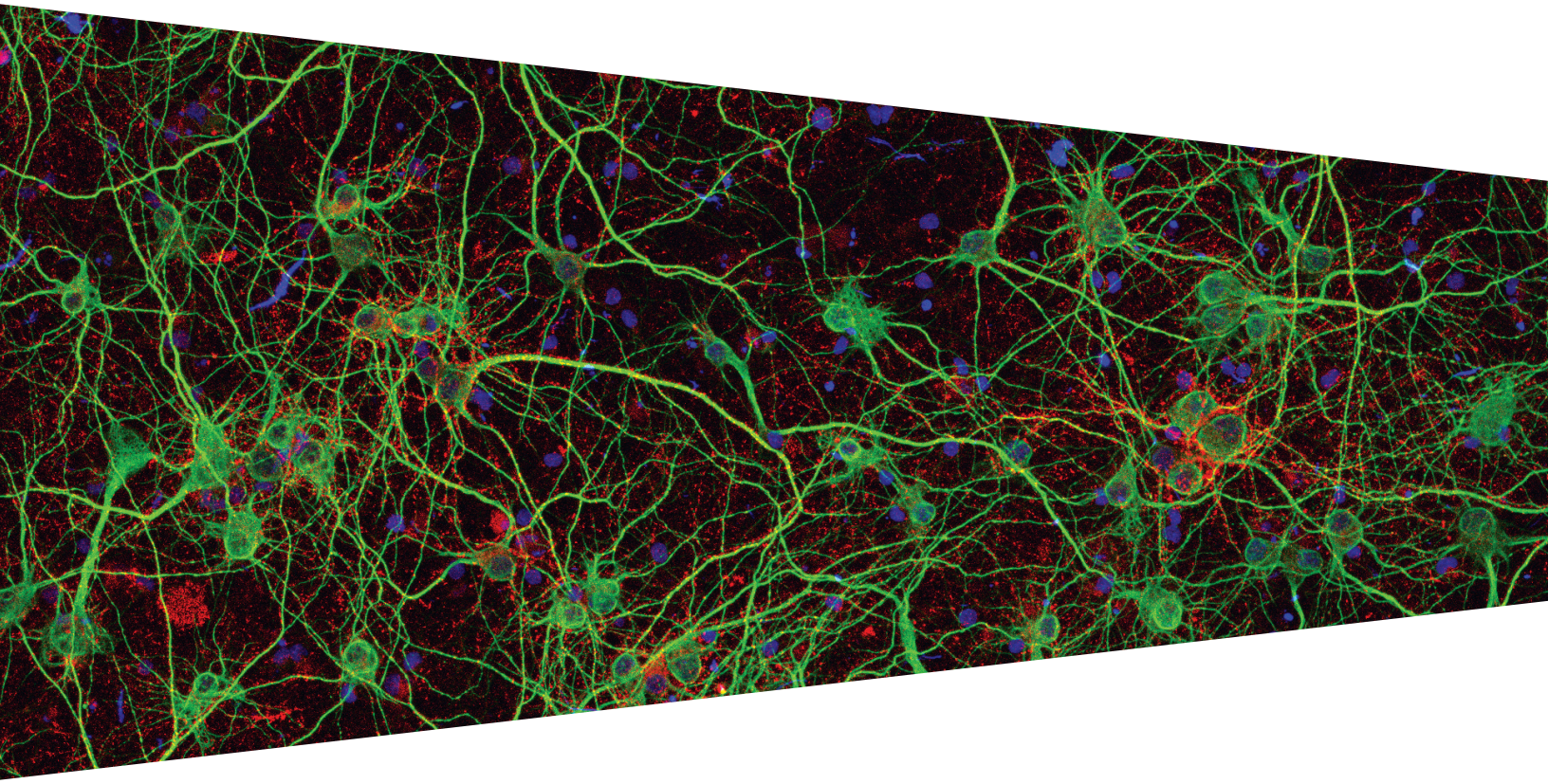
DANAHER | avantor™ delivered by VWR™



Cell Culture and Cell Analysis Streamlined Workflow Solutions

BECKMAN COULTER Life Sciences

HACH® Be Right™

Leica MICROSYSTEMS

MOLECULAR DEVICES

PALL® Laboratory

Cell culture

The success of the cell culture process affects the reliability, reproducibility and ultimately the credibility of downstream experiments.

Cell culture is fundamental to life science research in universities, biotechnology, pharmaceuticals, and industry. Whether your goal is to establish relevant cell models to answer research questions or to produce recombinant proteins or virus particles, Danaher™ Life Sciences companies provide complete solutions through VWR – from upstream media prep through downstream experimental analysis.

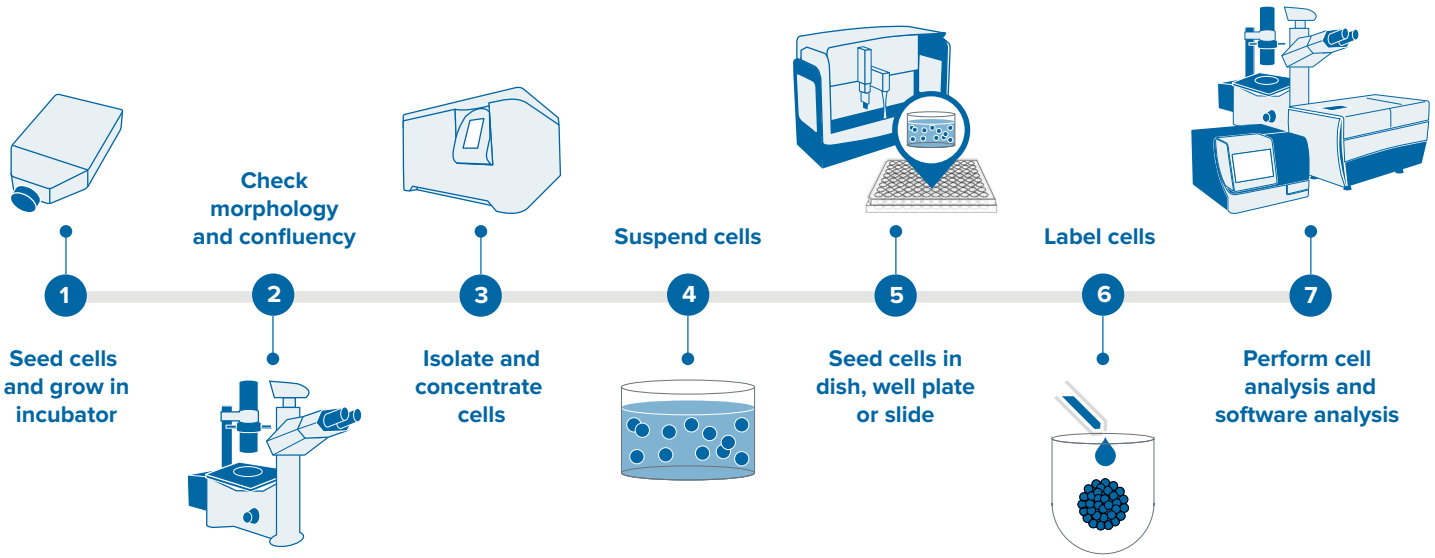
This cell culture workflow highlights the process from initial media prep and cell seeding through your scientific experiment and highlights systems to help you streamline the process and increase your cell culture throughput.

Why cell culture?

Cell culture is typically part of a workflow that ends with scientific experiments that include one of the following:

- Cell-based assays
- Cell based imaging
- Cell line development

Cell culture and cell analysis streamlined workflow



1 Seed cells

Cells are seeded into a flask, dish or multi-well plate using good aseptic technique and placed into an incubator for growth. An incubator provides the appropriate cell growth environment to control contamination, ensure adequate cell health, and promote end product yield for increased sample integrity.

2 Check morphology and confluence

At regular intervals, cells are monitored for contamination, morphology and confluency using a microscope or automated imager. Cells are typically sub-cultured when they are about 80% confluent, covering 80% of the cell culture vessel surface, to ensure proper growth and cell health.

3 Isolate and concentrate cells

When there are enough healthy cells to conduct an experiment, the cells of interest are isolated, concentrated, and counted in preparation for assay work.

4 Suspend cells

Concentrated cells are resuspended in fresh, agitated growth medium where they continue to multiply.

5 Seed cells

Next, the cells are re-seeded into the application-specific dish, multi-well plate, or slide required for the assay.

6 Label cells

Cells are treated and/or labeled to measure assay parameters such as amount or location of protein of interest or overall cell viability. Like any other chemical reaction, labeling is subject to conditions such as pH, concentration of reactants, incubation time and temperature, purity of reagents, and presence of interfering substances.

7 Analyze cell data

Finally, the cell assay is performed using instruments such as microplate readers, microscopes, automated cell screening and/or automated imaging systems. Data is acquired and analyzed using integrated software.

1 Cell seeding solutions

Hach
Electrochemistry meters and probes for accurate pH and DO measurement

Monitor cell growth by optical density using the 2100Q Portable Turbidimeter

Pall Corporation
Sterile filtration devices for cell culture (50 µL–150 L): spin filters, syringe filters, filter plates, vacuum devices and capsules

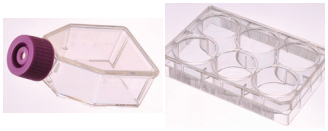
VWR/Avantor™
Incubating and cooling orbital shaker and high capacity incubating refrigerated shaker, Seradigm premium grade fetal bovine serum (FBS), water jacketed CO_2 Incubators, digital general-purpose water baths

2 Check morphology, confluence, cell counts and viability

Beckman Coulter
Vi-CELL XR Reagent Packs and Vi-CELL counter machine

Leica Microsystems
Microscopes for brightfield and fluorescence quick checks (e.g. morphology, confluence, presence of GFP)

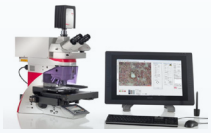
Molecular Devices
Automated imagers increase analysis power and imaging capabilities



VWR/Avantor
Cell culture flasks, culture plates

3 Isolate and concentrate cells

Beckman Coulter
Centrifugation for cell separation and concentration



Leica Microsystems
Laser microdissection for precise single cell and single molecule isolation from complex, intact tissue

Pall Corporation
Filtration: Clarification from small to large scale: desalting, buffer exchange, cell debris removal, DNA/RNA isolation, and more.

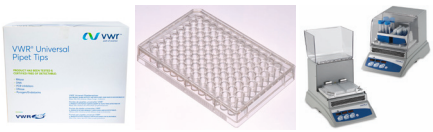
VWR/Avantor
Cell scrapers, high-performance centrifuge tubes with flat or plug caps, polypropylene

4 Suspend cells

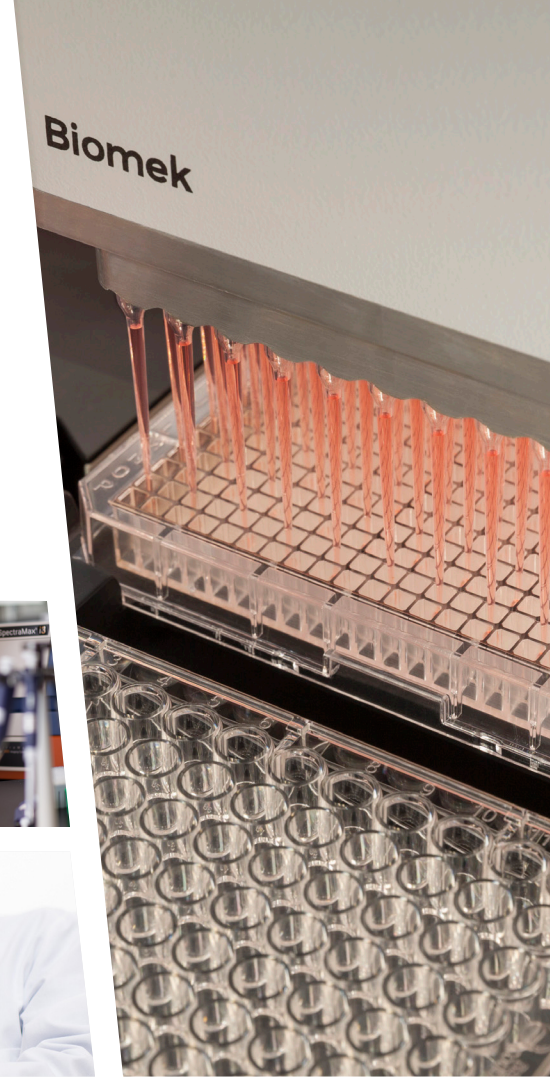
VWR/Avantor
Disposable serological pipets and square PETG media bottles

5 Seed cells in a dish, well plate or slide

Beckman Coulter
Biomek 4000 for automated, low to medium throughput cell culture and sample preparation



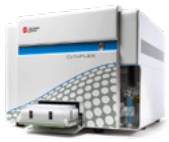
VWR/Avantor
Universal pipet tips, multi-well cell culture plates, microscope slides



6 Label cells

VWR/Avantor
Cryogenic vials, internally or externally threaded

7 Perform cell assay and software analysis



Beckman Coulter
Flow cytometers:
CytoFLEX Flow Cytometer

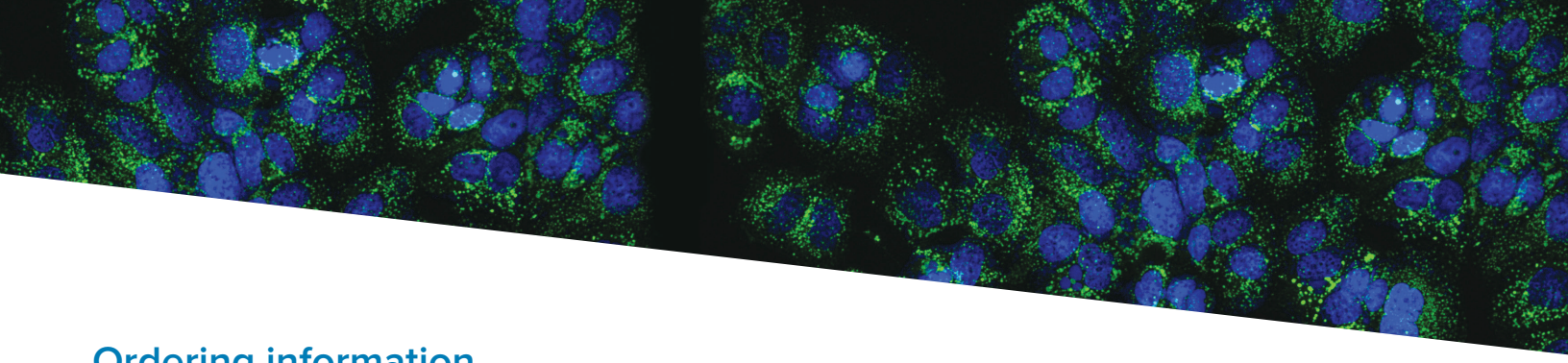
Hach
Monitor cell growth by optical density using the 2100Q Portable Turbidimeter

Leica Microsystems
Patented “Computational Clearing” for instant blur removal, high resolution and sensitivity for confocal comparable images in thick, 3D specimens

Molecular Devices
Automated colony picking: ClonePix™ Mammalian Colony Picking System

Molecular Devices
Microplate readers: Multi-mode detection for absorbance, fluorescence, luminescence (TRF, fluorescence polarization, and Western blot) with the SpectraMax® iD3/iD5/i3x Multi-Mode Microplate Readers

Molecular Devices
Automated widefield and confocal 3D imaging systems: ImageXpress® Imaging systems



Ordering information

Step 1 – Seed cells		VWR Cat. #
Hach	2100Q Portable Turbidimeter	**97049-281**
Hach	HQ440D Benchtop HQd Meter	**89174-012**
Pall Laboratory	AcroPak™ 500 Filtration Capsules	**28146-177**
Pall Laboratory	Acrodisc® 25 mm Syringe Filters	**28143-310**
Pall Laboratory	VacuCap™ 90 PF Bottle-Top Filters	**28139-706**
Pall Laboratory	AcroPak™ 1500 Filtration Capsules	**28146-196**
VWR/Avantor	Avantor Seradigm Premium Grade Fetal Bovine Serum (FBS)	**89510-194**
VWR/Avantor	VWR® Water Jacketed CO_2 Incubators	**10810-744**
VWR/Avantor	VWR Signature™ Incubating and Cooling Orbital Shaker	**12620-934**
VWR/Avantor	VWR® Digital General-Purpose Water Baths	**76308-830**
Step 2 – Check morphology, confluence, cell counts and viability		
Beckman Coulter	Vi-CELL XR Quad Reagent Pack	**76176-664**
Leica Microsystems	DMi1 Inverted Microscope	**10752-270**
Leica Microsystems	DM IL LED inverted microscope	**76382-982**
Molecular Devices	ImageXpress® Pico Automated Cell Imaging System	**76230-062**
Molecular Devices	ImageXpress Micro Confocal High-Content Imaging System	**76177-140**
VWR/Avantor	VWR® Cell Culture Flasks	**10062-862**
VWR/Avantor	VWR® Multiwell Cell Culture Plates	**75999-254**
Step 3 – Isolate and concentrate cells		
Beckman Coulter	Avanti™ J-15 Series Benchtop Centrifuge	**76102-920**
Beckman Coulter	Biomek® 4000 Automated Workstation	**10809-032**
Leica Microsystems	Laser Microdissection (LMD) System	**76414-892**
Leica Microsystems	PEN Membrane coated glass slides	**76414-898**
Pall Laboratory	Nanosep® Centrifugal Device – 3K	**29301-782**
Pall Laboratory	Nanosep® Centrifugal Device – 10K	**29300-620**
Pall Laboratory	Nanosep® Centrifugal Device – 30K	**29300-622**
Pall Laboratory	Nanosep® Centrifugal Device – 100K	**29300-624**
Pall Laboratory	Nanosep® Centrifugal Device – 300K	**29300-626**
VWR/Avantor	VWR® Cell Scrapers	**10062-904**
VWR/Avantor	VWR® High-Performance Centrifuge Tubes with Flat or Plug Caps, Polypropylene	**89039-658**

Step 4 – Suspend cells		
VWR/Avantor	VWR® Disposable Serological Pipets, Polystyrene, Sterile, Plugged	**76093-884**
VWR/Avantor	VWR® Square PETG Media Bottles	**89132-066**
Step 5 – Seed cells		
Beckman Coulter	Biomek 4000 Automated Workstation	**10809-032**
VWR/Avantor	VWR® Universal Pipet Tips	**76327-214**
VWR/Avantor	VWR® Plain and Frosted Micro Slides, Premium	**48300-026**
Step 6 – Label cells		
VWR/Avantor	VWR® Cryogenic Vials, Internally or Externally Threaded	**10018-738**
Step 7 – Perform cell assay and software analysis		
Beckman Coulter	CytoFLEX Flow Cytometer	**76330-530**
Leica Microsystems	THUNDER Imager Model Organism Packages	**76414-902**
Leica Microsystems	THUNDER Imager Assay	**76414-904**
Leica Microsystems	THUNDER Imager Tissue	**76414-906**
Molecular Devices	ClonePix™ 2 Mammalian Colony Picker	**76404-534**
Molecular Devices	SpectraMax® iD3 Multi-Mode Microplate Reader	**75886-128**
Molecular Devices	SpectraMax iD5 Multi-Mode Microplate Reader	**76175-288**
Molecular Devices	SpectraMax i3x Multi-Mode Microplate Reader	**10014-924**
Molecular Devices	ImageXpress® Micro Confocal	**76177-140**

To learn more about streamlining your cell analysis and cell culture workflow, please contact your VWR sales representative or visit https://us.vwr.com/

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