



Ultrasensitive Somatic Mutation Detection with UltraSEEK™ Reagents and the MassARRAY® System

Rare mutant alleles present in tumor and/or tumor-derived circulating cell-free DNA (cfDNA) may provide valuable information as to whether a patient is responding to targeted treatments. Tumor heterogeneity presents a major obstacle to the detection of these alleles, especially when analytical sensitivity is 5-10%.

The MassARRAY® System, powered by UltraSEEK™ chemistry, provides a targeted, multiplexed method for detecting rare events, increasing the sensitivity to less than 1% and as low as 0.1%. Now clinical and translational research labs can design targeted panels to virtually any genomic region.

UltraSEEK chemistry enables the identification of low-level genetic determinants for:

- ✓ Initiation and proliferation in primary tumors
- ✓ Noninvasive early detection of possible metastasis
- ✓ Patient-specific mutation therapeutic monitoring

UltraSEEK chemistry can also be used as a fast, cost-effective method for orthogonal validation of next gen sequencing and/or real-time PCR results to confirm or rule out borderline results, especially for mutant alleles present at less than 5% frequency.

For Ultrasensitive Mutation Detection

OVERVIEW OF ULTRASEEK CHEMISTRY

The UltraSEEK chemistry consists of PCR amplification of a set of pre-defined loci harboring the mutations of interest (Figure 1).

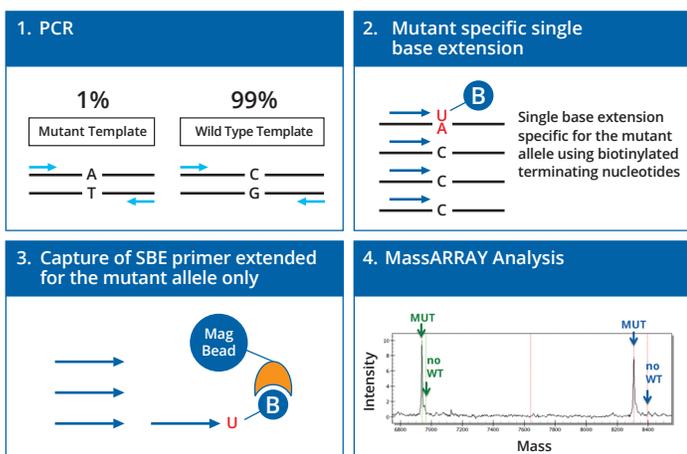


Figure 1. UltraSEEK mutation detection with the MassARRAY System

Step 1: Mutant and wild-type nucleotide sequences are amplified in the initial PCR reaction.

Step 2: A single base extension (SBE) enriches for the desired sequence(s) using a mutant-specific terminator. Up to ten UltraSEEK assays can be multiplexed together providing a cost and sample input advantage, provided that the sequences share the same terminator (e.g., G, T, or C).

Step 3: The UltraSEEK extension reaction utilizes a single mutation-specific chain terminator labeled with biotin for solid phase capture. This enrichment step involves capture, wash, and elution of the mutant alleles.

Step 4: The mutant-specific extension products are measured on the MassARRAY Analyzer using time-of-flight for detection. The MassARRAY Typer software provides a simple readout of mutations detected within the sample run.

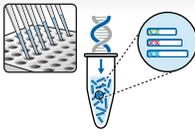
ULTRASEEK WORKFLOW

Use our online Assay Design Suite v2.0 software to develop your assays, or purchase one of our pre-designed panels. You can also use the expert services of the scientists in our Assays by Agena team to help with everything from designing custom panels to running the assays for you in our lab. Starting with purified DNA, genetic analysis on the MassARRAY System can be accomplished in a single day.

UltraSEEK™ Somatic Mutation Detection on the MassARRAY® System
Agena
BIOSCIENCE



Step 1:
Design assays



Step 2:
Prepare & run sample



Step 3:
Transfer analyte



Step 4:
View & analyze data

MassARRAY SYSTEM COMPONENTS			
Use Assay Design Suite v2.0 Software, or purchase predesigned panels (UltraSEEK Oncogene Panel), or purchase custom panels from Assays by Agena.	UltraSEEK Reagents	SpectroCHIP® Arrays, MassARRAY Analyzer with Chip prep module, or MassARRAY Analyzer and Nanodispenser RS1000 (not shown).	Typer Software
DESCRIPTION			
Assay Design Suite v2.0 allows for rapid design of single or multiplexed assays from formatted SNP sequences. Alternatively, predesigned or custom panels may be purchased from Agena Bioscience.	Isolate and quantitate genomic DNA, then PCR amplify the target region and process the PCR products using UltraSEEK biochemistry.	Transfer analyte, then acquire data from the SpectroCHIP Array on the MassARRAY Analyzer. The data is automatically saved to the MassARRAY database.	Generate reports - the software automatically analyzes the acquired data and presents the mutation(s) present for a given sample.

Software Tools

RAPID ASSAY DESIGN WITH ASSAY DESIGN SUITE

Assay Design Suite provides a rapid, streamlined method for designing UltraSEEK assays. With the new automated designer, any lab can take advantage of mutant-specific single base extension.

Assay Design Suite supports genotyping and somatic mutation design as well as ultrasensitive somatic mutation design using UltraSEEK chemistry.

The UltraSEEK assay design automatically includes:

- Process controls to assess DNA addition, PCR, and extension steps
- Five capture controls spanning the mass spectrum to gauge bead capture, clean-up and elution steps

Assay Design Suite is hosted online by Agena Bioscience.

CONVENIENT DATA ANALYSIS WITH TYPER SOFTWARE

MassARRAY analysis software is a suite of modular applications that enables you to evaluate and manage results. A new HTML-based report tool available for UltraSEEK chemistry facilitates quick analysis by making mutation call classification and quality control metrics available in an easy-to-use, interactive format.

Start with the Summary View (Figure 2), and then drill down to more detailed mutation, sample, and assay information.

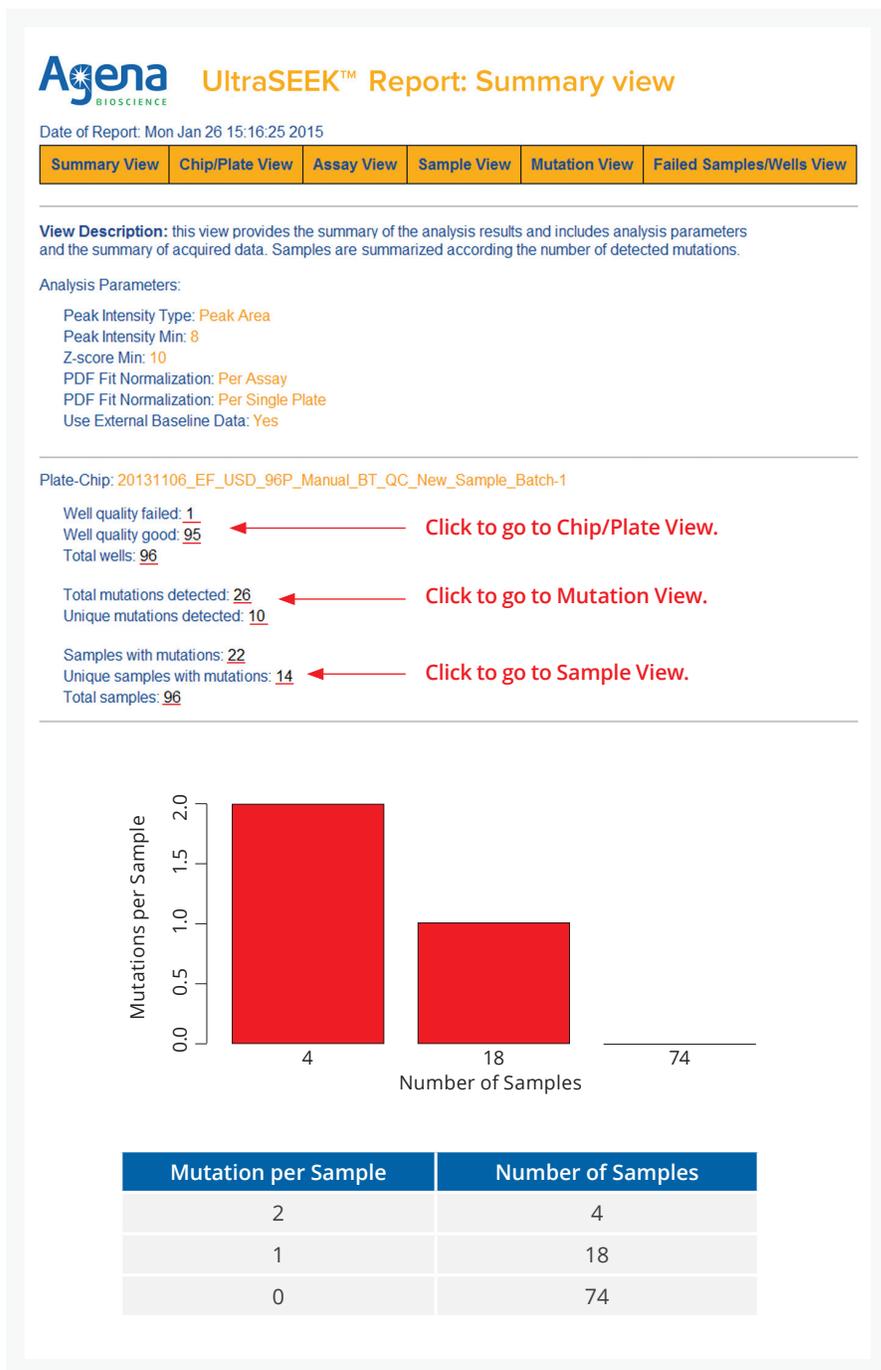


Figure 2. UltraSEEK Report: Summary View

Ordering Information

Design your UltraSEEK assays with the Agena Bioscience Assay Design Suite online tool and then order the appropriate reagents. You may need to order additional reagents for each set of designs depending upon your throughput.

	ITEM #	DESCRIPTION	QUANTITY (NO. RXNS)
Select One	27014	UltraSEEK™ Accessory Set, Small	192
	27015	UltraSEEK Accessory Set, Medium	384
Select One	27013	UltraSEEK Capture Reagent Set, Buffers	384
Select One	11331	PCR Accessory Set with dUTP	3840
Select One	1963	PCR Enzyme, 250 uL, GPR	960
	1735	PCR Enzyme, 1000 uL, GPR	3840
Select One	10188	SpectroCHIP & Resin Set, 2x96	192
	27012	SpectroCHIP & Resin Set, 1x384	384
	10191	SpectroCHIP & Resin Set, 2x384	768
	10163	SpectroCHIP & Resin Set, 10x96	960
	10117-2	SpectroCHIP & Resin Set, 10x384	3840
Select One	27007	Streptavidin Beads	192
Select One or More	27005	T-Mix	384
	27006	C-Mix	384
	27016	G-Mix	384
Select One or More	27017	UltraSEEK Process Control, T	384
	27018	UltraSEEK Process Control, C	384
	27019	UltraSEEK Process Control, G	384

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