

THE AI-NATIVE BIOPROCESS PLATFORM

# Bioprocess Expertise. Multiplied by AI.

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**Physics. Biology. Data.  
ML Models. Agentic AI.  
Human Expertise.**

One platform to advance R&D, process development,  
scale-up and manufacturing.

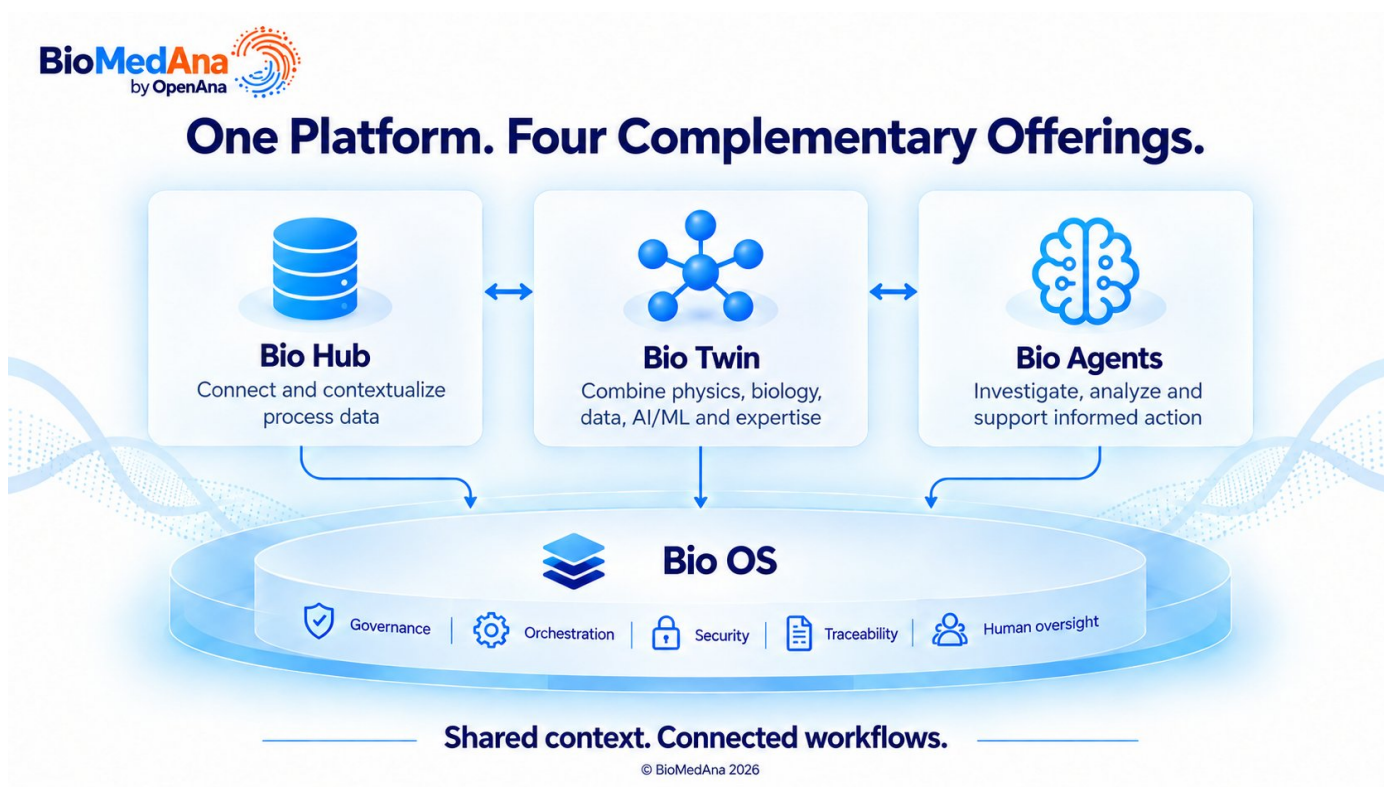
**Bio Hub | Bio Agents | Bio Twin | Bio OS**

THE AI-NATIVE BIOPROCESS PLATFORM

# Connected Intelligence. Across the Bioprocess Lifecycle.

One AI-native platform spanning R&D, process development, optimization, scale-up, technology transfer and manufacturing.

BioMedAna brings physics, biology, data, ML models, agentic AI and human expertise into a shared operating environment. Bio Hub, Bio Agents and Bio Twin work together through Bio OS to help teams investigate, coordinate work and make better-supported decisions, with governance and human oversight throughout.



MODALITY-SPECIFIC INTELLIGENCE

# From Early Development to Commercial Manufacturing.

## Scientific Depth. AI-Native Execution.

Specialist agents, scientific models and human expertise across biological development, process optimization, scale-up, manufacturing, Quality and CMC.

### 01 / BIOLOGICAL DEVELOPMENT

#### Advance promising candidates

Clone/strain comparison, expression and productivity analysis, biological pathway investigation and evidence-backed candidate selection.

### 02 / PROCESS DEVELOPMENT

#### Focus experimentation

DoE analysis, media/feed strategies, upstream and downstream optimization, chromatography analysis and next-experiment recommendations.

### 03 / CHARACTERIZATION + SCALE-UP

#### Explore before committing

Hybrid-model simulations, sensitivity analysis, operating windows, scale-dependent behavior and process-risk assessment.

### 04 / TRANSFER + MANUFACTURING

#### Strengthen process performance

Comparability, site readiness, PAT and Raman signal analysis, batch investigations, equipment-event correlation and continued process verification.

### 05 / QUALITY + CMC

#### Build review-ready evidence

OOS/OOT support, assay trends, deviations, CAPA follow-up, change-impact analysis, evidence mapping and submission-document consistency.

### 06 / ACROSS THE LIFECYCLE

#### Coordinate specialist work

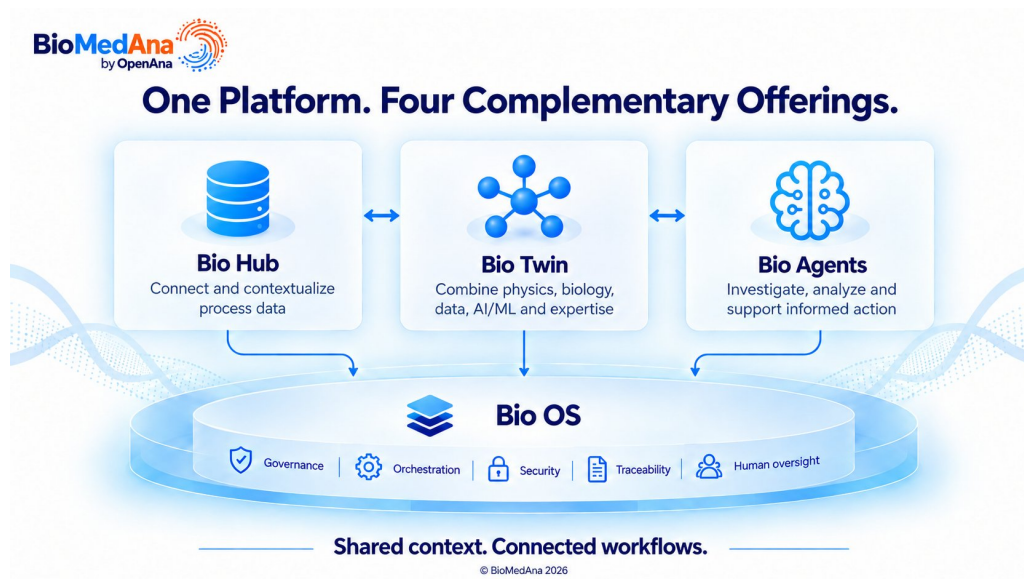
Deep analysis, investigations, simulation workflows and recommendations, shaped by modality-specific biology, analytical methods and quality attributes.

**Connected evidence. Scientific models. Coordinated agents. Human oversight.**

ONE AI-NATIVE PLATFORM

# Four Connected Capabilities.

Connect enterprise knowledge, apply scientific models and coordinate specialist agents within one governed operating environment.



## Bio Hub

### CONNECT AND CONTEXTUALIZE

Connects equipment, laboratory, manufacturing and enterprise data with scientific documents and batch, process and modality context. Creates reusable knowledge for investigation, analysis, modeling and agent workflows.

## Bio Twin

### MODEL, SIMULATE AND OPTIMIZE

Combines physics, biology, process data, ML models and human expertise in hybrid process models. Explores scenarios, predicts process behavior and informs experimentation, optimization and scale-up.

## Bio Agents

### ANALYZE, ORCHESTRATE AND EXECUTE

Breaks complex requests into coordinated tasks across specialist agents, connected data and scientific models. Performs deep analysis, investigations, evidence mapping and recommendations, and executes authorized workflows for expert review.

## Bio OS

### INTEGRATE, GOVERN AND OVERSEE

Provides shared integration, governance, security, permissions and traceability across data, models, agents and workflows. Coordinates platform operations with human oversight and controlled execution.

THE BIOMEDANA ADVANTAGE

# Scientific Depth. Connected Execution.

Across the bioprocess lifecycle: the capabilities your teams need, connected within BioMedAna.

| What your teams need                                                                       | Data platforms | Digital twin tools | AI / ML platforms | Agent / workflow tools | BioMedAna                                |
|--------------------------------------------------------------------------------------------|----------------|--------------------|-------------------|------------------------|------------------------------------------|
| <b>Reduce data-preparation effort</b><br>Connected, contextualized evidence                | <b>Core</b>    | Varies             | Varies            | Varies                 | ✓ <b>Bio Hub</b>                         |
| <b>Focus experimentation</b><br>DoE, hypotheses and experiment planning                    | Varies         | <b>Core</b>        | Varies            | Varies                 | ✓ <b>Bio Twin + Bio Agents</b>           |
| <b>Understand and optimize process behavior</b><br>Physics + biology + data + ML           | Varies         | <b>Core</b>        | <b>Core</b>       | Varies                 | ✓ <b>Bio Twin</b>                        |
| <b>Strengthen scale-up and transfer</b><br>Simulation, comparability and risk analysis     | Varies         | <b>Core</b>        | Varies            | Varies                 | ✓ <b>Bio Hub + Bio Twin + Bio Agents</b> |
| <b>Investigate manufacturing variability</b><br>PAT, chromatography and batch analysis     | Varies         | Varies             | Varies            | Varies                 | ✓ <b>Bio Hub + Bio Twin + Bio Agents</b> |
| <b>Advance Quality and CMC readiness</b><br>Evidence mapping, investigations, review packs | Varies         | Varies             | Varies            | Varies                 | ✓ <b>Bio Hub + Bio Agents</b>            |
| <b>Expand team capacity</b><br>Specialist agents and authorized execution                  | Varies         | Varies             | Varies            | <b>Core</b>            | ✓ <b>Bio Agents</b>                      |
| <b>Apply modality-specific intelligence</b><br>Scientific context, models and workflows    | Varies         | Varies             | Varies            | Varies                 | ✓ <b>Bio Hub + Bio Twin + Bio Agents</b> |
| <b>Coordinate work with oversight</b><br>Integration, governance and traceability          | Varies         | Varies             | Varies            | Varies                 | ✓ <b>Bio OS</b>                          |

**Core** = typical category focus. **Varies** = offering- and implementation-dependent. BioMedAna entries identify principal contributing offerings. Illustrative category comparison, not a vendor-by-vendor assessment.

**Bio Hub connects. Bio Twin models. Bio Agents executes. Bio OS governs.**

WHAT THIS MEANS FOR YOUR BUSINESS

# Accelerate Progress. Multiply Business Value.

Turn scientific depth and coordinated execution into greater team capacity, stronger processes and better use of development and manufacturing resources.

## 01 Shorten development timelines

Bring historical evidence, DoE analysis, scientific models and recommendations into experiment planning to focus effort and reduce avoidable iteration.

## 02 Reduce scale-up and transfer risk

Evaluate process behavior, equipment differences and evidence gaps before committing to costly engineering runs.

## 03 Improve yield and consistency

Connect PAT, process and analytical evidence with investigations and simulations to identify variability drivers and evaluate improvements.

## 04 Increase team capacity

Coordinate specialist agents across analysis, investigations, evidence mapping and reporting so experts can accomplish more.

## 05 Retain and reuse scientific knowledge

Carry biological context, experimental learning, models and decision rationale across programs, teams and sites.

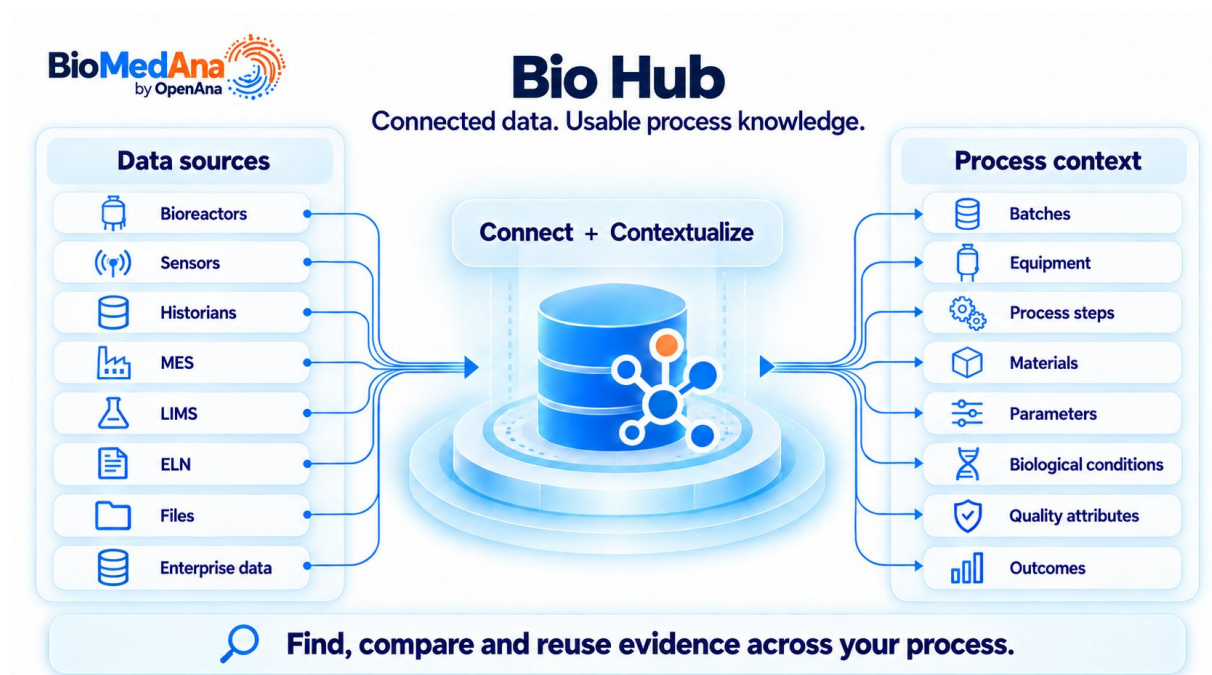
### MEASURE AGAINST YOUR BASELINE

Experiment cycle time | Investigation effort | Transfer preparation time  
Yield | Batch variability

BIO HUB + BIO AGENTS

# Make process knowledge accessible and actionable.

Give teams a practical starting point: bring evidence together and use intelligent assistance within the workflows they already perform.



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BIO HUB

## Connect and contextualize

Connect process, batch and analytical evidence with supporting documents so teams can find and review information in context.

BIO AGENTS

## Investigate and explain

Help users retrieve evidence, summarize findings and prepare documentation for review by the responsible expert.

### Quality, Regulatory & CMC evidence workflows

Support evidence assembly, review and documentation readiness. Bio OS provides traceability and human oversight; authorized personnel retain quality disposition and regulatory approval.

BIO AGENTS

# Specialist agents. Coordinated enterprise work.

Bio Agents connects enterprise evidence and coordinates specialist agents to turn complex requests into structured outputs for expert review.

**100+**

Specialist agents across six categories

**Up and running  
in weeks**

Enterprise deployment



### COORDINATE COMPLEX WORK

Break down requests, assign specialist agents and assemble evidence-linked findings, drafts and proposed actions.

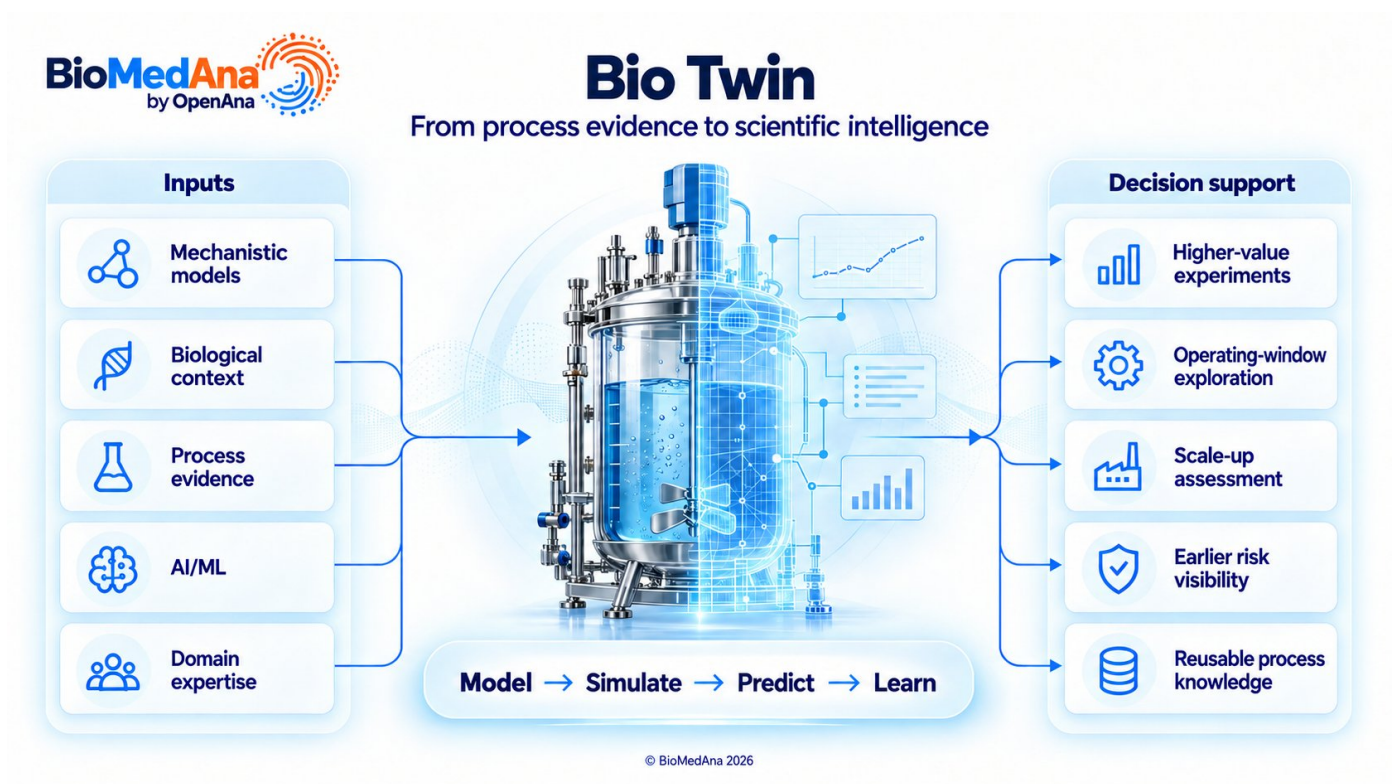
### GIVE EXPERTS TIME TO ACT

Reduce evidence-gathering and handoff effort so teams can focus on investigation, review and accountable decisions.

BIO TWIN

# Explore process decisions before committing resources.

Combine physics, biology, process evidence, AI/ML and domain expertise to explore scenarios and strengthen process understanding.



DECISION SUPPORT

## Focus the next experiment

Assess conditions and trade-offs to prioritize higher-value experiments and investigate operating ranges.

SCALE-UP AND IMPROVEMENT

## Make risks more visible

Explore scale-dependent behavior and improvement scenarios. Model suitability and validation are assessed for the intended use.

PROCESSES + LEADERSHIP PRIORITIES

# Designed around the decisions your teams own.

The value of intelligence is realized in the work of Process Development, MSAT and Manufacturing, alongside Quality, Regulatory Affairs and CMC. Analytical and Digital teams participate throughout.

PROCESS / ACCOUNTABLE TEAM

APPLICATION AND BUSINESS VALUE

## Process development

Connect upstream, downstream and analytical evidence. Investigate process drivers and explore scenarios.

Heads of PD / R&D

**Prioritize experimentation and retain learning.**

## Scale-up & transfer

Carry knowledge between scales, sites and teams. Organize evidence behind transfer decisions.

Heads of MSAT / Tech Transfer

**Identify risks earlier and preserve process context.**

## Manufacturing improvement

Compare batches, investigate variability and connect conditions with outcomes.

Heads of Manufacturing / Operations

**Support consistent performance and improvement.**

## Quality & regulatory readiness

Organize supporting evidence, summarize findings and prepare documentation for expert review.

Heads of Quality / Regulatory Affairs / CMC

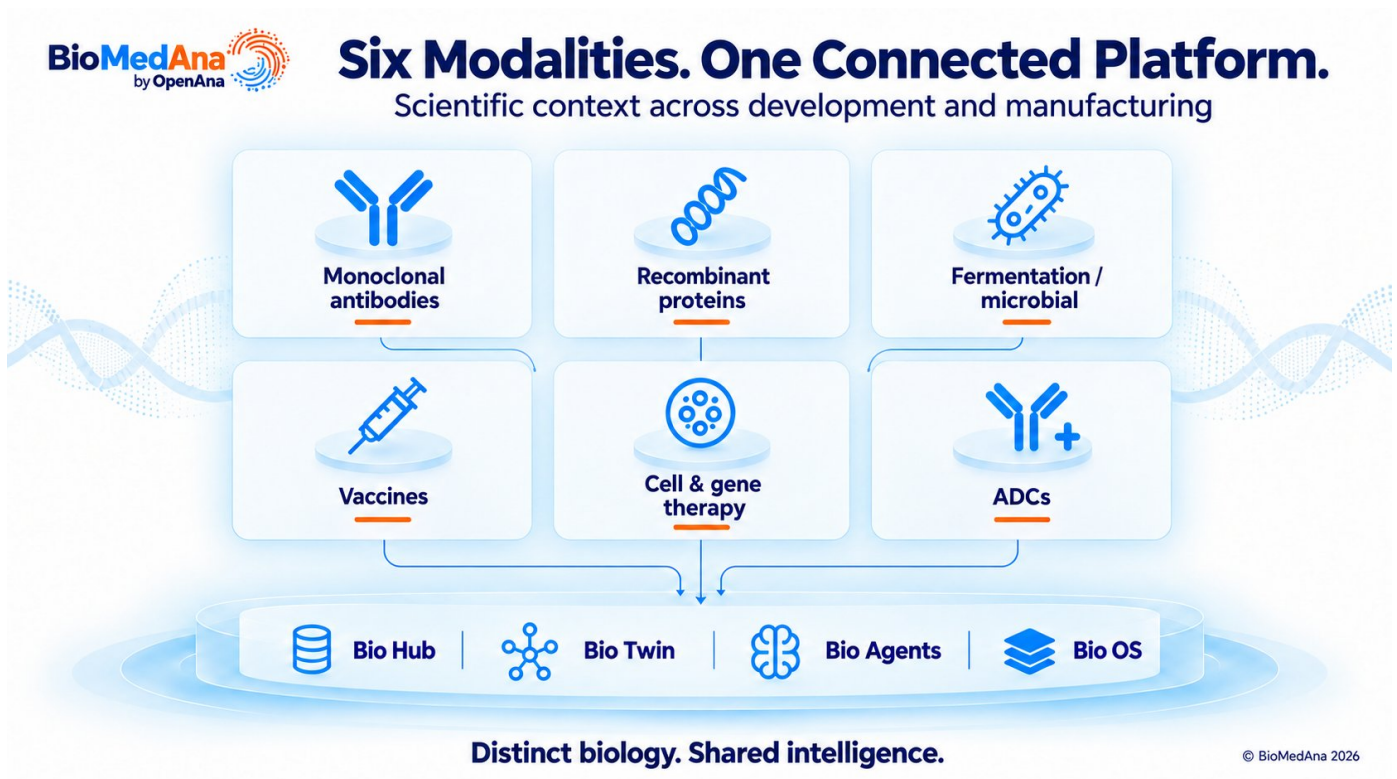
**Strengthen evidence access and review readiness.**

**EXECUTIVE PRIORITIES** Productivity / Risk / Knowledge continuity

SCIENTIFIC SCOPE + GOVERNANCE

# One operating foundation. Distinct biological contexts.

The platform supports a modality-native approach: data, workflows and models are configured around the biological system, process and intended use.



BIO OS

## Govern and orchestrate

Governance, integration, security, traceability and human oversight across the platform.

## A connected operating environment

Keep evidence and supported workflows connected to organizational controls. Bring scientific and operational stakeholders into the review of recommendations and model outputs.

A FOCUSED STARTING POINT

# Begin with a decision that matters.

Identify a priority process, a responsible team and the evidence they need. Explore how BioMedAna can support that workflow and create a foundation for broader use.

## 01 Connect the evidence

Bring a defined set of process data and knowledge into context with Bio Hub.

## 02 Equip the team

Apply Bio Agents to an investigation, analysis or knowledge workflow.

## 03 Extend the intelligence

Introduce Bio Twin where scenario analysis supports a meaningful decision.

## Book a tailored demonstration

[hello@openana.ai](mailto:hello@openana.ai)

[www.biomedana.ai](http://www.biomedana.ai)

### INDUSTRY READING

1. NIST: Data Infrastructure for Biomanufacturing (2026)
2. Satwekar et al.: Digital twins and interoperable PAT (2026)
3. NIST: Digital Twins for Advanced Manufacturing (updated 2026)