The MassARRAY technology is trusted by the leading genetics institutions worldwide. The bench top MassARRAY Compact System is a multi-application platform that addresses the following applications:

- Quantitative Methylation Analysis
- SNP Genotyping
- Somatic Mutations
- Quantitative Gene Expression
- Comparative Sequence Analysis

MassARRAY® Genotyping facilitates identification and prioritization of genetic targets within each stage of biomedical research. From targeted discovery utilizing 10s to 100s of multiplexed assays to validation of select markers against 100s to 1000s of samples, the MassARRAY system powers a variety of genomic studies.

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Publications


MassARRAY® SNP Genotyping

Overview
Unprecedented Levels of Accuracy
MassARRAY® technology is the leading technology for SNP Genotyping. The MassARRAY® system is easy to use, fast, powerful, and extremely accurate. MassARRAY® combines the benefits of a simple, reproducible PCR extension reaction chemistry with state-of-the-art MALDI-TOF mass spectrometry to quickly and cost-effectively characterize genotypes with the highest levels of accuracy. The iPLEX assay allows you to routinely design assays at a multiplexing level of 5-6x, which gives you a high level of flexibility and a low cost per genotype.

The iPLEX Assay
Scalable Throughput
FROM MASSARRAY TO HIGH THROUGHPUT
- Routinely multiplexing up to 50k genotypes per day
- Broad throughput ranges from several hundred to >95% of all confirmed SNPs
- Ideally suited for high-throughput screening
- Ready-to-use primer extension reaction chemistry

Accurate
- Most powerful data quality for your research
- Greater than 99.7% accuracy* on primer extension reaction conditions for all SNPs
- New small kit formats available for the iPLEX Reaction

Cost Effective
- Lowest cost for all of your studies
- Low cost per genotype even with low number of SNPs
- No fixed format. Load flexible SpectroCHIP with up to 1000 samples with one multiplex iPLEX assay – up to 3x more throughput vs. other kits
- New small kit formats available for the Analyzer 96 and 384 systems

Simple Workflow
Rapid Turn Around Time – FROM ASSAY DESIGN TO RESULTS
- Rapid, early assay design – working assays can be successfully designed for 95% of all confirmed SNPs
- Single-temperature reagent and universal reaction conditions for all SNPs
- Convenient automated data analysis and reporting for unambiguous genotyping results

Success from Assay Design to Result
How it Works
Assay Design - The MassARRAY® Designer software automatically designs both PCR and iPLEX single-base extension primers for multiplexed assays. Sequence information can conveniently be imported from public databases and the primer design sequence will be automatically transformed into an oligonucleotide sequence form and oligonucleotide primer ordering. The software has a proven design efficiency of >95% with a throughput of more than 5000 assays per day, with a throughput of more than 100,000 genotypes per day.

IPLEX Reaction – iPLEX assay is a primer extension reaction process designed to detect sequence differences at the single-nucleotide level. The iPLEX assay uses a single primer extension reaction for all SNPs. The primer is extended depending on the template sequence, resulting in an allele-specific difference in mass between extension products. This mass difference allows the data analysis software to differentiate between SNP alleles. Two lists are now available: iPLEX Gold for routine genotyping, and iPLEX Pro for more demanding applications that require high performance and sensitivity such as somatic mutations.

Instrumentation – Several system options are available for massively high throughput genotyping analyses. Choose from the MassARRAY System or the MicroArray Pro system.

Genotyping Calling and Results – The SpectroCHIP® array is placed into the MALDI-TOF mass spectrometer and the mass containing genotype is determined in real-time. A SpectroCHIP® is typically processed in 40-60 minutes. The results are automatically placed into a database that allows convenient data analysis.

Ideal for Analyzing Time to Hundreds of SNPs
- Scalable and cost-effective for most SNP genotyping studies
- Simple workflow with convenient, universal reaction conditions
- Multiplexed assay design with efficient primer labeling
- Rapid turnaround from primer design to results
- Sensitivity and data accuracy through user friendly software

MassARRAY® SNP Genotyping
CHIP SUMMARY
- Overview of genotypes for 1 Chip

PROJECT EXPLORER
- Allows you to select single or multiple chips to obtain an overview of genotypes

TRAFFIC LIGHT
- Quick assessment tool for the percent successful call rate of an assay per well
- Four user-definable colors describe the percent of calls per well

SPECTRUM
- Shows allele signals, genotypes and mass range

WELL DATA
- Detailed information and interaction with processed data stored in TYSE database
- Ability to manually interact with data

WEB DATA
- Detailed information and interaction with processed data stored in TYSE database
- Ability to manually interact with data

WELL DATA
- Detailed information and interaction with processed data stored in TYSE database
- Ability to manually interact with data

CLUSTER PLOT
- Four thresholds on x-axis, low mass homozygous, high mass homozygous, and the expected mass for the genotype (call) and the confidence calculations of the call(s)
- Rate data gives information for the entire plate which can be sorted by the different headers. All data is contained here, such as, assay, resolution and primer peak scores

Testimonial
"Sequenom’s iPLEX assay is a powerful tool for evaluating targeted sets of SNPs in a cost-effective manner. Due to an efficient multiplexed assay coupled with its robust chemistry, it is ideally suited for high throughput screening studies using tens to hundreds of SNPs over hundreds to thousands of samples." - Stacey Gabriel, Ph.D.
Unprecedented Levels of Accuracy

**Overview**

- **MassARRAY®** Reagents is the leading technology for SNP Genotyping. The **MassARRAY®** system is widely used for high-throughput, high-quality genotyping.
- MassARRAY® combines the benefits of a single, reproducible primer extension reaction chemistry with state-of-the-art MALDI-TOF mass spectrometry to quickly and cost-effectively characterize genotypes with the highest levels of accuracy.
- The **iPLEX®** assay allows you to routinely design assays at a multiplexing level of 36-plex, which gives you high levels of flexibility and a low cost per genotype.

- **How it Works**
  - The **iPLEX®** assay is a primer extension reaction performed in a single-step, high-throughput reaction.
  - The primer extension reaction is designed to detect sequence differences at the single nucleotide level. The **iPLEX®** assay uses a single primer extension reaction for all SNPs.
  - The primer extension reaction is dependent upon the template sequence, resulting in an allele-specific difference in mass between extension products. This mass difference allows the data analysis software to detect sequence differences for all SNPs.

- **Ideal for**
  - Rapid screening for many SNPs over hundreds to thousands of samples.
  - Quick analysis tool of the Amplification stage.

- **Primer Extension**
  - Four user-definable colors describe the percent of calls per well.
  - Well data tab allows the user to look at one particular well at a time for genotype calls.

- **CHIP SUMMARY**
  - **Overview** of genotype for each sample.
  - **CHIP SUMMARY**
    - **PROJECT EXPLORER** allows you to select single or multiple chips to obtain an overview of genotypes.
    - **SPECTRUM** shows allele sizes, genotypes, and mass range.
      - Amelogenin test for sex.
      - Rough judgment of interassay reproducibility.
    - **WELL DATA**
      - Detailed information on each sample.
      - Ability to manually interact with data.
      - Well data file allows the user to look at one particular well at a time for genotype calls.
      - The confidence calculations of the call(s).
      - Data file gives information on the entire plate which can be sorted by user defined columns such as mass differences.

- **Cluster plot**
  - Plot of all mass data vs. high mass allele for chosen assay and genotype over all unique samples.
  - Heat mapping colors calculated for each genotypic combination per assay.
  - Click on any data point in cluster plot to review spectra and determine confidence of individual assay.

- **Plate data** tab gives information for each sample.
- **Well data** tab allows the user to look at one particular well at a time for genotype calls.
- **Genotype Calling and Results**
  - The **MassARRAY®** system oversees the entire plate which can be sorted by user defined columns such as mass differences.
  - Each well data file allows the user to look at one particular well at a time for genotype calls.

- **How it Works**
  - The **iPLEX®** assay allows you to routinely design assays at a multiplexing level of 36-plex, which gives you high levels of flexibility and a low cost per genotype.

- **Testimonial**

- **Availability**
  - **iPLEX®** Reagents is the leading technology for SNP Genotyping.
  - **iPLEX®** Reagents allows you to routinely design assays at a multiplexing level of 36-plex, which gives you high levels of flexibility and a low cost per genotype. 

- **Simple Workflow**
  - Rapid turn around time – The **SpectroCHIP®** Analyzer 96 and 384 systems can be used for high throughput genetic analysis.
  - **Well data** tab allows the user to look at one particular well at a time for genotype calls.

- **Ideal for**
  - Rapid screening for many SNPs over hundreds to thousands of samples.
  - Quick analysis tool of the Amplification stage.

- **Optimizing turn around time –**
  - **FROM ASSAY DESIGN TO RESULT**
    - Rapid turn around time – The **SpectroCHIP®** Analyzer 96 and 384 systems can be used for high throughput genetic analysis.
    - **Well data** tab allows the user to look at one particular well at a time for genotype calls.

- **Success from**
  - **Assay Design to Result**
    - Rapid and highly efficient assay design – The **SpectroCHIP®** Analyzer 96 and 384 systems can be used for high throughput genetic analysis.
    - **Well data** tab allows the user to look at one particular well at a time for genotype calls.

- **Amplification**
  - **Primer Extension**
    - **Detection and Ratio Analysis**
      - **Ideal for**
        - Rapid screening for many SNPs over hundreds to thousands of samples.
        - Quick analysis tool of the Amplification stage.

- **Genotyping and Results**
  - The **SpectroCHIP®** Analyzer 96 and 384 systems can be used for high throughput genetic analysis.
  - **Well data** tab allows the user to look at one particular well at a time for genotype calls.

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Overview

Unprecedented Levels of Accuracy

MassARRAY® SNP Genotyping is the leading technology for SNP Genotyping. The MassARRAY® system is widely used for high-throughput genotyping. It offers the following benefits:

- **Increased accuracy**
- **Increased throughput**
- **Reduced cost**
- **Efficient data management**

The MassARRAY® system is designed to provide the most accurate and efficient SNP genotyping results.

The iPLEX Assay

Scalable Throughput

From Baseline to High Throughput

- **Over 100,000 genotypes per day**
- **Versatile for all throughput levels**

Ideal for analyzing whole exomes or genomes at high-throughput. The iPLEX assay has been used for fine mapping, linkage studies, and routine genetic testing of SNP panels of interest.

Ideal for evaluating target sets of SNPs in a cost-effective manner. Due to an efficient multiplexed assay coupled with robust chemistry, it is ideally suited for high-throughput mapping and other genotyping studies. Using tens to hundreds of SNPs over hundreds to thousands of samples. This allows for a wide range of applications such as somatic mutations.

Cost Effective

Low Cost for All of Your Studies

- **Low cost per genotype even with low number of SNPs**
- **Highly reproducible results**

**Instrumentation –** Several system options are available for maximum throughput in genetic analysis. Choose from a single 96-well or 384-well system.

**Simple Workflow:**

**Rapid Turn Around Time –**

- **From Assay Design to Result:**
  - Rapid and easily designed assay design – working assays can be successfully designed for 100s of all confirmed SNPs.
  -Single termination and universal reaction conditions for all SNPs.
  - Convenient automated data analysis and reporting for unambiguous genotyping results.

Success from Assay Design to Result

How It Works

Assay Design:

The MassARRAY® Designer software automates the design of both PCR and iPLEX single-base extension primers for multiplexed assays. Sequence information can conveniently be imported from public databases and the primer design process is automatically transformed into statistical and optimization software. The software has a proven design efficiency of 98% with a throughput of more than 5000 assays per day.

(iPLEX Reaction –) iPLEX assay is a primer extension reaction designed to detect sequence differences at the single nucleotide level. The iPLEX assay uses a single termination mix and universal reaction conditions for all DNA. The primer is extended dependent upon the template sequence, resulting in an allele-specific difference in mass between extension products. This mass difference allows the data analysis software to differentiate between SNP alleles. Two kits are now available - iPLEX Gold for routine genotyping, and iPLEX Pro for more demanding applications that require high performance and sensitivity such as somatic mutations.

Genotype Calling and Results:

The SpectroCHIP® array is the MALDI-TOF mass spectrometer and the mass correlative genotype is determined in real-time. A SpectroCHIP® is typically processed in 40-60 minutes. The results are automatically transferred into a database that allows convenient data analysis.

Ideal for Analyzing Time to Hundreds of SNPs in Hundreds to Thousands of Samples

- **Scalable and cost-effective for most SNP genotyping studies**
- **Simple workflow with convenient, universal reaction conditions**
- **Multiplexed assay design with efficient gel function**
- **Results automatically transferred from primer design to results**
- **High performance and sensitivity**

MassARRAY® SNP Genotyping

CHIP SUMMARY

- **Overview of genotypes for each SNP**

PROJECT EXPLORER

- Allows you to select single or multiple chips or assays to obtain an overview of genotypes

TRAFFIC LIGHT

- Quick assessment tool for the percent success rate of each assay per well

- Four user definable colors describe the percent of calls per assay well

WELL DATA

- Detailed information and interaction with processed data stored in the TYPER database
- Ability to manually interact with data

HISTOGRAM

- Four categories: no calls, low mass homozygous, high mass homozygous, and autotyped (results from the MALDI-TOF mass spectrometer)

SUPERVISOR

- Provides whole population assessment of assay behavior and quality

CLUSTER PLOT

- Plot of raw mass data, high mass allele for chosen assay and genotype over all unique samples

- Easily-identifying visual calculated for each genotyping population per assay

- Click on any data point in cluster plot to review spectra and differentiates quality of individual assay

- Provides whole population assessment of assay behavior and quality
MassARRAY® Analyzer 4 System®

The MassARRAY® technology is trusted by the leading genetics institutions worldwide. The bench top MassARRAY Compact System is a multi-application platform that addresses the following applications:

- Quantitative Methylation Analysis
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- Somatic Mutations
- Quantitative Gene Expression
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MassARRAY® Advantage

MassARRAY® Genotyping facilitates identification and prioritization of genetic targets within each stage of biomedical research. From targeted discovery utilizing 10s to 100s of multiplexed assays to validation of select markers against 100s to 1000s of samples, the MassARRAY system powers a variety of genomic studies.

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Zhang, S. et al. (2008) 
"Cumulative association of five genetic variants with prostate cancer."

"High-throughput genotyping of oncogenic human papilloma viruses with MALDI-TOF mass spectrometry"

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"A genome-wide association study identifies novel risk loci for type 2 diabetes."

Rioux J.D. et al. (2007)

Cox, A. et al. (2007)

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- Somatic Mutations
- Quantitative Gene Expression
- Comparative Sequence Analysis

MassARRAY® Advantage

MassARRAY Genotyping facilitates identification and prioritization of genetic targets within each stage of biomedical research. From targeted discovery utilizing 10s to 100s of multiplexed assays to validation of select markers against 100s to 1000s of samples, the MassARRAY system powers a variety of genomic studies.

MassARRAY® Genetic Analysis System

MassARRAY® iPLEX® Gold – SNP Genotyping

From target discovery to HTP validating

Publications


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