



The  
**Fume  
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Company**

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## Creating High-Performance Laboratories

Your Essential Industry Insights  
Featuring  
Trends, Challenges & Tailored Design Solutions

Creating Safer, smarter, and more efficient  
laboratory designs and the latest advancements in  
fume extraction

Practical solutions for future-ready environments

## Creating High-Performance Laboratories

### The Role of Laboratory Design in Life Sciences and Healthcare

For life sciences and healthcare organisations, the right workspace is more than a convenience — it's a necessity. Central to this is laboratory design. Which directly influences the efficiency, collaboration, and safety of scientific environments. In this article, we explore the critical aspects of laboratory design, including emerging trends, different laboratory types, challenges, and effective solutions.

### Laboratory Design and Construction

#### Market Trends

The demand for laboratory and science-related office spaces continues to grow. According to Savills, London alone requires 700,000 square feet of such spaces. The same is true for Cambridge, with supply often lagging behind demand across the Golden Triangle (London, Cambridge, and Oxford). Unlike the established scientific hubs of Cambridge and Oxford, London's life sciences market is relatively new, driving rapid development. In recent years, projects in areas like King's Cross and Canary Wharf have added over a million square feet of laboratory-enabled spaces. Between 2021 and 2023, investment in London's science facilities reached an impressive £1.1 billion.

#### Technology Integration

Modern laboratories are being transformed by advanced technologies, particularly the Internet of Things (IoT). Interconnected instruments now enable real-time data transmission, accelerating insights and enhancing efficiency. However, 69% of lab leaders express concerns about losing competitive advantage without further investment in automation and connectivity. The shift towards hybrid working is also impacting laboratory design. Collaboration across global teams increasingly relies on virtual tools like Zoom, necessitating lab spaces that support effective digital communication while maintaining an inclusive environment.

#### Sustainability

Sustainability is a priority for many organisations, with 56% of life sciences leaders surveyed reporting defined sustainability goals. These include water conservation, energy efficiency, and designing green buildings. Given the energy-intensive nature of laboratories, with demands for HVAC systems, lighting, and temperature-controlled storage, sustainable design is crucial to reducing carbon footprints during the initial planning phase.

#### Open Plan Spaces

Open-plan laboratory designs foster collaboration, particularly for interdisciplinary research teams. However, these layouts must balance the need for collaboration with safety. For example, chemical spills in open-plan spaces could necessitate shutting down an entire lab, highlighting the importance of targeted safety measures in such environments.

## Creating High-Performance Laboratories

### Understanding Laboratory Types

Laboratory design must account for the diverse range of laboratory types, each with unique requirements. Key examples include:

<b>Hospital Laboratories:</b>	Perform clinical specimen testing to assess patient health.
<b>Diagnostic Laboratories:</b>	Focus on disease-specific tests and diagnoses.
<b>Clinical Laboratories:</b>	Conduct broader tests for public health needs.
<b>University and Research Laboratories:</b>	Facilitate academic and scientific research.
<b>Manufacturing Laboratories:</b>	Ensure product quality and compliance through testing.

Additionally, the distinction between wet labs (focused on biological and chemical experiments) and dry labs (specialising in computation and engineering) is critical. Increasingly, integrated spaces are designed to enhance collaboration between these two domains.

### Key Challenges in Laboratory Design

<b>Safety:</b>	From storage systems to HVAC requirements, safety underpins every aspect of laboratory design.
<b>Storage:</b>	Laboratories require specialised storage solutions for chemicals, samples, and equipment, often incorporating temperature-controlled units.
<b>Movement and Accessibility:</b>	Effective layout planning ensures both efficient workflows and unimpeded access to critical areas like fume cupboards and sinks.
<b>Space Management:</b>	With extensive equipment needs, maximising usable space without compromising safety is a recurring challenge.
<b>Air Control:</b>	Proper ventilation and multi-zone HVAC systems are essential for both employee safety and equipment functionality.

### Designing an Effective Laboratory

To overcome these challenges, several principles are key

<b>Defining Needs:</b>	Engage stakeholders to outline the laboratory's specific activities, required equipment, and collaboration needs.
<b>Prioritising Safety:</b>	Incorporate hygiene stations, fire exits, and dedicated waste disposal areas into the design.
<b>Fostering Collaboration:</b>	Adaptable spaces, such as breakout areas and meeting rooms, enhance teamwork.
<b>Optimising Airflow:</b>	Implement multi-zone HVAC systems to manage diverse ventilation and temperature needs across the lab.
<b>Smart Lighting:</b>	Layered lighting strategies and maximised natural light enhance employee wellbeing while reducing energy consumption.
<b>Sustainable Design:</b>	Reduce energy demands through efficient HVAC systems, renewable materials, and eco-conscious construction.



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### Our Approach.

We understand the need for highly tailored environments that reflect the diverse and specialized nature of laboratory work. Our bespoke designs take into account every factor that influences the efficiency, safety, and sustainability of a laboratory. From the layout to the air control systems, fume extraction, and safety features, we ensure that every element is purposefully designed to support your goals and workflow.

### Why Choose us.

We specialize in creating laboratory environments that are as unique as the work being conducted within them. Our commitment to bespoke solutions ensures that every aspect of the laboratory meets your specific needs. From fume extraction systems and safety protocols to collaborative spaces and sustainable designs, we ensure that your laboratory is perfectly suited to your research goals.

By working with us, you gain more than just a laboratory – you gain a space that fosters innovation, collaboration, and safety, all while minimizing environmental impact and operational inefficiencies. As the demand for lab space continues to rise, we are here to provide the expertise and custom solutions necessary to meet those demands and help you achieve your mission in life sciences and healthcare.

As the landscape of life sciences and healthcare research continues to evolve, so too must the spaces in which that work takes place. Bespoke laboratory design is no longer a luxury but a necessity. We are committed to providing you with tailored solutions that not only meet today's demands but are also ready for the future.