BUYER'S GUIDE WITH AUTOMATION PLATFORMS

SPRQ YOUR RESEARCH

Streamline your HiFi long-read workflow from extraction to library preparation with proven automation solutions. Whether you're running a few samples or scaling up, the right automation platform can make all the difference.

Choosing the right platform for your lab

Selecting the right automation platform for HiFi sequencing involves evaluating several key factors based on your lab's scientific goals, throughput needs, budget, and workflow preferences. Here are the core considerations to guide your decision:

Throughput and scalability

Match platform capacity to your current and anticipated sample volume.

- **Low-throughput labs** (< 24 samples at a time) may prefer compact, budget-friendly systems (e.g., Integra Miro Canvas, Volta Labs Callisto, Tecan DreamPrep NGS Compact, and Hamilton NGS STARlet).
- **High-throughput labs** (> 24 samples at a time) may benefit from scalable systems with ready-to-use protocols (e.g., Hamilton NGS STAR MOA, Tecan DreamPrep NGS, Beckman Biomek i7).

Questions to ask to align with your lab's needs:

- How many samples do you process per week?
- Can the system scale with your lab's expanding projects?

Sample types and applications

Make sure the system supports your sample types (e.g., blood, saliva) and target applications (e.g., whole genome sequencing, RNA sequencing).

Questions to ask to align with your lab's needs:

- What is your primary sample type and application that you hope to scale with automation?
- Can you adapt or create protocols for new applications?

Coverage of HiFi workflow steps

Some platforms specialize in a single step (e.g., extraction or library preparation), while others offer end-to-end automation.

- **All-in-one systems** reduce hands-on time and integration complexity.
- **Modular setups** may offer more flexibility but require coordination between devices.

Questions to ask to align with your lab's needs:

- At what step of the workflow are you encountering bottlenecks?
- What steps of the workflow are you looking to streamline and automate?

Budget and total cost of ownership

Consider both upfront capital cost and long-term expenses like consumables, service contracts, and training.

- **Lower-CapEx options** may be ideal for pilot projects or low-throughput labs.
- **Higher-CapEx systems** often provide more walkaway times and more robust support.

Questions to ask to align with your lab's needs:

- What is the upfront cost of the system and what is included in the purchase (e.g., initial training, setup, software licenses)?
- Are there financing, leasing, or reagent rental programs available?

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Ease of Use and Training

Platforms vary widely in user interface, protocol customization, and onboarding time.

- **User-friendly platforms** like Hamilton Microlab Prep or SPT Labtech Firefly may speed up adoption.
- **Open-source systems** like Opentrons offer customization at the cost of more setup effort.

Questions to ask to align with your lab's needs:

- How much onboarding and troubleshooting help would be needed?
- What is the level of technical skill needed for the operators?

Total workflow time and lab efficiency

The total workflow time can be as critical as throughput—especially in resource-limited environments. Systems that minimize manual intervention free up staff for other tasks and reduce variability.

Questions to ask to align with your lab's needs:

- How much time can I expect to save using automation?
- Can I seamlessly integrate my current workflow and Laboratory Information Management Systems (LIMS) with the platform?

Vendor support and ecosystem

Reliable technical support, pre-validated protocols, and integration with PacBio long-read sequencing systems (Revio and Vega systems) can significantly ease implementation and troubleshooting.

- Get added assurance of compatibility with platforms sold or supported by PacBio:
  - Hamilton Microlab Prep (PacBio PN 103-283-600)
  - Thermo Fisher Kingfisher (PacBio PN 103-283-400)
  - Agilent Femto Pulse (PacBio PN 103-283-300)

Questions to ask to align with your lab's needs:

- When something unexpected happens, how quickly will I need to get help? Do I need on-site assistance, or would timely remote support be sufficient for my team's experience level?
- Am I comfortable setting up and optimizing automation protocols on my own, or would I benefit more from a well-established user community, protocol libraries, and technical documentation?
- Will I need expert help getting the platforms running smoothly with my specific samples and workflows? Do I expect personalized, hands-on assistance for installation, method verification, and early troubleshooting?

Compare automation solutions across workflow steps

This guide outlines PacBio Compatible third-party automation solutions across key HiFi workflow steps to help you choose the best-fit tools for your lab.

Sample preparation

High-quality sequencing starts with high-quality DNA. PacBio offers easy-to-use automation solutions that support sample preparation from DNA extraction through shearing.

DNA extraction

Automated extraction ensures consistent, high-quality DNA—a critical foundation for HiFi sequencing.

Platform	Advantages	Sample type	Max samples	Total time
Hamilton Nimbus Presto	Fully automated, flexible liquid handler	Human/Animal blood and bacteria	96	2.5 hours
Thermo Fisher Scientific KingFisher Apex	Compact, lower CapEx, and sold by PacBio	Human/Animal blood and bacteria	96	2 hours

DNA shearing

Predictable, consistent, and robust DNA shearing (i.e. fragmentation) are essential to get the most out of your HiFi sequencing experiments. There are a wide variety of shearing options from manual to automated solutions to fit your needs.

Platform	Advantages	Sample type	Samples per run	Time per run[1]
Hamilton NGS STAR MOA / STARlet / STAR V	• Part of a fully automated solution • Cost-effective • Fast	WGS (human, plant, animal, microbial)	8-96 STARlet: 24 samples	~10 min
Hamilton Microlab Prep	• Compact, • Affordable • Fast • Sold by PacBio	WGS (human, plant, animal, microbial)	8-24	22 min for 24 samples
Diagenode Megaruptor 3/3HT	• Flexibility • Dynamic range	WGS, Targeted	8-12	30-40 min, or 15 min with ultrafast protocol
Tecan DreamPrep NGS / NGS Compact	• Part of a fully automated solution • Cost-effective • Fast	WGS (human, plant, animal, microbial)	8-96	FCA: 9 min per column MCA: 6 min for 96 samples
Beckman Coulter Biomek i7 Hybrid Workstation	• Part of a fully automated solution • Cost-effective	WGS (human, plant, animal, microbial)	8-96	35 min
MP Biomedicals FastPrep-96	• Affordable • Ultra-high throughput • Dynamic range	WGS, Targeted	192	< 8 min
SPEX MiniG	• Affordable • High throughput • Dynamic range	WGS	1-96	1-8 min
Opentrons Flex	• Part of a fully automated solution • Lower Capex	WGS (human, plant, animal, microbial)	96	10 min
SeqWell LongPlex kit	• Kitted enzymatic shearing solution • No CapEx	Targeted, WGS microbial	24	2 hours
Covaris g-TUBE	• Low barrier to entry • No CapEx	WGS	1-24	10-30 min

[1]Times may vary based on protocol/application/sample type or pipetting head being used (e.g., 8 vs 96-channel).
[2]Check with automation vendors for the latest specs.

Library preparation

Automation improves reproducibility and throughput in complex library preparation workflows.

Platform	Advantages	Qualified protocols[1]	Max samples	Total time
Hamilton NGS STAR MOA / STARlet / STAR V	Fully automates complete HiFi workflow	SMRTbell prep kit 3.0, HiFi prep kit 96, HiFi plex prep kit 96	24: STARlet 96: STAR MOA and STAR V	6.5 hours
Tecan DreamPrep NGS Compact/ DreamPrep NGS	Fully automates complete HiFi workflow	SMRTbell prep kit 3.0	48-96	5 hours
Integra Miro Canvas	Low CapEx, ideal for lower throughput labs	SMRTbell prep kit 3.0, SeqWell LongPlex	1	4.5 hours
SPT Labtech Firefly	Miniaturized and flexible	SMRTbell prep kit 3.0	96	4 hours
Revvity Sciclone NGSx	High-throughput, common in many labs	SMRTbell prep kit 3.0	96	4.5 hours
Beckman Coulter Biomek i7	High-throughput, common in many labs	SMRTbell prep kit 3.0	96	5 hours
Opentrons Flex / OT-2	Cost-effective, flexible	HiFi prep kit 96, HiFi plex prep kit 96, Kinnex kits	96	4.5 hours
Volta Labs Callisto	Cost-effective, full walkaway solution	SMRTbell prep kit 3.0	1–24	5.5 hours

[1] Check with the automation vendor on the latest specs, qualified protocols, and ability for customization.

Need help evaluating your options?

We're happy to help you map your current workflow and recommend platforms that align with your needs and budget. Reach out to your PacBio representative or visit pacb.com/contact to get started.

PacBio product information:

Explore PacBio Compatible partners

Quick reference card for equipment and materials needed for HiFi sequencing

Featured partner product information:

Automated solutions for Nanobind extraction kits

Diagenode Megaruptor

Hamilton NGS STAR MOA

Hamilton Microlab Prep

Integra Bioscience Miro Canvas

MP Bio FastPrep-96

Opentrons

Revvity Sciclone G3 NGSx

Tecan DreamPrep NGS and DreamPrep NGS Compact systems

Tecan DreamPrep NGS Compact and SMRTbell prep kit 3.0

Volta Labs Callisto and SMRTbell prep kit 3.0

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