



Laboratory

From cell line development to clone selection, optimization, and protein analysis, Pall's high-performance filtration solutions cover every step of the life science workflow. Our dependable, reliable products have earned researchers' trust by simplifying processes, reducing risk, and accelerating laboratory throughput.

## Life Science Solutions



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# High-Performance Filtration for Life Science Workflows

Pall is your trusted filtration partner for life science research and discovery. Our team is dedicated to creating ultra-reliable filter products so you can focus on research. Filtration is critical in each step of the life science workflow. With Pall's heritage of industry leadership, we understand process issues and offer innovative filtration solutions that save time, reduce cost, and enhance performance.

## Cell Line Development



High-producing, stable cell lines are fundamental to biotherapeutic production of monoclonal antibodies (mAb), bi-specific monoclonal antibodies, fusion proteins, and vaccines. The goals: rapid generation and selection of clonal cell lines that deliver high concentrations of quality recombinant protein; early elimination of clone candidates that may fail in process scale-up.

Pall supports researchers throughout the cell line development process. High-performance proprietary membranes address the challenges of complex, next-generation biologics while simplifying commercial manufacturing scale-up. Innovative and time-saving products help streamline workflows and ensure sterility from gene editing to cell culture to omics analysis.

## Clone Selection, Optimization, and Recombinant Protein Analysis



The key to delivering large titers of quality recombinant protein is rapid selection and optimization of the best clone candidates expressing the protein of interest. The mission is to further refine the clone candidates that express proteins with the critical quality attributes of an effective protein-based drug.

Pall filtration is designed to maintain sterility while streamlining the harvest, clarification, and purification of cell culture products prior to analysis. We also offer filtrations solutions that are scalable, reducing the risk of material changes during scale-up to commercial manufacturing.

# Select the Best Filtration Products for Your Application

## Cell Line Development

### Gene Editing

AcroPrep™ advance filter plate for nucleic acid binding (NAB) and Nanosep® centrifugal device



### Strain Construction

AcroPrep filter plates and Nanosep centrifugal devices  
Acrodisc® sterile syringe filters  
VacuCap® vacuum filtration device  
AcroPak™ capsules



### Cell Culture and Clone Screening

Acro® 37, Acro 50, Acro 300 vent/in-line filters  
Acrodisc sterile syringe filters  
AcroPak capsules  
AcroPrep Advance filter plates  
AcroPrep NAB plates and NAB Nanosep filtration device  
BioTrace™ NT, FluoroTrans® and FluoroTrans W blotting membranes  
VacuCap vacuum filtration device

### Sample Prep for Omics Analysis

AcroPak capsules  
AcroPrep NAB plates and NAB Nanosep filtration device  
BioTrace and FluoroTrans blotting membranes  
Centrifugal devices:  
AcroPrep Advance, Macrosep®, Microsep™, and Nanosep, filter plates  
Supracap™ 50 and 100 depth filter capsules



## Clone Selection, Optimization, and Recombinant Protein Analysis

### Cell Culture

Acrodisc sterile syringe filters  
AcroPak capsules  
Acro vent/in-line filters  
VacuCap vacuum filtration device



### Cell Harvest and Clarification

Supracap depth filter capsules

### Sterile Filtration

AcroPak capsules

### Purification

Centramate™ LV, Minimate™, SS, PE system

### Functional Analysis

Acrodisc syringe filters and Nanosep centrifugal devices  
BioTrace NT, FluoroTrans, and FluoroTrans W blotting membranes

### Innovation

Clarify and sterile filter samples in one AcroPrep 24-well plate



# Cell Line Development Filtration



## Gene Editing

Despite recent advancements, multi-step gene editing workflows remain resource intensive. Pall centrifugal ultrafiltration devices simplify common nucleic acid preparation to achieve substantial savings in time, labor, and materials. Nucleic acid binding (NAB) products provide flexibility and reduced risk of cross-contamination.



## Strain Construction

Efficient strain construction through the transformation of bacterial cells or transfection of yeast or mammalian cells is dependent on the quantity and quality of the recombinant nucleic acid. Our low molecular weight cut-off (3 to 1,000 kDa) ultrafiltration devices and plates streamline a number of steps vital to successful strain construction.



## Cell Culture

Aseptic techniques and cell culture sterility are essential to avoid contamination and downstream complications. Pall's low protein-binding 0.2  $\mu\text{m}$  filter media offers fast, efficient filtration to maintain sterility in cell-culture applications. From feed volumes of a few milliliters to over 150 liters, proprietary dual-layer membranes provide sterile filtration of media and supplements ensuring valuable nutrients are not captured.



## Clone Screening

Rapid screening of large clone populations is essential to select targets of value for analysis. AcroPrep Advance filter plates reduce the risk of cross-contamination for sample processing and high-throughput screening. Sample preparation with filter plates equipped with 30-40  $\mu\text{m}$  PP/PE media ensures clear results for flow cytometry and cell labeling.



## Sample Preparation for Omics Analysis

Comprehensive characterization of the expressed target protein is essential to select suitable clones for further optimization and scale-up. Pall's high-throughput, 96-well nucleic acid purification products eliminate sequential sample preparation, increasing workflow speed. Simple-to-use, NAB centrifugal devices provide high yields, plus purify genomic DNA or total RNA in a single device. And Pall's high-sensitivity protein binding membranes produce low background noise to ensure clarity and sensitivity of results.

# Clone Selection, Optimization, and Recombinant Protein Analysis Filtration



## Cell Culture

Cell health is critical to optimize protein production. Pall offers a range of 0.2  $\mu\text{m}$  sterile-grade filtration solutions that process volumes from a few milliliters to over 150 liters. Sterile syringe filters permit culture monitoring without the risk of contamination. And Pall's mycoplasma reduction filters limit the introduction of mycoplasma into cell cultures by serum-containing media.



## Cell Harvest and Clarification

During cell harvesting, clarification is required to remove cells, debris, and large aggregates prior to sterile filtration and purification. Pall's Seitz<sup>®</sup> depth filter capsules and filter plates are optimized for biological and pharmaceutical requirements and are scalable for GMP production. Streamline workflows with AcroPrep 24-well filter plates to clarify and sterile filter in one device, in one step.



## Sterile 0.2 $\mu\text{m}$ Filtration

Efficient sterile filtration through a 0.2  $\mu\text{m}$  filter is essential to remove biological contamination prior to downstream processing. Pall's high-performance, dual-layer sterile filters reduce processing time, increase throughput, and eliminate multiple filter change-outs. AcroPak capsules and AcroPrep 24-well filter plates with Supor<sup>®</sup> PES membranes are ideal for applications where rapid filtration or low protein binding is required.



## Purification

The purification step enhances recovery of the target biomolecule for detailed functional analysis. To ensure target proteins are in the desired solution for purification, diafiltration (desalting or buffer exchange) is performed before or after the chromatography step. Pall's Tangential Flow Filtration (TFF) systems enable efficient processing, concentration, and diafiltration on the same system from 50 mL to 125 mL.



## Functional Analysis

Pall offers innovative centrifugal devices that simplify protein sample preparation and gDNA and RNA purification prior to analysis. High-sensitivity, low-background transfer membranes for protein analysis applications provide clarity of results. When analytical techniques such as LC-MS or HPLC are the preferred analysis method, Pall's Acrodisc syringe filters offer high throughput with little sample loss and reduced extractables.

## Pall's scale-up filtration streamlines workflows from cell line development to manufacturing



Pall Laboratory offers products that use the same membranes and materials that scale up from research and discovery to GMP manufacturing-scale filtration. This means scientists can research, develop, and validate their processes with lab-scale filters and then, as volumes increase or processes move to manufacturing scale, the same filters are available in larger sizes with pharmaceutical certificates. As life science workflows scale up in size, this advantage ensures the same filtration performance, chemical and biological compatibilities, and efficiencies – shortening redevelopment and accelerating time to market.

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