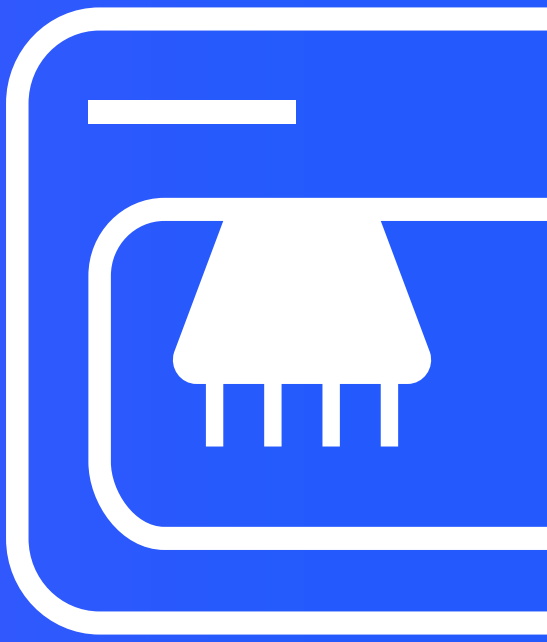
Realize the Promise of the Connected Lab



Benchling Instrument Integrations

Technical Note

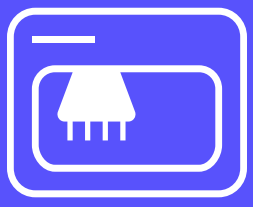
As life science R&D organizations increase their investment in lab instruments to automate their workflows, the size, speed, and diversity of the data they generate grows exponentially.

Without the right digital infrastructure in place, scientists managing the data coming off these machines become a bottleneck to otherwise high-throughput workflows.

By manually processing thousands of pieces of instrument output data, organizations run the risk of introducing any number of errors — errors that drain resources, hamper productivity, and throttle experimental throughput.

To optimize your organization's instrument-driven workflows, you need an informatics solution that can automatically ingest, parse, and append data from liquid handlers, plate readers, and other analytical instruments.

Built on top of an extensible, high-performance cloud infrastructure, Benchling seamlessly integrates with laboratory instrumentation, allowing forward-thinking companies to realize the promise of the connected lab.



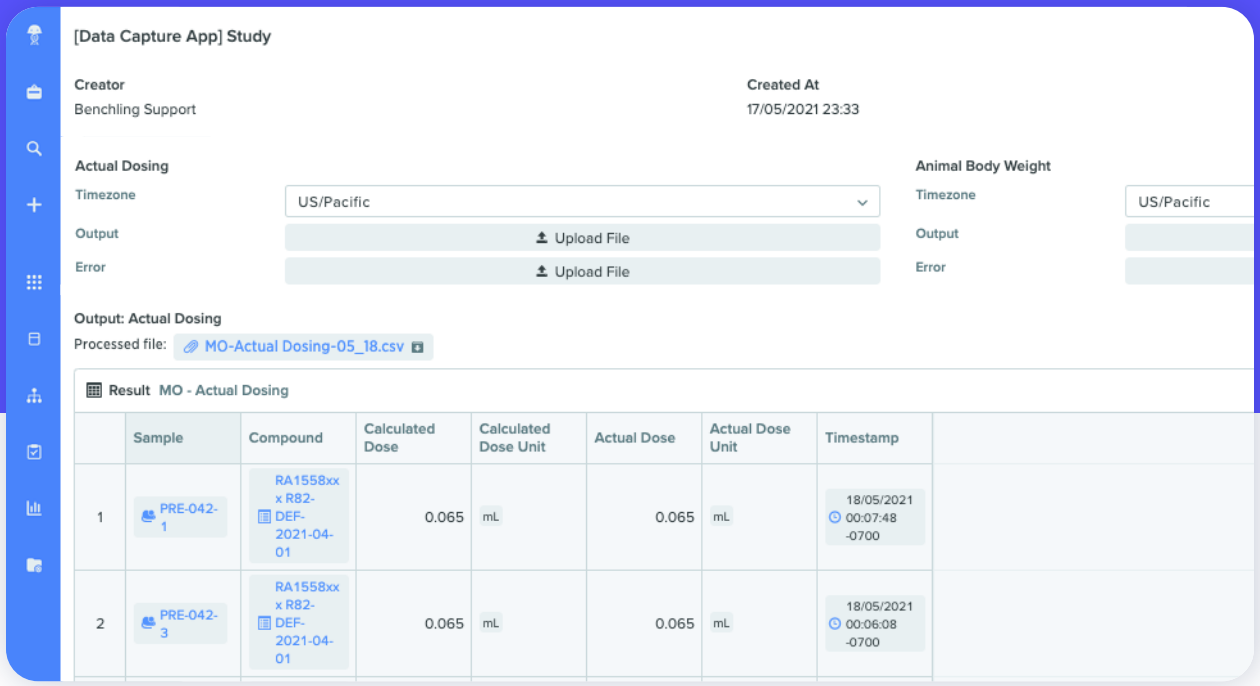
Automate and Optimize R&D Workflows with Benchling's Instrument Integrations

Streamline instrument data input to increase experimental scale

Automate output data transfer to improve data integrity

Maintain sample and process traceability at high-throughput

Connect, Automate, and Accelerate Instrument-Driven Workflows



Utilize custom and out-of-the-box integrations to connect Benchling with anything from benchtop instruments to high-throughput instruments, including:

- Digital calipers and scales (ex. Fowler)
- Liquid handlers (ex. LabCyte)
- Colony pickers (ex. Hudson, QPix)
- Plate readers (ex. Molecular Devices)
- Flow cytometers (ex. FACS AriaIII)
- NGS machines (ex. Illumina NovSeq)
- Smart freezers (ex. Askion)

Streamline instrument data input

Remove manual input bottlenecks to increase experimental scale. Use Benchling to define input samples and instrument-specific input parameters to increase scientists' efficiency.

Automate output data transfer

Prevent manual transcription errors to improve data integrity. Instrument data automatically sync to their respective samples and reagents in predefined, assay-specific tables.

Maintain sample and process traceability

Prevent data silos. The full context around a run is easily viewable, with sample locations, volumes, results, and notes automatically captured and interlinked.

Instrument Integration Overviews

File-Based Instrument Integrations

Benchling supports off-the-shelf, file-based integrations through instrument-specific adapters that support complex file formats (e.g. from plate readers, spectrophotometers, etc.), as well as a native CSV adapter that supports a wide array of instruments (e.g. liquid handlers, cell counters, etc.). For instruments like liquid handlers, scientists can use Benchling to generate and send instructions containing sample layout & locations, volumes, and run parameters to the instrument.

After a run concludes, data and other output files from the connected instrument are automatically pulled into a cloud-based file uploader, which passes those files along to a cloud storage provider (e.g. AWS, Azure, or Google Cloud). Once the file is in the cloud, data are automatically transformed, processed, and loaded into Benchling via the native CSV or instrument-specific adapter — no additional software or infrastructure required.

Desktop-Based Instrument Integrations

Our desktop-based integrations pull data from benchtop instruments (e.g. RFID scanners, scales, digital calipers) that are connected to local workstations through USBs or COM ports. Measurements taken with benchtop instruments are pulled into the app on the connected workstation, appended to the predefined samples and results fields, then automatically synched to the defined fields in the Benchling web app.

Integrations via Middleware

For organizations that prefer to use a common middleware platform across instrument integrations, Benchling enables the seamless consumption of source instrument data via various API or IoT connections.

Recursion

"As a digital biology company, Recursion is industrializing drug discovery with a high-throughput, high-content, data-centric approach, and harnessing automation is critical to our success. We are thrilled to partner with Benchling to enable flexible and seamless capture of standardized data across many scaled assays."

Mason Victors
Chief Product Officer, Recursion Pharmaceuticals

Trusted Partner to Leading Life Science R&D Organizations

Benchling's Technical Solutions Consultants (TSC) team has extensive expertise integrating automation and analytical instrumentation across dozens of life science R&D organizations. Together with our partners in the Customer Experience team, we work with your team to plan, prioritize, and execute on rapidly launching instrumentation integrations, no matter the complexity.

- **Step 1: Plan**
  Deep-dive technical and project scoping to ensure we understand how to address your needs
- **Step 2: Prioritize**
  Identify the ideal order of operations for implementing and deploying your integrations
- **Step 3: Execute**
  Onboard, train, and support your users to harness the full power of your integrations

Learn how Benchling can accelerate the pace of your R&D innovation. Visit benchling.com.