

Cleanert[®] 96-Well Protein Precipitation Plate for Newborn Screening

BONNA-AGELA TECHNOLOGIES

NEW



What is inborn error of metabolism?

An inborn error of metabolism (IEM) is a permanent and inherited biochemical disorder generally caused by lack of a functional enzyme, transmembrane transporter or similar protein resulting in a blockage of the corresponding metabolic pathway. There may be an accumulation of metabolites prior to the metabolic block and /or deficiency in the ultimate product(s) of the path way.

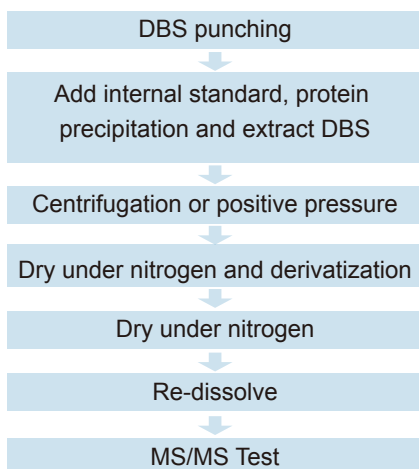
Since 2001 MS/MS technique has been accepted for newborn screening worldwide with nearly 100% newborn coverage. The advantages of the MS/MS technology highlighted by its promoters are its ability to screen for a large number of diseases in a single analytical step. Its ability to screen for diseases, such as Medium-Chain Acyl-CoA Dehydrogenase Deficiency (MCADD), that are not detectable by other techniques. The technology is automated and thus suitable for high throughput and its performance is better than that of other screening techniques (e.g., fewer false positives for PKU).

Table 1 Some Newborn Screening Items Tested by MS/MS

Item	Sample	Biomarkers
Type I tyrosinemia	DBS	succinylacetone
Carnitine test	Plasma	acyl carnitine
Phenylketonuria	DBS	phenylalanine and tyrosine
Methylmalonicaciduria, propionic aciduria	DBS	isosuccinic acid and 3-hydroxypropionic acid
Congenital adrenal hyperplasia	DBS	17 α -Hydroxyprogesterone, androsterone, cortisol
11 β -hydroxylase deficiency	DBS	11-deoxycortisol, androstenedione, cortisol
Fabry disease	Urine	Gangliosylceramide

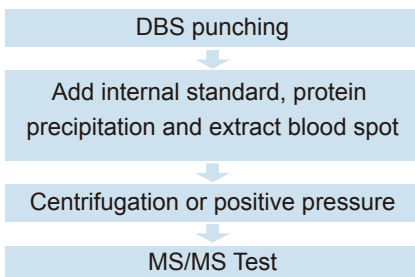
★ Sample Pretreatment Prior to MS/MS in Newborn Screening

Derivatization



MS/MS for newborn screening mainly comprises four parts: sample collecting, sample preparation, MS/MS analysis and data report. The sample preparation of dry blood spots (DBS) can be performed by following methods:

Non-derivatization

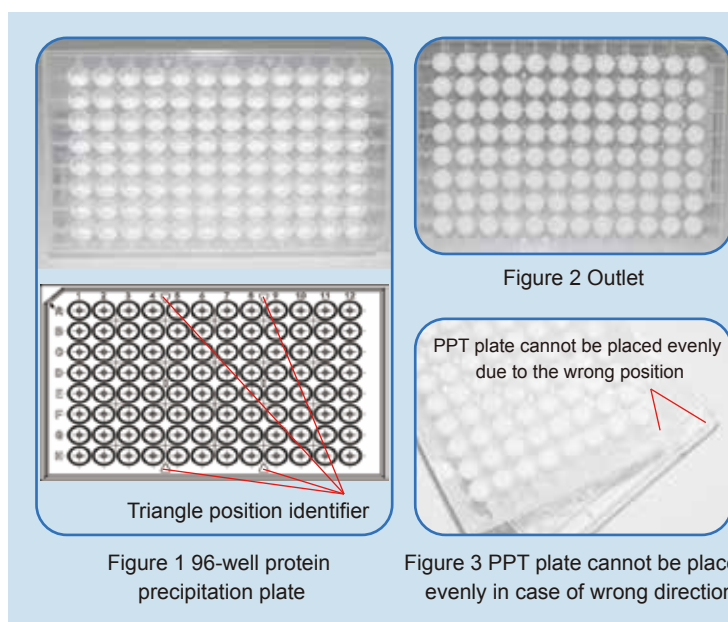


★ Bonna-Agela 96-Well Protein Precipitation Plates for Newborn Screening

Sample pretreatment is an important step in MS/MS analysis of DBS (Dry Blood Spot) in newborn screening. A fast and efficient approach with high-throughput is essential for clinical laboratories. Protein precipitation is a common technique to remove proteins prior to MS/MS. Bonna-Agela has launched a new 96-well protein precipitation (PPT) plate specified for the treatment of DBS in newborn screening. This new product has following features that facilitates sample preparation of DBS:

Features:

- The Plates are designed in lieu to Centrifugal Approach;
- High-throughput and easy-to-handle, allowing in-well DBS separation;
- With Unique Hyrdophobic Frit, removal of undesired impurities and proteins efficiently to avoid clogging of MS Ion Source;
- Plate is made with highly Inert material to avoid leaching out effect and interaction of impurities with plate.;
- Position of 96 wells are more identifiable with addition of Triangle Marks Δ apart from regular Alphanumeric marks;
- Explain Unique Locator Design bit more clearly;
- Special outer ring design at outlet side avoiding cross contamination of the filtrated fractions;
- Compatible with automated punching device, improving sample pretreatment efficiency.



Please contact your local Bonna-Agela sales representatives for pricing and other information about this product.



Best Value
Guaranteed Product Quality
Innovation to Benefit Customers

Comparative Study : NEW PPT Vs Brand M

Sample preparation of DBS involves protein precipitation and the separation of bio-markers such as amino acids and acyl carnitines. Since the ability of filtration of precipitated proteins of the plate may impact the result of MS/MS analysis directly, it is important that the plates must have high efficiency. The following data compares new PPT plate with the plate from other suppliers as well as traditional method with various plasma volumes and centrifugal speeds.

Results show that Cleanert® protein precipitation plate has better efficiency than Brand M filtration plate and conventional high-speed centrifugal precipitation method in terms of the removed of the proteins. The plate is excellent in its performance without risk of protein leakage during high speed vortex. The plate can achieve “in-well” protein precipitation and separation of the target compounds from DBS, and also can be used for protein precipitation of small blood sample (10~50 µL).

Comparison of absorbance of three various methods at 4000rpm

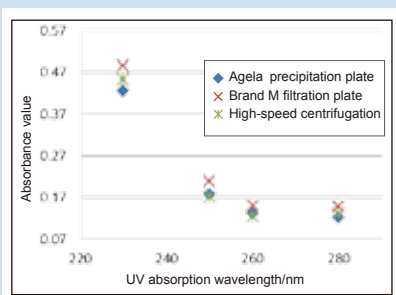


Figure 4 Comparison of absorbance value

Absorbance value of Bonna-Agela precipitation plate with various plasma dosage at 4000rpm

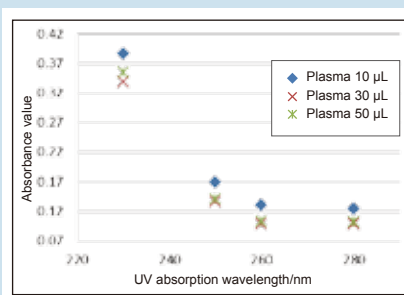


Figure 5 Sample absorbance value with various plasma dosage

Bonna-Agela precipitation plate with 50 µL plasma under various vortexing speed

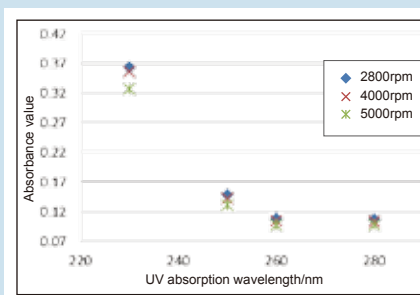


Figure 6 Sample absorbance value under different vortex speed

Note: under certain UV absorption wavelength, the absorbance value of solution and is proportional to protein concentration, therefore, the absorbance value of tested sample can reflect the effectiveness of different methods.

★ Ordering Information

Cleanert® 96-well protein precipitation plate

Specification	Packing	Cat.Number
0.3 mL	4 pieces/pk	96CD0325

Device

Product Name	Specification	Packing	Cat.Number
Cleanert® V96 Nitrogen Evaporator	For 96-well collecting plate sample concentration	1 set/pk	NV-96G
Cleanert® M96 Positive Pressure Device	For 96-well collecting plate sample pretreatment	1set/pk	SPE-96

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