Benchling

# 4 ways AI is earning its place with in vivo teams

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## Table of contents

# Introduction

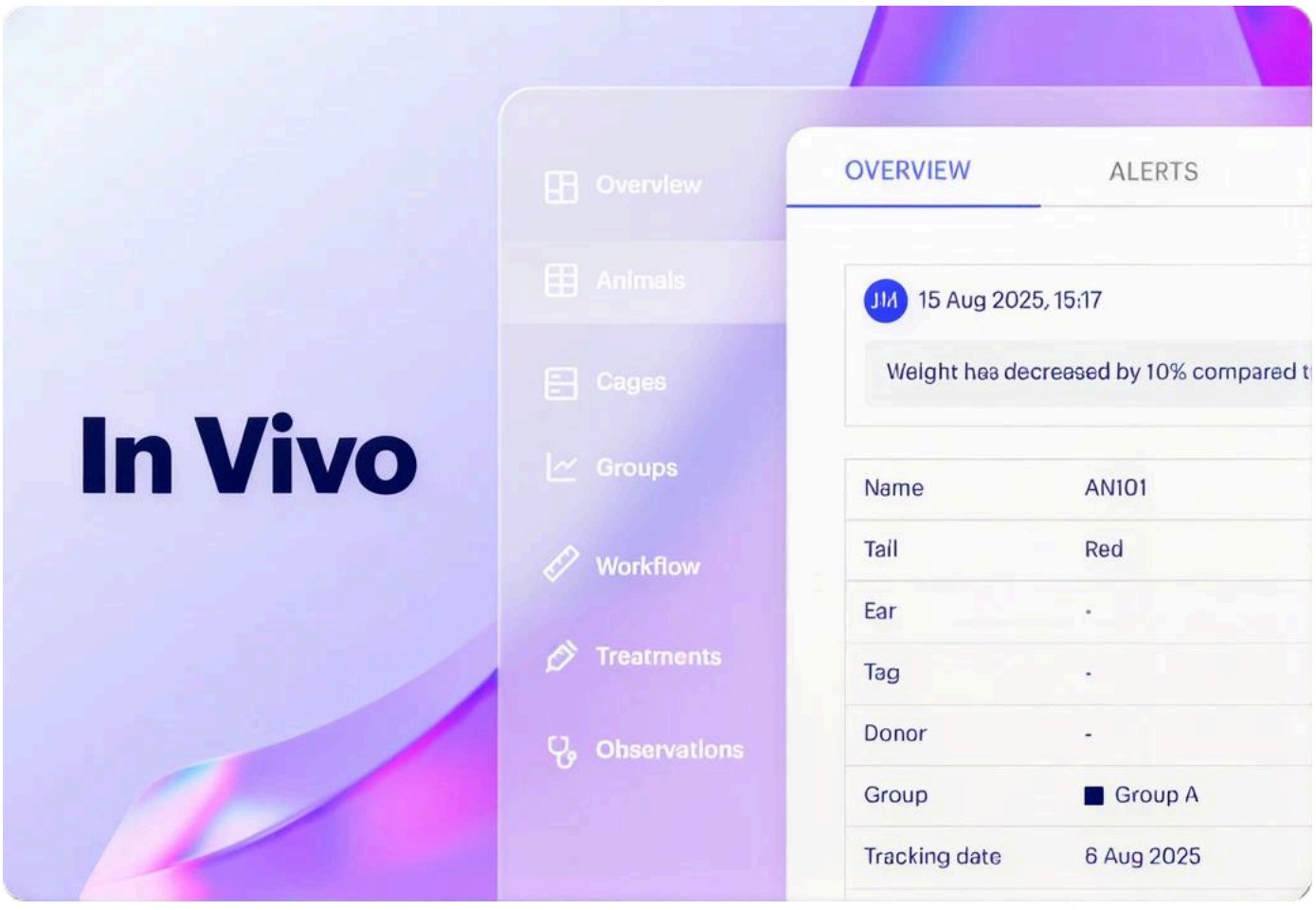
AI first showed up in the in vivo conversation a few years ago but it was mostly a conversation about potential. That's changed. In vivo teams aren't asking whether AI could help anymore. They're asking how to get the most value out of it, and putting that question to work in study design, in-life capture, and analysis.

The answer comes down to one thing. AI is only as good as the structured, connected data underneath it. Digitization has made it possible to collect more in-life data, faster, but volume alone doesn't create value. The teams seeing real returns are the ones treating their data foundation as the prerequisite in order to bring back returns in efficiency and productivity.

That principle plays out in two ways. First, where AI is already delivering measurable value for in vivo teams today. Second, in what it takes to build the kind of study infrastructure that makes that value possible in the first place. This white paper covers both, along with a look at how one of biotech's largest R&D organizations, AstraZeneca, is putting the same principle into practice across two of its subsidiaries.

# Where AI is paying off for in vivo teams

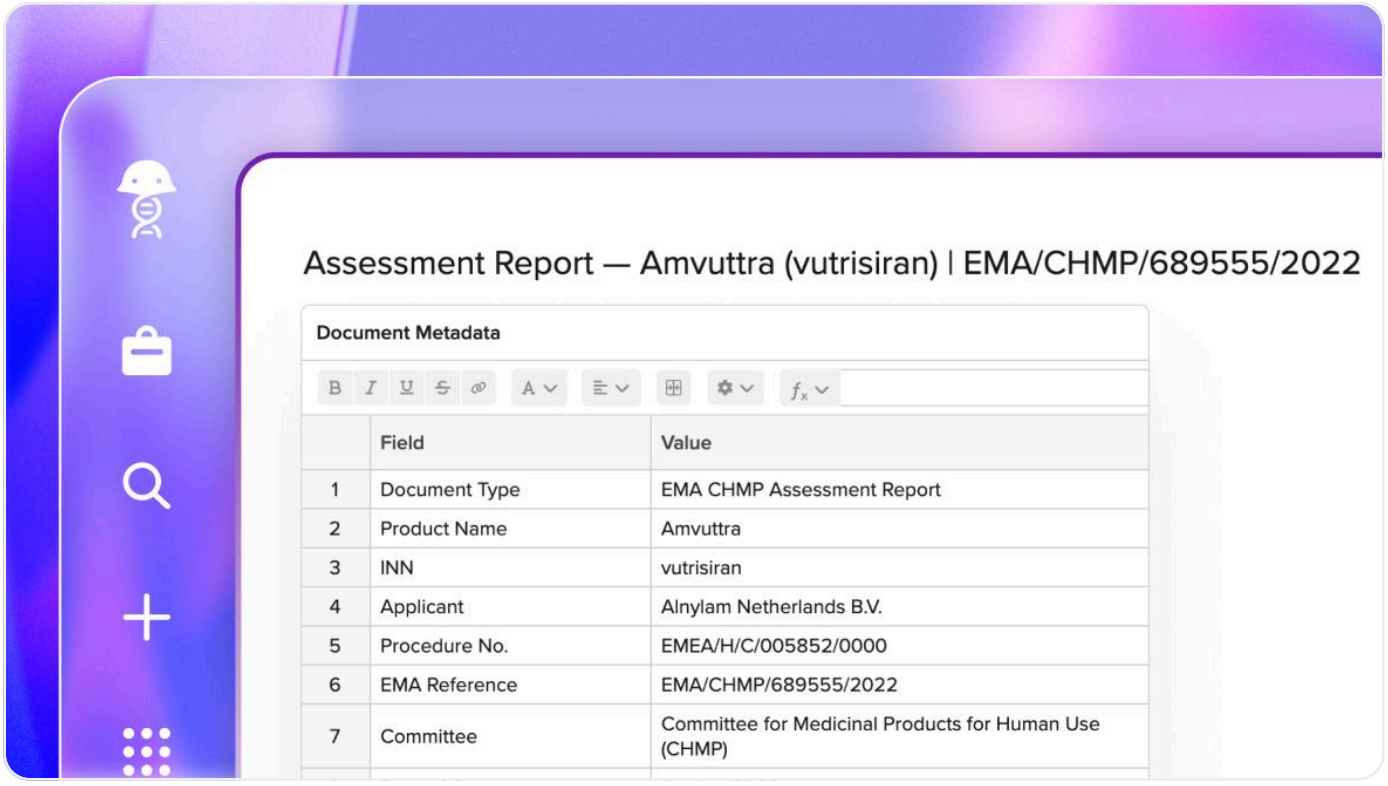
Almost every in vivo program has a piece that runs externally, whether that's assays on samples or entire studies outsourced to a CRO. That data comes back as PDFs, Excel files, Word docs, or PowerPoint decks, and someone has to manually restructure it before it can be graphed and compared. It's slow, error-prone, and it traps insight inside files nobody can query.



## Turning CRO and legacy data from a bottleneck into an asset

This is where AI is delivering some of the clearest early wins. Agents can now ingest a CRO data package directly, linking results back to the right study, animals, and test articles with no manual re-entry and no broken lineage between the outsourced result and the internal record. The same applies to legacy data sitting in older systems: instead of leaving years of historical studies stranded, teams can bring that data into a structured, searchable form and use it to inform the design of future studies.

Learn more about Data Import with Benchling.



## Building the next hypothesis from experiment history

Deciding what to try next in a study, whether that's a new dosing regimen, an added arm, or a different endpoint, usually means either digging back through past studies or starting from the literature alone. Literature-only tools tend to converge on the same well-known answer, since a hypothesis built entirely on public data is a consensus hypothesis, not a program-specific one.

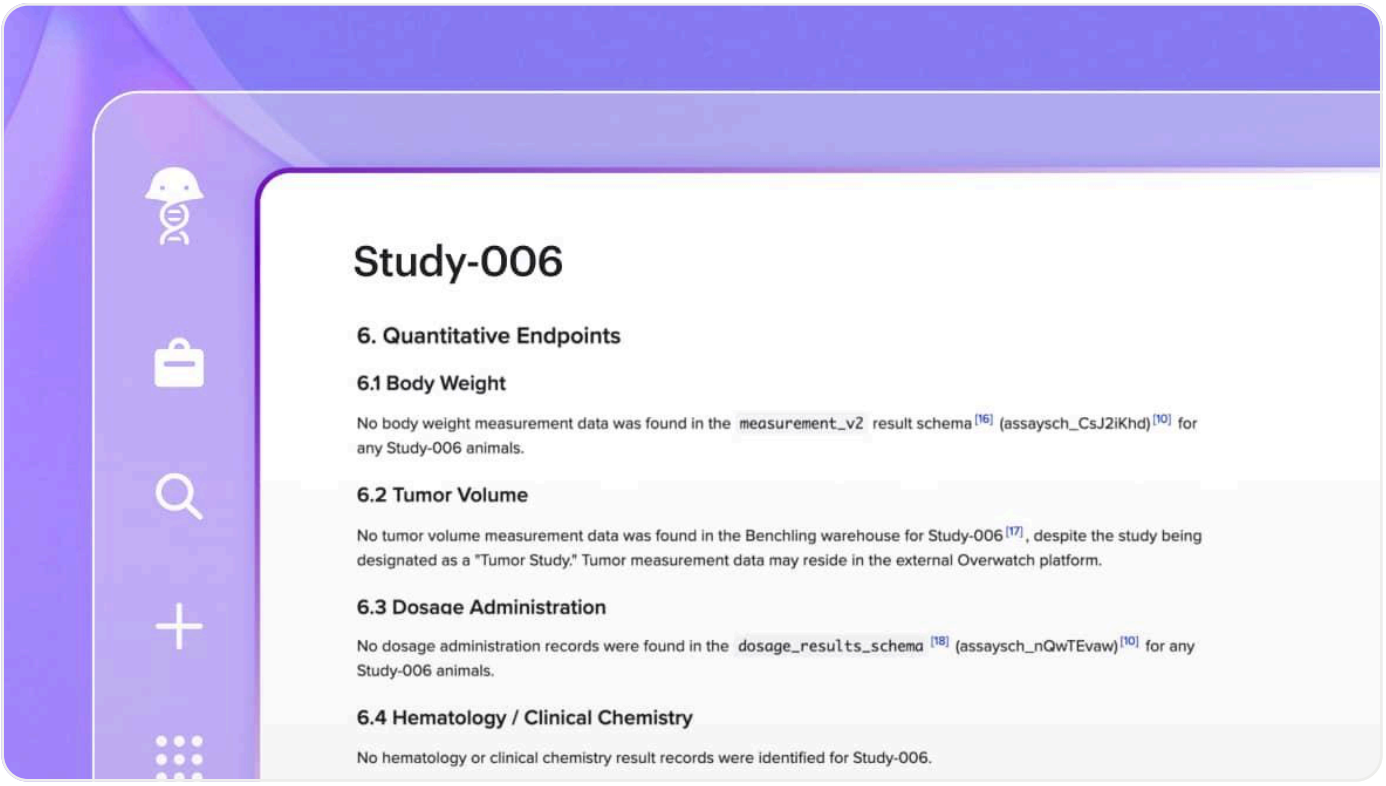
AI can close that gap by reasoning across both the published literature and a team's own institutional data at once, including past studies, failed assays, and prior program decisions. Pointed at a specific mechanism or troubleshooting question, it draws on internal experiment history first, then brings in outside literature to sharpen the idea, producing a hypothesis specific to your program and enriched with public findings.

Learn more about Hypothesis Generation with Benchling.

## Getting scientists' time back from reporting

Roughly half of a scientist's week disappears into data preparation, handling, and reporting rather than active science, and reporting in particular is a perennial drain. Pointed at structured study data, AI can generate a topline study report in minutes rather than an afternoon, take on formatting tasks that used to require consultancy hours, and check data against submission standards like SEND, with the scientist acting as final approver rather than first-pass compiler.

Learn more about Report Writing with Benchling.

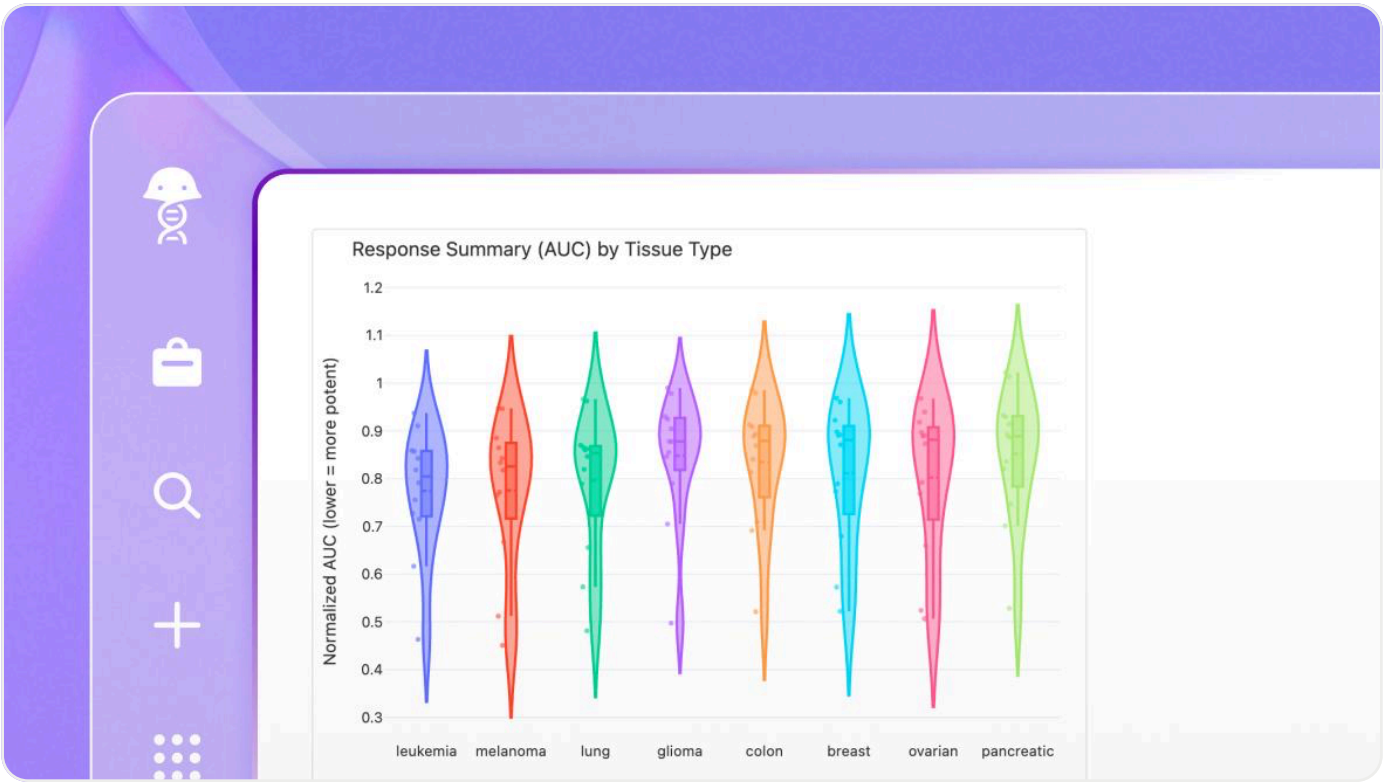



## Anomaly detection and statistical analysis as a built-in safety net

Capturing data accurately gets harder the more people are collaborating on one dataset.

A tumor volume that jumps more than expected between measurements, or a duplicate reading logged on the same date, is easy to miss until someone catches it in review, if anyone does. AI can flag these anomalies on studies still in progress and can run a full statistical workup on demand, checking normality, applying the appropriate test, and flagging when a headline p-value doesn't survive correction. That combination catches errors before they compound, protecting both study integrity and the animals, since fewer undetected errors means fewer repeat experiments.

Learn more about Data Analysis with Benchling.




CRO and legacy data ingestion, automated reporting, and anomaly detection all depend on the same underlying condition: governed, structured, connected data that an intelligent tool can actually read. Free-text observations and isolated, proprietary data models are effectively invisible to the AI stack most R&D organizations are building.

# What building that foundation actually looks like

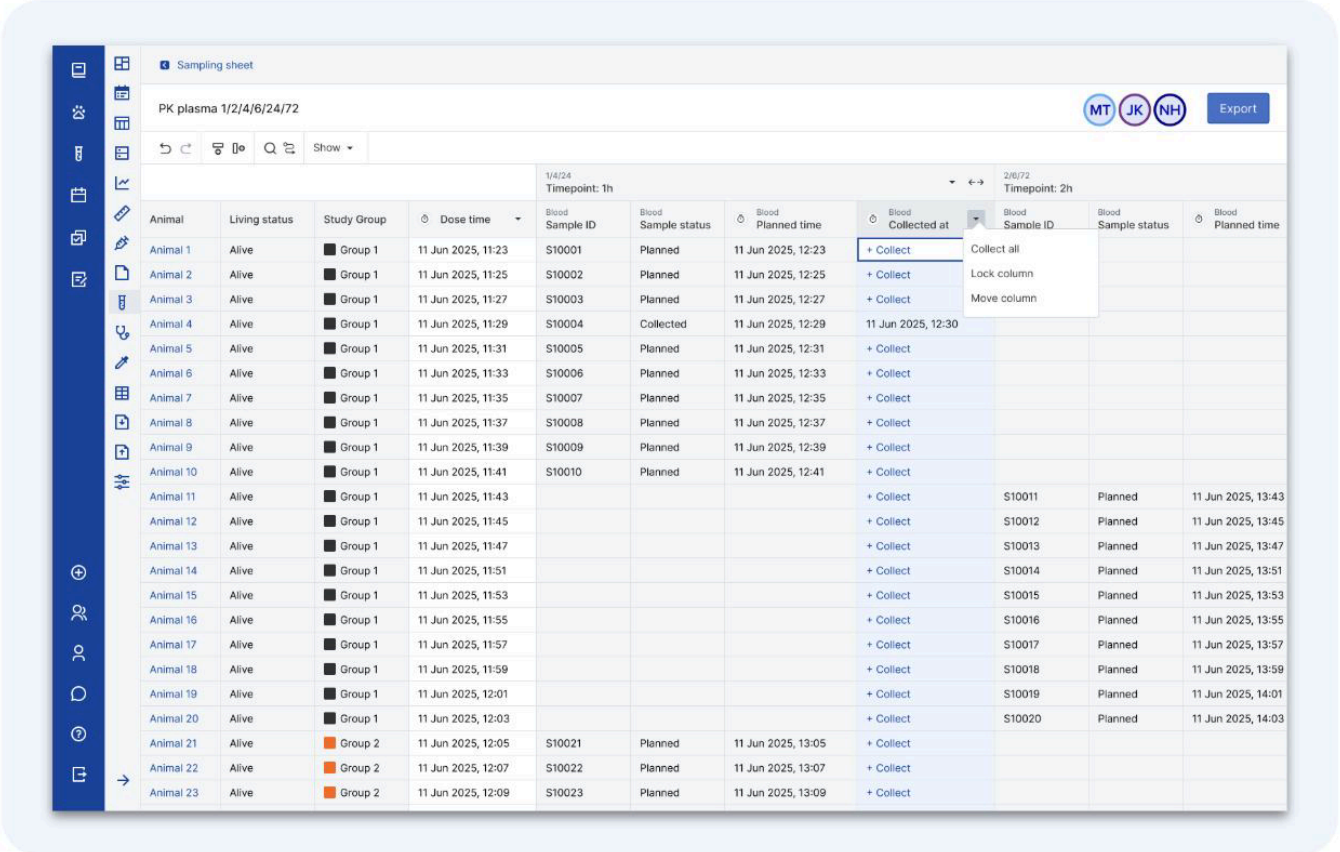
Saying "structure your data" is the easy part. What it requires in practice is a platform that captures in-life data precisely as a study is designed, tracks welfare and protocol conditions exactly as written, and keeps that structure intact from planning through in-life execution to reporting. Over the past six months, three updates to Benchling In Vivo have been built directly against that requirement.

### Sample collection should happen in the same system where the study plan lives.

Sample collection is often manual and easy to get wrong, especially in PK studies, where timepoints and draw volumes have to be tracked precisely across dozens of animals and multiple collection windows.

This is where Sampling Sheets feature comes in, connecting a study's sampling plan directly to a live collection interface:

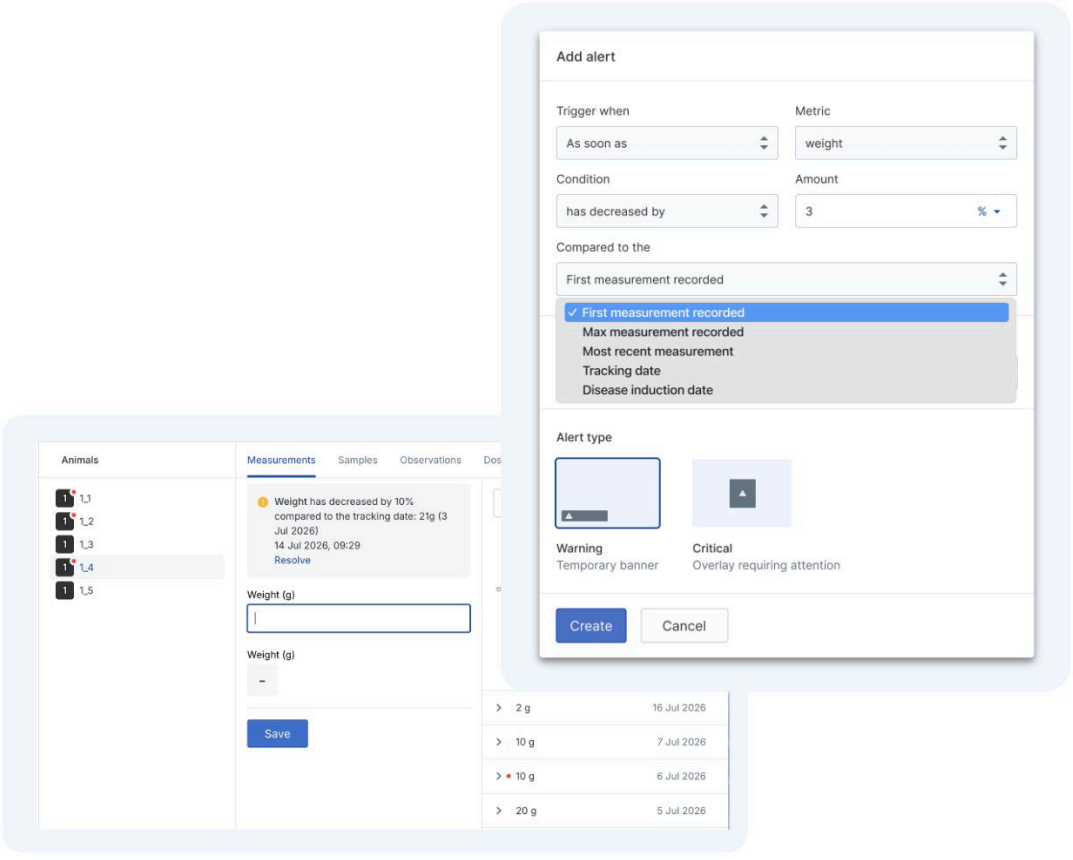
- Collection times auto-calculate from dose time, so there's no manual math
- Clash alerts flag overlapping collection windows before they become a data issue
- The same interface supports necropsy workflows, capturing tissue weights and volumes as they're collected
- Multiple team members can work in the same table at once, and every update is immediately available across Benchling for downstream processing and analysis



**Welfare tracking should match a protocol instead of forcing manual workarounds.** Humane endpoint protocols are often built around specific reference points, like removing an animal from study if body weight drops a set percentage below its maximum recorded weight. Until recently, Benchling In Vivo only supported alerts based on change from an animal's first or most recent measurement.

The Alert Conditions feature closes that gap, adding percentage change from maximum weight, from a custom tracking date, and from disease induction date:

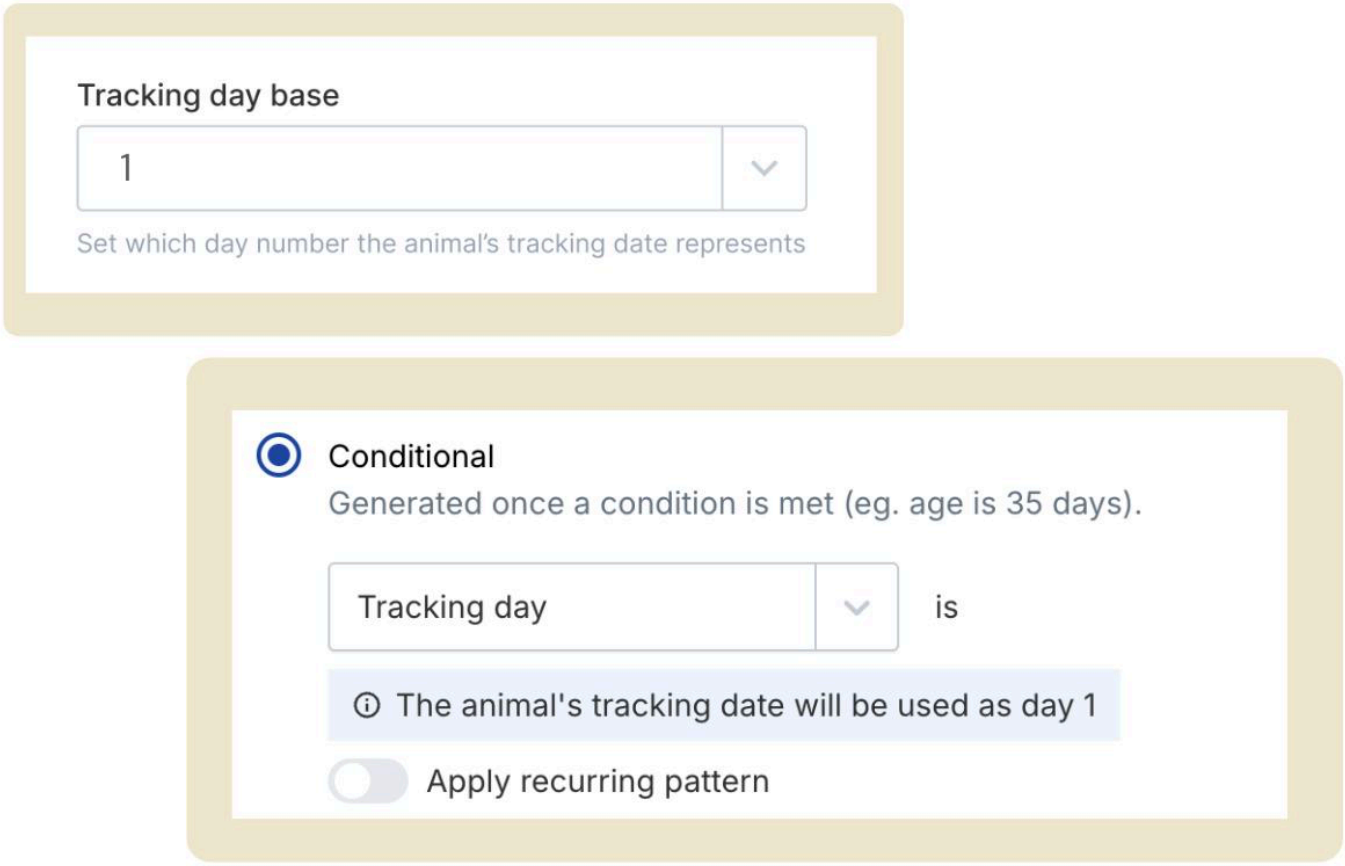
- Alerts can be configured to match an IACUC-approved protocol exactly as written
- Configure alerts based on % change from maximum weight
- Track changes from disease induction or custom tracking dates



**Study timelines should reflect the conventions of your protocol, not the platform.** Some teams treat the first day of dosing or enrollment as Day 0. Others start at Day 1.

The Tracking Day Base feature addresses this directly, making the convention configurable at the study level:

- Match your protocol, studies follow the convention your teams use.
- Accurate graphs, axis and relative change reflect the right baseline.
- Correct scheduling, tasks appear on the days your study plan expects.



Individually, these are workflow improvements but together, they point to a broader shift in how in vivo teams need to think about their data. Structure has to be built in at the point of capture. Areas like sample collection, welfare tracking, and study timelines are exactly the areas where small gaps between protocol and practice tend to compound, turning into inconsistent data, and studies that don't hold up under later scrutiny. By closing those gaps at the jump, teams can prepare their data for AI-powered insights, improving productivity and returning more time to the science.

# The thread that ties it together

**None of this works as a single tool or a one-time fix. It works because the foundation comes first with data captured in a structured form at every stage, from sample collection to reporting, so the AI tools and insights built on top of it have quality data to work with**

**Benchling In Vivo** is built for exactly this. It captures in-life data in a structured form, connects it across upstream and downstream teams, and keeps that data ready for Benchling AI to turn into insight, all while upholding 3Rs compliance and animal welfare standards.

**Request a demo** to see how Benchling In Vivo and Benchling AI can help your team build a strong foundation.

Benchling is the R&D platform built specifically for life sciences — purpose-built for the complexity of modern biology, combining ELN, LIMS, molecular biology tools, biological registry, inventory management, and workflow automation. Trusted by leading global biopharma organizations including Eli Lilly, Sanofi, and AstraZeneca, Benchling is designed from the ground up to produce FAIR, AI-ready data at every stage of the R&D lifecycle.