RAPID GENOMICS

CAPTURE-SEQ

Finding Needles in the Genomic Haystack

Capture-Seq

Capture-Seq is the most comprehensive targeted genotyping system for:

- Allele mining: Pre-breeding marker discovery
- SNP genotyping & haplotyping
- QTL mapping & candidate gene identification
- Genetic fingerprinting
- Polyploid genomic selection
- Resistance gene sequencing (RenSeq)
- Pan-genome construction & mapping

Capture-Seq Genotyping Results

Species	Genotyping Objective	# Capture-Seq Targets	# SNPs Detected	Missing data %
Maize	Fine mapping resistance genes (R-genes)	5,000	4,623	0.15
Sugarcane	Genomic selection and genetic mapping	10,000	37,976	0.1
Loblolly Pine	Genomic selection	20,000	67,525	0.002
Blueberry	Genomic selection and genetic mapping	31,000	205,057	0.03

About Capture-Seq

Capture-Seq is a targeted next-generation sequencing (NGS) solution for characterizing 1,000 - 450,000+ genomic targets in any species (including complex polyploids). These results can be flexibly applied towards pre-breeding marker discovery, including diversity analysis, and high-throughput genotyping for breeding. Rapid Genomics offers an extensive library of optimized Capture-Seq genotyping panels for a wide range of plants and animals, as well as the option to design customized panels for novel commercial or research solutions.

Capture-Seq's flexibility, both in scope and application, provides a superior option to alternative NGS solutions. Capture-Seq results yield lower missing data than restriction enzyme genotyping (GBS) and are more compatible with complex genomes than array (SNP chip) technology. Legacy data from any platform can be incorporated into Capture-Seq panels, ensuring consistency with prior datasets in any agricultural program. Additionally, Capture-Seq panels can reliably recover similar genomic targets across closely related species.

Capture-Seq solutions are available for both high and low volume applications. There is no minimum sample number required to utilize an existing Capture-Seq panel or for custom Capture-Seq panel design.

Full-service Capture-Seq solutions, including custom panel designs, are delivered at Rapid Genomics starting from tissue/DNA to FASTQ data, SNP calls or additional bioinformatic data analyses.

Using Capture-Seq

Capture-Seq Projects Follow 3 Easy Steps:

1 Contact Us

- Project Scope
- Research goals & timelines
- Species/group & sample volume

2 Sample Processing

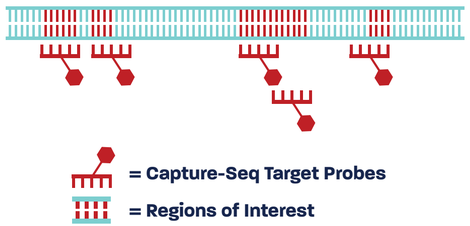
- Capture-Seq probe synthesis
- Predesigned or custom
- Batch submissions or all-at-once

3 Receive Results

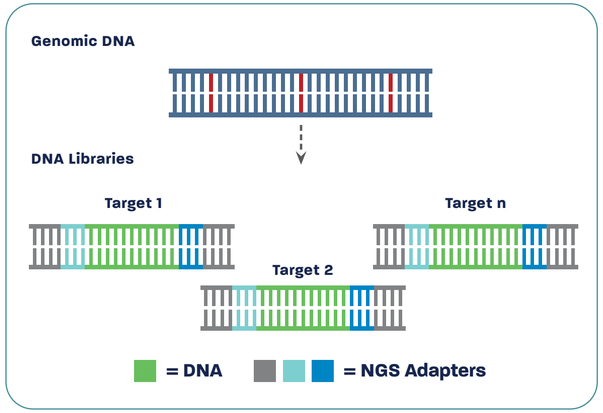
- FASTQ data or assembled loci

Capture-Seq Workflow & Technology

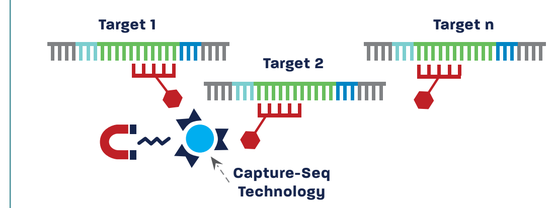
1 Capture-Seq Assay Design



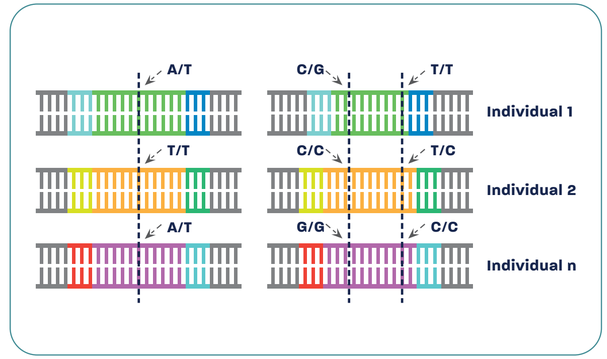
2 DNA Library Preparation



3 Capture-Seq Enrichment



4 Next Generation Sequencing



5 Data Analysis/Reporting

Individual 1	1 0 2 2 0 1 1 2
Individual 2	2 2 1 1 0 0 0 1
Individual n	0 2 1 2 2 1 0 2

- Allele Frequencies
- Casual Region Identification
- Sequence Analysis

Genomic Selection

Genome-Wide Association Studies

Insertion Site Characterization

Capture-Seq Workflow & Technology

Capture-Seq solutions begin with bioinformatically designing Capture-Seq probes (for custom panels) to target genomic regions of interest (1). Once finalized, samples are processed to NGS DNA libraries (2) and Capture-Seq enrichment selectively recovers the targeted regions while removing other, undesirable DNA sequences (3). After Capture-Seq enrichment, libraries are sequenced via NGS (4) and processed to identify markers for additional data analyses & applications (5).

LEADING A NEW ERA OF GENOMICS

At Rapid Genomics, the key to improving the future is within the secrets of the genome. Our mission is to expand global access to the technologies required for uncovering those secrets with the highest standards of accuracy and reliability. We provide flexible solutions to a range of commercial and research interests focused on agriculture, veterinary genomics, healthcare, and evolutionary biology. Our customers partner with us to advance their goals and, ultimately, strengthen the industries that do everything from producing our food to curing disease.

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