS PATHOGENESIS

4.1 SARS-CoV-2 Research – Understanding the Virus and its Pathogenesis

HUBERLAB. committed to science

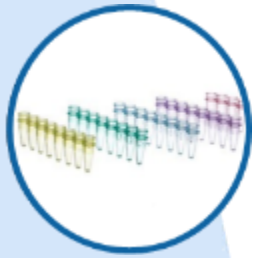
greiner BIO-ONE

CELLview™ products

- Studying virus-cell interactions in live cell imaging

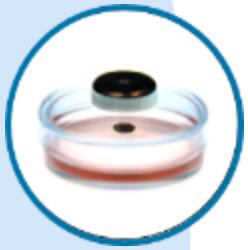
ThinCert™ products

- Studying virus effects on airway epithelia in vitro



Sapphire PCR tubes

- Detecting virus in any sample type at any stage of an experiment



Magnetic 3D products

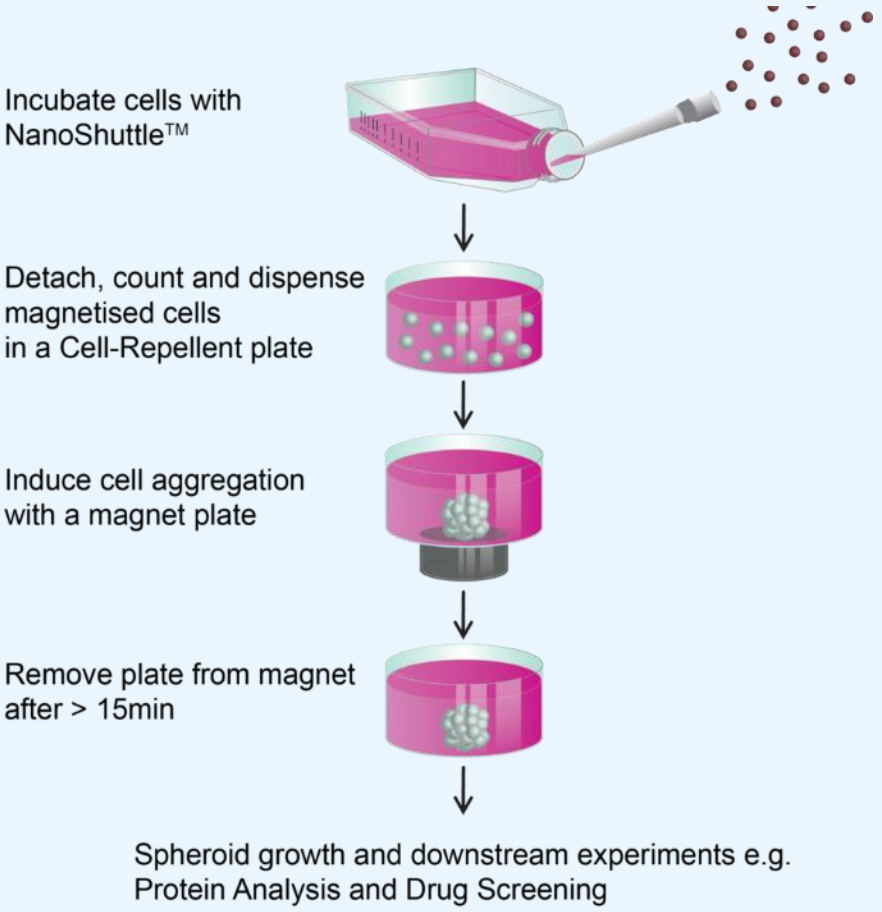
- Studying virus-cell interactions in three-dimensional organoids

4.2 Magnetic 3D Products – Workflow

- High-throughput 3D cell culture to screen anti-viral agents and model viral infection
- Magnetized cell harvesting for streamlined virus and antigen production

Magnetic 3D Workflow

A 3D-cell culture approach following a 2D-cell culture workflow

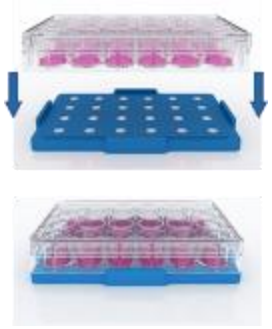


4.3 Magnetic 3D Products – Details

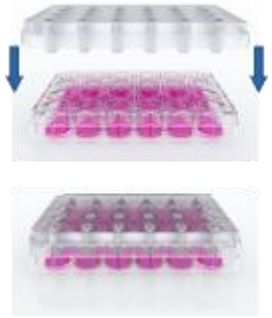
- High-throughput 3D cell culture to screen anti-viral agents and model viral infection
- Magnetized cell harvesting for streamlined virus and antigen production

Magnetic Separation and Levitation

Magnetic cell-separation and Bioprinting:



Magnetic Levitation:



Magnetized Cells:

- Streamline cell separation/harvesting without centrifugation
- Efficiently trap virus inside 3D cell culture
- Maximize virus-cell interaction in 3D
- Form 3D cell culture at air-liquid interface by magnetic levitation
- Surrogate for microcarriers used for cell & virus expansion or harvesting

Magnetic Nanoshuttle:

- Biocompatible magnetic nanoparticle assembly
- Available in large volumes when needed
- Sterile nanoparticle solution (USA Pharmacopeia USP34/NF29)

Available versions:

- Nanoshuttle: single, three, six, and twelve vials
- Bio-Assembler for 3D cell culture by magnetic levitation and separation: 6- and 24 well
- Magnetic separation and 3D Bioprinting: 6-, 24-, 96-, 384-, and 1536 well
- MagPen for harvest of magnetized cells

4.4 ThinCert™ Cell Culture Inserts

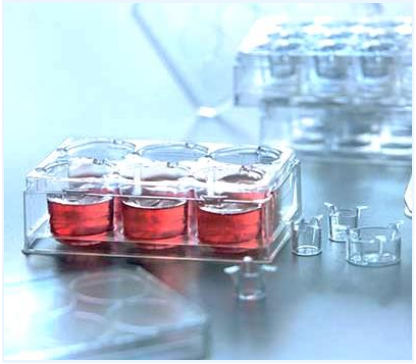
- Studying COVID-19 with reconstructed airway epithelia in ALI*-culture
- Infection studies utilizing co-culture set-ups

* ALI = air-liquid-interface or culture

ThinCert™

Cell Culture Inserts:

Deep-well Companion Plate:



Features & function

- Permeable membrane supports for in vivo-like cell culture conditions
- TC treatment for adherent cell culture on upper and underside of membrane
- Deep-well plates for increased media volumes and optimum conditions for air-exposed cell cultures

Quality & certification

- Minimum batch-to-batch variation of pore diameter due to usage of track-etched membranes
- Sterile (SAL 10^{-3}, ISO 11137 conform)
- Non-cytotoxic (ISO 10993-5 conform)
- Free of endotoxins, human DNA, DNase/RNase

Available versions

- Culture inserts: 6-, 12- and 24-well versions
- Deep well companion plates: 6 and 12-well versions
- Pore diameter choices: 0.4**, 1.0**, 3.0 and 8.0 µm

** 0.4 and 1.0 µm are recommended pore sizes for tissue reconstruction, ALI-culture and co-culture experiments.

Detection limits apply

YOUR POWER FOR HEALTH