BIOINTRON

RushData:

High-Throughput Data Generation for AI-Driven Antibody Discovery



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Biointron

ANTIBODY DISCOVERY IS EVOLVING

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AI Is Expanding the Antibody Design Space

Candidate generation is becoming faster and broader — across an increasingly vast sequence space.



FROM

A limited set of candidates

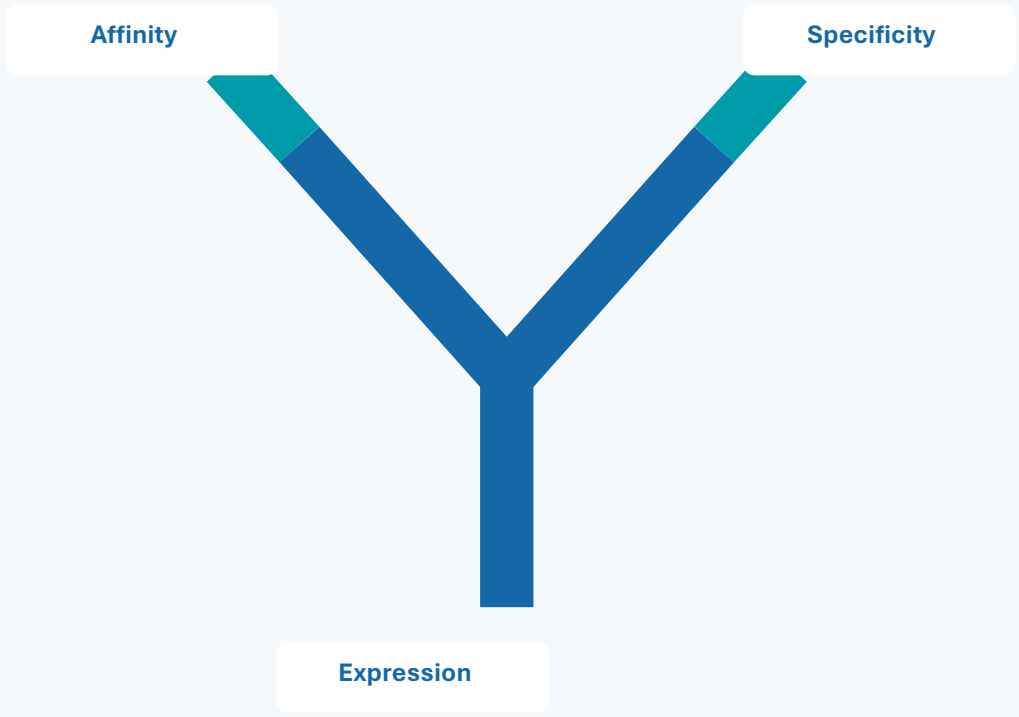
TO

Broader, faster sequence exploration

Computational generation increases the number of hypotheses that experiments may need to test.

The Bar for Antibody Candidates Is Rising

Strong target binding matters — but a viable development candidate must meet multiple requirements.



TARGET ENGAGEMENT

Affinity · Functional activity

PRODUCTION FITNESS

Expression · Purity · Yield

MOLECULAR BEHAVIOR

Stability · Self-interaction · Specificity

The best binder is not necessarily the best development candidate.

Developability Assessment Is Moving Upstream

Earlier multidimensional evidence can reveal potential liabilities before costly downstream development.



Identify risk earlier. Prioritize with more evidence. Reduce avoidable late-stage surprises.

AI can accelerate sequence generation — but learning from candidates at speed, at scale, and with confidence remains a critical unmet need.

When Digital Design Outpaces Experimental Learning

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- **The Learning Cycle Becomes the Bottleneck**

DESIGN
AI proposes candidates

▶

BUILD
Turn sequences into molecules

▶

TEST
Generate multidimensional experimental evidence

▶

LEARN
Structure evidence to inform the next design

↖ **Experimental learning informs the next design — creating a compounding data flywheel** ↩

DIGITAL DESIGN

Thousands of candidates

Generated and refined in hours to days

→

TRADITIONAL EXPERIMENTAL WORKFLOWS

- **LIMITED THROUGHPUT** — Dozens rather than thousands
- **LONGER TURNAROUND** — Weeks rather than days
- **FRAGMENTED DATA** — Disconnected assays and manual integration

Generation of structured, actionable experimental data at speed and scale is strongly demanded by the modern antibody discovery

RushData: Built to Accelerate the Learning Loop

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DIMENSION	RUSHDATA APPROACH	WHAT IT ENABLES
SCALE	Thousands, not dozens	Broader exploration of candidate space
SPEED	Days, not weeks	Shorter build–test–learn cycles
SUFFICIENCY	Multidimensional, decision-shaping experimental profiles	Confident prioritization at each discovery stage
STRUCTURE	Standardized, comparable, model-ready data	Reusable evidence for AI-driven learning

The Foundation Behind RushData

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✓ **For more than a decade, Biointron has been building a "Smart Factory" upon:**



High-throughput Antibody Production



Automation Infrastructure



Advanced Antibody Characterization Capability



Data Generation at Scale



Digital Foundation for Modern Discovery

✓ **RushData is the convergence of these capabilities.**

| **About Biointron --** Founded in 2012 | 700+ staffs | 150K+ antibodies delivered annually | 3000+ global partners |









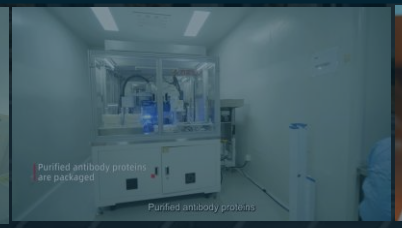

Floor 4: Gene & Plasmid Construction

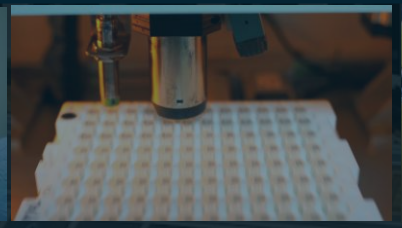
Floor 3: Purification

Floor 2: Cell Culture

Floor 1: QC & Material Prep











Digitalization: Connecting Experiments and Data

From experimental throughput to structured, traceable, and reusable data

CONNECTED WORKFLOWS

End-to-end integration
and traceability

STRUCTURED DATA

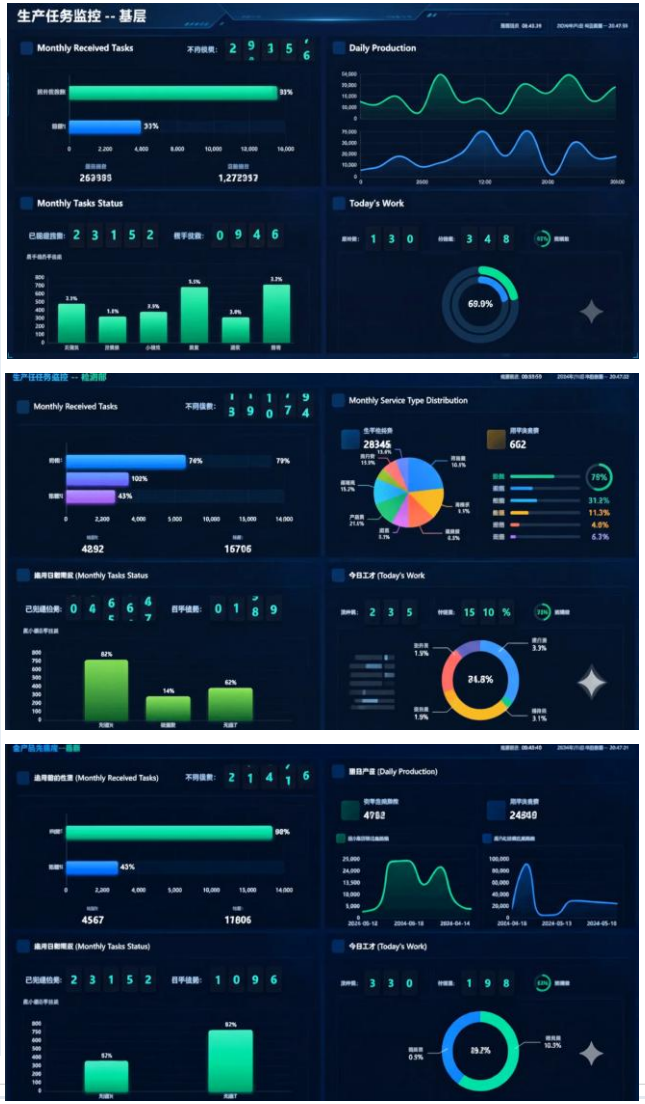
Standardized capture
and comparison

REAL-TIME VISIBILITY

Live monitoring
and automated alerts

DIGITAL CORE

LIMS · ELN · AI



Automation delivers high throughput.
Digitalization turns it into structured data.

From Sequences to Data: How RushData Work Operationally?

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✓ An integrated workflow for rapid, scalable, and standardized experimental data generation

7 DAYS (**Supernatants**)

Sequences Collection → DNA Synthesis → Plasmid Construction → 1 Day → **3000/batch** produced in **CHO cells**

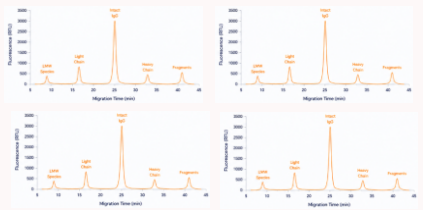
Titer (BLI) V Binding (BLI)



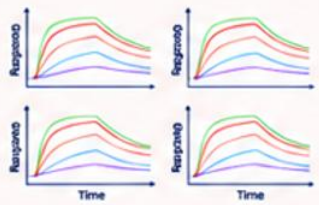
Purification

Project ID	Conc. (mg/ml)
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx

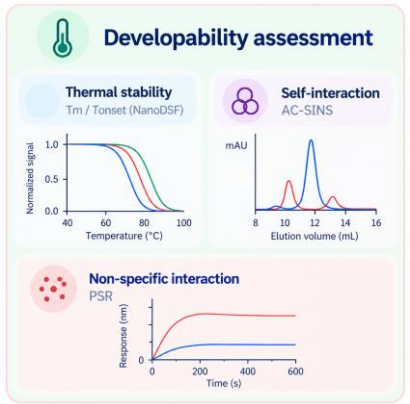
Conc. (A280)



cGE (NR)



Affinity (SPR, Carterra)



14 DAYS (**purified samples**)

From Throughput to Information Depth

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Seven Readouts. Three Evaluation Dimensions.

PRODUCTION FITNESS

Can we make it well?

Expression performance

Titer

BLI · Supernatant

Product quality

Concentration · Purity

A280 · cGE

TARGET ENGAGEMENT

Does it bind as intended?

Rapid binding screening

Binding response

BLI · Supernatant

Quantitative affinity

KD

Carterra LSA XT

MOLECULAR BEHAVIOR

Does it behave like a viable molecule?

Thermal stability

Tm / Tonset

NanoDSF

Self-interaction

AC-SINS

HT-ELISA / PAIA

Non-specific interaction

PSR

HT-ELISA / PAIA

ONE STANDARDIZED WORKFLOW Same molecules • Comparable profiles • Reusable experimental data

Data Delivery: For Both Scientists and AI

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One experimental workflow. Two ways to use the data

For Scientists

Human-readable

FIGURES & CURVES

Binding and assay results

IMAGES

Experimental records

REPORTS

Results and analysis

QC DOCUMENTATION

Quality and traceability

For AI Teams

Machine-readable

RAW DATA

Original measurements

METADATA

Conditions and parameters

STRUCTURED DATASETS

Standardized formats

INTEGRATION

API / secure transfer

✓ **Each team (scientists, project leaders, and AI teams) can access the level of information most relevant to their decisions.**

RushData: the “Wet” for the “Dry”

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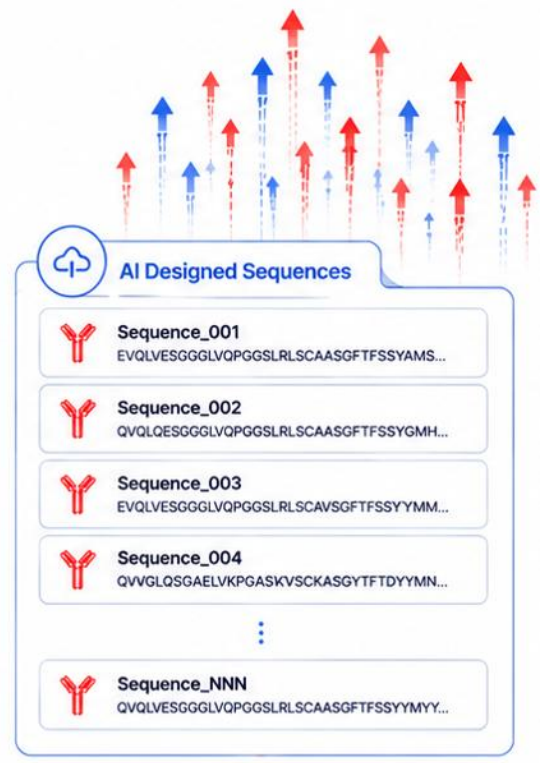
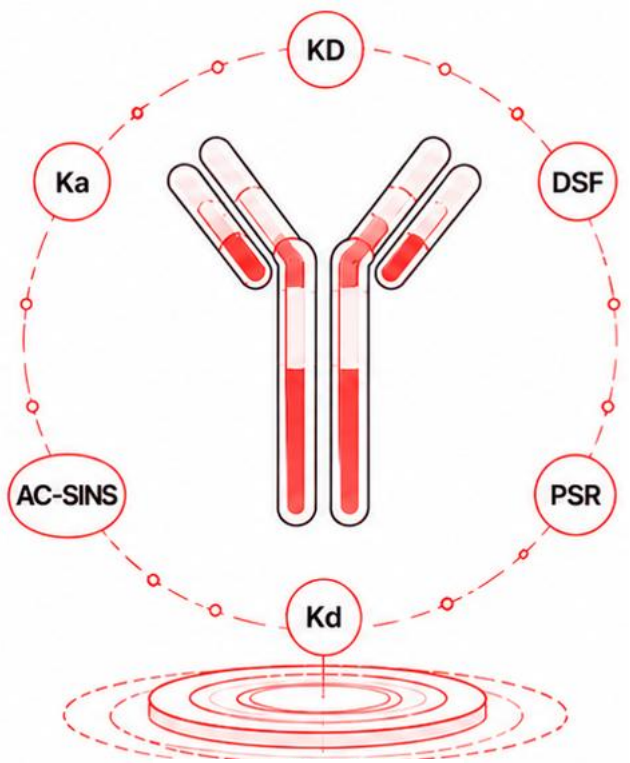
From experimental measurements to data that can inform computational design

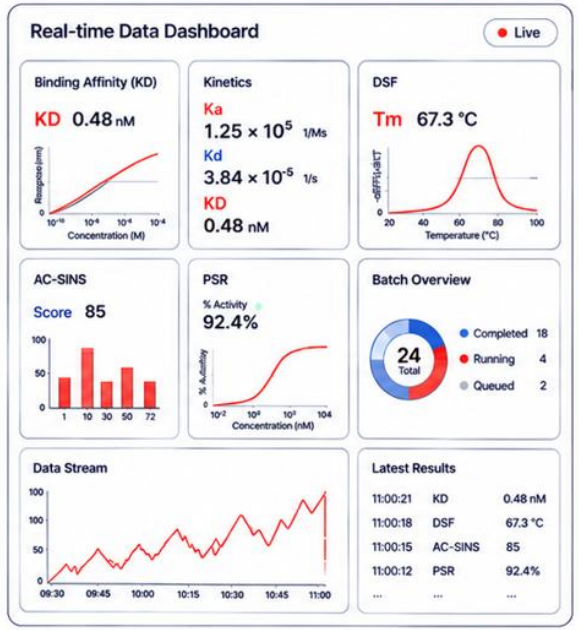
1 AI-generated Antibody Sequences



2 CHO-Based Expression and Characterization



3 Structured Experimental Data



Experimental Data Drives Model Refinement

Confidence in Decisions Starts with Confidence in Data

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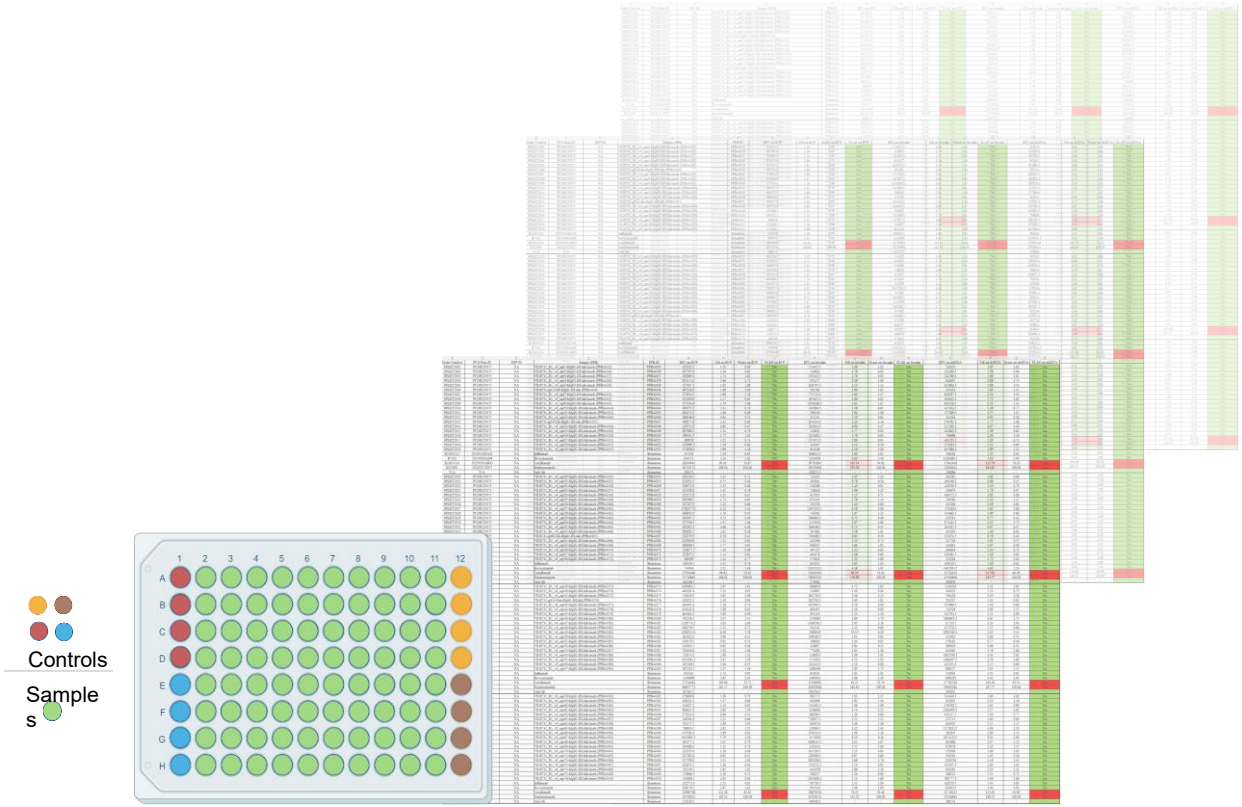
- ✓ **Every** run includes built-in controls and continuous performance monitoring to ensure data **quality**, **consistency**, and **reproducibility**.

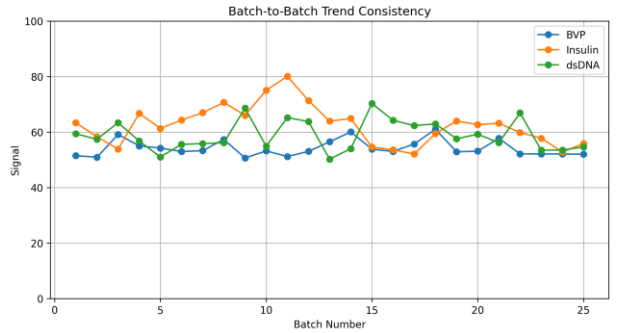
Built-in Assay Controls

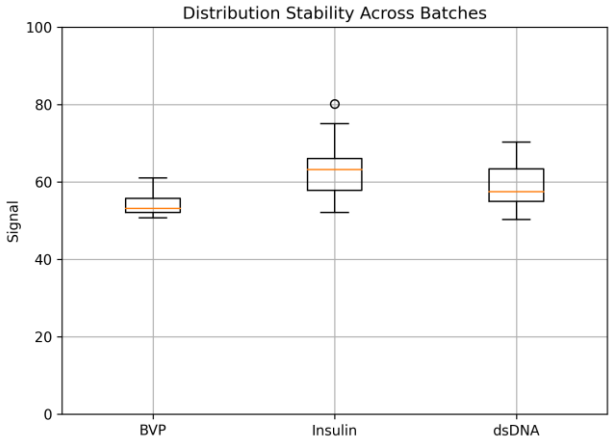
Quality within every run



Batch-to-Batch Consistency

Reproducibility across runs





Reliable measurements. Comparable datasets. More confident decisions.

Quantitative Profiling of 504 Antibodies

A single-project example of scalable expression, purity assessment and SPR characterization

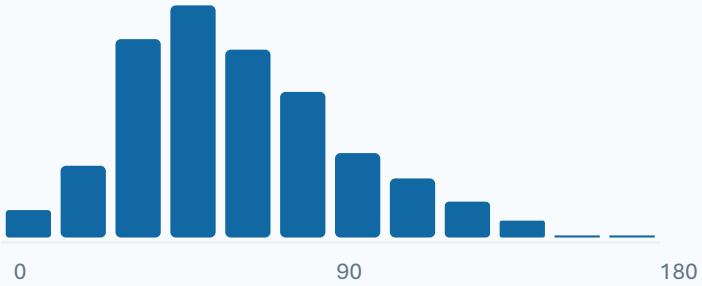
504 ANTIBODIES

3 QUANTITATIVE READOUTS

1 PROJECT / DELIVERY ROUND

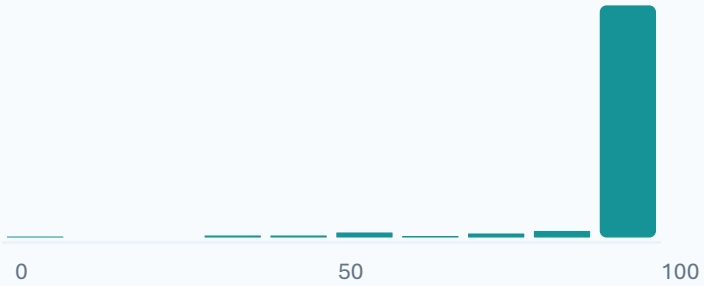
Expression yield

Median 60 µg/mL



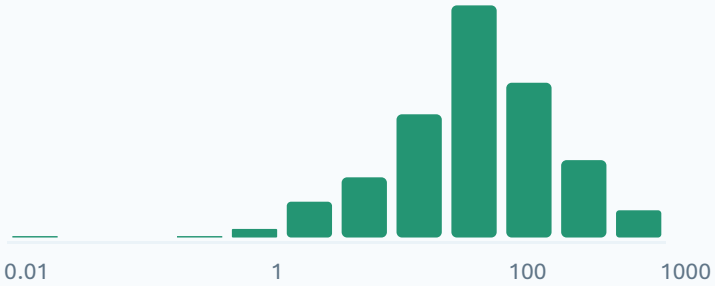
cGE purity

Median 100%



SPR affinity

Median KD 40.45 nM



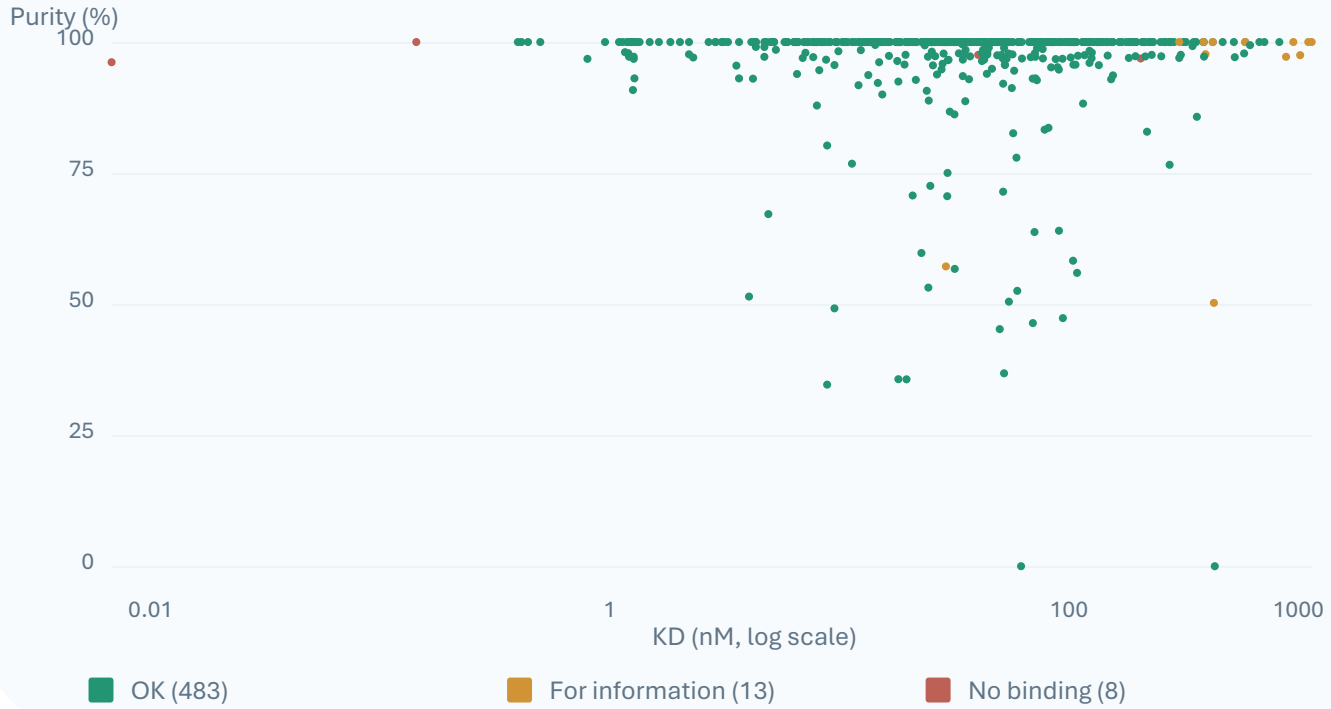
Distributions use all 504 non-control sample records; descriptive statistics are not pass/fail thresholds.

From High-Throughput Measurements to Comparable Evidence

Sample-level data enable distribution analysis, affinity ranking and transparent QC review

Affinity–purity landscape

Each dot represents one antibody; color indicates SPR report classification.



Classification labels are reproduced from the report; they are not a universal quality assessment.

What this example demonstrates

01 Scale

504 sample-level records from one project

02 Quantitative breadth

Expression, cGE purity and SPR kinetics

03 Structured evidence

Linked measurements support comparison and prioritization

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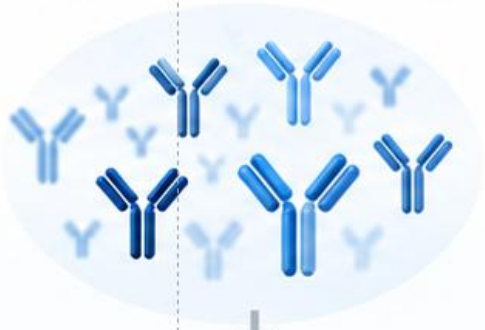
RushData: The 4S Advantage

SCALE
Thousands



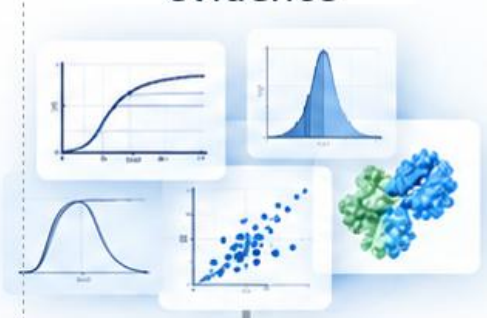
Explore more

SPEED
Days



Learn faster

SUFFICIENCY
Decision-shaping evidence

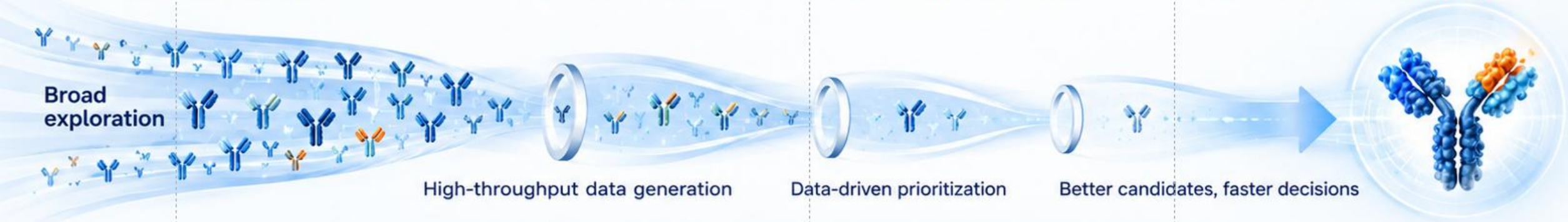


Prioritize better

STRUCTURE
Standardized data



Enable AI learning



RushData: | Scale experiments, accelerate learning, and keep discovery moving.

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Thank you!



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