

LABKEY BIOLOGICS LIMS SUPPORTS HIGH-THROUGHPUT ANTIBODY DEVELOPMENT IN FEDERAL BIODEFENSE RESEARCH

Platform enables structured data management, traceability, and reproducibility for labs bridging computational design and physical experimentation



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[Biologics LIMS](#) is supporting antibody R&D workflows at a federal rapid-response biodefense laboratory, helping researchers bridge the gap between computational antibody design and physical experimentation at scale.

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Bernard Lee, Product Manager, LabKey

An operational biodefense lab at [Lawrence Livermore National Laboratory](#) operates at the intersection of computational biology and wet-lab science, where AI-designed antibody candidates must be physically synthesized, tested, and validated across dozens of assay protocols. The facility, established with federal support, is building a broad antibody knowledge base to strengthen national preparedness against emerging biological threats. This work demands rigorous sample tracking, structured data capture, and full traceability across high-throughput experimental workflows.

Managing that complexity — tens of thousands of samples, thousands of registered molecular entities, and more than 15 distinct assay protocols running concurrently — requires robust laboratory informatics infrastructure. Biologics research environments depend on capabilities such as entity registration, sample management, assay data capture, and support for workflows spanning antibody R&D, cell line development, and bioprocess operations. LabKey Biologics LIMS, a laboratory information management system, is designed for the scale and rigor that high-throughput research environments like these demand.

"The convergence of AI-driven design and physical experimentation is creating a new class of laboratory challenges," said Bernard Lee, Product Manager, LabKey. "When computational teams are generating thousands of antibody candidates and lab teams need to track each one through synthesis, characterization, and validation, the data infrastructure has to be as rigorous as the science. That's the problem Biologics LIMS was built to solve."

In federal biodefense settings, structured data management is not optional, it is foundational. Reproducibility across experiments and campaigns, traceability from registered entity to final assay result, and the ability to feed validated physical data back into computational pipelines all depend on laboratory systems that enforce data integrity without slowing the pace of discovery. Automated transform scripts, structured electronic lab notebook documentation, and integration pathways between wet-lab and computational teams are critical capabilities in these environments.

The national security implications of this work extend beyond any single laboratory. As the U.S. invests in infrastructure to rapidly characterize and counter emerging biological threats, the ability to move efficiently from computational prediction to experimentally validated antibody candidates becomes a strategic capability — one that depends on laboratory data systems built for the scale and complexity of modern biologics research.

"Biodefense preparedness increasingly depends on how fast labs can close the loop between computational design and physical validation," Lee added. "We built Biologics LIMS to operate at that interface — where data integrity, throughput, and scientific flexibility all have to work together."

Will Bozoki

LabKey

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