**THE MASSARRAY SYSTEM**

The MassARRAY System, a MALDI-TOF mass spectrometer, provides precise, rapid, and cost-effective analysis for a variety of biomarkers against a full spectrum of biological samples.

**FLEXIBILITY OF SCALE WITH VERSATILITY OF APPLICATION**

MassARRAY genotyping on the MassARRAY System facilitates the identification and prioritization of genetic targets within each stage of biomedical research. From targeted discovery utilizing 90s to 100s of multiplexed assays to validation of select markers against 10s to 1000s of samples, the MassARRAY System powers a variety of genomic studies in the fields of biomarker validation, pharmacogenetics, cancer genetics, and applied testing (e.g., breeding and crop strain validation).

Several system options are available for moderate to high throughput genetic analysis. Choose from a 24-well, 96-well, or 384-well format:

- **24-well**
- **96-well**
- **384-well**

Each Complete iPLEX Genotyping Reagent Set includes:

- PCR reagents for amplification
- iPLEX Gold or iPLEX Pro reagents for primer extension
- SpectroCHIP Arrays and Clean Resin

**ORDERING INFORMATION**

For Research Use Only. Not for use in diagnostic procedures.

Two iPLEX reagent versions are available - iPLEX Gold for routine genotyping, and iPLEX Pro for more demanding applications that require high performance and sensitivity, such as somatic mutation analyses. Reagent sets are available in 24-well, 96-well, and 384-well formats. iPLEX reagent sets are designed to be used with the MassARRAY System with Typer 4 Software.

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**CHALLENGING SAMPLE TYPES**

Due to the short amplicon length inherent to the iPLEX method (80-120 bp), virtually all DNA sample types are amenable to analysis on the MassARRAY System. Depending on your application, choose from:

- Blood plasma
- Cytos
- Fresh frozen tissue
- Biopsy samples
- Formalin-fixed tissue samples
- Micro-dissected cells
- PCR amplified DNA

**FLEXIBILITY OF SCALE WITH VERSATILITY OF APPLICATION**

Somatic mutation profiling

Routine genetic testing

Biomarker validation

**PUBLISHED STUDIES USING THE MASSARRAY SYSTEM**

Visit http://agenabioscience.com/genetics to search our online database to find published studies using the MassARRAY System in your area of interest.

**AGENA BIOSCIENCE LOCATIONS**

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**COMPLETE iPLEX PRO GENOTYPING REAGENT SETS**

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**COMPLETE iPLEX GOLD GENOTYPING REAGENT SETS**

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**FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.**
**OVERVIEW**

**iPLEX®** in the leading technology for SNP genotyping. The MassARRAY System is widely used for fine mapping, linkage studies, and routine genetic testing of SNP panels of interest.

The MassARRAY System combines the benefits of a simple, 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 40, which gives a high level of flexibility and a low cost per genotype.

For medium to high throughput studies:
- Ideal for 10-400 SNP panel.
- Routine multiplexing at ≥ 40-plex level.
- Broad throughput ranges from 10s to 1000s of samples per day.
- Ideally suited for high throughput.

**iPLEX® Reagents**

- Direct mass detection of the molecule of interest – unexpected events such as failed PCR or tri-allelic SNPs can easily be discovered.
- Greater than 99.7% accuracy.
- Highly reproducible.
- Highest available data quality for your research.
- Simple workflow with convenient, universal reaction conditions.
- Flexible format - design experiments to match your needs.
- Rapid turn-around time from primer design to results.
- Multiplexed assay design with efficient re-plexing function.
- Low cost per genotype with low number of SNPs.
- Scalable and cost-effective for most SNP genotyping studies.

**ASSAY DESIGN**

- Assay Design Suite (ADS) is an online tool for designing genotyping and somatic mutation assays for use with the MassARRAY System. ADS provides full support for human, bovine, and mouse genome sequences, and allows users to:
  - Import target sequences from a list of numbers, FASTA files, or sets of formatted SNP sequences.
  - Create design criteria.
  - Generate information and documents for oligo ordering, downstream workflows, and assay performance predictions.

The software has a proven design efficiency of ≥ 95% with a verifiable and scalable throughput to meet your specific needs.

**PLEX REACTION**

After DNA or RNA extraction/cDNA synthesis, the desired region of interest is PCR-amplified using gene-specific primers (see Figure 1). The iPLEX assay uses a single termination mix and universal reaction conditions for all SNPs. 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.

**DATA ACQUISITION AND RESULTS REPORTING**

The iPLEX reaction products are dispensed onto a SpectroCHIP Array, a silicon chip with pre-dispersed matrix crystals. The SpectroCHIP Array is then placed into the MALDI-TOF mass spectrometer and the mass correlating genotyping is determined in real time. A SpectroCHIP is typically processed in 45-60 minutes. The results are automatically loaded into a database that allows convenient data analysis with the Typer software.

**WORKFLOW - SUCCESS FROM ASSAY DESIGN TO RESULT**

1. **Amplify** - Design your own assays using our online Assay Design Suite.
2. **Project Explorer**
   - Allows you to select single or multiple chips or assays to obtain an overview of genotypes.
3. **Traffic Light**
   - Quick assessment tool for the percent success or call rate of an assay per well.
4. **Spectrum**
   - Shows analysis signals, genotypes and mass range.
   - Annotations for allele peaks.
   - Rough judgments of interalleles, resolution, and signal-to-noise ratio.

**CHOOSE THE OPTION THAT BEST MEETS YOUR NEEDS**

- Design your own assays using our online Assay Design Suite.
- Convenient automated data analysis and reporting for unambiguous genotyping results.
- Multiplexed assay design with efficient re-plexing function.
- Simple workflow with convenient, universal reaction conditions.
- Flexible format - design experiments to match your needs.
- Low cost per genotype with low number of SNPs.
- Scalable and cost-effective for most SNP genotyping studies.
- Rapid turn-around time from primer design to results.
- Convenient automated data analysis and reporting for unambiguous genotyping results.

**TYPER SOFTWARE**

Typer software is a suite of modular applications that allows you to determine the SNP genotype of iPLEX reactions analyzed on the MassARRAY System. Typer provides tools that enable you to evaluate and manage results, including viewing data in table and graphical formats, automatically checking results for errors, applying cluster analysis to results, and generating reports.

**CHP SUMMARY**

- Overviews of genotypes for 1 Chip.

**PROJECT EXPLORER**

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

**TYPER SOFTWARE**

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**SPECTRUM**

- Shows analysis signals, genotypes and mass range.
- Annotations for allele peaks.
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**HISTOGRAM**

- Four categories: to-calls, low mass homozygous, heterozygous, or high mass homozygous.
- Quick analysis tool of the calls per assay over all samples within the plate.
- Quickly monitor assay stability.

**CLUSTER PLOT**

- Plot of low mass allele vs. high mass allele.
- Hardy-Weinberg values calculated for each genotyped population per assay.
- Click on any data point in cluster plot to view spectra and determine quality of individual assay.
- Provides whole population assessment of assay behavior and quality.
iPLEX® is the leading technology for SNP genotyping. The MassARRAY System is widely used for fine mapping, linkage studies, and routine genetic testing of SNP panels of interest. The MassARRAY System combines the benefits of a simple, 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 ≥ 40-plex, which gives a high level of flexibility and a low cost per genotype.

For medium to high throughput studies:
- Ideal for 10-400 SNP panel design.
- Routine multiplexing at ≥ 40-plex level.
- Broad throughput ranges from 150 to 1,000 samples per day.
- Ideal for high throughput, high-throughput, or NGS follow-up studies.

Cost effective and flexible to your research needs:
- Low cost per genotype even with low number of SNPs.
- Flexible format - design experiments to match your sample or assay throughput.
- Reagent sets available in 24-, 96-, or 384-well formats.
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Highest available data quality for your research:
- Highly reproducible.
- Greater than 99.7% accuracy.
- Direct mass detection of the molecule of interest – unexpected events such as failed PCR or tri-allelic SNPs can easily be discovered.

Assay Design Suite.

Delivering Low-Cost, Mid-Plex Assays
- Reagent sets available in 24-, 96-, or 384-well formats.
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- Low cost per genotype even with low number of SNPs.

Choose the option that best meets your needs:
- Design your own assays using our online Assay Design Suite.
- Purchase one of our pre-designed genotyping or somatic mutation panels.
- Let our Agena Custom Services Laboratory scientists develop custom assays for you.

See back for ordering and contact information, or visit our website at www.agenabioscience.com

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(iPLEX® Reagents)

WORKFLOW - SUCCESS FROM ASSAY DESIGN TO RESULT

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- Simple workflow with consistent, universal reaction conditions.
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ASSAY DESIGN
- Assay Design Suite (ADS) is an online bioinformatics genotyping and somatic mutation assay design for use with the MassARRAY System. ADS provides full support for human, mouse, and mouse genome sequences, and allows users to:
  - Import target sequences from a list of n numbers, FASTA file, or sets of formatted SNP sequences.
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The software has a proven design efficiency of > 95% with a verifiable and scalable throughput to meet your specific needs.

iPLEX REACTION
- After DNA or RNA extraction, DNA synthesis is performed to identify the loci-specific allele(s). The iPLEX assay uses a single termination mix and universal reaction conditions for all SNPs. 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.

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For medium to high throughput studies:
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ASSAY PERFORMANCE
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Each Complete iPLEX Genotyping Reagent Set includes:
- MassARRAY® System with Typer 4 Software
- Typer 4 Software License
- iPLEX genotyping sets
- SpectroCHIP Arrays and Clean resin

PUBLISHED STUDIES USING THE MASSARRAY SYSTEM

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THE SCIENCE OF SNP GENOTYPING

SNP GENOTYPING WITH iPLEX REAGENTS AND THE MASSARRAY® SYSTEM

- Biomarker validation
- Routine genetic testing
- Somatic mutation profiling
- Up to 400 biomarkers
- Multiple sample types
- Swift panel design
- Mid-density multiplex
- High sample throughput
- Absolute detection
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Each Complete iPLEX Genotyping Reagent Set includes:
- MassARRAY System with Typer 4 Software.
- Flexible, sensitive, and accurate detection.
- Up to 400 biomarkers
- Multiple sample types
- Swift panel design
- Mid-density multiplex with high sample throughput
- Absolute detection

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