CHIMERABIO

SAMPLE MANAGEMENT SYSTEM
MULTI-SITE | MULTI-DEPARTMENT | MULTI-PROJECT
CONNECT. MANAGE. ADVANCE RESEARCH.

PRODUCT UPDATE · 2026

# Research Operations Infrastructure for Modern Biobanks

Enterprise-ready infrastructure connecting research institutions, biobanks, and multi-site teams — built to scale toward commercial deployment.

# The Operational Problem

Research environments still rely on fragmented workflows — spreadsheets, disconnected databases, legacy systems, and manual audit trails. As sample volumes and multi-site studies grow, operational complexity compounds, creating gaps across:

- Chain-of-custody visibility
- Governance and auditability
- Sample tracking consistency
- Cross-site coordination
- Reporting and operational oversight
- Consent-aware workflows
- Manual administrative overhead

# Why Existing Systems Fall Short

Most institutions are left choosing between systems that no longer fit how modern research operates:

### Hard to modernise

Legacy platforms are difficult and expensive to extend, tightly coupled to outdated infrastructure.

### Built for a different era

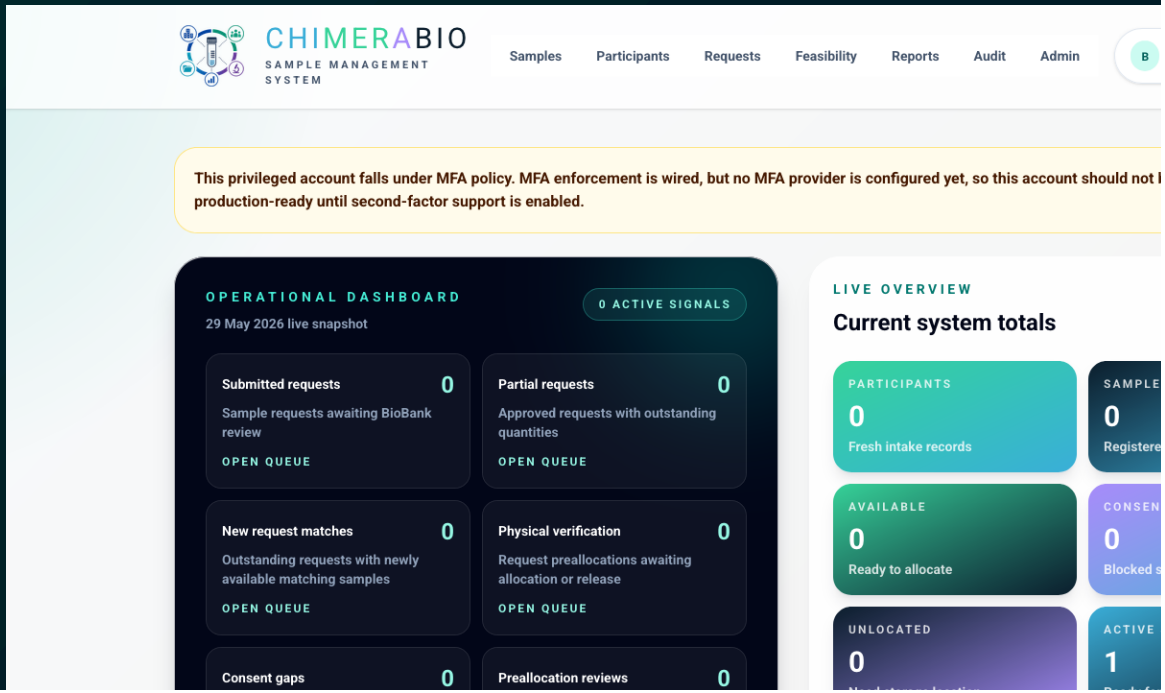
Existing tools were not designed for multi-site scale, governance, or consent-aware workflows.

**ChimeraBio** was built to close these gaps — a modern, scalable, governance-focused platform.

# Introducing ChimeraBio

ChimeraBio is a central operational layer for research operations, sample management, and participant workflows.

It unifies operational oversight, workflow management, governance, reporting, and sample lifecycle handling into one environment built for long-term scalability.



# Core Platform Areas

The platform currently spans eight operational areas:

- Participant & consent management
- Sample intake & tracking
- Workflow allocation & issuance
- Audit & governance review
- Operational reporting
- Multi-role access control
- Researcher & study management
- Inventory & location tracking

The rebuild replaces fragmented legacy processes with a modern operational platform — built to support institutional growth and future commercial deployment.

# Why ChimeraBio Is Different

### Governance First

Built around auditability, chain-of-custody visibility, consent-aware workflows, and operational accountability.

### Research Intelligence

Designed to evolve beyond sample tracking through medication intelligence, cohort identification, feasibility analysis, and research insight.

### Operational Infrastructure

Multi-site workflows, reporting, allocation management, inventory governance, and institutional scalability.

*ChimeraBio is not simply a sample inventory system — it is a research operations platform that connects governance, workflows, intelligence, and infrastructure.*

# Operational Dashboard

The dashboard provides centralised operational visibility across workflow activity, governance signals, inventory state, and operational queues.

Current dashboard functionality includes:

- Workflow summaries
- Sample visibility
- Consent indicators
- Inventory state monitoring
- Operational queue tracking
- Administrative readiness metrics

The dashboard architecture is designed to evolve alongside institutional requirements and future operational intelligence tooling.

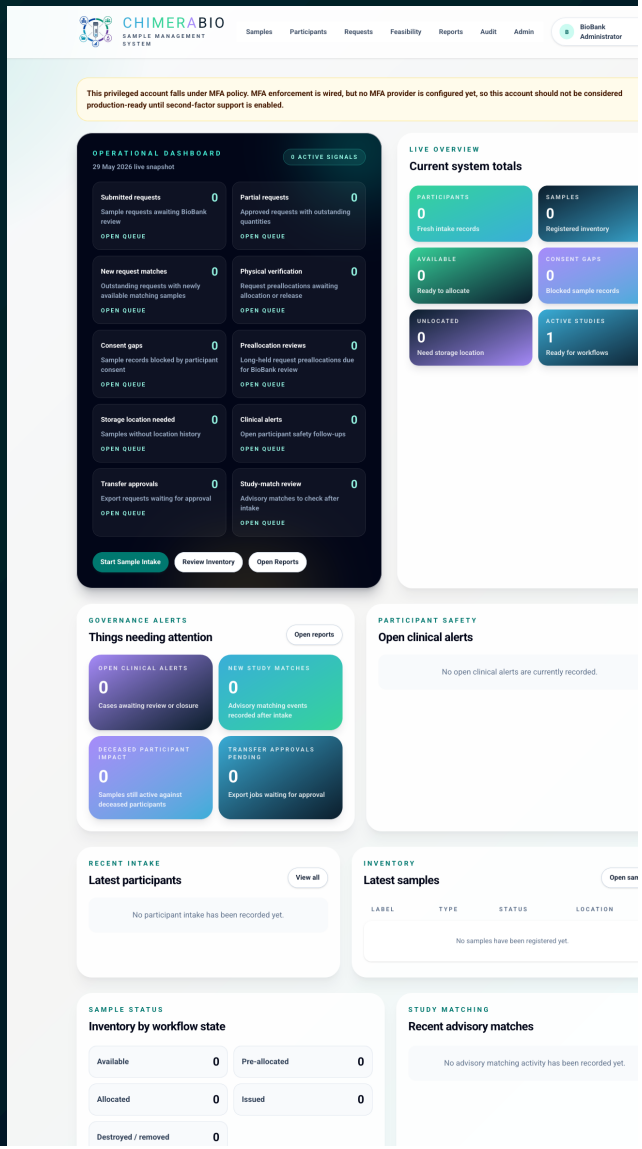
# Workflow Visibility & Operational Oversight

Operational workflows are designed around real-time visibility and queue-based management.

The platform surfaces:

- Allocation activity
- Workflow bottlenecks
- Missing governance data
- Inventory movement
- Recent operational activity
- Workflow completeness indicators

This allows operational teams to identify issues earlier while improving overall workflow consistency and oversight.



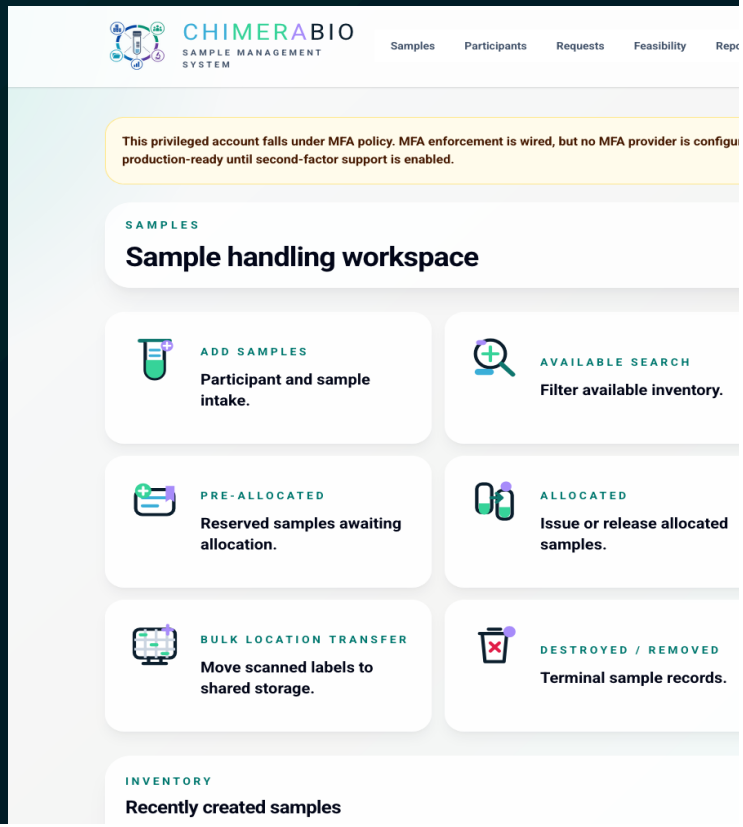
# Sample Lifecycle Management

ChimeraBio supports structured end-to-end sample lifecycle handling across intake, allocation, issue, return, and removal workflows.

Current capabilities include:

- Sample registration
- Storage tracking
- Consent-aware workflows
- Research allocation handling
- Issue and transfer workflows
- Return-to-inventory handling
- Destruction and removal states

Every workflow integrates directly into the governance and audit infrastructure.



# Allocation, Transfer & Inventory Workflows

Operational workflow tooling is designed to reduce manual overhead while improving traceability and governance consistency.

Current workflow functionality includes:

- Pre-allocation handling
- Bulk workflow operations
- Bulk location transfers
- Researcher and study assignment
- Queue-based operational workflows
- Location history tracking
- Inventory release and reissue handling

The architecture supports future expansion into barcode handling, freezer hierarchies, and automated inventory operations.

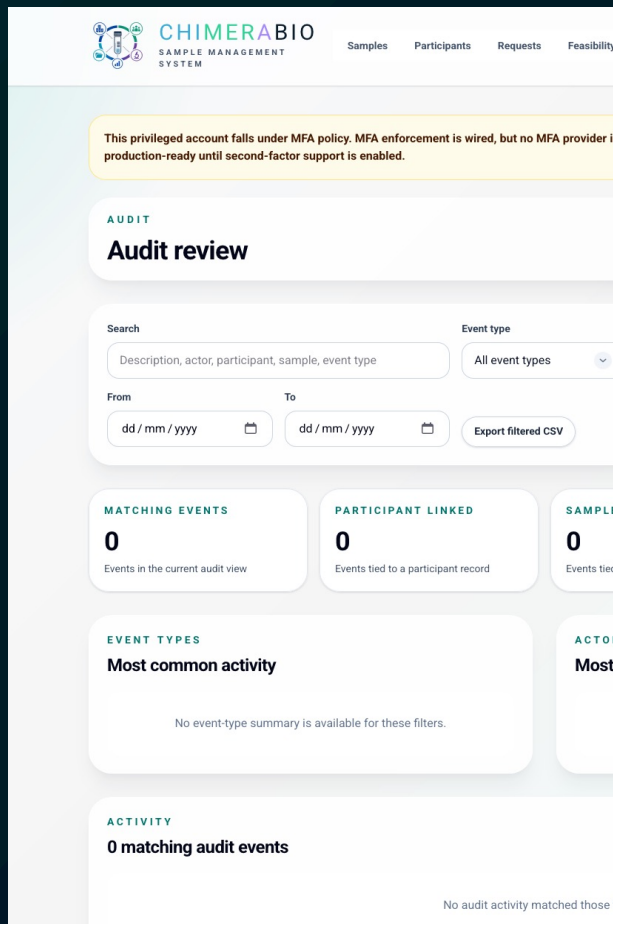
# Governance & Audit

Governance and operational auditability are central to the ChimeraBio platform architecture.

The platform includes append-only operational tracking designed to improve visibility into:

- Workflow actions
- Participant changes
- Sample movements
- Administrative activity
- Governance-related updates

This governance-first approach helps position the platform for institutional operational review and future compliance-focused environments.



# Audit Infrastructure & Workflow Visibility

The audit layer supports operational review, reporting, and long-term chain-of-custody visibility.

Current audit tooling includes:

- Workflow event history
- User activity tracking
- Filtered operational review
- CSV export capability
- Participant change visibility
- Sample movement auditing
- Role-aware access control

The audit infrastructure also creates a strong foundation for future governance automation and oversight tooling.

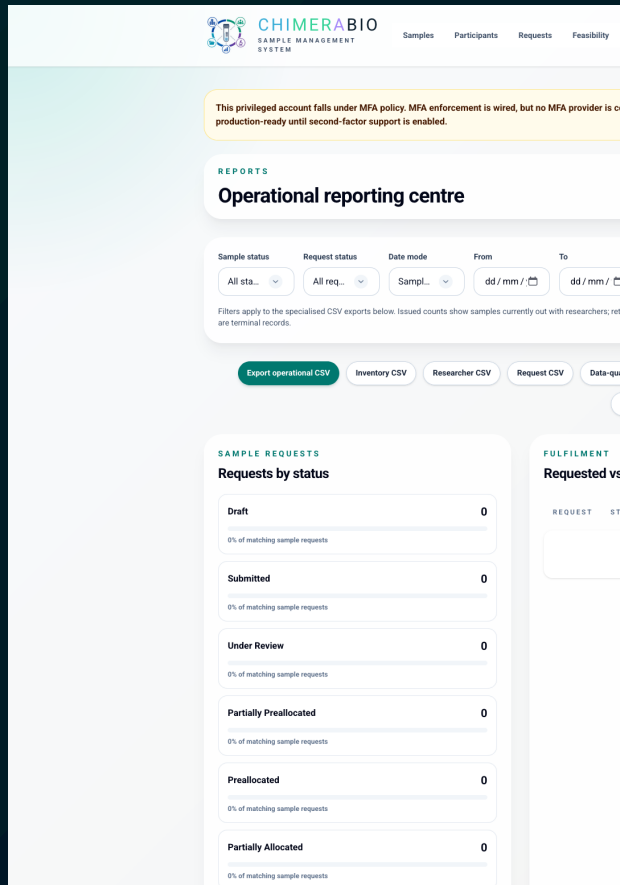
# Operational Reporting

ChimeraBio includes a dedicated reporting layer designed to provide visibility into operational health and workflow activity.

Current reporting functionality includes:

- Inventory summaries
- Workflow state reporting
- Researcher workload visibility
- Governance gap monitoring
- Operational export tooling
- Audit reporting workflows

The reporting layer is designed for both operational review and future analytical expansion.



# Operational Intelligence & Future Analytics

Future reporting and intelligence opportunities include:

- Predictive workflow analysis
- Operational trend monitoring
- Inventory forecasting
- Workflow optimisation insights
- AI-assisted recommendations
- Governance-risk visibility

Long-term roadmap planning focuses on transforming reporting from passive visibility into active operational intelligence.

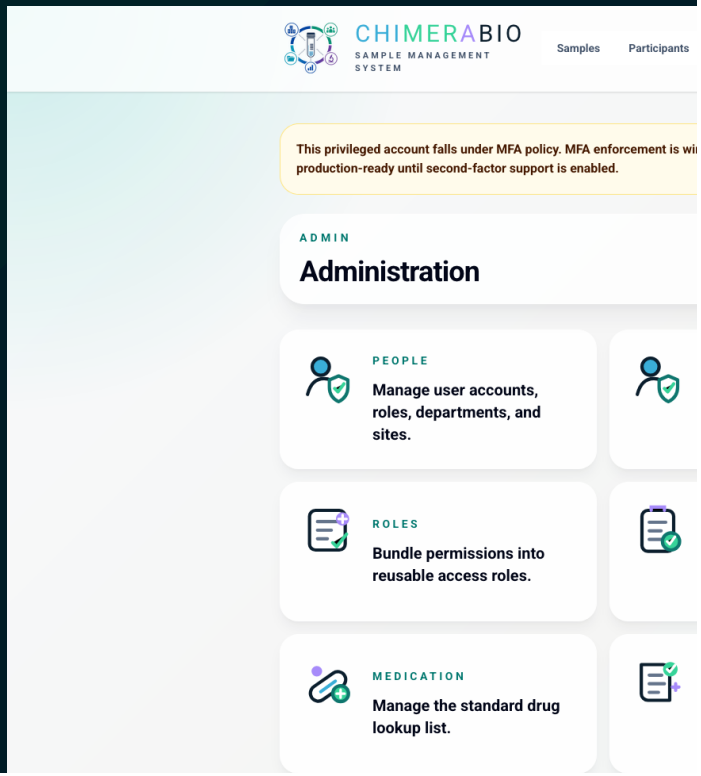
# Administration & Access Control

The platform includes a flexible multi-role administration and governance architecture.

Current functionality includes:

- Role-based permissions
- Multi-user workflows
- Researcher and study management
- Administrative governance tooling
- Workflow protection rules
- Department-aware access handling

The architecture has been designed to support future institutional scaling and governance expansion.



# Institutional Governance & Identity Expansion

Future administration roadmap areas may include:

- Single sign-on integration
- MFA support
- External collaborator access
- Federated institution support
- Temporary access provisioning
- Advanced governance controls

The long-term vision is to support larger institutional and cross-site operational environments while maintaining governance clarity.

# Technical Foundation

ChimeraBio has been rebuilt using a modern Laravel and Vue application architecture focused on maintainability, scalability, and operational resilience.

The rebuild currently includes:

- Laravel 13 application architecture
- Vue 3 workflows
- Tailwind CSS v4 design system
- Modular workflow infrastructure
- Export and reporting tooling
- Operational governance systems

The technical foundation has been designed for long-term extensibility and future deployment flexibility.

# Workflow Hardening & Operational Resilience

Significant focus has been placed on operational reliability and workflow validation.

The platform currently includes:

- Automated operational testing
- Workflow validation rules
- Governance-aware protections
- Audit-linked workflow handling
- Queue-based operational tooling
- Bulk operational workflows

The system currently includes more than 160 automated tests and over 1,400 passing assertions across operational and governance workflows.

# Commercial Pathways

## Institutional Deployment

- Research institutions
- Universities
- NHS research environments
- Biobanks

## Platform Licensing

- Multi-site deployments
- White-label opportunities
- Private research networks
- Commercial laboratories

## Strategic Growth

- Partnerships
- Ecosystem integrations
- Acquisition opportunities
- International expansion

ChimeraBio has been intentionally designed to support multiple deployment models without being tied to a single commercial pathway.

# Platform Status

ChimeraBio has progressed beyond concept stage into a functioning operational platform with substantial workflow coverage and governance infrastructure already implemented.

## Current Implementation

- ✓ Participant Management
- ✓ Sample Lifecycle Workflows
- ✓ Governance & Audit Infrastructure
- ✓ Operational Reporting
- ✓ Workflow Queue Management
- ✓ Role & Permission Management
- ✓ Administrative Tooling
- ✓ Researcher & Study Management

## Platform Metrics

- ✓ 160+ Automated Tests
- ✓ 1,400+ Passing Assertions
- ✓ Laravel 13 Architecture
- ✓ Vue 3 Frontend
- ✓ Multi-Site Design Foundation
- ✓ Active Development Ongoing

# Why ChimeraBio Was Built

Having spent years working on operational platforms across multiple industries, I repeatedly encountered fragmented workflows, disconnected data, and systems that had evolved through years of workarounds and manual processes.

When exploring the biobanking and research space, many of the same challenges appeared repeatedly:

- Fragmented operational workflows
- Limited audit visibility
- Siloed data
- Manual reporting processes
- Difficulty scaling across departments and sites

ChimeraBio began as an exploration into how modern software architecture, governance-first design, and operational intelligence could be combined into a platform built specifically for modern research environments.

The goal was not simply to build another sample database, but to create a foundation capable of supporting governance, research intelligence, operational oversight, and future innovation within a single scalable platform.

# Development Journey

### Phase 1 — Foundation COMPLETE

- Core architecture rebuild
- Governance model
- Workflow engine

### Phase 2 — Operational Platform COMPLETE

- Sample lifecycle management
- Audit infrastructure
- Reporting framework

### Phase 3 — Research Intelligence ACTIVE

- Medication intelligence
- Environmental monitoring
- Operational intelligence

### Phase 4 — Research Ecosystem PLANNED

- Interoperability
- AI-assisted workflows
- Cross-institution collaboration

# Strategic Development Roadmap

## Current Platform Foundation

- Sample lifecycle management
- Governance & audit
- Operational reporting
- Multi-study workflows
- Researcher allocation management

## Active Development Priorities

- Research medication intelligence
- Environmental monitoring integration
- Operational intelligence & automation

## Long-Term Vision

To evolve ChimeraBio from a sample management platform into a comprehensive research operations and governance ecosystem.

### Research Intelligence

Unified drug, sample, and study insights

### Environmental Governance

Temperature, custody, and compliance tracking

### Operational Intelligence

AI-driven analytics and workflow automation

# Research Medication Intelligence

## Why It Matters

Research participants often take multiple medications that influence study outcomes, eligibility, sample interpretation, and cohort selection.

Most biobank platforms capture medication data as static text fields — limiting analytical value.

## Future Potential

By connecting participant data, medications, and sample inventories, ChimeraBio could help researchers identify suitable cohorts faster and improve study feasibility assessments.

### Connected Data Flow

# Medication Intelligence Capabilities

- Full formulary integration
- Drug classifications
- Drug interaction checking
- Medication contraindications
- Research cohort identification
- Therapeutic group analysis
- Participant medication profiling
- Structured medication data layer

# Environmental Monitoring & Chain of Custody

### Why It Matters

Sample integrity depends on environmental conditions — yet most platforms don't track temperature or chain of custody.

## Potential Capabilities

- Freezer & cold-storage temperature monitoring
- Continuous environmental logging
- Full sample storage history
- Threshold & excursion alerts
- Equipment health tracking
- Automated compliance reporting

## Chain-of-Custody Record

- Location tracking at every step
- Transfer & handoff logging
- Environmental conditions captured
- Real-time excursion alerts
- Governance & accountability
- Complete, exportable audit trail

# Sample Lifecycle & Integrations

## Sample Lifecycle

Collection › Storage › Temp. Logs › Transfer › Research Allocation › Archive / Destruction

## Potential Integrations

- T-Scan
- Vaisala
- Testo
- Sensitech
- IoT Freezer Monitoring

### Audit-Ready by Design

Every sample carries a complete, time-stamped record of location, environment, and custody — from collection through to archive or destruction.

# Operational Intelligence & AI Roadmap

**Future Areas Under Evaluation**

- Feasibility matching
- Cohort discovery
- Sample recommendations
- Predictive inventory reporting
- Workflow bottleneck detection
- Governance monitoring
- AI-assisted reporting

**Strategic Goal**

Transform operational data into actionable research intelligence while reducing administrative burden across research organisations.

# Connect. Manage. Advance Research.

ChimeraBio is being developed as a modern research operations platform designed to bring together sample management, governance, reporting, research intelligence, and operational oversight within a single scalable ecosystem

**CURRENT FOCUS AREAS**

- Research medication intelligence
- Environmental monitoring & chain of
- Operational reporting & intelligence
- Governance automation
- Institutional scalability

**LOOKING FURTHER AHEAD – Exploring Opportunities For:**

- Research collaboration
- Pilot deployments
- Strategic partnerships
- Product feedback
- Future commercial pathways

**Interested in the project, have feedback, or see potential collaboration opportunities?**