

MRD Express

MRD Express is Twist's customized, tumor-informed target enrichment panel for molecular residual disease research and ctDNA characterization. Built on Twist's silicon-based DNA synthesis platform, researchers can move from biomarker identification to a next-day biomarker-specific panel.

MRD Express panels support up to 10,000 probes per design so researchers can track more custom variants per assay, push limits of detection further, and operate at express speed.

KEY ADVANTAGES

Decision-ready speed

- Panels move from order to shipment with next-day shipping.

Modified bases in panels for challenging targets

- Locked Nucleic Acids (LNA) incorporation lifts coverage in low-GC regions for tracked variants to stay measurable.

High-efficiency capture for deep, customized sensitivity

- High-performing probes recover more molecules from limited cfDNA input.
- Panels of up to 10,000 custom probes per design supporting limit of detection down to the low ppm range.

Fits the Twist workflow you already run

- Compatible with Twist library prep, adapters, and hybrid capture.
- High performance in line with standard panels.

Manufacturing reproducibility at scale

- Twist's silicon-based synthesis platform delivers oligo quality and manufacturing capacity researchers demand.

Streamlined digital ordering

- BED or FASTA design intake, an eCommerce checkout, and LIMS API integration remove manual steps from design and ordering.

Panel synthesis removed from critical path

Time is of the essence when it comes to customized MRD panels. Twist rebuilt its manufacturing process to deliver custom panels with next-day shipping, so panel turnaround is no longer the bottleneck in the MRD workflow.

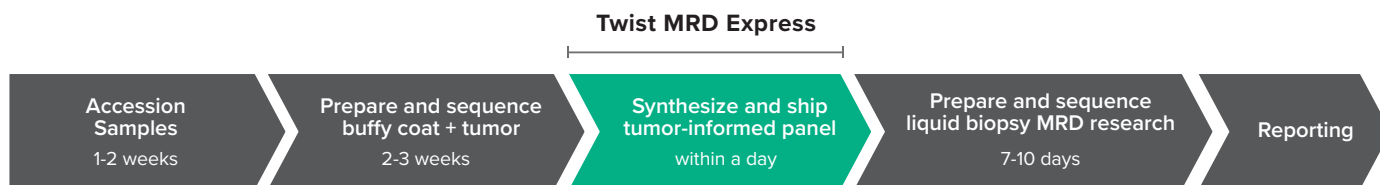


Figure 1. End-to-end workflow schematic for an MRD workflow, including a within-a-day window for panel synthesis and shipment (highlighted in green).

Challenging tumor markers stay trackable

Locked Nucleic Acids (LNA) are incorporated during synthesis for robust coverage across AT-rich genomic regions.

- LNA increase melting temperature (Tm) and binding strength, which stabilizes probe-template hybridization.
- Coverage holds in regions down to 20% GC, where standard designs drop out.
- Fewer variants lost to difficult sequence content.

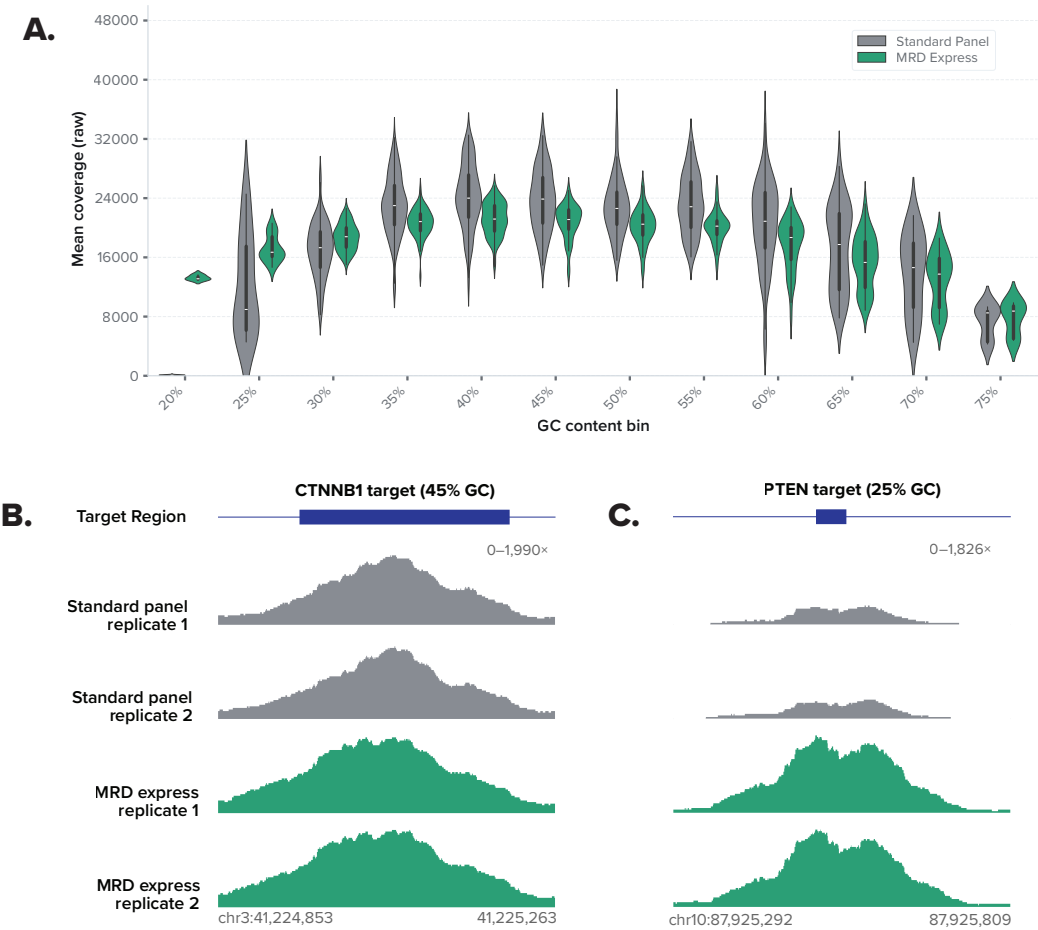
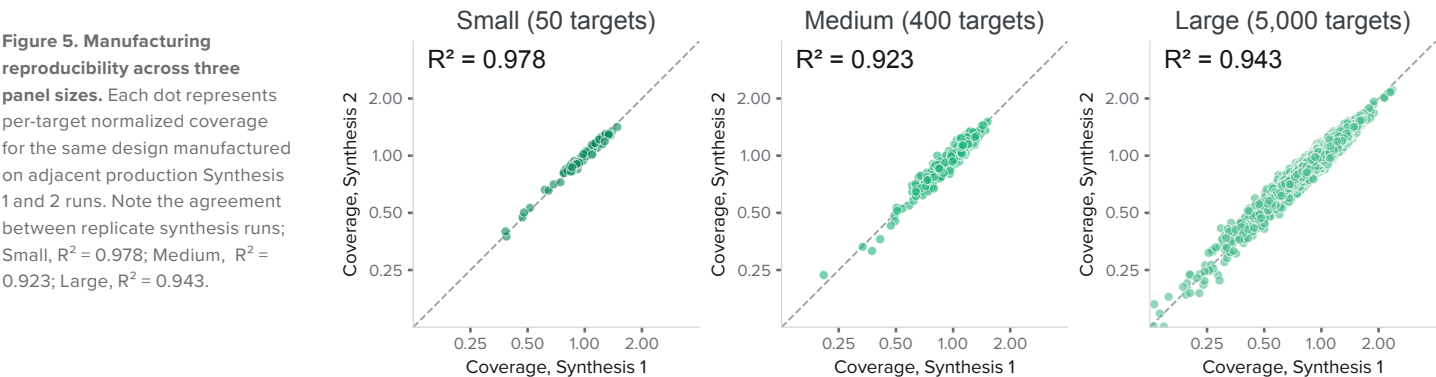


Figure 2. MRD Express panel LNA benefits. (A) MRD Express panel shows improved robustness in coverage across 20%-30% GC regions. (B) Coverage plot across CTNNB1 (45% GC) comparing target enrichment performed with standard vs MRD Express panels. (C) Coverage plot across PTEN (25% GC) comparing target enrichment performed with standard vs MRD Express panels. Data were generated with Twist consumables in singleplex enrichment and downsampled to equivalent coverage. Sequencing was performed on an Illumina NextSeq 550 using 2 x 75 reads.

Reproducible manufacturing across panel sizes

Twist's silicon-based synthesis platform prints every panel through the same fixed process, at the same probe-level quality specification, whether the design contains few or many probes.

As demonstrated by NGS, small, medium, and large representative designs show very low lot-to-lot variability when taken through the complete Twist capture and sequencing workflow.



High sensitivity to hit low ppm with upwards of 10,000 targets

MRD panels deliver high-quality sequencing performance across various panel sizes.

- Uniform coverage even if targets increase.
- Low % targets missed ensure every design is measurable.
- High library complexity for maximum sensitivity.

PANEL DESCRIPTION				PERFORMANCE (PICARD METRICS)		
NAME	VARIANT SITES	PROBES	TARGET SIZE (KB)	UNIFORMITY (FOLD-80)	TARGETS (≥ 0.2X MEAN)	MEAN TARGET COVERAGE
Small	50	100	6	1.28	100%	1644
Medium	400	800	48	1.17	99.75%	1778
Large	5,000	10,000	600	1.25	99.95%	1706

Table 1. MRD Express panel target enrichment performance. Across three panel sizes designed with default tiling strategy, data were generated with 15 ng Twist cfDNA Pan-Cancer Reference Standard v2 and Twist consumables in 500 ng singleplex enrichment and subsampled to 30,000x coverage. Picard metrics are highlighted. The representative MRD Express designs shown in this table use default double-stranded staggered tiling (2 probes per variant site).

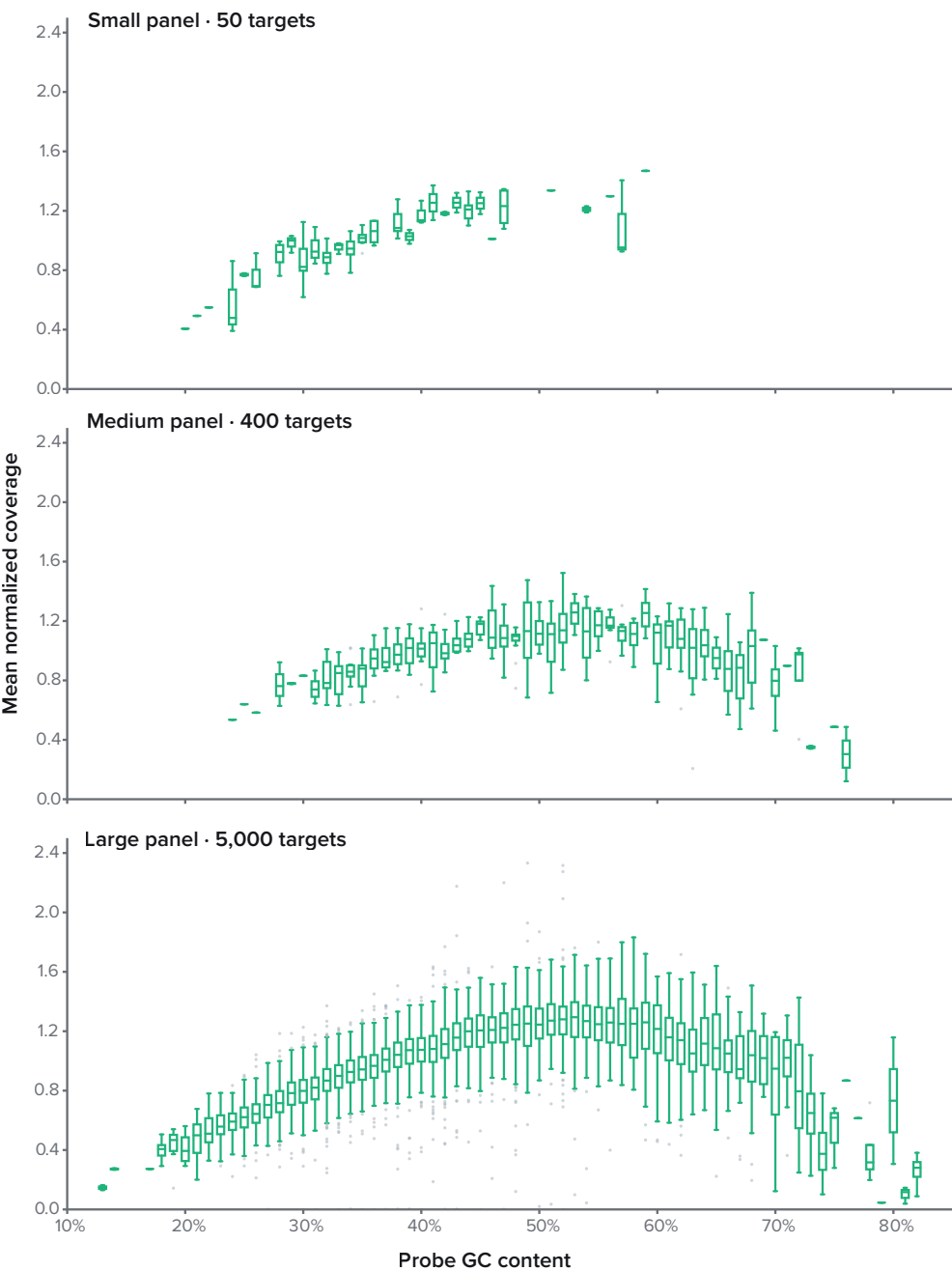


Figure 3. MRD Express panel coverage uniformity. Normalized target coverage for three panels (small, medium, large) binned at specific GC content. Data were generated with Twist cfDNA Pan-Cancer Reference Standard v2 and Twist consumables in singleplex enrichment and subsampled to 1,000x coverage. Sequencing was performed on an Illumina NextSeq 550 using 2 x 75 reads.

Validated performance across Twist end-to-end workflow

MRD Express panels are compatible with Twist’s ecosystem of library preparation and target enrichment kits. No extensive re-validation of front-end NGS workflows is necessary to add a personalized MRD assay.

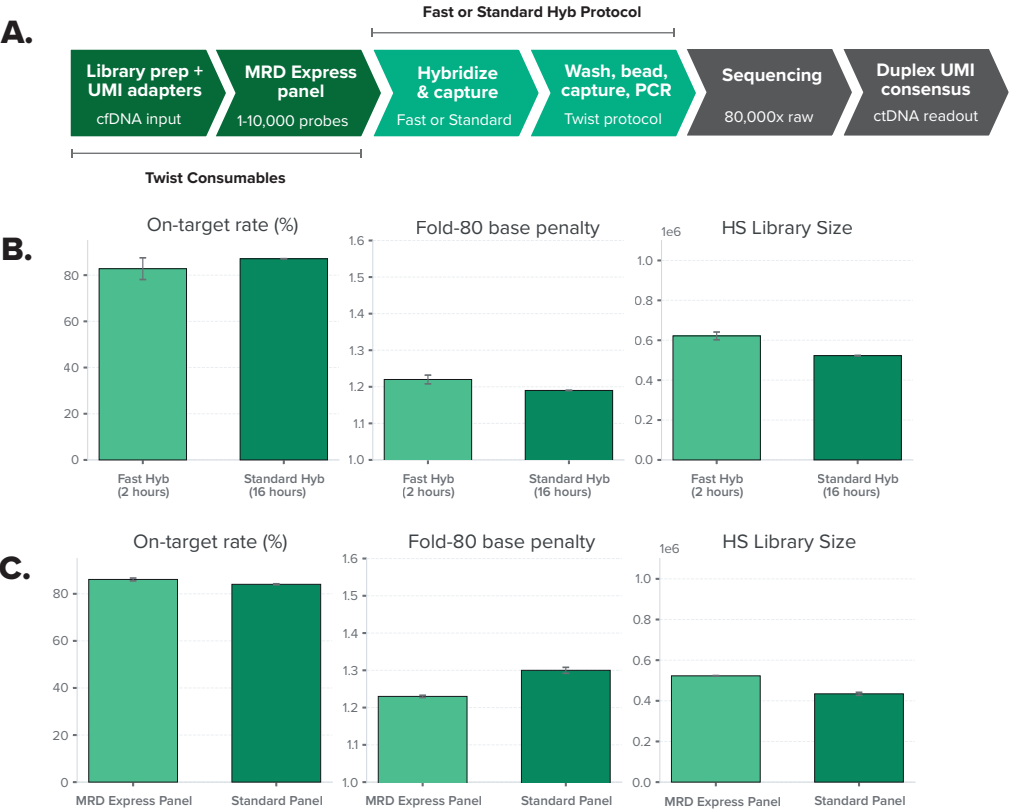


Figure 4. MRD Express panel compatibility. (A) MRD Express panel fits in the end-to-end Twist library preparation and target enrichment workflow. (B) Enrichment performance between Fast and Standard Hybridization. (C) Enrichment performance between MRD Express panel and standard panel. Data were generated with Twist consumables in singleplex enrichment and subsampled to 1000x coverage. Sequencing was performed on an Illumina NextSeq 550 using 2 x 75 reads.

Streamlined design, ordering, and bioinformatics support

MRD Express panels are designed from BED inputs or directly from FASTA probe sequences. Completed designs can be ordered directly through Twist’s eCommerce platform in minutes, in time to make that day’s synthesis run. Ordering APIs can integrate directly into LIMS systems.

Twist’s bioinformatics and field application science teams are also available to consult on standing up a liquid biopsy workflow end to end, from identifying critical tumor markers to designing the enrichment probes themselves.

Panel Information

ATTRIBUTE	DETAIL
Panel size	1 to 10,000 probes
Variant types	SNVs, small indels, CNVs, and exonic target regions
Design input	Variant target coordinate BED file or FASTA probe sequences
Genome builds	hg19 and hg38
Workflow compatibility	Existing Twist library preparation and hybrid capture workflows
Recommended protocol	Twist Standard Hybridization v2 and Fast Hybridization
Ordering	Twist eCommerce platform or API integration for LIMS-connected ordering
Shipping Tubes	0.5-ml Sarstedt, FluidX or Matrix (available through API)
Intended use	Research Use Only

Scan the QR code to learn more.



Design and order your panel.



Turnaround times are estimates only and are not guaranteed. Actual turnaround may vary based on order specifications, sample characteristics, processing requirements, operational capacity, and other applicable factors. Product information, specifications, features, availability, and timing are subject to change without notice. Twist products are for research use only. They are not intended for the diagnosis, prevention, monitoring, or treatment of a disease or condition. Twist Bioscience assumes no liability regarding the use of its products in unintended applications.