INCREASED PRODUCTIVITY WITH MICROFLUIDICS

The Fluidigm high-throughput genotyping solution requires dramatically less manual manipulation and saves time and money over traditional 384-well plate approaches. The modular architecture allows for the work of automaticallycombining samples and primer-probe sets into 2,304 to 2,316 PCR reactions through next-generation sequencing and genome-wide association studies, there is a critical need for high throughput, flexible, and cost-effective SNP genotyping solutions to validate and apply these polymorphisms.

HUMAN GENOTYPING

SNP combinations have been associated with human traits varying from longevity and identity in mammals and autonomous diseases, resulting in a better understanding of human metabolism, disease etiology, and population variation; driving new pharmaceutical development, and aiding in the advent of personalized medicine. Our genotyping solution enables you to quickly and efficiently identify these causal SNP combinations.

THE FLUIDISM SOLUTION FOR SNP GENOTYPING

SNPtype™ Assays provide a high-throughput, low-cost SNP genotyping solution which enables rapid SNP genotyping experiments. Our genotyping solution provides a high-throughput, low-cost SNP genotyping solution which enables rapid SNP genotyping experiments.

The EP1™ System, with the Dynamic Array IFCs, is uniquely suited for a range of applications that require very high sample throughput. These include validation studies in which many thousands of individuals, whether from a single breed or different populations, are tested against as many as 1,000 genetic markers. Validated markers can be integrated into an array of screening applications, such as the following:

- Marker-assisted breeding and selection
- Seed testing
- Disease resistance
- Population genetics
- Parentage studies

EASY WORKFLOW WITH THE EP1 SYSTEM

Place the IFC onto the FC1™ Cycler.

Thermal cycle the IFC using the IFC Controller to automate set-up, genotyping experiments, and data analysis.

The system integrates thermal cycling and detection of SNP type assays for all Dynamic Array IFCs and acquires data for each reaction chamber on the IFC simultaneously and can operate in either real-time or end-point detection mode for genotyping experiments.

EASY WORKFLOW WITH THE BIOMARK HD SYSTEM

Pipette samples and SNPtype™ Assays into the IFC.

Thermal cycle the IFC using the IFC Controller to automatically set-up genotyping experiments.

Read the IFC on the BioMark HD Reader.

View and analyze data using the Genotyping Analysis Suite.

OUTSTANDING DATA QUALITY

Core strengths of the Fluidigm systems is their ability to obtain high call rates and accuracy using standard chemistries. Here, cattle sample data obtained from the USDA Agriculture Research Service (ARS) demonstrates the outstanding results achieved on the EP1 System. Typical cluster plots are displayed and call rates achieved on the Dynamic Array IFC are 99.9%.

AGGIO GENOTYPING

Agricultural biologists aim to accelerate valuable traits in plants and animals for disease resistance, robustness, and profitability. Wildlife managers work to attain the fitness of a wild salmon population. Both fields require low cost, high-throughput SNP genotyping. Our genotyping solution provides a high-throughput, low-cost, reproducible, and flexible assay choice with the reliability of Dynamic Array SNP genotyping solution which enables rapid SNP genotyping. SNPtype™ Assays provide a high-throughput, low-cost SNP genotyping solution which enables rapid SNP genotyping.
Single nucleotide polymorphism (SNP) genotyping is a powerful tool in human genetics and agricultural biotechnology, with applications ranging from the discovery of human disease modifier regions to sample collection and analysis. SNP genotyping requires dramatically less manual manipulation of high yield dairy cows, validate seed populations, or combination with a favorable trait for directed breeding of livestock and crops. As SNP discovery accelerates through next-generation sequencing and genome-wide association studies, there is a critical need for high throughput, flexible, and cost-effective SNP genotyping solutions to validate and apply these polymorphisms.

AGRO GENOTYPING

Agricultural biologists aim to accelerate valuable traits in plants and animals for disease resistance, robustness, and profitability. Wildlife managers work to achieve an ecological balance by maintaining the genetic fitness of wild migratory species. Both fields require low cost high-throughput SNP genotyping. Our genotyping solution allows you to quickly and efficiently associate a SNP combination with a favorable trait for directed breeding of livestock and crops. As SNP discovery accelerates through next-generation sequencing and genome-wide association studies, there is a critical need for high throughput, flexible, and cost-effective SNP genotyping solutions to validate and apply these polymorphisms.

HUMAN GENOTYPING

SNP combinations have been associated with human traits varying from longevity and obesity to autoimmune disease, resulting in a better understanding of human metabolism, disease etiology, and population genetics. Our genotyping solution enables researchers to map the fitness of a wild salmon population.

THE FLUIDIGM SOLUTION FOR SNP GENOTYPING

SNPtype™ Assays provide a high-throughput, low-cost SNP genotyping solution, which enables rapid assay development and enabling the simultaneous performance of PCR reactions in nanoliter volumes, collects more data points per day at a lower cost than 384-well systems, and enables the use of multiple reagents and different sample and assay configurations.

EASY WORKFLOW WITH THE EPI™ SYSTEM

Place the IFC onto the IFC Controller to automatically set up genotyping experiments.

INCREASED PRODUCTIVITY WITH MICROFLUXES

The Fluidigm high-throughput genotyping solution requires dramatically less manual manipulation and saves time and money over traditional 384-well plate approaches. The Fluidigm architecture does the work of automatically combining samples and primer-probe sets into 2,304 to 9,216 PCR reactions using 200-fold less master mix than traditional systems. Each microfluidic plate generates 24-fold more data than that produced by a 384-well plate. This radical advance in experiment density is fully leveraged through a hardware/software system that automates setup and data analysis.

OUTSTANDING DATA QUALITY

Core strengths of the Fluidigm systems are their ability to obtain high call rates and accuracy using standard chemistries. Here, cattle sample data obtained from the USDA Agricultural Research Service (ARS) demonstrate the outstanding results achieved on the EPI System. Typical cluster plots are displayed and call rates achieved on the Dynamic Array IFC are 99.9%.

THE FLUIDIGM SOLUTION FOR SNP GENOTYPING

SNPtype™ Assays provide a high-throughput, low-cost SNP genotyping solution, which enables rapid assay development and enabling the simultaneous performance of PCR reactions in nanoliter volumes, collects more data points per day at a lower cost than 384-well systems, and enables the use of multiple reagents and different sample and assay configurations.

EPI™ SYSTEM

The EPI System, with the Dynamic Array IFC, is uniquely suited for a range of applications that require very high sample throughput. These include validation studies in which many thousands of individuals, whether from a single seed lot or human population study, are tested against as many as 1,000 genetic markers. Validated markers can be integrated into an assessment of each individual's genotypic result. The system streamlines workflows for genotyping experiments with benefits that are impossible to achieve using many other conventional PCR systems. The IFC technology both prepares and performs thousands of reactions in nanoliter volumes, saving both time and money, as well as reducing pipetting steps by 95%. The system sets a new standard for high-throughput SNP genotyping, with applications demanding sensitivity and dynamic range at an extremely high throughput.

The system integrates thermal cycling and detection of PCR reactions for all Dynamic Array IFCs and acquire data for each reaction chamber on the IFC simultaneously and can operate in either real-time or end-point detection mode for genotyping experiments.

BIOMARK™ HD SYSTEM

The Biomark HD System sets a new standard for high-throughput real-time gene expression analysis and end-point genotyping with benefits that are impossible to achieve using many other conventional PCR systems. The system significantly improves productivity by enabling the simultaneous performance of PCR reactions in nanoliter volumes, collects more data points per day at a lower cost than 384-well systems, and enables the use of multiple reagents and different sample and assay configurations.

EASY WORKFLOW WITH THE BIOMARK HD SYSTEM

Place the IFC into the IFC Controller to automatically set up genotyping experiments.

Call map view for 48 cattle samples and 48 SNPtype™ Assays (left); cluster plot for a typical SNPtype Assay (right).

Comparison of materials and pipetting steps between conventional microplates and Dynamic Array IFCs; reduced pipetting steps by 95%.
**INCREASED PRODUCTIVITY WITH MICROFLUIDICS**

The Fluidigm high-throughput genotyping solution requires dramatically less manual manipulation and saves time and money over traditional 384-well plate approaches. The microfluidics architecture does the work of automatically combining samples and primer-probe sets into 2,304 to 9,216 PCR reactions using 200-fold less master mix than traditional systems. Each microfluidic plate generates 24-fold more data than that produced by a 384-well plate. This radical advance in experiment density is fully leveraged through a hardware/software system that automates setup and data analysis.

**HUMAN GENOTYPING**

SNP combinations have been associated with human traits varying from longevity and obesity to autism and autoimmune diseases, resulting in a better understanding of human metabolism, disease etiology, and population variation; driving new pharmaceutical development, and aiding in the advancement of personalized medicine. Our genotyping solution enables you to quickly and efficiently identify these causal SNP combinations.

**EASY WORKFLOW WITH THE EPI SYSTEM**

1. Pipette samples and SNPtype Assays into the IFC.
2. Place the IFC onto the IFC Controller to automatically set up the IFC.
3. Thermal cycle the IFC on the EPI™ Cycle.
4. Read the IFC on the EPI™ Reader in a matter of minutes.

**OUTSTANDING DATA QUALITY**

Core strengths of the Fluidigm systems is their ability to obtain high call rates and accuracy using standard chemistry. Here, cattle sample data obtained from the USDA-Agricultural Research Service (ARS) demonstrates the outstanding results achieved on the EPI System. Topical cluster plots are displayed and call rates achieved on the Dynamic Array IFC are 99.9%.

**INDUSTRY CHALLENGES**

Single nucleotide polymorphism (SNP) genotyping is a powerful tool in human genetics and agricultural biotechnology, with applications ranging from the discovery of human disease to the elucidation of population identification and tracking to marker-assisted breeding of livestock and crops. At SNP discovery accelerates through next-generation sequencing and genome-wide association studies, there is a critical need for high throughput, flexible, and cost-effective SNP genotyping solutions to validate and apply these polymorphisms.

**AGRO GENOTYPING**

Agricultural biologists aim to accelerate valuable traits in plants and animals for disease resistance, robustness, and profitability. Wildlife managers strive to maintain ecological balance by monitoring the genetic fitness of wild migratory species. Both fields require low cost, high-throughput SNP genotyping. Our genotyping solution allows you to quickly and efficiently access a SNP combination with a favorable, desirable trait for high yields, dairy cows, validate seed populations, or combine with a favorable trait for directed breeding and profitability. Wildlife managers work to attain the fitness of a wild salmon population.

**THE FLUIDISM SOLUTION FOR SNP GENOTYPING**

SNPtype™ Assays provide a high-throughput, low-cost SNP genotyping solution, which enables rapid assay design and polymorphism screening. The assays are based on allele-specific PCR and combine the advantages of minimum experimental setup time and flexible assay choice with the reliability of Dynamic Array™ Integrated Fluidic Circuit (IFC) technology.

- Designed to target species with available sequence information
- Thinner-to-four week design and turnaround time with customer-provided sequence (minimum of 24 assays per order)
- Access to loss-specific primer sequences assures reproducibility
- Compatible with Specific Target Amplification (STA) protocol for improving reads from samples of low quality and/or concentration, or from species with large genome sizes (chromes); necessary for plant primers provided

**EASY WORKFLOW WITH THE BIOMARK HD SYSTEM**

1. Pipette samples and SNPtype Assays into the IFC.
2. Place the IFC onto the IFC Controller to automatically set up genotyping experiments.
3. Thermal cycle the IFC on the BIOMARK™ Cycle.
4. View and analyze results with the data analysis suite.

**BIOMARK™ HD SYSTEM**

The Biomark HD System sets a new standard for high-throughput real-time gene expression analysis and endpoint genotyping with benefits that are impossible to reproduce using many other conventional PCR systems. The IFC technology both prepares and performs thousands of reactions in nanoliter volumes, saving both time and money, as well as reducing pipetting steps by 95%. The system streamlines workflows for thousands of reactions in nanoliter volumes, collects more data points per day at less cost than 384-well plates, and enables the use of multiple reagents and different sample and assay configurations. The system integrates thermal cycling and detection of PCR amplification for all Dynamic Array IFCs, and acquires data for each reaction chamber on the IFC simultaneously and from different sample and assay configurations. It is most suitable for large-scale genotyping experiments demanding sensitivity and dynamic range at an extremely high throughput. The system integrates thermal cycling and detection of PCR amplification for all Dynamic Array IFCs, and acquires data for each reaction chamber on the IFC simultaneously and from different sample and assay configurations. It is most suitable for large-scale genotyping experiments demanding sensitivity and dynamic range at an extremely high throughput.


Seeb, J. E. 2010. Summer-Fall Distribution of Stocks of Immature Sockeye Salmon in the Bering Sea as Revealed by Single-Nucleotide Polymorphisms. Transactions of the American Fisheries Society

Habicht, C., Seeb, L. W., Myers, K. W., Farley, E.V., Seeb, J. E. 2010. Summer-Fall Distribution of Stocks of Immature Sockeye Salmon in the Bering Sea as Revealed by Single-Nucleotide Polymorphisms. Transactions of the American Fisheries Society


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PUBLICATIONS


