

# Twist Advances in NGS Applications

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CEO and Co-Founder



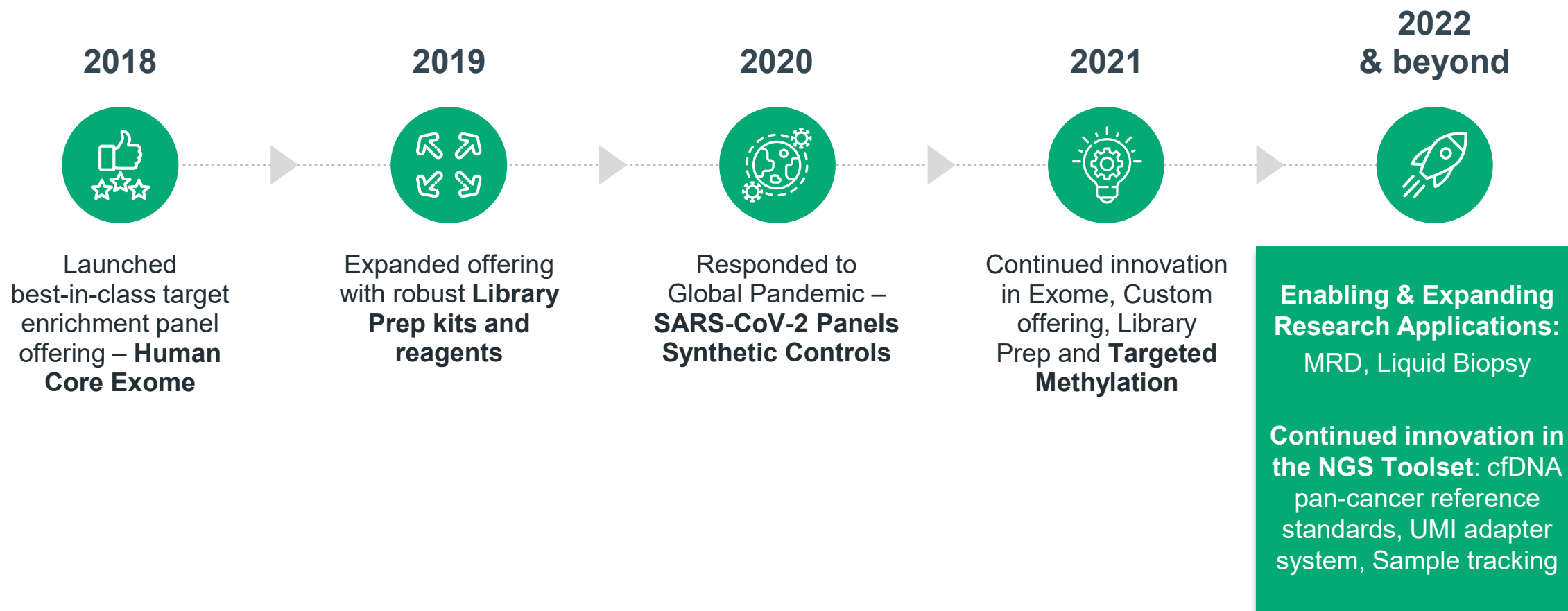
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# Twist Continues to Command Innovation in NGS Solutions





# NGS | Accelerating R&D Diagnostic Innovation



Human Core Exome



Fixed Panels



Custom Panels



Library Preparation



Reagents and Kits



Synthetic Viral Controls



Targeted Methylation



SARS-CoV-2 NGS Assay

## High Value Applications

- Liquid biopsy/MRD
- Rare disease
- Oncology
- Population genetics
- Infectious diseases

## Why we win

- Quality
- Uniformity
- Lower sequencing cost
- Rapid customization
- Fast throughput



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SARS-CoV-2 NGS Assay

## High Value Applications

- Liquid biopsy/MRD
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Sequencer  
Agnostic

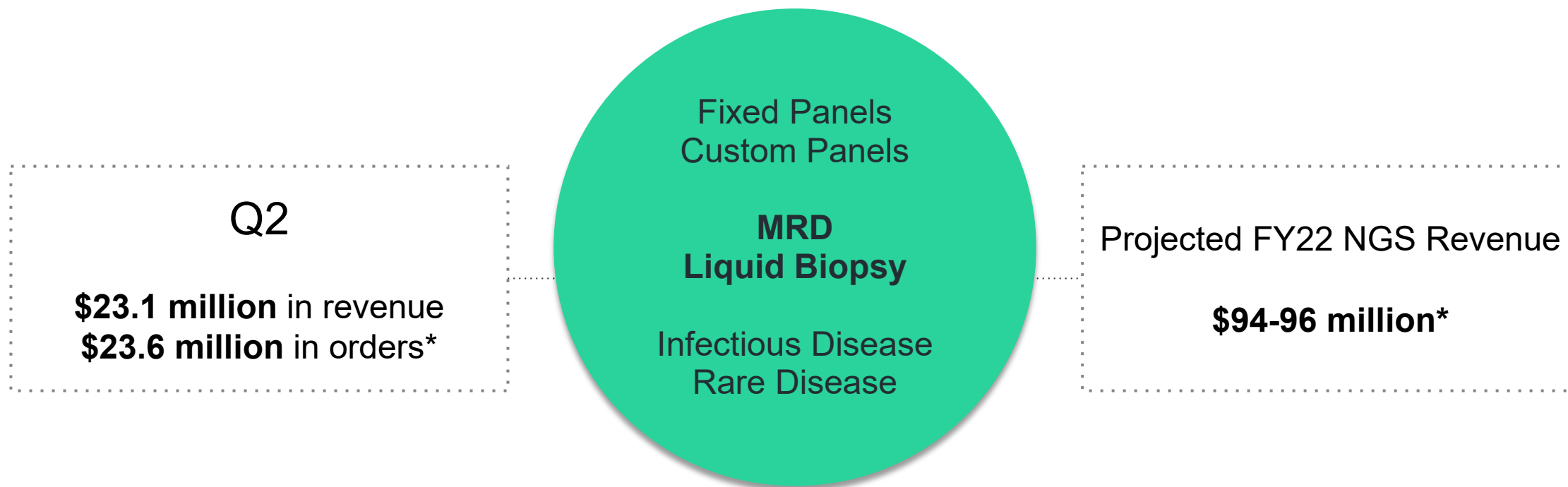


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# NGS Revenue Drivers

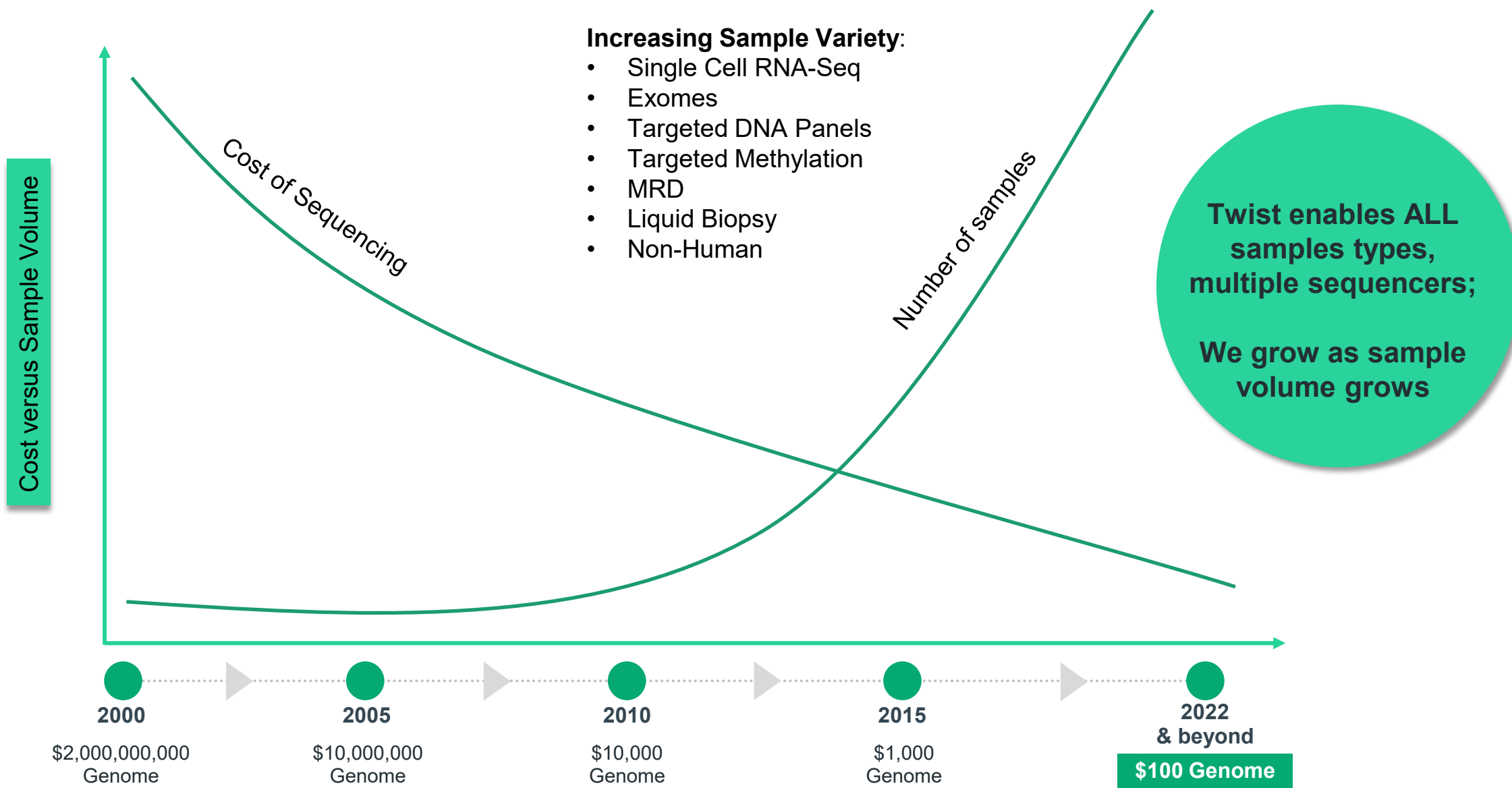


Owning the market between the sample and the sequencer



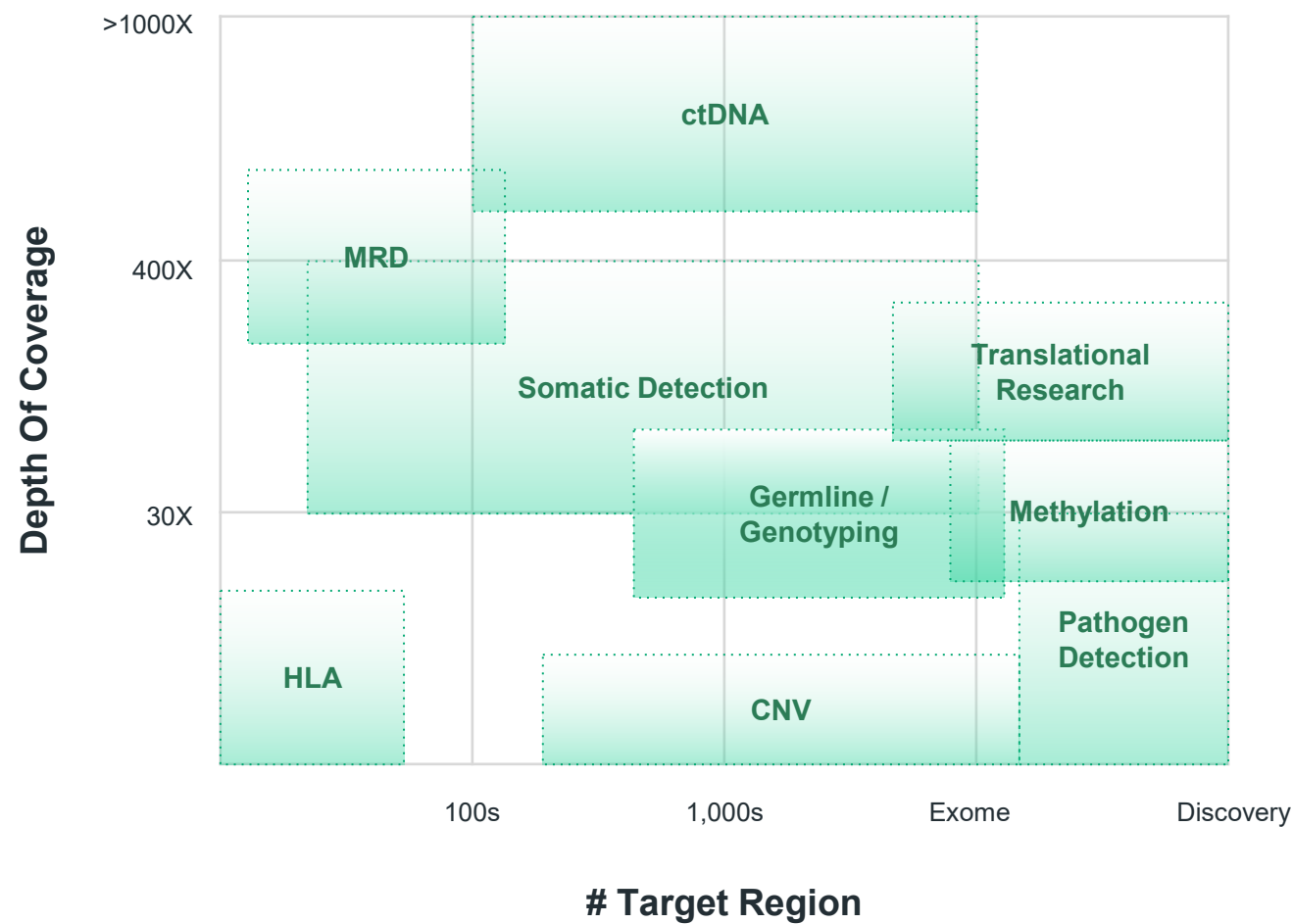


# As Cost of Sequencing Decreases, Sample Variety/Volume Increase





# Multiple Applications for Disease Profiling and Detection







# Building A Robust Toolset of NGS Products

## Fixed Panels

Fixed panel content, curated from the most up-to-date genomic databases, covering a variety of species

## Custom Panels

Customized projects, content; delivered quickly and with high quality

## Library Preparation

A variety of robust, high quality enzymatic and mechanical fragmentation library preparation tools, including UMI's, to enabling various applications

## Hybridization and Indexing Reagents and Kits

All of the tools and reagents needed for efficient hybridization reactions and sample multiplexing

## Methylation Detection System

An end-to-end sample preparation solution for identifying methylated regions in the human genome

## Synthetic Controls

Fully synthetic RNA controls provide quality control measures for a wide range of applications



# Commitment to Drive Innovation in NGS Solutions

## Innovation in Library Prep

Innovate in NGS library preparation as market shifts

- **96-Plex Library prep** for WGS
- **RNASeq**
- **Integrated DNA/RNA assay**
- **In-house library prep** solution (including normalization), to push performance boundaries

## Broaden NGS Panels and Toolset

Continue enrichment performance leadership

- **Exome V2**, and future iterations
- **Blocker, Hyb buffer, probe** design optimization
- Enrichment optimized for **RNA**
- **Alliance panels** and community content facilitation

## New Applications, New Markets

Enabling key segments with **Built-for-Purpose** tools

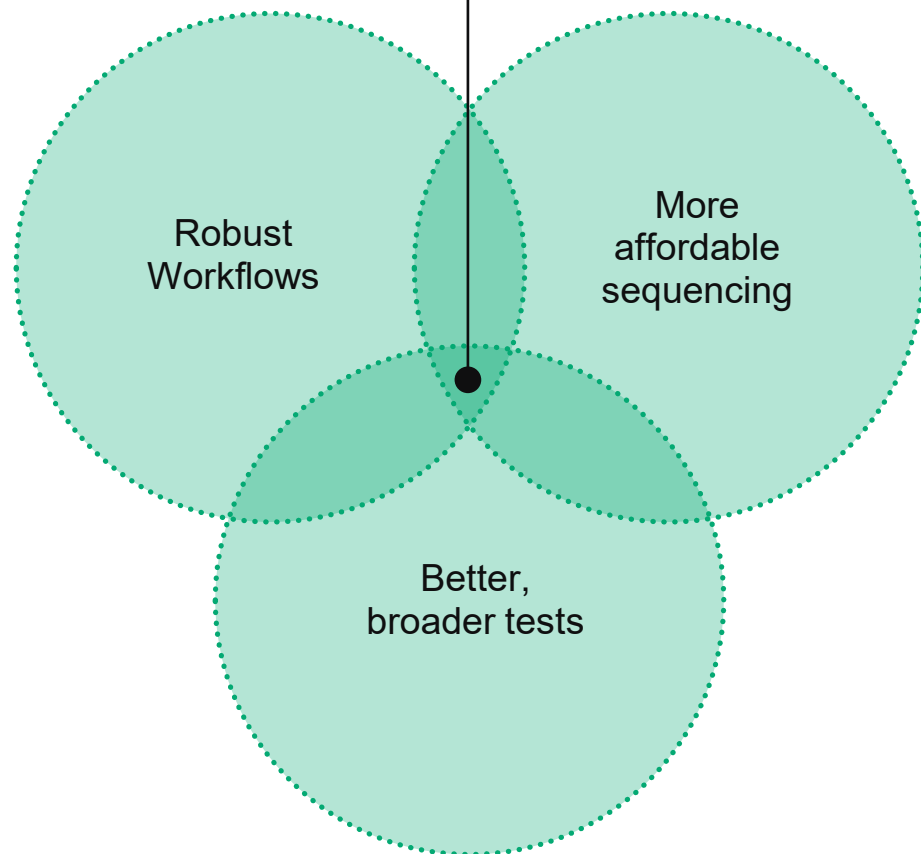
- **Pan-Cancer cfDNA control**
- **Genotyping by Sequencing** for both Pop-Gen and Agrigenomics applications
- **Liquid Biopsy** for early detection
- **Minimal Residual Disease** testing for solid tumor

# Oncology Solutions

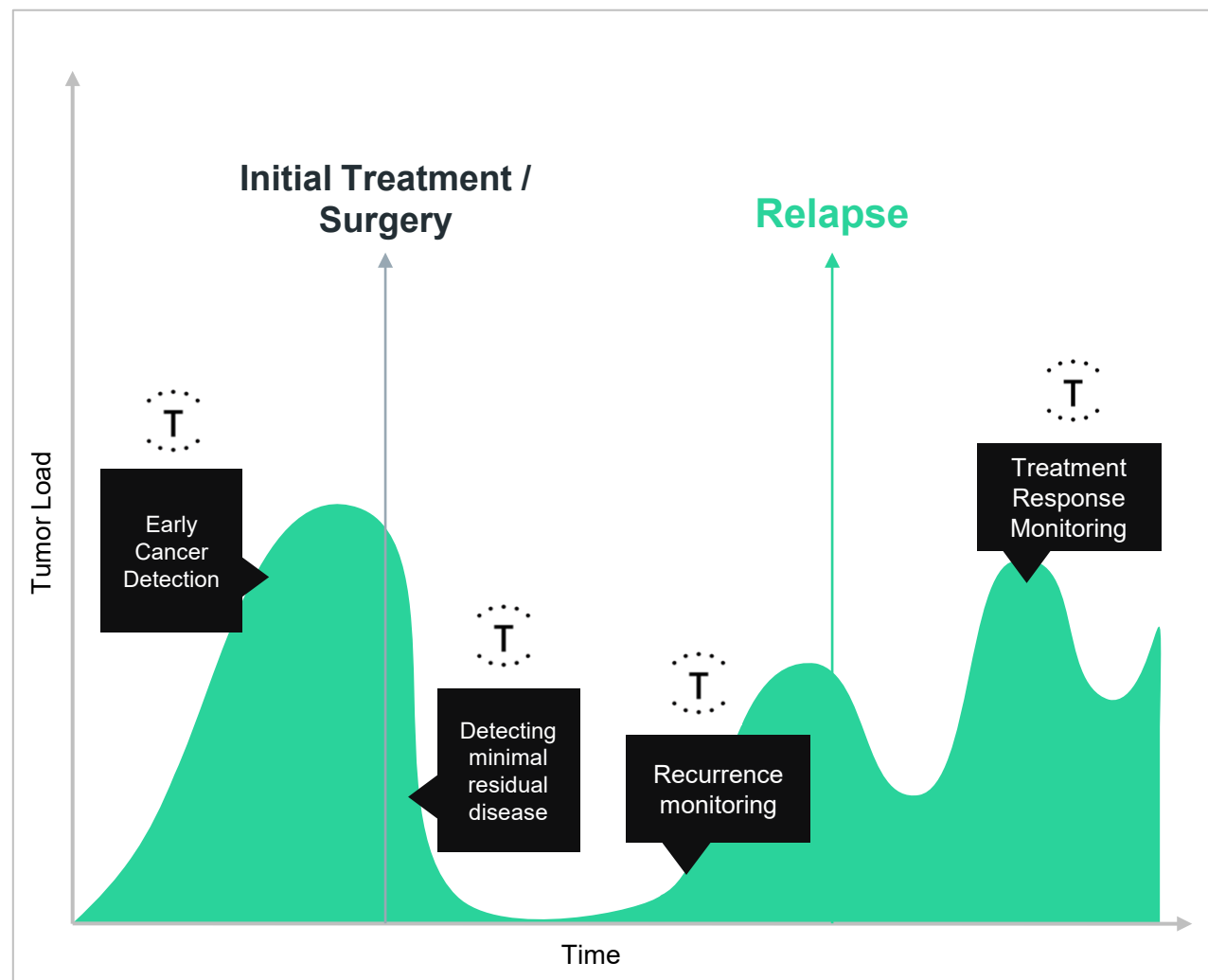


# Personalized Cancer Research Demands Personalized Sequencing

## Personalized Sequencing



Personalized Sequencing leads to **better outcomes**.

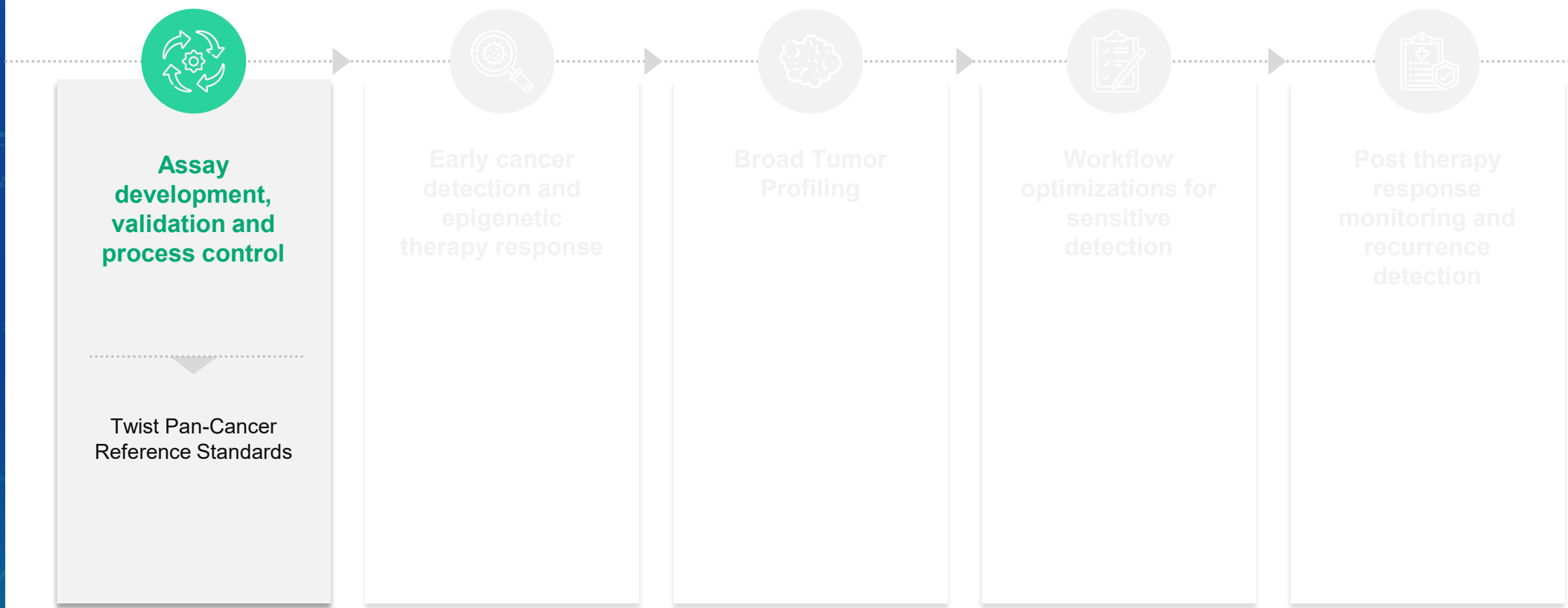


Leveraging **Twist MRD Solutions** for research at multiple points of a cancer journey.

*Twist Products are intended for research use only; not for use in diagnostic procedures*



# Driving the Future of Oncology Solutions

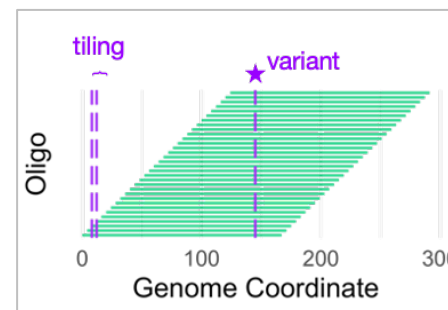




# Establishing Robust Controls for R&D in Liquid Biopsy Testing

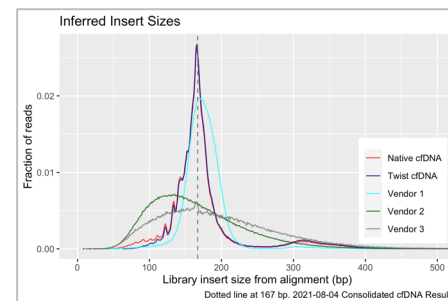
**Twist cfDNA Pan-Cancer Reference Standards** validate and track the ongoing quality of NGS assays for liquid biopsy

- ✓ **160 synthetic molecules** tiled over each site of interest
- ✓ **458 variants**, including 228 SNVs, 215 indels, 15 SVs/fusions
- ✓ 7 variant allele frequencies ranging from **0% (WT) to 5%**
- ✓ Fully characterized **donor-derived background DNA**



## ctDNA oligo tiling

Only possible with Twist's massive oligo manufacturing capabilities



## Superior Background DNA

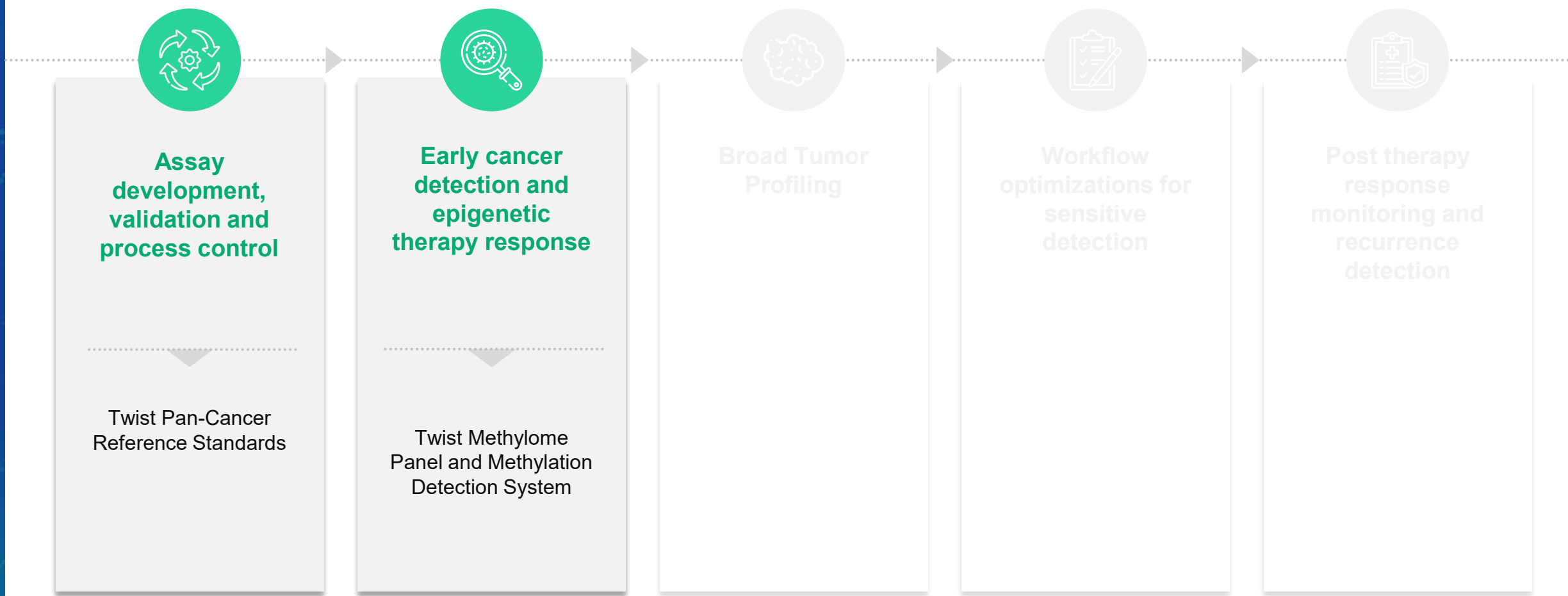
Twist cfDNA shows a size profile very similar to that of real, donor-isolated cfDNA unlike comparable cell line derived standards

**Characterizing assay analytic performance with confidence**





# Driving the Future of Oncology Solutions

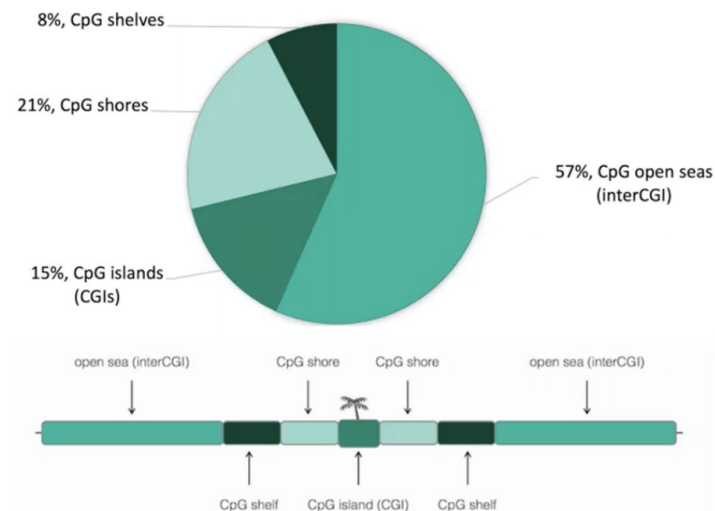




# Twist Methylation Solutions

**The Twist Methylome panel** combines highly efficient target enrichment design with **novel enzymatic conversion** for a more cost effective and streamlined solution than WGBS

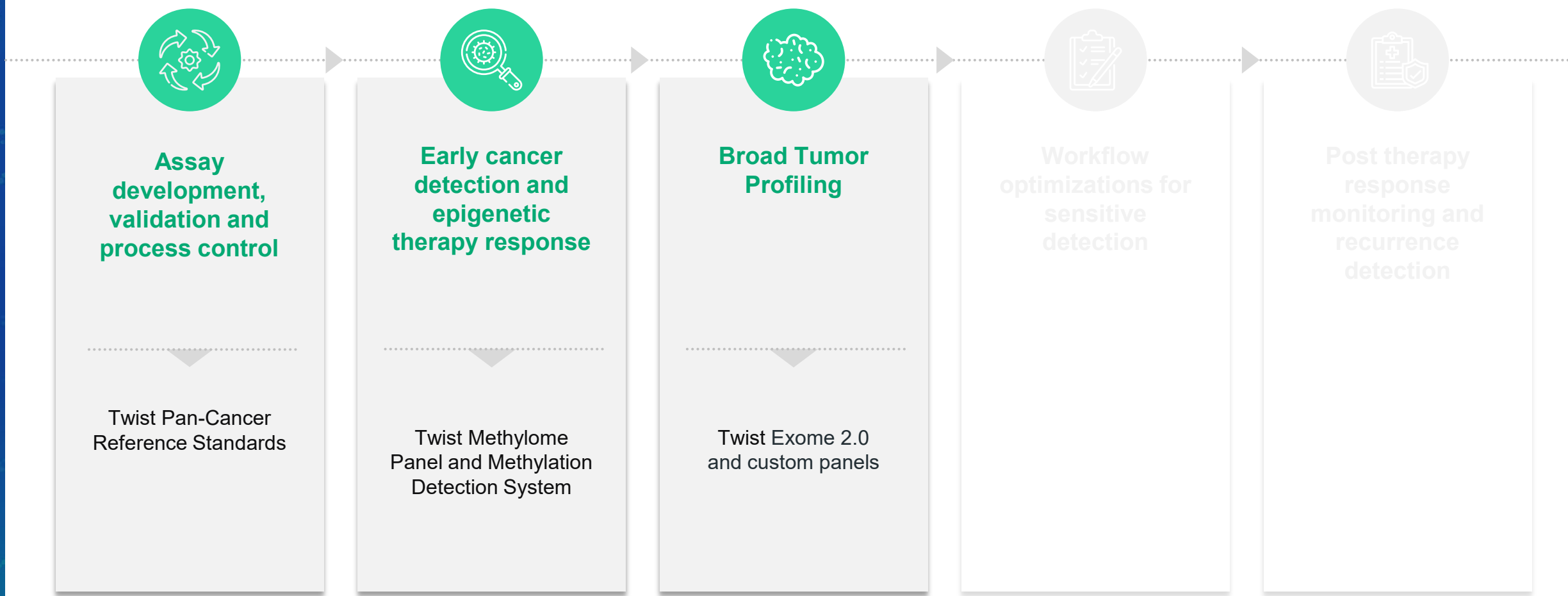
- ✓ Comprehensive identification and study of methylation biomarkers
- ✓ State-of-the-art enzymatic conversion process that replaces classical bisulfite approaches
- ✓ Unique probe design to capture methylated and unmethylated target regions
- ✓ Superior dynamic range, content flexibility, and cost to methylation arrays
- ✓ Epigenetic characterization of cfDNA for early cancer signal detection or cancer classification



**NEW Twist Methylome:** 123Mb covering 3.97 million CpG sites based on UCSC, Ensembl, ENCODE, and more



# Driving the Future of Oncology Solutions





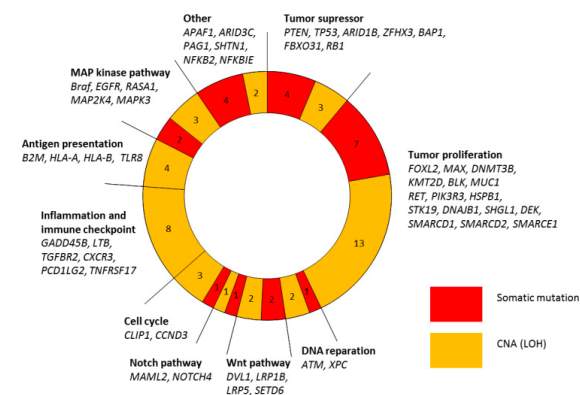
# Twist Exome 2.0 for Comprehensive Tumor Profiling

✓ Uncover critical biomarkers that dictate tumor progression

✓ Robustly call relevant variants with high quality target enrichment

✓ With the best-in-class performance of Twist Exome 2.0, tumor profiling is highly leveraged

✓ Comprehensive and carefully curated content enables higher hit rate in tumor profiling



Somatic mutations and copy number alterations as measured by Twist Exome sequencing in Non small cell lung cancer.

<https://europepmc.org/article/med/32581058>



# Ancillary Content for Expanded Cancer Targets

**Custom tumor panels** can be leveraged with Exome 2.0 to survey additional targets of interest relevant for cancer research and discovery

## Blended Panel

Add your tumor targets of interest to Twist commercial panels

✓ **Industry leading efficiency & exceptional coverage uniformity** to increase your confidence in tumor profiling

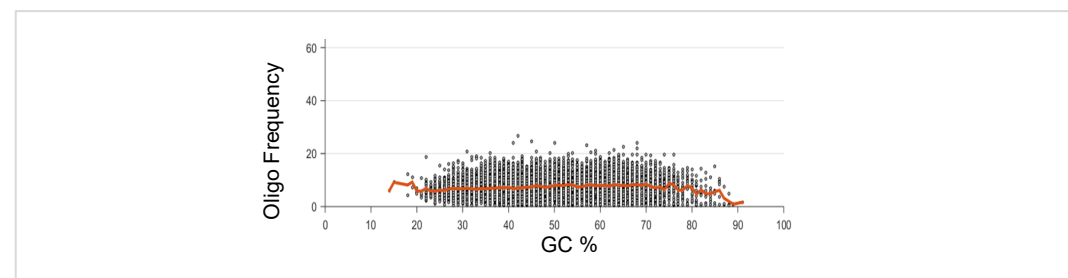
✓ **Scalable solution from 100 to over 1M probes in various reaction sizes**

✓ **Rapid iteration pipeline with NGS based probe QC** to make downstream decisions faster

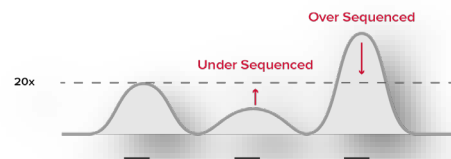
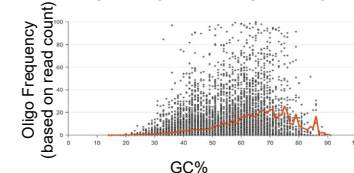
## Custom Panel

We design panels to meet your needs

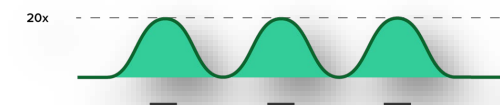
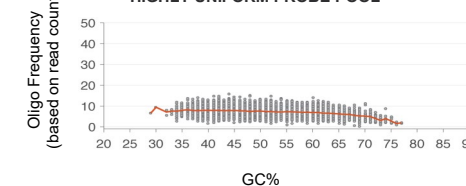
## Uniform Synthesis



STANDARD AMPLIFICATION METHODS  
BIASED PROBE REPRESENTATION



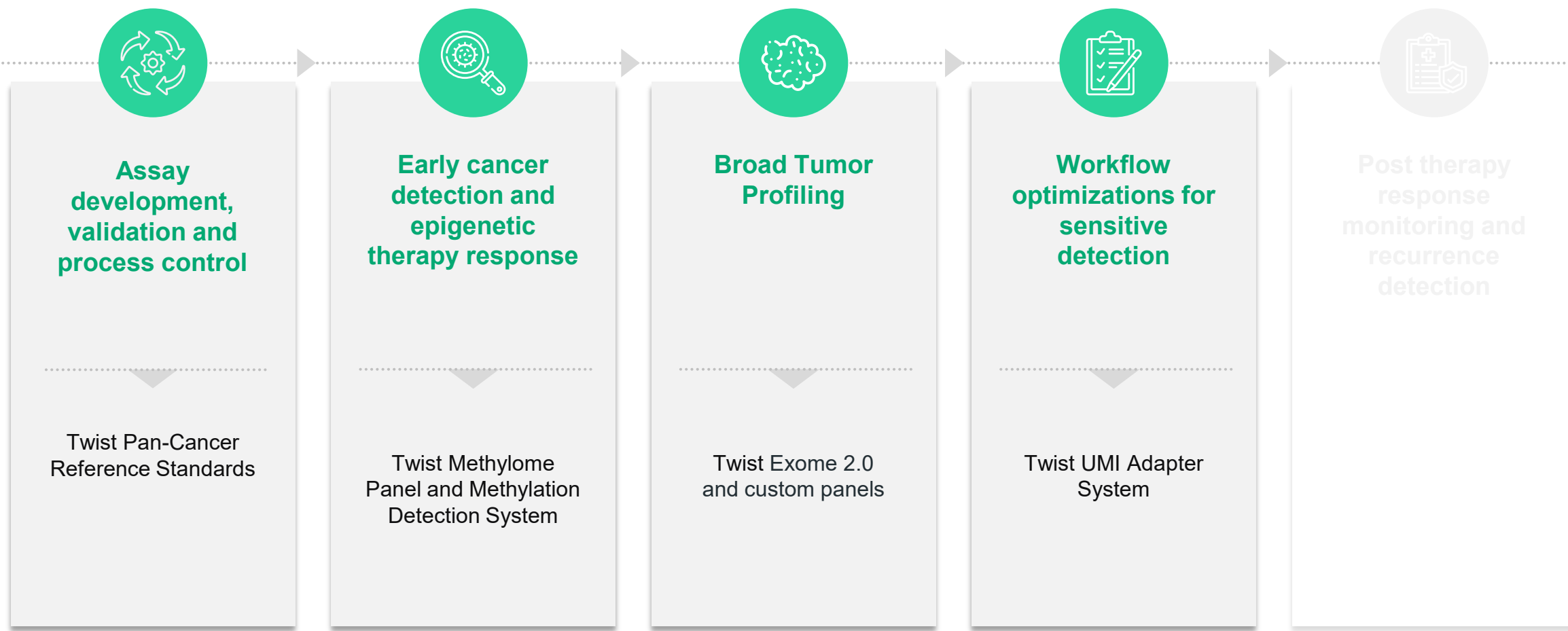
TWIST AMPLIFICATION METHOD  
HIGHLY UNIFORM PROBE POOL



**Flexible sequencing solutions to address all your cancer profiling needs.**



# Driving the Future of Oncology Solutions



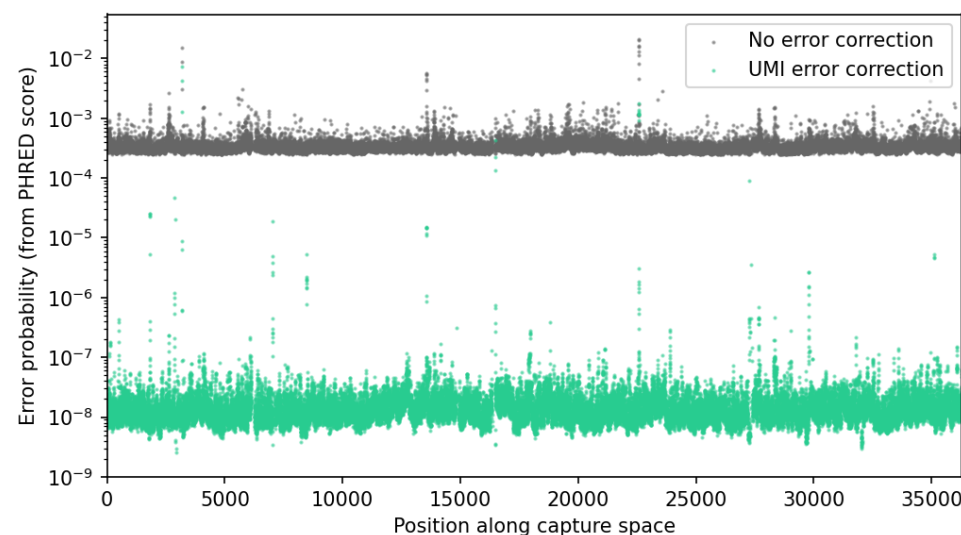




# Driving Accuracy Down to the Individual Molecule

The Twist UMI Adapter System offers a highly sensitive tool for somatic variant detection

- ✓ Molecular identifiers to enable extremely high coverage of low frequency alleles
- ✓ Optimized for use with difficult samples like liquid biopsy and FFPE
- ✓ Enables multi-fold improvement of error rates over standard process
- ✓ Paired with Twist Enzymatic Fragmentation 2.0 to minimize chimeras



**Confident identification of true variants**, made possible by consensus called read families and eliminated PCR duplicates



# Driving the Future of Oncology Solutions



**Assay  
development,  
validation and  
process control**

Twist Pan-Cancer  
Reference Standards



**Early cancer  
detection and  
epigenetic  
therapy response**

Twist Methylome  
Panel and Methylation  
Detection System



**Broad Tumor  
Profiling**

Twist Exome 2.0  
and custom panels



**Workflow  
optimizations for  
sensitive  
detection**

Twist UMI Adapter  
System



**Post therapy  
response  
monitoring and  
recurrence  
detection**

Twist MRD Rapid 500  
panels



# Revolutionizing Research in Post-Therapy Response and Recurrence Monitoring

**Personalized monitoring** should  
not rely on amplicon technologies.

- ✓ Personalized assays improve sensitivity relative to fixed panels
- ✓ PCR-based NGS testing offers advantages in cost and turnaround
- ✓ However, PCR-based approaches lack scalability and breadth of coverage

# A NEW SOLUTION FOR MRD



# 500 TARGETS

# 5 DAYS FROM DESIGN TO SHIP



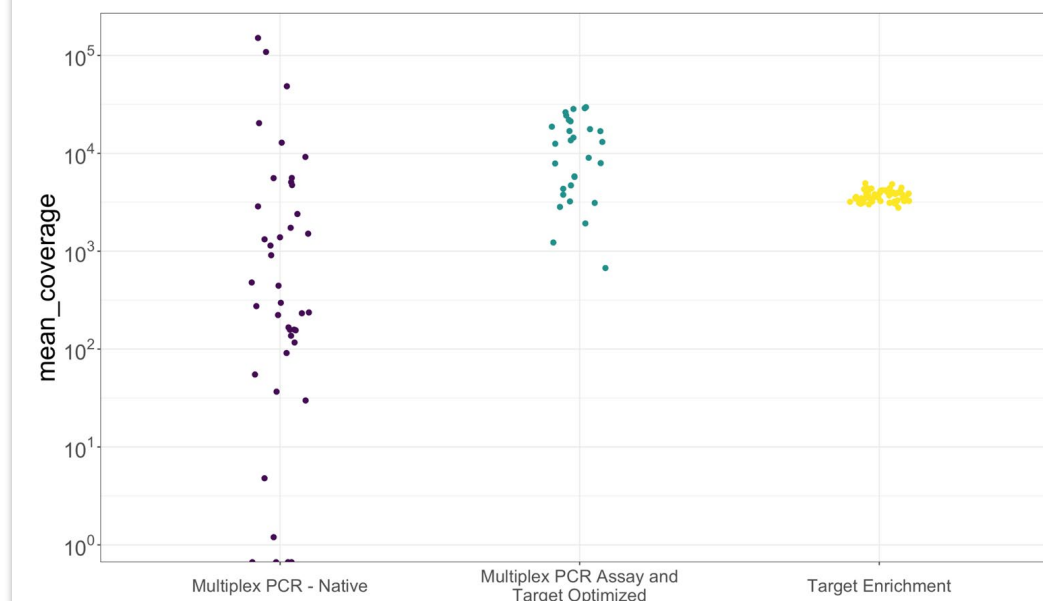
**\$50  
ACCESSIBLE  
FOR ALL**



# Superior Coverage Across a Wide Array of Targets

Quantifying and monitoring clonal cancer evolution requires **comprehensive coverage**, not limited by 10-50 targets.

- ✓ With up to **500 targets**, Twist MRD Rapid 500 Panels offer better coverage with less variation than equivalent amplicon methods
- ✓ **Captures variants of interest** without losing critical information like fragment size and start and stop position
- ✓ Offered at an **industry-leading price point**, Twist MRD Rapid 500 Panels obsoletes the trade-off between content and cost





# Personalized Sequencing Solution in 5 Days

The **Twist MRD Rapid 500** panels bring personalized testing methods to the bench in record time.



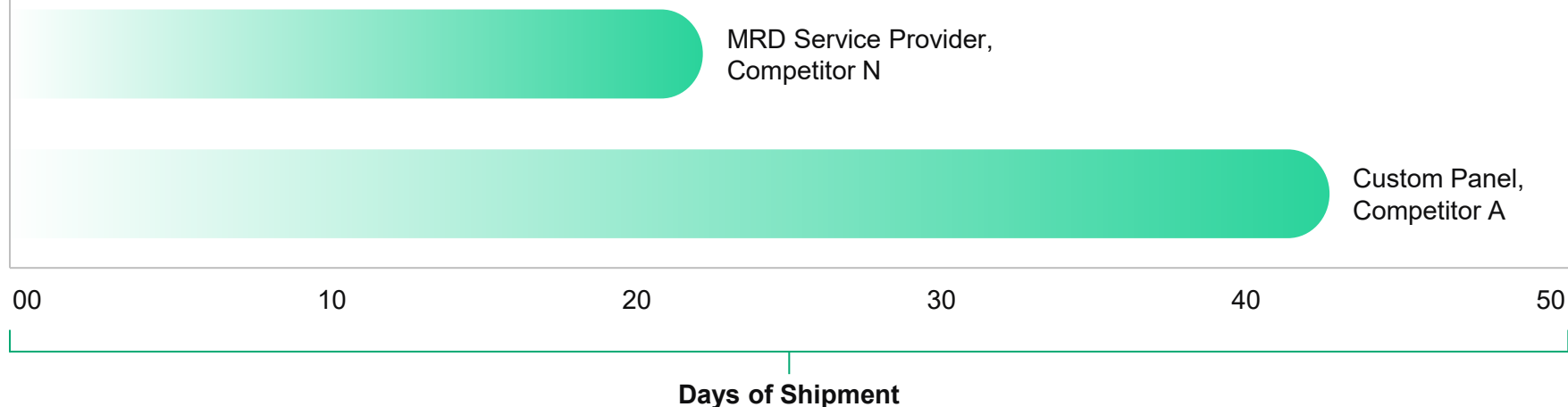
Rapid turnaround time from order to hip to meet critical time points after treatment



12 run equivalents per order, so personalized testing is at your fingertips



## Twist MRD Rapid 500 Panel





# Continuing to Push the Boundaries of What's Possible

## Today



Human Core Exome



Fixed Panels



Custom Panels



Library Preparation



Reagents and Kits



Synthetic Viral Controls



Targeted Methylation /  
Methylome

## Targeted sequencing is powering new applications



Liquid biopsy



Rare disease



Oncology



Population  
genetics



Infectious  
diseases



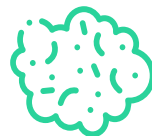
# Our Future is Bright

As the Sequencing market continues to grow, so will Twist NGS Solutions



**NGS** is projected to continue to be a **driver of revenue**.

Recent launches of new products such as the MRD and methylome panels in addition to continuous improvement of existing products



Our New product portfolio is enabling the future of **Cancer Research and Clinical Oncology Solutions**:

- Twist MRD panels
- Twist Methylome Panel and Methylation Detection System
- Twist Pan-Cancer Reference Standards
- Twist UMI Adapter System
- Twist Exome 2.0 and custom panels



Focused on continued **innovation, execution across NGS** and full portfolio of products

As sequencing applications expand, we rise to the challenge and continue to deliver best-in-class solutions that customers want



**THANK YOU**