



Sample Tracking Control Set v1.0

Internal spike-in controls for sample tracking, carry-over assessment and workflow integrity.

Product Overview

The Sequins™ Sample Tracking Control Set v1.0 is an internal, sample-specific molecular tracking control for sequencing-based workflows. Each well contains a predefined combination of three Sequins molecules that acts as a well-specific spike-in molecular signature, supporting sample tracking, sample swap detection and assessment of cross-sample contamination or carry-over. Because the identity and input amount of each Sequins molecule is known, recovery of the expected Sequins molecules can also provide sample-level and run-level workflow quality control (QC) insights.

Background

Cross-sample contamination, carry-over and sample swaps are persistent risks in sequencing-based workflows. These events can be difficult to detect once samples have progressed through extraction, library preparation, sequencing and analysis, particularly when the tracking signal is external to the sample or depends only on plate position, index assignment or laboratory chain-of-custody records.

An ideal molecular tracking control would be introduced into each sample at a user-defined point in the workflow, remain detectable through downstream processing, and provide an orthogonal signal that can be distinguished from both the native sample material and other wells in the same run. Such a control could help laboratories compare the planned sample layout with the observed sequencing data, identify unexpected carry-over between wells or runs, and generate sample-level workflow QC information from the point of addition.

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Sequins (sequencing spike-ins) are synthetic nucleic acid controls that mirror naturally occurring sequences while remaining analytically distinguishable from the native sample. The mirrored Sequins design enables control-derived reads to be detected separately from sample-derived reads in the sequencing output, allowing the Sequins controls to be assessed without interfering with interpretation of the sample.

Building on this core Sequins technology, the Sequins Sample Tracking Control Set v1.0 provides an in-sample, sequencing-compatible molecular tracking system for 96-well plate-based workflows. Each sample is assigned to a planned well, spiked with a predefined well-specific combination of three Sequins molecules, processed through the workflow and assessed after sequencing (Figure 1). Together, the three Sequins molecules form a defined molecular signature that links each sample to its expected well position.

After sequencing, the observed Sequins signature for each sample is compared with the planned plate map. A match supports correct sample tracking from the point of Sequins addition, while discordant, missing or mixed signals may indicate a sample-to-well assignment issue, sample swap, carry-over or cross-sample contamination.

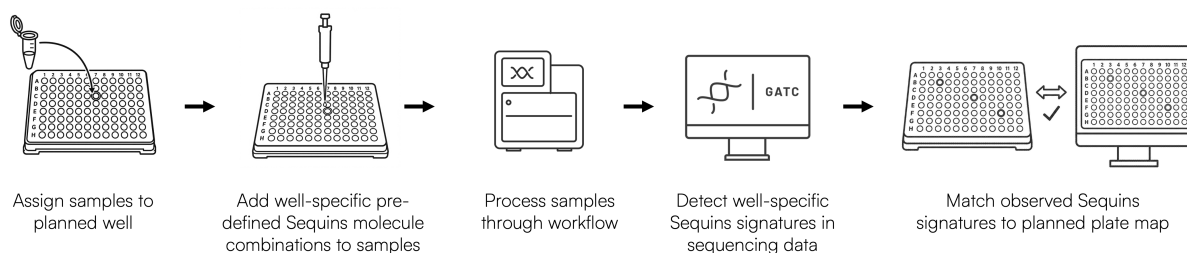


Figure 1: Workflow for using well-specific Sequins molecule combinations as in-sample molecular tracking controls. A predefined well-specific combination of three Sequins molecules creates a unique set of molecular signatures. These predefined combinations are added to each sample at a selected workflow stage, processed with the sample, and detected bioinformatically after sequencing to compare the observed Sequins signal with the planned plate layout.

Intended Use and Limitations

The Sample Tracking Control Set v1.0 is intended for Research Use Only (RUO) as an internal molecular tracking control for sequencing-based workflows. It supports comparison of the planned sample layout with the observed Sequins signatures after sequencing.

Recovery of the expected Sequins molecules can provide workflow QC insights, but results should be interpreted according to the point of addition, sequencing depth, workflow chemistry, bioinformatics parameters and laboratory-established acceptance criteria.

The Control Set does not replace conventional laboratory controls, sample identity checks, chain-of-custody procedures, indexing or demultiplexing controls, or laboratory validation.

Control Set Uses

The Sample Tracking Control Set v1.0 can support two complementary applications: (1) internal, sample-specific molecular tracking, and (2) workflow QC review based on recovery of known Sequins inputs.

As an internal, sample-specific control, the Control Set can support:

- **Sample tracking.** Each sample is assigned a predefined combination of three Sequins molecules. The observed Sequins signature can be compared with the planned plate layout to support sample identification from the point at which the Control Set was added.
- **Cross-sample contamination and carry-over monitoring.** Detection of Sequins molecules assigned to another well may indicate unintended carry-over between samples within a run or between runs where residual material is present.
- **Sample swap detection.** A mismatch between the expected and the observed Sequins signature may indicate a possible sample swap or sample-to-well assignment error.

- **Sample-specific QC insights.** Recovery of the expected Sequins molecules can provide sample-level information about control recovery and sequencing representation. When aggregated across samples, this data can also support run-level performance review.

As a process control, the Control Set provides a reference of known content and input amount. Comparison of expected and observed Sequins recovery can be used to assess workflow variability, support workflow QC and guide workflow optimization. Interpretation should take into consideration the point of addition and thresholds established for the specific workflow.

Control Set Description

The Sample Tracking Control Set v1.0 is supplied as a kit containing a single 96-well microtiter plate containing dried Sequins material (a combination of three predefined molecules), together with nuclease-free water for resuspension (Table 1). A bioinformatics resource bundle is provided electronically to support downstream detection and interpretation of Sequins signatures (unique combinations of three Sequins molecules).

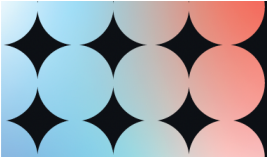
Each well contains a unique combination of three Sequins molecules selected from ten Sequins fragments (Table 2). Short IDs are used in the plate layout for ease of use. Full Sequins IDs are provided for traceability and correspond to the supplied reference sequence in the bioinformatics resource bundle.

Table 1: Sample Tracking Control Set v1.0 kit components.

Component	Quantity	Description
96-well Sequins plate	1 plate	Each well contains dried material prepared from a 20 µL Sequins formulation in stabilizing solution
Nuclease-free water	2 tubes, 1.1 mL each	Water supplied for resuspension of plate wells
Resource bundle	Provided separately	Reference sequences and sequence metadata required for bioinformatic analysis

Table 2: Sample Tracking Control Set v1.0 fragment details.

Sequins full ID	Short ID	Size (bp)
SQN000000183	SQN183	982
SQN000000138	SQN138	997
SQN000000055	SQN055	988
SQN000000181	SQN181	1,000
SQN000000058	SQN058	1,000
SQN000000145	SQN145	1,138
SQN000000180	SQN180	1,138
SQN000000179	SQN179	1,487
SQN000000178	SQN178	1,516
SQN000000177	SQN177	1,558



Product Ordering Information

Product	Catalog Number	Description
Sample Tracking Control Set v1.0	PN-10050	Sample Tracking Control Set v1.0 (384 samples*/96x4 reactions)
Sample Tracking Control Set v1.0	PN-10041	Sample Tracking Control Set v1.0 (768 samples*/96x8 reactions)

**based on a 1% spike-in; 250 ng library input*

After resuspension using the supplied nuclease-free water, each well is intended to provide either four (4) or eight (8) reactions (PN-10050 and PN-10041, respectively).

Contact Information

Ordering and Support

enquiries@sequins.bio | support@sequins.bio

Notes

For research use only.