


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 modifier regions to sample validation and application of SNP polymorphisms. Validated markers can be integrated into an existing workflow enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.

AGGRO GENOTYPING

Agricultural biologists aim to accelerate valuable traits in plants and animals for disease resistance, robustness, and profitability. Wildtype management to attain ecological balance by maintaining the genetic fitness of wild migratory species. Both fields require low cost, high-throughput SNP genotyping. The Fluidigm™ System, with the Dynamic Array IFC is uniquely suited for a range of applications that require high reproducibility and automation.

HUMAN GENOTYPING

SNP combinations have been associated with human traits varying from longevity and obesity to metastatic disease, resulting in a better understanding of human metabolism, disease etiology, and population variation; driving new pharmaceutical applications demanding sensitivity and dynamic range at an extremely high throughput.

EPI™ SYSTEM

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

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

EPI™ SYSTEM

The EPI™ System offers outstanding data quality—mean from many sample sources and the most streamlined workflow in the industry. The system integrates thermal cycling and detection of each reaction chamber on the IFC simultaneously enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.

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 SNP genotyping. Our genotyping solution is a powerful tool in human genetics and agricultural biotechnology, with applications ranging from the discovery of human disease modifier regions to sample validation and application of SNP polymorphisms. Validated markers can be integrated into an existing workflow enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.

EASY WORKFLOW WITH THE EPI SYSTEM

1. Pipette samples and SNPtype Assays into the IFC.
2. Place the IFC onto the EP1 Reader in a matter of minutes. The system integrates thermal cycling and detection of each reaction chamber on the IFC simultaneously enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.
3. Thermal cycle the IFC on the EPI™ Cycler.
4. Read the IFC on the EPI Reader in a matter of minutes. The system integrates thermal cycling and detection of each reaction chamber on the IFC simultaneously enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.

EASY WORKFLOW WITH THE BIORANK HD SYSTEM

1. Pipette samples and SNPtype Assays into the IFC.
2. Thermal cycle the IFC on the BioMark HD Reader.
3. View and analyze results with the data analysis suite.

BIORANK™ 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 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 applications demanding sensitivity and dynamic range at an extremely high throughput.

The system integrates thermal cycling and detection of each reaction chamber on the IFC simultaneously enabling the simultaneous performance of PCR reactions in nanoliter volume enabling the simultaneous performance of PCR reactions in nanoliter volume.

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 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.

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; 48.48, 96.96, 192.192, 240.240, 480.480, 720.720, 1920.1920, 3600.3600, 5760.5760, 10,080.10,080.

Call rates achieved on the Dynamic Array IFC are 99.9%.

SNP type assay...
**Increased Productivity with Microfluidics**

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**EP1™ System**

The EP1 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, are tested against as many as 1,000 genetic markers. Validated markers can be integrated into an assessment of high-throughput applications such as the following:

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

The EP1 System offers outstanding data quality—more than 99.9% call rates and 99.9% reproducibility using many other conventional PCR systems. The system streamlines workflows for thousands of reactions in nanoliter volumes, saving both time and money, as well as reducing pipetting steps by 85%.

**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 Animal and Plant Health Inspection Service demonstrates the outstanding results achieved on the EP1 System. Typically, cluster plots are displayed and call rates achieved on the Dynamic Array IFC are 99.9%.

**Easy Workflow with the EP1 System**

1. **Prepare samples and SNPtype™ Assays into the IFC.**
2. **Place the IFC into the FC1™ Cycler.**
3. **Read the IFC on the EP1 Reader in a matter of minutes.**

**Easy Workflow with the Biomark HD System**

1. **Prepare samples and SNPtype™ Assays into the IFC.**
2. **Thermal cycle the IFC on the FC1™ Cycler.**
3. **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 end-point 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 85%. This streamlined assays is particularly suited for high-throughput genotyping experiments.

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Single nucleotide polymorphism (SNP) genotyping is a powerful tool in human genetics and agricultural biotechnology, with applications ranging from the discovery of human disease markers to efficient identification and tracking to marker-assisted 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. Whole-genome management to attain 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 marker with a desirable trait or increase the economic value of high yield dairy cows, validate seed populations, or improve livestock and crop productivity. Wildlife managers work to attain conservation and profitability. Wildlife managers work to attain population stability and yield development, and adding 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 type discrimination in a wide variety of organisms and amplicon sizes. SNPtype Assays can be used for genotyping crops, livestock, and wild migratory species. Both fields require low cost, high-throughput SNP genotyping. SNPtype 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.

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SNP combinations have been associated with human traits varying from longevity and obesity to metastatic cancer and autoimmune disease, resulting in a better understanding of human metabolism, disease etiology, and population variation; driving new pharmaceutical and biotechnology, with applications ranging from the discovery of human disease markers to efficient identification and tracking to marker-assisted 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.

INCREASED PRODUCTIVITY WITH MICROFLUIDICS

Microfluidics is a powerful tool in human genetics and agricultural biotechnology, with applications ranging from the discovery of human disease markers to efficient identification and tracking to marker-assisted 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.

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PUBLICATIONS


Paez, D., Pare, L., Espinosa, I., Salazar, J., Del Rio, E., Barnade, A., Mercuesto, E. and Baigel, M. May 18, 2010. Immunoglobulin G fragment C receptor polymorphisms and MSAS mutations: Are they useful biomarkers of clinical outcome in advanced colorectal cancer treated with anti-EGFR-based therapy? Cancer Science

PUBLICATIONS

Corporate Headquarters
7000 Shoreline Court, Suite 100
South San Francisco, CA 94080 USA
Toll-free: 1-866.FLUIDLINE | Fax: 650.871.7152
www.fluidigm.com

Sales
North America | +1 650.266.6170 | info-us@fluidigm.com
Europe/EMEA | +33 1 60 92 42 40 | info-europe@fluidigm.com
Japan | +81 3 3555 2351 | info-japan@fluidigm.com
Asia | +1 650.266.6170 | info-asia@fluidigm.com

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FMC BioSystems
7000 Shoreline Court, Suite 100
South San Francisco, CA 94080 USA
Toll-free: 1-866.FLUIDLINE | Fax: 650.871.7152
www.fluidigm.com

Sales
North America | +1 650.266.6170 | info-us@fluidigm.com
Europe/EMEA | +33 1 60 92 42 40 | info-europe@fluidigm.com
Japan | +81 3 3555 2351 | info-japan@fluidigm.com
Asia | +1 650.266.6170 | info-asia@fluidigm.com

PUBLICATIONS


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


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