BIOMARK X9 SYSTEM

High-throughput, scalable SNP and indel marker development and screening with PACE genotyping reagents on the Biomark X9 System

The Biomark™ X9 System for High-Throughput Genomics and PACE® chemistry present an unparalleled solution for large-scale, cost-effective PCR analysis, facilitating high-throughput, scalable single-nucleotide polymorphism (SNP) and insertion/deletion (indel) marker development. Using PACE chemistry with the Biomark X9™ System for marker discovery results in user-friendly marker sets for extensive screening, with applications spanning agricultural genomics, marker-assisted breeding, and pathogen screening.

Biomark X9 System and PACE Technology: Key Features and Benefits

The Biomark X9 System uses microfluidics technology and offers automated, high-performance PCR at nanoliter volumes, allowing simultaneous monitoring of multiple SNPs and indels across numerous samples. PACE, the latest in allele-specific chemistry, provides consistent performance, making it ideal for high-throughput genotyping, screening, pathogen detection, and biomonitoring. PACE genotyping reagents offer sensitive, accurate allele-specific PCR detection with excellent performance, flexibility, and scalability.

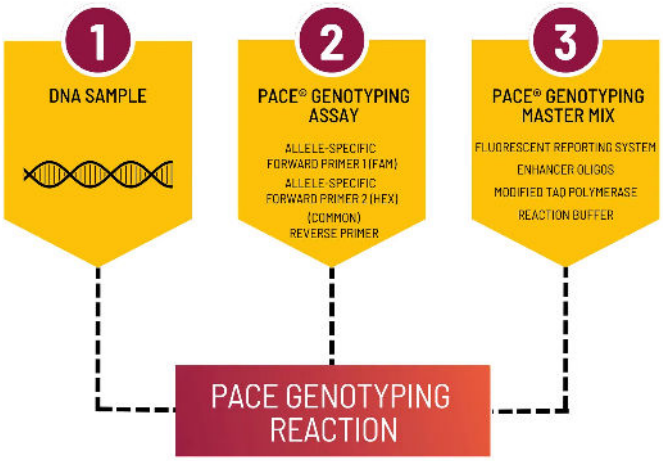

Figure 1. Components of a PACE genotyping reaction

Synergistic Features and Benefits

The synergy of the Biomark X9 System and PACE technology amplifies cost-effective, high-throughput PCR analysis with thermal cycling and fluorescence detection using integrated fluidic circuits (IFCs). The combination allows the development of platform-agnostic marker sets, utilizing existing assays with PACE genotyping reagents. Enhanced specificity and sensitivity, universal reporting, and compatibility with various throughput platforms ensure future-proofing, automation, and reproducibility.

Applications

The combination of the Biomark X9 System and PACE chemistry can be used in SNP genotyping, variant discovery mapping, linkage map construction, genetic diversity studies, and population studies. Additionally, it is well suited for parental selection, hybrid breeding, quality control in seed production, and pathogen detection, offering a versatile tool for a wide range of research and breeding strategies.

Method/Workflow Overview

An example workflow involves the preparation of reactions in IFCs, PCR amplification on the Biomark X9 System, and data acquisition with SNP calling. This method allows for the analysis of 96 samples and 96 assays, generating 9,216 datapoints in approximately 4 hours.

Figure 2. An example high-throughput genotyping workflow with the new Biomark X9 System

Example Use Case Study

Next-generation sequencing (NGS) for SNP discovery followed by PACE SNP marker saturation in quantitative trait loci (QTL) intervals exemplify the utility of this combination. Designing PACE genotyping assays against SNP variants, high-throughput screening using the Biomark X9 System, and genotyping recombinants on lower-throughput platforms demonstrate the versatility in research and breeding applications.

Example Use Case Study Data Plot

Data below is taken from a study generated by a high-throughput genotyping and sequencing technology service provider for a public research institute. The example study saw 96 samples run across 96 SNPs, demonstrating tight clustering and high concordance of SNPs. The representative data showcases the accuracy and reliability of using PACE chemistry on the Biomark X9 System.

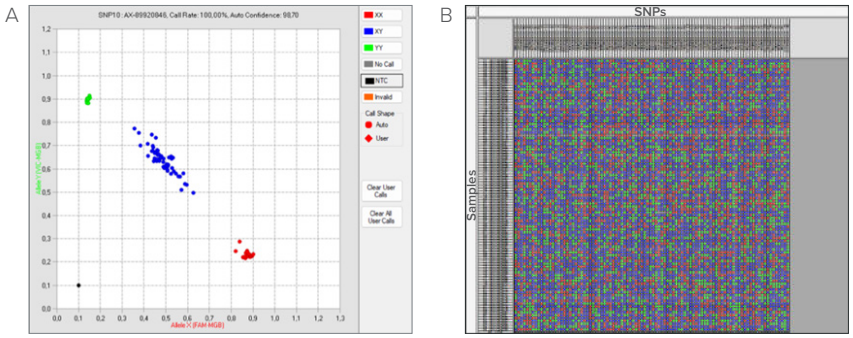

Figure 3. Example data of 96 samples over 96 SNPs. Data calling (A) from the heat map (B) shows tight clustering and a high concordance of SNPs in the principal component analysis plot.

Summary and Conclusion

The integration of the Biomark X9 System with PACE SNP and indel genotyping provides a powerful and versatile solution for animal and plant breeding workflows. Offering high-throughput genotyping, precise marker identification, and diverse applications, this approach stands as a cornerstone for advancements in genomics and breeding technologies.

Learn more at **standardbio.com/x9** or **3crbio.com**

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