SYSTEMS

MassARRAY® Chemistries

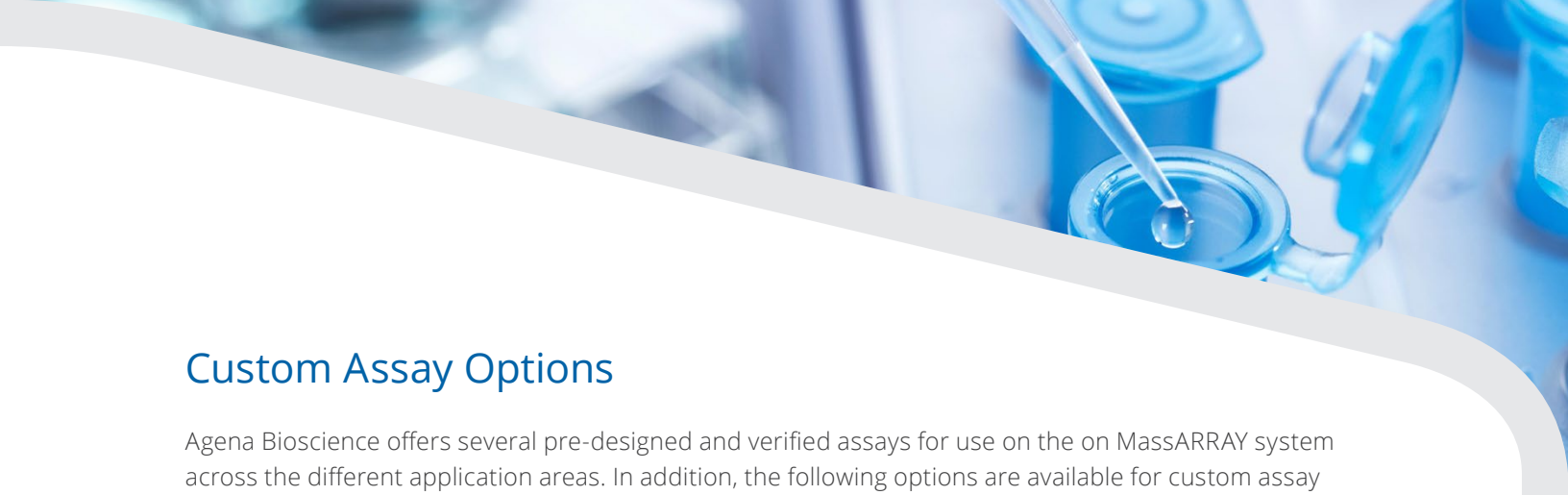
For Research Use Only.
Not for use in diagnostic procedures.

Agena BIOSCIENCE

Single Platform, Multiple Biomarkers

Variety of biomarkers that can be tested on the MassARRAY® System:

	iPLEX® Pro	iPLEX® HS	UltraSEEK™	MassCLEAVE™
Ideal For	Genotyping germline variants	Detecting somatic and low-frequency variants	Detecting very low-frequency and rare variants	Quantifying methylation changes
Biomarkers	• SNPs • Insertions • Deletions • Translocations • Copy Number Variants	• SNPs • Insertions • Deletions	• SNPs • Insertions • Deletions	• CpG Methylation
Limit of Detection	5% - 10%	≥ 1%	≥ 0.1%	≥ 5%
Quantitative Range	5% - 100%	1% - 20%	0.1% - 10%	5% - 100%
Sample Types	• Blood • Buccal swabs • Fresh frozen tissue • FTA cards • Hair follicles • Ear punches • WGA DNA	• Formalin-fixed, paraffin embedded tissue (FFPE) • Fine needle aspirates (FNA) • Fresh frozen tissue • Cytology blocks • Core needle biopsy	• Plasma • Circulating cell-free DNA (ccfDNA) • Circulating tumor DNA (ctDNA) • Circulating tumor cells (CTCs)	• Blood • FFPE • Fresh frozen tissue
Application Areas	• Biomarker validation • Pharmacogenetics • Inherited disease • Livestock testing • Crop strain validation	• Somatic mutations • Low-frequency variants • NGS discovery validation • GMO screening	• Oncogenic resistance and progression monitoring	• Epigenetic studies • Environmental factors studies • Biomarker validation • Disease prognostic markers

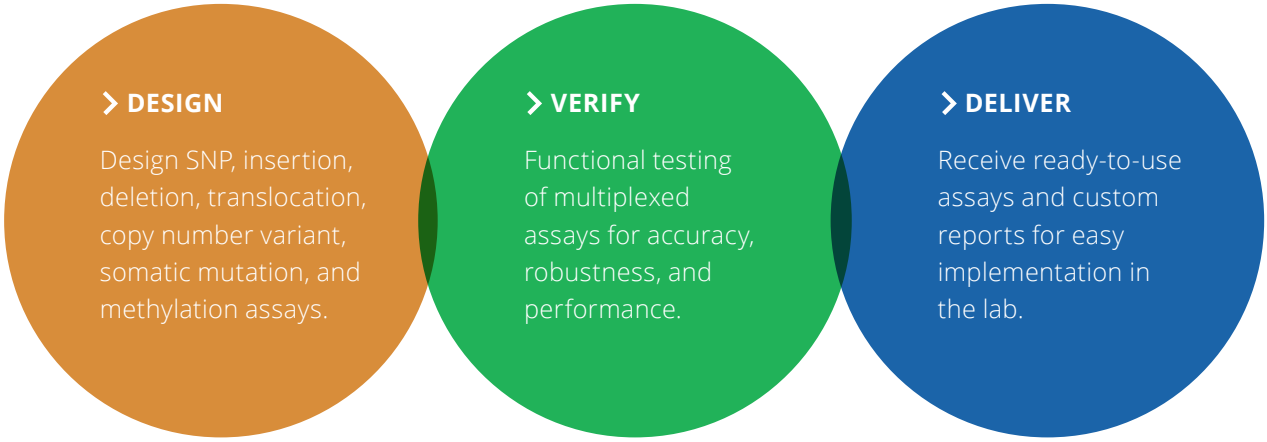


Custom Assay Options

Agena Bioscience offers several pre-designed and verified assays for use on the on MassARRAY system across the different application areas. In addition, the following options are available for custom assay development:

PARTNER WITH OUR EXPERT APPLICATION SCIENTISTS

Minimize your assay development time with **Assays by Agena** services. Our expert scientists iteratively design, develop and verify assays in the laboratory for superior performance and provide ready-to-use assays for validation in your laboratory.



CREATE YOUR OWN PANEL WITH ASSAY DESIGN TOOLS

Assay Design Suite is a streamlined tool for designing genotyping, somatic mutation, gene fusion, and ultrasensitive assays. Given a NCBI dbSNP rs number or FASTA DNA sequence, the software identifies and designs optimal PCR and extension primers for each variant of interest, including insertions and deletions. Compatible markers are multiplexed into a single well to increase breadth of coverage and minimize DNA input. Depending on the number and type of variants, anywhere from one to multiple wells per sample can be designed.

EpiDesigner software is available for designing methylation assays. Using an input of genomic DNA sequence, the software designs multiple PCR primers for bisulfite converted DNA giving the user the option to select the optimal primers to interrogate their CpG sites of interest.

Both software tools are hosted online on Agena Bioscience's customer portal, AgenaCx, and provide a user-friendly interface for designing and modifying panels, enabling easy addition of newly discovered markers to laboratory tests.

iPLEX® Pro Chemistry

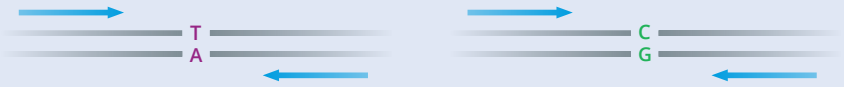
The iPLEX Pro chemistry combines the benefits of simple, reproducible, PCR-based primer extension reaction chemistry with state-of-the-art mass spectrometry to quickly and cost-effectively characterize genotypes with the highest levels of accuracy. The iPLEX assay allows you to routinely design assays at a multiplexing level of 25 to 40 variants per reaction, which gives a high level of flexibility and a low cost per genotype. With direct mass detection of the variant of interest, multi-allelic and copy number variants can be easily identified.

IDEALLY SUITED FOR:

- Genotyping germline variants
- Carrier screening & inherited disease assays
- Biomarker validation
- Pharmacogenetics Studies
- Sample identification and qualification
- Livestock testing and crop strain validation

Variant detection with iPLEX Pro

1 PCR



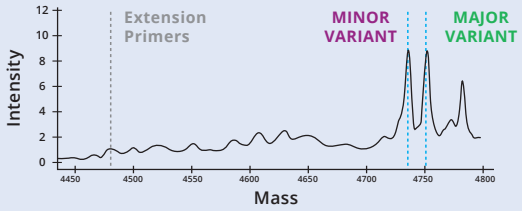
2 Single Base Extension Into Variant Site

- Allele specific mass difference between extension products

3 MassARRAY

Automated sample processing with the MassARRAY System

4 Data Analysis



- Direct analysis of mass difference between alleles provides unambiguous results

iPLEX HS Chemistry

The iPLEX High Sensitivity chemistry increases the sensitivity of the iPLEX reaction by restraining the wild type signal, thereby amplifying the variant signal. With multiplexing of up to 15 variants per reaction, the iPLEX HS chemistry enables detection of variants as low as 1% minor allele frequency (MAF) using minimal DNA input. The short amplicon length (80 -120 bp) makes it an ideal method for use with degraded samples.

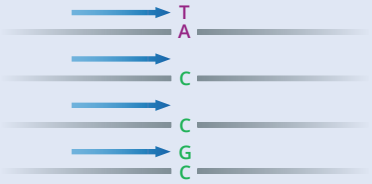
IDEALLY SUITED FOR:

- Low frequency variant detection from somatic tissue
- Identifying oncogenic markers in FFPE tissue, core needle biopsies, FNA and cytology smears
- Validation of NGS discoveries
- GMO screening

1% variant detection with iPLEX HS

1 PCR

2 Variant Enriched Base Extension

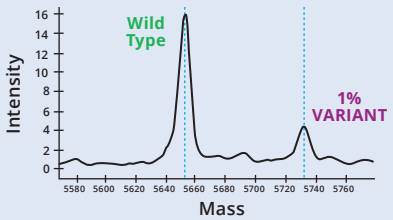


- Single base extension (SBE) enriched for the mutant allele

3 MassARRAY

Automated sample processing with the MassARRAY System

4 Data Analysis



- Clear, unambiguous results, no bioinformatics needed

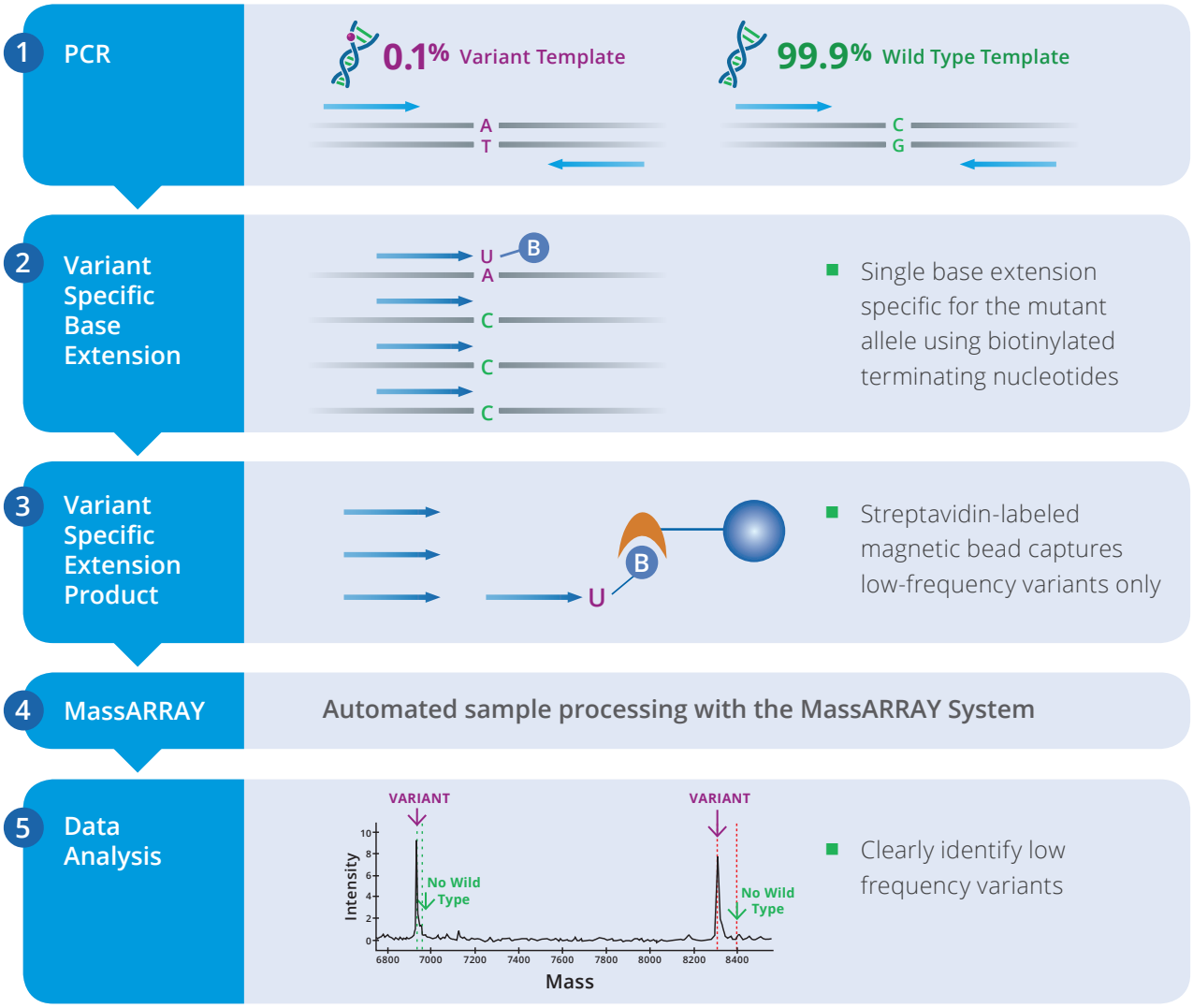
UltraSEEK™ Chemistry

The UltraSEEK chemistry extends the sensitivity of the MassARRAY system to as low as 0.1% MAF. This ultra-sensitivity is achieved by mutant specific single base extension and capture by streptavidin-labeled magnetic beads. You can still multiplex up to 15 markers in a single reaction and identify over 100 variants from minimal starting material.

IDEALLY SUITED FOR:

- Rare variant detection
- Identification of oncogenic resistance and progression markers from ctDNA, ccf-DNA, CTCs
- Non-invasive testing

≥0.1% variant detection with UltraSEEK



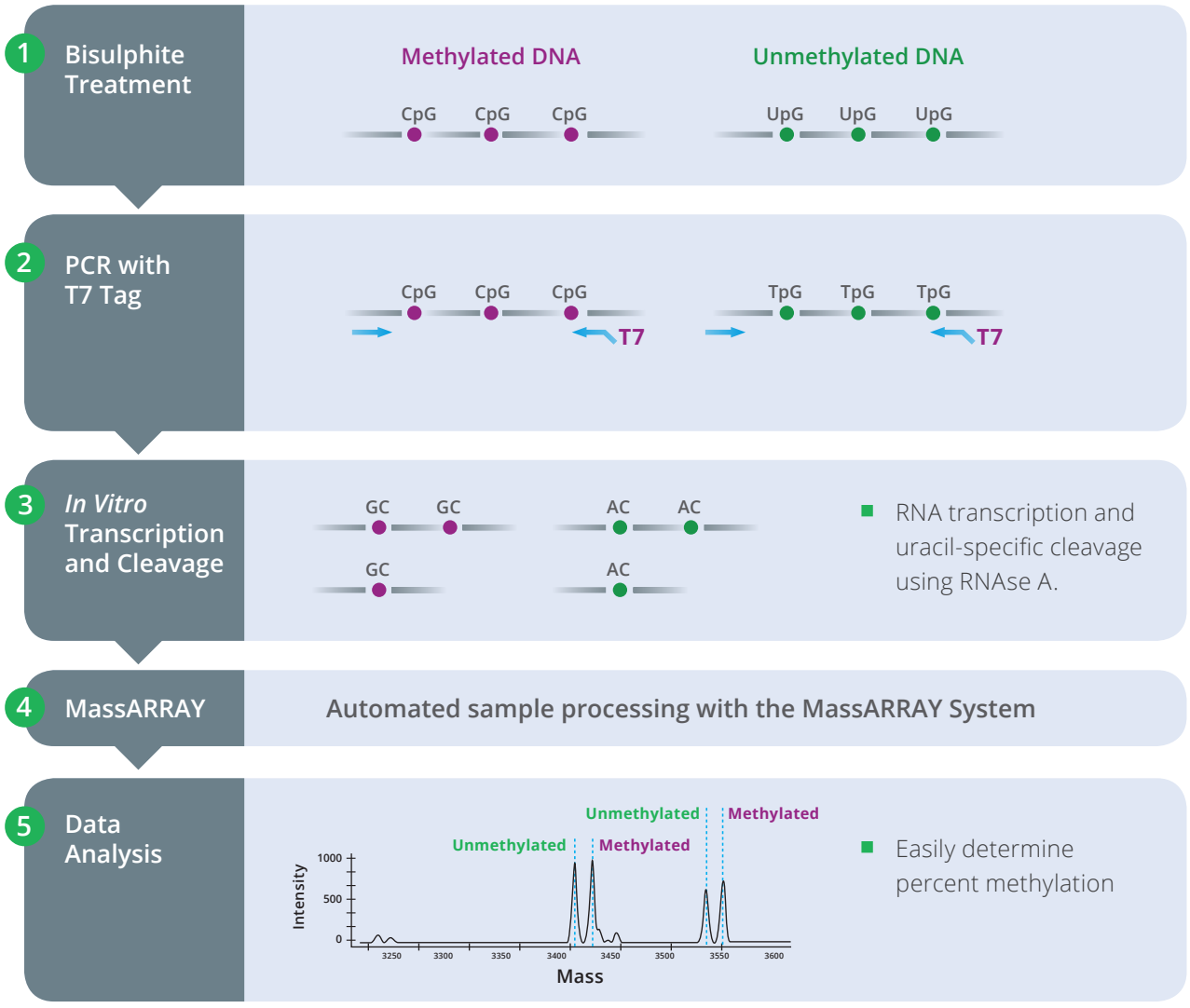
MassCLEAVE™ Chemistry

The MassCLEAVE chemistry enables high-resolution, quantitative methylation profiling on the MassARRAY system. Easily detect differences as low as 5% between methylated and non-methylated DNA.

IDEALLY SUITED FOR:

- Profiling CpG methylation changes across 150 bp – 550 bp amplicons
- Identifying methylation changes in FFPE tissue and other sample types
- Validation of methylation arrays, NGS, or gene promoter studies

Methylation Profiling with MassCLEAVE



THE MASSARRAY SYSTEM

All Agena Bioscience chemistries run on the MassARRAY System, a benchtop molecular testing platform. It provides timely and accurate multiplexed analysis of up to hundreds of clinically relevant mutations in a single workflow. The flexible throughput capacity can meet the needs of any testing volume. The system supports diverse applications, allowing labs to consolidate tests onto a single platform.

PUBLICATIONS

View our online database of over 4,000 user publications using the MassARRAY System across various applications. To learn more about Agena Bioscience, the MassARRAY System, or our other products and services, visit www.agenabio.com

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