

# LAB

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NO. 2, 2024



# Healing Communities: The Importance of Inclusive Medical Research

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22



## CONTENTS

22

**COVER STORY**

Healing Communities:  
The Importance of  
Inclusive Medical Research

16



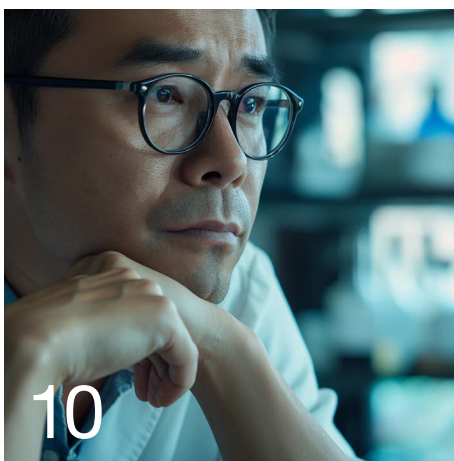
10

Communicating Science: Your  
Role in Building Public Trust

16

Eruption Disruption: Exploring  
New Volcano Monitoring  
Technology

10



38

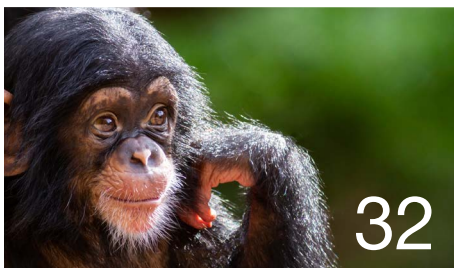
32

It's No Joke—Apes Seem to Find  
Humor Appealing

38

Study Asks If Sustainability  
Success Impacts Local  
Communities

32



44



44

Inside the Box: The Modular  
Way to Build a Cleanroom



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## SUPPLIER ARTICLES



**6**  
Li-Ion Batteries: The Role of Karl Fischer Titration in Ensuring Quality

Honeywell



**19**  
Select Your Ideal Glove Box in 4 Steps

Labconco



**28**  
Peptones: Established Supplements for Vaccine Applications

Gibco



**31**  
Purchase with Confidence: Outstanding Quality Backed by Our Best Warranty

Thermo Scientific



**35**  
Benefits of Gravimetric Reference Standard Preparation Using an XPR Automatic Balance

METTLER TOLEDO



**40**  
Benefits of Ready-to-Use Parenteral Packaging Components and Kits

DWK Life Sciences



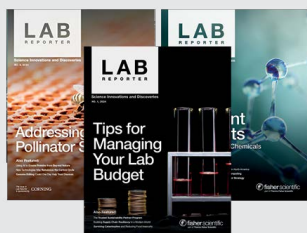
**42**  
Minimize Your Laboratory's Environmental Impact

Thermo Scientific

## SUPPLIER PRODUCT GUIDE

<b>Agilent</b> BioTek Automated Instruments.....	18
<b>Air-Tite</b> Premium Syringes .....	13
<b>AlphaProTech</b> Critical Cover Frocks .....	4
<b>Beckman Coulter</b> Carbon Analyzer.....	47
<b>Bel-Art</b> Laboratory Essentials.....	34
<b>Bio-Techne</b> Reagents.....	15
<b>Corning</b> Advantage .....	5
<b>Decon</b> Pure Ethanol.....	26
<b>DuPont</b> Tyvek IsoClean Garments .....	8
<b>Epredia</b> Pathology Products .....	9
<b>Fisherbrand</b> Bead Mill Homogenizer .....	47
<b>Fisherbrand</b> Ultrasonic Cleaners .....	26
<b>Fisher Scientific</b> Clearance Sale .....	46
<b>Fisher Scientific</b> Edge Program .....	46
<b>Fisher Scientific</b> Research and Production.....	30

<b>Fisher Scientific</b> Sustainability Support.....	48
<b>Gibco</b> Peptone Starter Paks.....	12
<b>Greiner BioOne</b> Microplates.....	21
<b>IKA</b> EasySyn Reactor System.....	21
<b>Labconco</b> Freeze Dryers.....	9
<b>METTLER TOLEDO</b> Balances and Instruments.....	14
<b>New Pig</b> HazMat Absorbents.....	34
<b>Qorpak</b> French Square Bottles.....	13
<b>Qorpak</b> Plastic Consumables.....	37
<b>Synoptics</b> Syngene 5-Position Gantry.....	36
<b>Thermo Scientific</b> Finnpipline Kits.....	43
<b>Thermo Scientific</b> Intellistack Shakers .....	4
<b>Thermo Scientific</b> Nalgene Labware.....	20
<b>Thermo Scientific</b> Pipette Tip Rack Kits.....	14



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# Li-Ion Batteries: The Role of Karl Fischer Titration in Ensuring Quality

The shift toward sustainable energy solutions has placed electric vehicles (EVs) at the forefront of the automotive industry. Central to this revolution is the lithium-ion (Li-Ion) battery, which powers most of today's EVs. These batteries are critical for the performance, range, and safety of electric vehicles, making their quality and reliability paramount. As the market for EVs grows exponentially, so does the need for precision in manufacturing Li-Ion batteries, particularly in managing the electrolyte's water content through techniques like Karl Fischer titration.

## Growing Importance of Li-Ion Batteries in EVs

Li-Ion batteries are the preferred choice for EVs due to their high energy density, longer lifespan, and relatively low self-discharge rate. Unlike older battery technologies, such as lead-acid or nickel-metal hydride, Li-Ion batteries offer a superior power-to-weight ratio, essential for vehicles that need to maximize efficiency and range. This makes them indispensable as the world pushes toward reducing carbon emissions and reliance on fossil fuels.

The growing adoption of EVs, driven by environmental concerns and regulatory pressures, has led to a significant increase in the demand for Li-Ion batteries. According to industry reports, the global market for Li-Ion batteries is expected to reach over \$100 billion by 2027, with a compound annual growth rate (CAGR) of more than 18 percent from 2020 to 2027. This growth is fueled not only

by the automotive industry but also by the expanding use of Li-Ion batteries in consumer electronics, renewable energy storage, and industrial applications.

## Market Growth and Challenges

The rapid expansion of the Li-Ion battery market presents both opportunities and challenges. On the one hand, increased production capacity is necessary to meet the growing demand. On the other hand, maintaining the quality and safety of these batteries is crucial, as even minor flaws can lead to significant performance issues or, in the worst-case scenario, safety hazards like thermal runaway and fires.

One of the critical factors in the quality of Li-Ion batteries is the purity of the electrolyte, a component that plays a vital role in the battery's performance. The electrolyte facilitates the movement of lithium ions between the anode and cathode during charging and discharging cycles. Any impurities, particularly water, can severely impact the battery's efficiency and safety.

## Impact of Water in Li-Ion Battery Electrolyte

The presence of water in Li-Ion battery electrolytes can have several detrimental effects:

- Decreased performance
- Safety risks
- Reduced battery life
- Gas formation

There have been multiple reports of electric vehicle (EV) battery fires in various models, including high-profile cases involving Tesla, Chevrolet Bolt, and others. In some instances, investigations have suggested that water content in the electrolyte could have contributed to the internal short circuits that led to these fires.

These incidents have resulted in vehicle recalls, legal actions, and increased scrutiny over battery safety. They have also prompted manufacturers to adopt more rigorous testing protocols to detect and prevent electrolyte contamination. Given these risks, the accurate determination and control of water content in the electrolyte are crucial for the safe and efficient operation of Li-Ion batteries in EVs.





## The Role of Karl Fischer Titration in Ensuring Electrolyte Quality

To ensure the electrolyte's quality, manufacturers rely on coulometric Karl Fischer (KF) titration, a precise analytical method used to measure water content, providing the precision needed to ensure that water levels remain within safe limits.

Honeywell's Hydranal NEXTGEN Coulomat A-FA/C-FA KF reagents are specifically designed for the accurate and efficient determination of water content in the electrolytes used in Li-Ion batteries.

## The Need for Alcohol-Free Karl Fischer Reagents

Even though KF titration is extremely accurate, common Li-Ion battery electrolyte additives, such as vinylene carbonate (VC), fluoroethylene carbonate (FEC) or borates (e.g., lithium bis(oxalate) borate, LiBOB), cause strong side reactions with the alcohols in standard KF reagents. This leads to an increase in drift, and delayed or no titration endpoint, rendering incorrect water content results. It can even make water determination impossible.

Hydranal NEXTGEN Coulomat A-FA & C-FA are the first alcohol-free reagents for coulometric KF titration that suppress these strong side reactions and provide consistent results for many challenging alcohol-sensitive samples. Additionally, these alcohol-free formulations do not contain carcinogenic, mutagenic, and reprotoxic (CMR) or halogenated hydrocarbons.

Hydranal NEXTGEN Coulomat A-FA/C-FA KF reagents are typically used in quality control laboratories where the water content of the electrolyte is closely monitored with advanced solutions that enhance this process by offering several key benefits:

- Alcohol-free formulation
- Efficiency
- Improved accuracy and precision
- Fast titration times
- Compatibility with a wide range of solvents

## Conclusion

As the demand for electric vehicles continues to grow, the importance of Li-Ion batteries will only increase. Ensuring

the quality and safety of these batteries is critical to the success of the EV market. Honeywell's Hydranal NEXTGEN Coulomat A-FA/C-FA KF reagents are an essential tool in the quality control of Li-Ion battery electrolytes. By providing accurate, precise, and efficient water determination, these reagents help manufacturers ensure that their batteries meet the stringent performance and safety standards required in today's competitive market.

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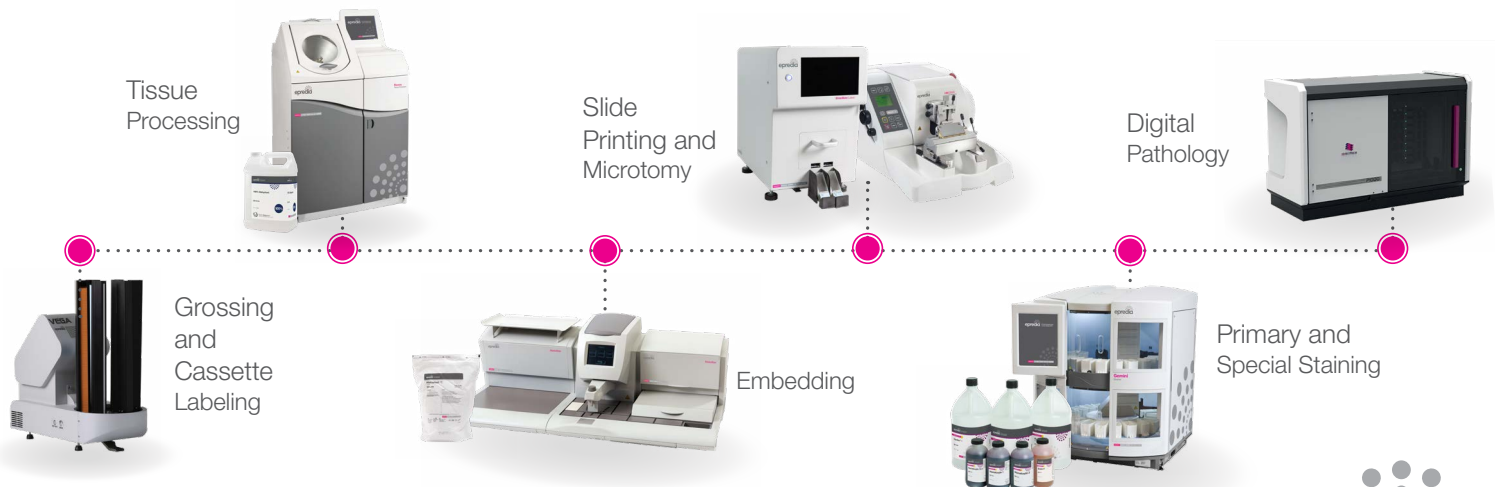
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# Communicating Science: Your Role in Building Public Trust

By Kylie Wolfe

As a scientist, you're focused on advancing knowledge through research, but effectively communicating your discoveries is just as important. This is your opportunity to make science approachable and impactful to increase the public's understanding of and trust in your work.

According to a paper published in the *Proceedings of the National Academy of Sciences*, members of the Strategic Council of the National Academies of Sciences, Engineering, and Medicine found that the public's confidence in science is declining. Even though 84 percent of people are very or somewhat confident in the competency, trustworthiness, and honesty of scientists, only 53 percent said that scientists provide unbiased conclusions.

With this in mind, here are a few tips to help you share your science and instill confidence beyond academia.

## Organize Your Thoughts

Whether you're drafting a grant application, communicating with fellow scientists, or interacting with the public, organizing your thoughts is an important first step. Ask yourself about your findings, their significance, any challenges you faced, and any biases you may have. Sharing these details with your audience will help them understand your methods, motivations, and conclusions.

According to the study mentioned earlier, 84 percent of participants agreed that it's somewhat or very important to be transparent about your funding source. Disclosing this information, for example, helps readers understand why a study may have been initiated and whether they should be concerned about biased results.

## Write with Your Audience in Mind

The tone you choose will ultimately depend on who is reading or hearing about your work, what they know about the subject, and what you hope for them to learn. It's likely you're discussing something that hasn't been described before or that your audience isn't familiar with. It may feel like you're overexplaining—but that's okay. The explanation you provide to a fellow scientist should not be the same explanation you provide to a member of the public.

For your audience to understand your work, you must consider their knowledge gaps. You'll want to break down scientific jargon and define acronyms, especially if you're going to refer to them later. If words or concepts can't be simplified without losing their meaning, take time to provide detailed descriptions.

## Instill Trust in Your Work

As you share your work with others, especially non-scientists, it can be challenging to balance accuracy with simplicity. But, presenting your research in a new and digestible way without compromising factual information is essential for establishing trust. This, of course, requires you to have a deep understanding of the topic and its relevance, to stick to your key points, and to provide thorough explanations.

The explanation you provide to a fellow scientist should not be the same explanation you provide to a member of the public.

You can use analogies and metaphors to help you bridge the gap between complex research and general understanding, but this will require clarity and precision. Any inconsistencies or ambiguities could be misinterpreted, making it harder to regain your reader's trust. Carefully review your work and collaborate with other scientists to help catch these errors before it's too late.

## Maintain Important Values

No matter how you approach your work, doing so with a clear moral compass matters to your audience. In addition to clear and honest reporting, this means being open to critiques, engaging in peer review, and acknowledging any shortcomings you may have experienced in your research.

Communicating science, especially from a scientist's perspective, is about sharing the wonder of discovery. It's an opportunity to shape the future of STEM by contributing to a scientifically literate society, encouraging others to trust science, stay curious, and make informed decisions. As you make advancements in your field, know that by taking the time to write about and communicate your science, you're making the world a better place.

*Kylie Wolfe is a Thermo Fisher Scientific staff writer.*

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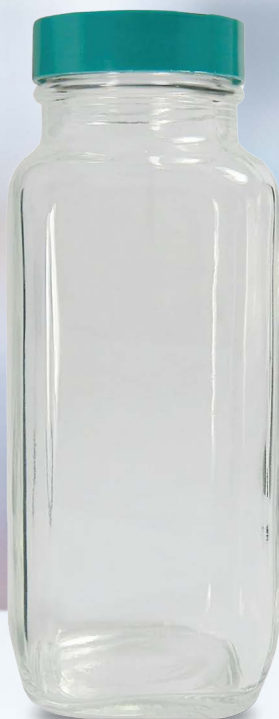
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# Eruption Disruption: Exploring New Volcano Monitoring Technology

By Sierra McConnell

Researchers have made incredible strides in monitoring volcanic activity over the last decade, making these natural phenomena easier to spot and predict. In turn, they are reported on more often, giving the illusion that volcanic eruptions are on the rise when they have remained about the same for over 20 years.

At the time of this writing, 64 volcanoes have erupted in 2024. To put that into perspective, there have been between 67 and 83 volcanoes with reported activity each year since 2000.

## Monitoring on the Ground and in the Air

All volcanic monitoring focuses on detecting deviations in activity, ranging from simple observations like lava flow to advanced techniques like drone monitoring, GPS network signaling, and machine learning for eruption prediction.

One new tool is the United States Geological Survey (USGS) Spider, a package of several monitoring instruments that can be safely deployed from a helicopter. This device reduces the risk to scientists and enables rapid data collection in remote or hazardous areas. Designed to monitor seismic activity, ground deformation, and gas emissions, the Spider, which gets its name from its leggy appearance, provides comprehensive data in real time. Its ability to integrate various monitoring tools into a single unit lowers power requirements, minimizes environmental impact, and has vastly improved the safety and efficiency of volcano monitoring efforts across the globe.

Machine learning algorithms enhance real-time volcano monitoring and forecasting capabilities.

Another group of researchers at Cornell University discovered that, by analyzing the fluid found within volcanic crystals, they can determine magma's location before, during, and after an eruption with an accuracy of up to 100 meters. This technique allows for rapid and precise data collection, significantly enhancing the speed and accuracy of eruption forecasts. Such advancements enable scientists to provide near real-time assessments, which are crucial for timely evacuation and risk management to nearby populations.

Long-range drones equipped with miniaturized gas sensors, spectrometers, and sampling devices have also transformed data collection in hazardous volcanic environments. These unmanned aerial vehicles can now sample gases directly from volcanic plumes, significantly improving researcher safety and data quality. Cambridge University's Aerial-Based Observations of Volcanic Emissions (ABOVE) project exemplifies this advancement, having successfully deployed drones to study the highly active Manam volcano in Papua New Guinea.

## Data Integration and Machine Learning

A study published in *Frontiers in Earth Science* demonstrated the potential of machine learning algorithms to significantly enhance volcano monitoring and eruption prediction. Researchers developed a novel approach that analyzes four key seismic features: energy, softened Shannon entropy, kurtosis, and frequency index. By applying this method to data from various volcanoes, the team created a probabilistic tool for real-time monitoring that can provide early warnings from hours to days in advance. This innovative technique represents a major step forward in volcanic hazard assessment and has the potential to greatly improve disaster preparedness and risk mitigation efforts.

The system works by organizing the seismic data into a temporal matrix, which captures the evolution of volcanic activity states over time. This matrix is then processed by a neural network, a sophisticated machine learning model capable of recognizing complex patterns that traditional methods might overlook. The neural network learns to identify precursory signals of volcanic activity by analyzing the relationships between the four seismic features. Once trained, the network can process new data in real-time, generating probabilistic forecasts of imminent eruptions. This approach not only enhances the accuracy of eruption predictions, but also provides volcanologists with a powerful tool for continuous, automated monitoring of volcanic activity.

## Future Directions

With advancements in AI-driven forecasting and durable equipment enhancing eruption predictions, the future of volcanic monitoring is bright. As technologies evolve, they offer unprecedented insights into volcanic behavior, improving the ability to mitigate risks and protect communities living near these sometimes-terrifying natural wonders.

Sierra McConnell is a Thermo Fisher Scientific staff writer.



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# Select Your Ideal Glove Box in 4 Steps

By Mike Zubelewicz

Selecting the right glove box is essential to the safety and efficiency of any laboratory. With a range of glove boxes available, it's important to choose the one that best fits your specific lab requirements. This guide outlines key considerations to help you find the glove box that's appropriate for your application.

## Step 1: Assess Your Laboratory Environment

Start by identifying the specific conditions your lab requires. Are you working in an environment that demands strict control over atmospheric conditions, or do you need flexibility to switch between different operational modes? Understanding your lab's specific needs is the first step in choosing the right glove box.

## Step 2: Explore Glove Box Options

### Controlled Atmosphere Glove Boxes

Consider a controlled atmosphere glove box for environments that require near-zero oxygen and moisture levels. These glove boxes are particularly suited for sensitive applications like battery research, including hydrogen fuel cell and lithium-ion battery production. With single-width or double-width configurations available, your lab can maintain a controlled atmosphere for sensitive applications.

### Combination Glove Boxes

If your lab's needs are more varied, consider a combination glove box. These units offer both filtered and controlled atmosphere functions, making them suitable for labs that work with hazardous particulates and materials

that are sensitive to atmospheric conditions. This versatility is especially valuable in multidisciplinary research environments such as semiconductor and pharmaceutical labs.

### Large-Capacity Glove Boxes

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- **Custom Pass-Throughs:**

Glove boxes can be configured with pass-throughs for specific application needs.

## Step 4: Review and Optimize

Once you've selected the glove box and accessories that meet your lab's needs, review your setup to ensure optimal performance. Proper customization and regular monitoring can significantly improve the efficiency and safety of your laboratory operations.

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# Prioritize Sustainability with ACT Label Labware

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## Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure

Description	Mfr. No.	Cat. No.	Quantity
Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure, 30 mL	21890001	03-313-4A	Case of 72
Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure, 60 mL	21890002	03-313-4B	Case of 72
Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure, 125 mL	21890004	03-313-4C	Case of 72
Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure, 250 mL	21890008	03-313-4D	Case of 72
Thermo Scientific Nalgene Wide-Mouth HDPE Economy Bottles with Closure, 1 L	21890032	03-313-4F	Case of 24

## Thermo Scientific Nalgene Polypropylene Graduated Cylinders

Description	Mfr. No.	Cat. No.	Quantity
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 10 mL	36620010	08-572A	Case of 24
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 25 mL	36620025	08-572B	Case of 18
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 50 mL	36620050	08-572C	Case of 18
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 100 mL	36620100	08-572D	Case of 12
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 250 mL	36620250	08-572E	Case of 12
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 500 mL	36620500	08-572F	Case of 8
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 1,000 mL	36621000	08-572G	Case of 6
Thermo Scientific Nalgene Polypropylene Graduated Cylinders, 2,000 mL	36622000	08-572H	Case of 4

## Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure

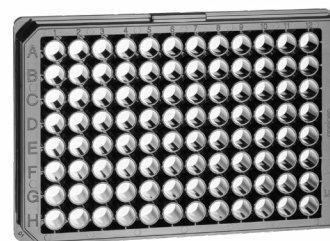
Description	Mfr. No.	Cat. No.	Quantity
Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure, 30 mL	20180030	03-311-1N	Pack of 12
Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure, 60 mL	20180060	03-311-1P	Pack of 12
Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure, 125 mL	20180125	03-311-1Q	Pack of 12
Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure, 250 mL	20180250	03-311-1R	Pack of 12
Thermo Scientific Nalgene Square Narrow-Mouth HDPE Bottles with Closure, 1 L	20181000	03-311-1T	Pack of 6

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LUMITRAC 200 Plate, PS, Medium Binding, Flat Bottom, White $\mu$ Clear	655095	07-000-097
FLUOTRAC 200 Plate, PS, Non-Treated, Flat Bottom, Black $\mu$ Clear	655096	07-000-088
CELLSTAR Plate, PS, TC Treated, Sterile, Flat Bottom, Chimney Style, White $\mu$ Clear with Lid	655098	07-000-167
UV-Star Plate (Lower UV Applications), Flat Bottom, Chimney Style, Clear	655801	07-000-407
<b>384-Well Microplates</b>		
CELLSTAR Plate, PS, TC Treated, Sterile, Flat Bottom, Black $\mu$ Clear with Lid	781090	07-000-062
CELLSTAR Plate, PS, TC Treated, Sterile, Flat Bottom, Black $\mu$ Clear with Lid	781091	07-000-072
CELLSTAR Plate, PS, TC Treated, Sterile, Flat Bottom, White $\mu$ Clear with Lid	781098	07-000-076
UV-Star Plate (For Lower UV Applications), Flat Bottom, Clear	781801	07-000-406
<b>1,536-Well Microplates</b>		
LoBase CELLSTAR Plate, TC Treated, Sterile, Flat Bottom, Black $\mu$ Clear	783092	07-000-028

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**EasySyn 5000 Starter**  
Volume: 5,000 mL  
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**EasySyn 500 Advanced**  
Volume: 500 mL  
Cat. No. 01183149

**EasySyn 1000 Advanced**  
Volume: 1,000 mL  
Cat. No. 01183151

**EasySyn 2000 Advanced**  
Volume: 2,000 mL  
Cat. No. 01183153

**EasySyn 5000 Advanced**  
Volume: 5,000 mL  
Cat. No. 01183155



# Healing Communities: The Importance of Inclusive Medical Research

By Kelley Northam



When physicians first don their white coats and enter the medical profession, they traditionally recite the Hippocratic Oath, pledging to uphold ethical standards. A slice of the oath published by *Penn State College of Medicine* reads: “I shall try to establish a friendly relationship with my patients and shall accept each one in a nonjudgmental manner, appreciating the validity and worth of different value systems and according to each person a full measure of human dignity.”

While the language has varied since Hippocrates—known as the father of medicine—likely wrote it over two thousand years ago, the oath’s principle of do no harm has remained the same. However, history has shown us harm has been done and part of the healing can be accomplished through more inclusive medical research.

## Misses, Misdiagnoses, and Mistreatments

In August 2024, a historically taboo topic raised international outrage after researchers discovered toxic metals in tampons. Described in the article “Tampons as a source of exposure to metal(loid)s” published in the journal *Environment International*, a UC Berkeley team of researchers evaluated the concentrations of 16 metals in tampons and found traces of all 16, including arsenic and lead, across brands and product lines. While more research is needed to determine health effects, these toxic metals have no “safe” exposure level. Past heavy metal research has overwhelmingly linked exposure to numerous health problems, including cardiovascular, endocrine, and brain damage.

While these findings are concerning, many found it equally concerning that this research is the first of its kind. The tampon was patented in 1933 and became a product trusted by billions. In the United States today, 52 to 86 percent of people who menstruate use tampons, and yet, it took over 90 years to discover these risks.

Breast cancer has also been known for centuries, with descriptions dating back to approximately 3,500 BCE. While there have been numerous advancements in diagnoses and treatments, current trends indicate that there is far more work to be done. In 2022, the American Cancer Society reported that Black women are 41 percent more likely to die of breast cancer than white women. Breast cancer in Black women is also often diagnosed later compared to white women, and Black women with this diagnosis are expected to live five years less. The American Cancer Society also reported that they are twice as likely to die from uterine cancer and more likely to be diagnosed with stomach, liver, and pancreatic cancer than white women.

## Making Inclusivity an Industry Standard

There is a myriad of other examples of these lapses in medical research, such as the AIDS crisis and when researchers withheld treatment from afflicted Black men during the Tuskegee syphilis study, to name even more. Women, people of color, and other communities have been understudied, underserved, and overlooked in medical research to the detriment of their financial, physical, and mental well-being.

Now more than ever, many scientists and healthcare professionals are working to make medical research more inclusive so that innovations and therapies benefit everyone. According to the article “Combating Bias in Medicine” published by *Harvard Medical School*, this work begins by recognizing and overcoming personal biases. The article suggests that researchers should look inward and reflect on their lived experiences and implicit values to uncover unconscious biases. After identifying blind spots, they should remain mindful of these biases, working to overcome them to provide a positive experience for every participant.

Distrust of healthcare officials is also a barrier to inclusion. Because many communities have troubled histories with medical professionals, they are less likely to want to participate in clinical trials and other studies. According to the “Achieving Diversity and Its Benefits in Clinical Research” policy forum published by the *American Medical Association (AMA) Journal of Ethics*, researchers should familiarize themselves with the cultural norms and beliefs of a study’s population. Using this knowledge, they can avoid assumptions and approach cultural differences with humility and empathy. To gain participants ethically, researchers should enact outreach plans that involve trusted community and institutional communication channels, such as places of worship or neighborhood associations. Community leaders and potential participants should also be involved in recruitment. Finally, they should frequently communicate progress and findings to support transparency and build trust.





## Healing Communities: The Importance of Inclusive Medical Research

### Moving Medicine Forward—For Everyone

Many of these strategies have been implemented in Baltimore, Maryland, thanks to the African Ancestry Neuroscience Research Initiative. In a groundbreaking collaboration between Morgan State University (a historically Black university), the Lieber Institute for Brain Development at Johns Hopkins University, and local community leaders, researchers gained new neuroscience insights. As described in the *STAT* article “How a Baltimore neuroscience study is rewriting Black America’s relationship with medical research,” the purpose of the study was to better understand the biology behind certain neurological conditions, such as schizophrenia and depression, that are more common among those of African American descent.

They found that environmental factors, which refer to everything from pollution to discrimination, affected neurological wellness. These factors caused epigenetic (structural) changes to DNA and accounted for 15 percent of disease occurrence. The genes that determine the body’s immune response were also likely to be higher in people of African descent. Since stress can affect the immune system, it may make some neurological conditions more severe for Black Americans. This research opens the door to personalized therapies informed by genetic ancestry, environmental stressors, and lived experiences, which could improve health outcomes for all patients.

Another groundbreaking aspect is that this research was made possible by over one hundred Black Baltimoreans who entrusted researchers with the brains of their deceased loved ones as donations to the study. Alvin C. Hathaway Sr., co-founder of the African Ancestry Neuroscience Research Initiative, attested to this, saying that “we reasoned that if we could demonstrate the success of this model in Baltimore (a city with a largely Black population and a long history of racial trauma and mistrust of medical institutions), we could institute a model that is suitable to be applied throughout neglected communities across the nation.” Given the fraught history between Black communities and medical establishments, this study is an example of how to conduct inclusive medical research and its profound benefits.

And hope is on the horizon for more inclusive cancer research, as the American Cancer Society is conducting a new study to help remove barriers to preventing, diagnosing, and treating cancers

in Black women. The VOICES of Black Women study is the most extensive study of its kind and plans to enroll over 100,000 Black women. The study will follow each participant for 30 years to observe how their medical histories, lifestyle, and experiences of racism affect their cancer risks. Once enrolled, participants will be asked to complete two surveys per year, providing updates on physical and mental health, stress levels, and whether they’ve experienced events of discrimination or racism.

These researchers recognize how Black communities have been treated and are striving to ensure that ethics remain at the forefront of the study. In the *NBC News* piece “Landmark study of cancer in Black women launches in 20 states, aiming to be largest ever,” co-principal investigator of VOICES, Dr. Alpa Patel, notes, “It’s been really front and center for us to ensure that we’ve partnered with Black women to understand how to build this study in a way that is respectful.” A few ways they’re fostering this respect is by allowing participants to abstain from providing medical records, keeping participant names hidden from published research, and having a review board provide ethical oversight. This research is an important step in transforming how cancer is treated and how Black women are treated in the medical community.

At Thermo Fisher Scientific, we’re working to advance equity in clinical research by helping train research and medical professionals on how to foster more inclusive trials. One example is our collaboration with the Schools of Medicine at Morehouse College and Stanford University on the Training Researchers to Advance Inclusion Networks (TRAIN) program. This segment of the program was designed to equip professionals with the historical context and evidence-based solutions they need to best interact with under-studied communities. Through classes, community meetings, and peer learning, we’re teaching them how to partner with communities to conduct studies, ultimately becoming a permanent part of the TRAIN curriculum.

From tampons to tumors, it’s clear that while medicine may be moving forward, many people are being left behind. To truly make a difference through medicine, it is imperative that all researchers adopt inclusive methods that respect and represent all communities to create healthier futures for all.

*Kelley Northam is a Thermo Fisher Scientific staff writer.*



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Glass Bottle	1 Pint	24	07-678-006	-	-
Plastic Bottle	1 Pint	24	04-355-450	-	-
Glass Bottle	1 Gallon	4	04-355-721	04-355-723	-
Plastic Bottle	1 Gallon	4	04-355-451	04-355-454	07-678-001
Plastic Bottle	5 Gallon	-	04-355-452*	04-355-455*	04-355-351
Plastic Bottle	5 Gallon	-	22-032-104**	22-032-106**	-
Plastic Bottle	55 Gallon	-	04-355-456	04-355-457	07-678-010
Metal Drum	55 Gallon	-	04-355-460	04-355-461	-

\* Spout

\*\* Closure can be fitted with spigot

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Model	Capacity	Cat. No.
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FB-11203	5.75 L (1.5 gal.)	FB11203
FB-11206	6.9 L (1.8 gal.)	FB11205
FB-11207	12.75 L (3.3 gal.)	FB11207
FB-11209	18 L (4.75 gal.)	FB11209
FB-11211	28 L (7.3 gal.)	FB11211

# Peptones: Established Supplements for Vaccine Applications

When developing a vaccine, you will continually look for ways to increase process productivity while simultaneously reducing the per-unit cost of your vaccine. As such, you're likely focused on optimizing cell culture media, feeds, and serum substitutes that have the potential to drive down costs.

Peptones, which are rich in amino acids, peptides, vitamins, carbohydrates, nucleosides, minerals, and other components, make great supplements and feeds and may offer a solution. This versatile, low-cost option can also be used as an alternative to serum, enhancing performance and offering cellular protective effects. Having played an important role in viral vaccine development for many decades, peptones can continue to help you get your vaccine to market more efficiently and cost-effectively.

## An Alternative to Serum

While serum has traditionally been used to achieve adequate production levels in mammalian cell culture, challenges associated with the use of sera are leading vaccine developers to look for alternatives. These challenges include limited availability, changing supply, fluctuating costs, and lengthy ordering processes. In addition, animal-derived sera can add significant risk to your vaccine development process with the potential for contamination.

That said, there is a growing trend within the bioprocessing industry to remove and replace serum when possible. As a nutrient-rich supplement, peptones have been shown to increase performance

in a variety of vaccine applications. In addition, with animal origin-free options available, peptones can reduce the risk factors associated with products derived from animals. Serum all too often drives up costs associated with vaccine development, so selecting an alternative with low-cost volatility can be an essential first step.

Outsourcing your media manufacturing or qualifying a secondary or tertiary supplier has the potential to alleviate some of these pressures. At times of unpredictability, having access to additional capacity is paramount to risk mitigation. Considering the approval of multiple sites or vendors for media and bulk process liquids may be your best bet.

## Versatile and Flexible

Peptones can be used in several ways—as feeds or supplements, to support serum reduction, or as a serum replacement. Peptones are also varied in their origin and composition, with some derived from animals, some from plants,

and some from microbial sources. As a result, this wide variety of peptones, all with differing nutritional profiles, can be used for a broad range of process types, cell types, and applications to achieve target viral titers. In addition, peptones are highly stable, with a long shelf life, and can easily blend into any medium or supplement, whether in liquid or dry powder format.

However, this versatility also means that peptones should be selected carefully based on bioprocess requirements. Because the nutritional requirements of cell lines can differ, it is important to identify a peptone that meets the requirements of your cell line.

## Peptones Are Familiar to Regulators and Suppliers

Numerous vaccines, including the hepatitis B vaccine, are manufactured using peptones. As a result, both suppliers and regulators are experienced







in using peptones for vaccine development and filing. Gibco peptones, for instance, are currently used in the manufacturing of more than 150 marketed drugs, including 15 blockbuster drugs and many more in the pipeline.

While peptones offer many benefits when compared with sera, peptones offer different benefits across bioprocesses. Historically, peptones were manufactured for the food industry as nutritional additives and flavor enhancers. When considering peptones, choosing those that have been manufactured and tested specifically for bioprocessing applications will be critical for maintaining consistency from batch to batch.

Your supplier can help select the optimal peptone scheme for your specific process,

with recommendations based on libraries of data and experience working with customers to develop ideal solutions. Finding the right balance for your cells can be a challenge, but through screening and key driver analysis, you will be able to identify the peptones that provide the greatest benefit. With your optimal peptone scheme identified, you can enhance performance and reduce time-to-market for your critical vaccine.

### Looking to the Future

With the increasing demand for serum from the growing gene therapy market, the bioprocessing industry is anticipating a serum supply deficit in the coming years. Acceleration in serum consumption means that demand for sera will soon

exceed supply, causing a significant increase in serum prices.

As a result, it has never been more important to consider alternatives for your bioprocesses. Peptones, which offer a flexible, versatile, and efficient means to support vaccine development and manufacturing, may be the solution to improve your processes now and into the future.

Content provided by:

**gibco**

**Note:** While peptones can be used as a complete replacement for serum, this is limited to cells grown in suspension. For adherent cells, which are commonly used in vaccine production, peptones cannot be substituted for serum by themselves and need to be used in combination with cell adhesion factors.

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- Thermo Scientific TSG Series: 4 years parts and labor, 5 years compressor

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Understanding the terms and conditions is essential to effectively leveraging your warranty. Warranties often offer different coverage periods for parts and labor than for the compressor.

The parts and labor warranty covers the cost of parts and the service to repair your lab fridge or freezer if it malfunctions. The compressor warranty specifically covers the refrigerator or freezer's compressor, which maintains the cold temperature within the unit. If the compressor fails within the warranty period, the manufacturer will bear the cost of replacing or repairing it.

Familiarize yourself with these details so you can make informed decisions when facing equipment issues.

## Use All Offered Maintenance and Servicing

Regular maintenance and servicing will help keep your unit running smoothly.

Understand what your manufacturer includes and take full advantage of the benefits.

### Unit Repairs

When the unexpected occurs, be sure the service personnel are properly trained to work on your cold storage unit. Thermo Fisher Scientific has a global service team that's trained to support any situation that may arise with your laboratory equipment.

### Preventive Maintenance Programs

Learn what preventive maintenance programs are offered with your unit to help keep it in running order. This may include annual or semi-annual unit reviews and wellness checks. Set a structured maintenance schedule and stick to it.

## Minimize Harsh Conditions

It's worth noting that even with the best equipment, certain factors, such as higher-than-normal ambient conditions, loading with room-temperature samples, and repeated door openings, can impact temperature stability. Understanding and

avoiding these suboptimal conditions can help keep your equipment up and running.

## Keep a Record

Maintain a detailed record of service and maintenance activities performed on your equipment, including the date of service, the specific maintenance performed, any parts that were replaced, and the name of the technician or service provider.

Regular maintenance and servicing, coupled with the support and services offered by your manufacturer, can significantly extend the life of your lab equipment and minimize disruptions to your operations. So, remember to factor in the warranty when considering your next cold storage unit so you can spend your time focusing on your lab's crucial work rather than worrying about equipment failures.

Content provided by:

**thermo** scientific









# It's No Joke—Apes Seem to Find Humor Appealing

By Gina Wynn

Apes seem to enjoy a good prank as much as the rest of us. In the four great ape species: orangutans, chimpanzees, bonobos, and gorillas, researchers have observed playful teasing behaviors like hitting and poking, hair pulling, close staring, and movement disruption, according to a 2024 study. They've also been seen repeatedly waving or swinging a body part or object in their target's field of vision.

Although some field primatologists, including Jane Goodall, have described similar ape behaviors, this study—conducted by cognitive biologists and primatologists from the University of California Los Angeles (UCLA), the Max Planck Institute of Animal Behavior (Germany), Indiana University, and the University of California San Diego—has been the first to systematically research playful teasing. The group's findings were published in the *Proceedings of the Royal Society B* article “Spontaneous playful teasing in four great ape species.”

## A Shared History of Humor

Since the researchers have observed the propensity for humor in both great apes and humans, they believe that the cognitive prerequisites for joking most likely originated in the common ancestor from which they evolved 13 million years ago. The ability to joke draws on competencies typically associated with humans, according to the study, including complex cognitive processing, understanding social norms, grasping the theory of mind, anticipating others' responses, and appreciating the violation of others' expectations.

However, the findings suggest that apes may possess many of these competencies as well. Teasing shares commonalities with joking, and some see playful teasing as a cognitive precursor to joking, as reported in the Max Planck website article “Do apes have humor?”

## Humanlike Habits

In 75 hours of video footage of zoo-housed great apes, the team saw the primates persistently provoking their targets, surprising them, and incorporating elements of play into their activities just as a human prankster would. Since apes don't possess language ability—which is not a prerequisite for playful teasing—their practical jokes showed similarities to those witnessed in young preverbal humans.

Human infants begin clowning and teasing early in life, as observed by authors of the *National Library of Medicine* article “Teasing and clowning in infancy.” Starting around four months of age, they tease adults by pulling a parent's hair and shrieking with delight as they try to break free. By six months, babies knock over a tower of blocks carefully built by a sibling.

By nine months, they offer an object and then whip it back as the other person reaches to grab it.

## Attracting Attention

In both the infant and ape studies, it seemed that the goal of the playful teasing was to provoke a response or attract attention. Many of the 18 different ape playful teasing behaviors the researchers recorded appeared to achieve these ends.

Even though playful teasing primarily occurred in relaxed contexts, it would not be considered play because it was one-sided and rarely reciprocated. In the great apes, the intent to play involves certain signals and facial expressions, which were not present during the activity observed by the team, according to the Max Planck article.

Perhaps the apes were trying to use playful teasing to initiate play, however. Or they could have been using it to bond with another troop member. It's difficult to know the purpose of playful teasing and what kind of evolutionary advantage humor could give animals, according to the BBC article “Why some animals have evolved a sense of humour.”

Some think laughter evolved in humans to help us bond. Humor can also serve as an icebreaker, remove social barriers, and strengthen relationships, according to the study's first author, Isabelle Laumer (UCLA and the Max Planck Institute), as reported by the BBC.

Could it serve the same purposes for apes? Laumer said we'd need to observe more groups of primates to know for sure.

Gina Wynn is a Thermo Fisher Scientific staff writer.





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## 3. Efficient Substance Use—Cost Savings

Analytical methods may require 20 to 50 different reference standards. The

quantity to be weighed depends on the number of batches to be analyzed and the analytical method. If substances are weighed directly into the target vessel, such as a volumetric flask, the risk of substance loss during the sample transfer is substantially reduced. Therefore, both the precision and reproducibility of the analytical method are significantly higher. The XPR Automatic Balance allows you to scale down and reduce the amount of substance weighed to make up the reference standard solution thanks to the lower minimum weight of the automated system.

## 4. Improved User Protection

Automated reference standard preparation can improve operator safety and mean less time wearing protective clothing and equipment. An automated approach minimizes a user's contact with the substance because the dispensing module enables the direct weighing of a substance from an enclosed dosing head into a vial.

## 5. Less Rework and Easy Cleaning—Time Savings

Using the XPR Automatic Balance, reference standards for analytical methods can be prepared accurately and efficiently.

- Avoid manual weighing errors that lead to incorrect analyses and the need for expensive, time-consuming, and unnecessary rework
- Reduce cleaning time—lower spillage risk, easier to clean, and no washing of volumetric flasks

## 6. Error-Free Documentation, Process Security, and Traceability

When you use the XPR Automatic Balance in conjunction with LabX laboratory software, you'll gain automatic documentation, process security, and traceability. Create workflows (SOPs) with LabX and access them conveniently with just one click. LabX guides you through your SOP directly on the balance terminal so every operator follows the same procedure. Complete raw data and metadata is collected and stored in a secure database in accordance with ALCOA+ standards.

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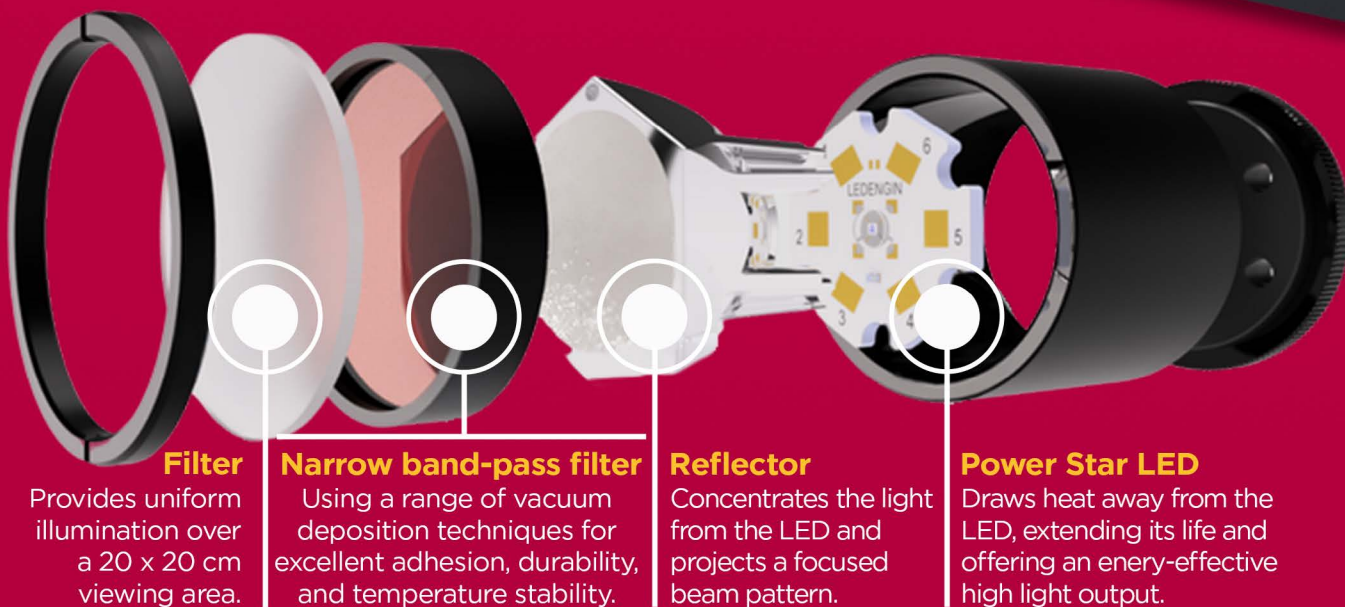
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# Study Asks If Sustainability Success Impacts Local Communities

By Mark Miller

Research and clinical laboratories are making substantial efforts to achieve their sustainability goals and help combat the global climate crisis. They are focused on improving resource management, reducing waste and CO<sub>2</sub> emissions, conserving energy, and bringing greater attention to environmental issues.

Their work extends to the companies that supply and serve them. Thermo Fisher Scientific, for example, supports these labs by creating environmentally responsible product packaging, developing energy-efficient equipment, offering greener products through its distribution channels, and pursuing and measuring its own aggressive climate goals, among many other initiatives.

Higher education also contributes. Many universities have established sustainable lab programs as part of their overall environmental aspirations and curricula. One such institution, North Carolina State University, has published a study that asks: Do universities that score well on sustainability measures have a positive environmental effect in their local communities?

## Good News and Bad News

According to the article “Are universities connected to local sustainability? A new study suggests yes...and no.” on ScienceDaily.com, researchers from NC State examined data from 105 U.S. metropolitan areas that are local to 427 institutions of higher learning. The team used the U.S. Cities Sustainable Development Goal (SDG) Index—which scores municipal sustainability—and the QS Sustainability Universities Ranking—which evaluates educational sustainability—to understand the relationship between municipalities that achieved high marks on the SDG and schools that did well on the QS Sustainability Universities Ranking.

They found a correlation between high-scoring universities and communities that “score well on innovation, reducing poverty, creating economic opportunities, and reducing inequality,” the ScienceDaily.com article states. However, Ha Vien, first author of the study, said that the team also discovered “that universities that perform strongly on sustainability measures are also associated with a decline in responsible consumption and production—measured here as increased air pollution and release of toxic chemicals—in their surrounding areas.”

## Acting Locally with Lab Coats

The NC State study’s mixed outcomes resonate with today’s labs’ environmental endeavors. They pursue sustainable practices that, over time, promise to have a larger positive impact. These pursuits may seem like small steps in some cases, but as labs consider everything from water usage to replacing single-use plastic consumables with reusable glass, each component of their environmental agendas becomes critical.

For example, San Diego State University (SDSU) found that lab coats present a significant opportunity to improve sustainability. The school is piloting lab coat vending machines to help ensure that lab coats are reused and that researchers always have access to clean, protective garments.

As the article “Pressed for Safety: Lab coat vending machines arrive on campus” from SDSU points out, researchers working with chemicals and hazardous materials require lab coats and other personal protective equipment to help ensure safety. But used lab coats can often get left behind in closets, contributing to (possibly harmful) waste. The lab coat vending program promotes reuse by enabling researchers to deposit used coats and swipe a card at one of the vending machines to retrieve a fresh coat in the size they need.

## Time and Effort

The NC State study indicates that programs such as the lab coat vending machines at SDSU may ultimately connect to broader change, but that change doesn’t occur overnight. “It took significant time and effort for universities to become the economic drivers that we see today,” added Vien. “Climate change will continue to be a defining challenge for the foreseeable future. Our findings highlight that there are still a lot of opportunities for higher education to make more of a difference in surrounding communities.” Labs will continue to embrace these opportunities, too, and work with businesses and academia to bring about a more pervasive sustainable transformation.

*Mark Miller is a Thermo Fisher Scientific staff writer.*



# Benefits of Ready-to-Use Parenteral Packaging Components and Kits

By Robert Popilock

## Legacy Approach and Challenges

As the demand for personalized, injectable drug products grows, so does the need for sterile, efficient packaging solutions. Ready-to-use (RTU) packaging components provide an innovative answer to some of the industry's most pressing challenges.

Regulatory agencies expect drug developers and packagers to assure compliance with global sterile manufacturing controls, helping ensure that drug products meet patient safety, drug efficacy, and shelf-life claims. Those who choose to process primary packaging components in-house face challenges associated with sterility assurance and incur significant upfront and operational costs. Ready-to-use (RTU) primary

packaging options offer solutions to many of these challenges.

## A Simplified Approach to Aseptic Filling

The recent growth of personalized, complex, and high-value injectable biologics is driving the need for drug research and development labs to qualify and use RTU packaging to accelerate development timelines and eliminate downstream adoption risks. These benefits drive interest in replacing in-house washing, depyrogenation, and sterilization with RTU container closure systems (CCS).<sup>1,2</sup>

RTU components reduce costs and effort associated with traditional in-house/inline cleaning and sterilization by eliminating complex

facility design, capital equipment investment, process controls and validations, and specialized operators.<sup>3</sup>

## Productivity and Cost Savings

The costs associated with inline preparation of processed vials are significant compared to drug filling using RTU primary packaging options. In our model, we assume the processing of 250,000 vials per year. The comparative analysis includes operational costs associated with the use of unprocessed vials undergoing in-house/in-line processing versus RTU components (Table 1).

The savings on operations alone is an estimated 37 percent. When the elimination of capital equipment is added to this analysis, the use of RTU alternatives can save an estimated 80 percent of total costs.<sup>4</sup>

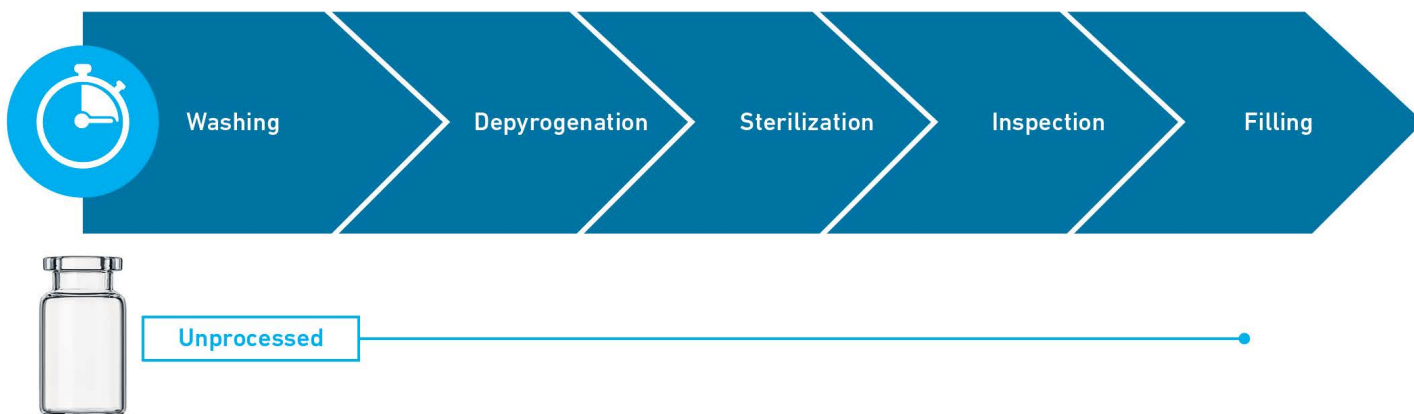
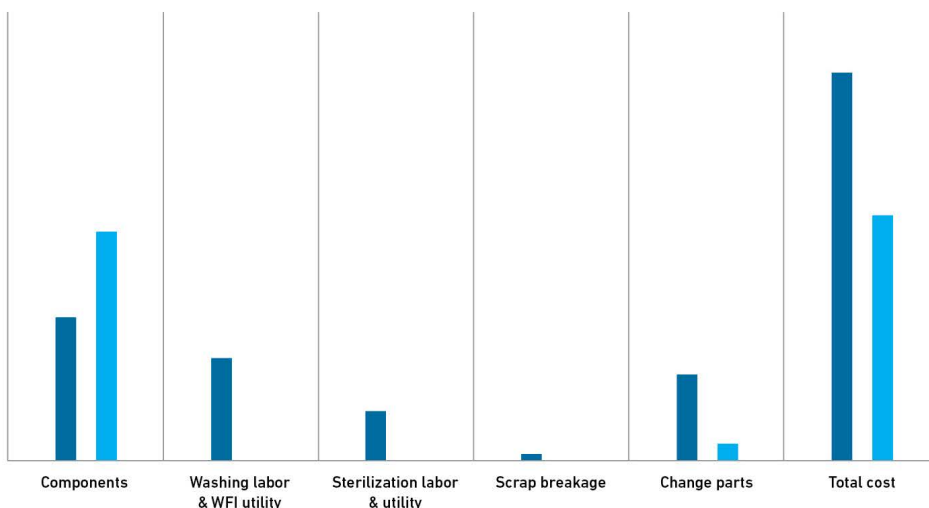




Table 1 – Operational costs

■ Inline processing ■ RTU



## Cascade Benefits

Beyond cost, many drug manufacturers seek to reduce risks associated with implementing in-line process controls and executing validations required by international regulatory bodies.<sup>5</sup> RTU components are certified to USP injectable application standards and ship with lot traceable certifications, allowing direct entry into the aseptic core.

For developers, RTU products allow them to identify promising injectable proteins and targets using primary packaging components, accelerating and derisking the development cycle and technology transfer.

RTU components directly enter the filling environment to streamline your

workflow and negate the need for time-consuming, in-house/in-line processing steps. This results in developers and packagers having more time for primary development and manufacturing.

## Conclusion

In today's fast-paced pharmaceutical industry, efficiency and safety are paramount. With RTU components, developers and packagers can meet the demand for personalized medicines while significantly reducing costs, contamination risks, and operational complexities. As the industry evolves, adopting RTU solutions will help ensure companies remain at the forefront of innovation.

At DWK Life Sciences, we recognize the dynamic nature of today's drug development and packaging markets and their need to meet validated aseptic operational requirements. Our RTU portfolio, which includes the CompletePAK and EZ-fill brands, is designed to maximize the selection of certified choices, assuring workflow efficiencies and alignment to development, clinical, and commercial packaging processes.

Learn more about **DWK's RTU** capabilities.

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# Minimize Your Laboratory's Environmental Impact

Laboratories make it possible for important research to take place, but they require a lot of energy to operate, significantly more than the average office building. Many scientists express concerns regarding environmental sustainability and waste challenges in the lab. From planning to discovery, learn how even the smallest choices you make as an innovator and laboratory professional can contribute to a better world.

## Resource-Conscious Designs

Sustainability starts at the beginning. Seek products designed to minimize your use of and exposure to hazardous materials and buy from manufacturers who consider the entire life cycle of their lab supplies. Look for suppliers that provide data regarding their environmental claims through an ACT label or other sustainability-driven product marking.

Thermo Scientific products are part of a program run by the nonprofit My Green Lab ([mygreenlab.org](http://mygreenlab.org)), an organization that provides an environmental assessment label for laboratory products. The ACT label emphasizes accountability (A), consistency (C), and transparency (T) around manufacturing, energy, water use, packaging, and end-of-life disposal.

The ACT label makes it easy to compare and select environmentally friendly products. It can inform your buying decisions or help you evaluate the impact of a product currently in use.

## Consumables You Can Reuse

Plastic consumables are often the best choice for your lab, especially those you can reuse again and again. As is the case with many Thermo Scientific Nalgene products, by the time you're ready to part with them, you may be able to recycle them. Many of our products are made from polypropylene and polyethylene, which are recyclable plastics.

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### Nalgene Polypropylene Graduated Cylinders

Conduct applications accurately with Thermo Scientific Nalgene Polypropylene

Graduated Cylinders, which feature generous pour spouts, molded-in graduations, and a large, blue base. There is no meniscus to confuse readings, helping to eliminate guesswork. The cylinders can be chemically sterilized, and they're suitable for food and beverage use.

### Nalgene Polypropylene Beakers

Carry out precise and efficient pouring with Thermo Scientific Nalgene Polypropylene Griffin Low-Form Beakers. These beakers feature a single-spout design and easy-to-read, silk-screened graduations. Their rugged, reusable construction will last for years under typical laboratory conditions, and they meet ISO/DIN 7056 international standards for laboratory plasticware accuracy.

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# Recycle your pipette tips and tip racks

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Note: Pipette tips and racks are recycled into building materials, e.g., recycled plastic lumber, and not into new pipette tips.

## ART Barrier Hinge Rack TipCycle Recycle Kit, sterile packaging

Description	Mfr. No.	Cat. No.	Quantity
ART 10 $\mu$ L, Barrier Sterile Hinged Rack Kit	2139RCHR	02-681-573	Case of 4,800
ART 20 $\mu$ L, Barrier Sterile Hinged Rack Kit	2149PRCHR	02-681-577	Case of 4,800
ART 100 $\mu$ L, Barrier Sterile Hinged Rack Kit	2065ERCHR	02-681-540	Case of 4,800
ART 200 $\mu$ L, Barrier Sterile Hinged Rack Kit	2069RCHR	02-681-576	Case of 4,800
ART 1,000 $\mu$ L, Barrier Sterile Hinged Rack Kit	2069RCHR	02-681-575	Case of 3,072
ART 10 $\mu$ L, Low Retention, Barrier Sterile Hinged Rack Kit	2139RC05HR	02-681-544	Case of 4,800
ART 20 $\mu$ L, Low Retention, Barrier Sterile Hinged Rack Kit	2149PRC05HR	02-681-546	Case of 4,800
ART 100 $\mu$ L, Low Retention, Barrier Sterile Hinged Rack Kit	2065ERC05HR	02-681-539	Case of 4,800
ART 200 $\mu$ L, Low Retention, Barrier Sterile Hinged Rack Kit	2069RC05HR	02-681-541	Case of 4,800

## ART Non-Barrier Rack TipCycle Recycle Kit, sterile packaging option

Description	Mfr. No.	Cat. No.	Quantity
ART 10 $\mu$ L, Standard Length, Non-Barrier Sterile Hinged Rack Kit	3501RCHR	02-681-556	Case of 4,800
ART 10 $\mu$ L, Extended Length, Non-Barrier Sterile Hinged Rack Kit	3511RCHR	02-681-558	Case of 4,800
ART 20 $\mu$ L, Non-Barrier Sterile Hinged Rack Kit	3521RCHR	02-681-560	Case of 4,800
ART 200 $\mu$ L, Non-Barrier Sterile Hinged Rack Kit	3551RCHR	02-681-562	Case of 4,800
ART 1,000 $\mu$ L, Non-Barrier Sterile Hinged Rack Kit	3101RCHR	02-681-554	Case of 3,072
ART 10 $\mu$ L, Low Retention, Non-Barrier Sterile Hinged Rack Kit	3101RC05HR	02-681-553	Case of 3,072
ART 20 $\mu$ L, Low Retention, Non-Barrier Sterile Hinged Rack Kit	3521RC05HR	02-681-559	Case of 4,800
ART 200 $\mu$ L Low Retention, Non-Barrier Sterile Hinged Rack Kit	3551RC05HR	02-681-561	Case of 4,800
ART 1,000 $\mu$ L Low Retention, Non-Barrier Sterile Hinged Rack Kit	3501RC05HR	02-681-555	Case of 3,072

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“We are able to build it, make it sustainable, make it operational.” Deborah Haring, Controlled Environments and Production Specialist

Photo of a cleanroom pass-through by Rose Tichava, Laboratory Builders, Inc.

# Inside the Box: The Modular Way to Build a Cleanroom

By Dawn Patton Mangine

The traditional image of a cleanroom is a conventionally built room inside a regular building with stark white walls and people in white sterile gowns completing their production work. However, a modular cleanroom is a break from the past, providing a faster timeline for completion and allowing operations to gain time and profit to start process and production lines sooner.

When Pharmaceutical Product Development (PPD, Inc.), part of Thermo Fisher Scientific, needed a cleanroom, they initially contacted a traditional general contractor for a proposal. PPD operates the largest GMP (good manufacturing practices) testing lab in Middleton, Wisconsin, testing pharmaceuticals.

According to Jessica Phillips, senior group leader for PPD, “We were designing quickly and with flexibility in mind because we’re onboarding many new technologies.” Discussions with the general contractor (GC) were stalled, and Phillips decided to call on the Fisher Scientific team for input on the matter.

“It was good to have other opinions on calls to talk through everything because [we were] trying to get to market as soon as possible,” Phillips said.

## Cleanroom in a Box

While the GC was pushing for a traditional build—what’s known in the industry as a “stick” build—Deborah Haring, Fisher Scientific controlled environments and production specialist, had a different idea. She advised that a more appropriate solution was a modular, prefabricated controlled environment.

Because customers in biotech and pharmaceuticals can experience a growth phase and have shortened timelines as a result, “We like to recommend a prefabricated cleanroom,” said Kristine Tiangco, Fisher Scientific regional safety specialist for Illinois and Wisconsin. This gives the customer the flexibility to configure the environment to their needs on an expedited timeline, which in this instance was faster than the traditional stick-build timeline proposal by over two months.

With the modular cleanroom, which Tiangco called a “cleanroom in a box,” a lab can configure an empty space to become an ISO-5 aseptic cleanroom or an ISO-8 non-classified space. The interconnecting panels are composed of high-quality, non-shedding, non-conductive materials that can withstand the rotations of cleaning, disinfection, sanitation, and sporicidal chemicals. The materials lend themselves to a long lifespan of the modular space.

If the space needs to be reconfigured, it’s simply a matter of reconfiguring walls. Haring explained that with a modular lab,

it’s easy for the client to expand or contract their footprint and even pick up and relocate the modular cleanroom down the road to a new location and building when desired.

Phillips confirmed that both speed and flexibility were two urgent factors for PPD. “We needed that flexibility, so when we found how a test would run, we could make those changes as we go.”

Another reason to choose a modular build, said Haring, is sustainability. “We help the customer check the box on sustainability because when you choose modular over the existing methods, there’s no carbon footprint of building materials on a work site.” The manufacturing detritus does not impact the customer. All the components are constructed offsite and shipped to the worksite to erect. “It’s a very nice, green presentation.”

## Expertise and Trust

The modular cleanroom at PPD is set up in a 2,000-square-foot building. It contains biosafety cabinets, where most of the testing is done. The lab is non-classified with the biosafety cabinets rated to ISO level 5.

Phillips explained that the cabinets are used for mycoplasma testing. “Mycoplasma is very small, less than two microns (>0.2 microns), and it can easily infect cell lines.” The modular setup with the cabinets mitigates contamination risk, which was a big concern, Phillips said. Having a separate lab for mycoplasma allowed PPD to prioritize their workflows and pass-throughs for this testing.

In addition to the cleanroom, the Fisher Scientific channel supplied the biosafety cabinets, stainless steel benches, and guidance for operating procedures, such as gowning protocols and cleaning tools and solutions. “We are able to build it, make it sustainable, make it operational, and give them a much better result at the end of the day with their whole process,” Haring said. “They hit the easy button when they called us.”

Tiangco said, “We hit the big three for PPD: a faster timeline, appropriate materials, and lower costs.” She added, “What I’m most proud of is the strong, exhaustive, consultative relationship we were able to build with our customers.”

For more information on cleanrooms and other types of research facility construction that the Fisher Scientific channel can provide, visit [fishersci.com/new-facility-support](https://fishersci.com/new-facility-support).

*Dawn Patton Mangine is a Thermo Fisher Scientific staff writer.*





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