

NeoBase™2 Non-derivatized MSMS Kit - Improved Performance for Expanded Newborn Screening



Marko Ahlas, Jenny-Maria Brozinski, Tero Lehtonen,
Tuomas Nikula and Jonathan Rehnberg

PerkinElmer Diagnostics, Turku, Finland



1 Introduction

New PerkinElmer® NeoBase™2 Non-derivatized MSMS Kit allows faster multiplex tandem mass spectrometry (MSMS) analysis of 57 marker metabolites from single dried blood spot (DBS) specimen.

The new assay provides high quality ready-to-use reagents, streamlined assay workflow and improved reliable performance for expanded newborn screening of several inborn errors of metabolism (IEM).

2 Kit features

14 new analytes:

Amino acids (ASA, Glu, Gln)
Acylcarnitines (C18:2OH, C20-C26)
Lysophospholipids (LPC20:0-LPC26:0)
Nucleosides (Ado, dAdo)

Internal Standards (30): Single all-in-1 vial, easier preparation and improved stability (1 day -> 1 week) of extraction working solution.

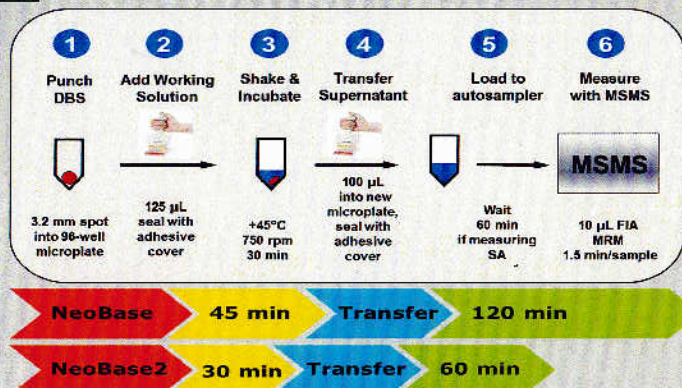
Kit controls (30): Optimized levels (Low, High) and improved dried blood spot (DBS) stability.

Microplates and covers: New single ANSI-standard plate for all assay steps, new single easy-to-use cover designed for MSMS use.

Non-derivatized Assay Solutions: New flow solvent with lower MSMS background, new high quality borosilicate bottle.

SA Assay Solution: Improved succinylacetone (SA) extraction efficiency and 60 min shorter waiting time.

3 Assay procedure



4 Analytical Performance

DBS samples serially enriched with selected current (blue) and new (green) analytes were tested with the NeoBase2 assay and Waters Acquity Xevo TQD MSMS system. The results are summarized in Table 1.

Table 1: Typical NeoBase2 assay results at endogenous DBS concentration level (L1) and 5 serially enriched analyte levels (L2-L6).

Average (µM, 12 replicates)	GLN	MET	PHE	SA	ADO	CD	C5DG+C6OH	C6	C18	C26	LPC 26:0
L1	496.66	15.11	67.81	0.36	0.57	21.06	0.08	0.04	0.62	0.02	0.23
L2	618.01	57.27	139.85	3.65	1.30	47.57	0.60	0.51	1.37	0.13	0.39
L3	716.29	97.73	208.11	7.28	2.09	73.51	1.07	0.97	2.08	0.24	0.52
L4	941.60	181.30	350.12	14.53	3.83	126.04	2.00	1.90	3.55	0.46	0.86
L5	1352.21	334.60	612.64	28.68	7.13	221.52	3.83	3.66	6.27	0.93	1.60
L6	2219.57	654.68	1165.32	57.41	14.45	421.59	7.61	7.19	11.88	1.87	2.88
Linearity, R2 L1-L6	0.9999	0.9999	0.9999	1.0000	0.9992	0.9999	0.9999	0.9999	0.9999	0.9998	0.9992
CV%, L1 Endogenous	6%	6%	4%	22%	11%	6%	11%	15%	4%	14%	19%
CV%, Average L2-L6	5%	6%	5%	6%	5%	6%	6%	5%	6%	5%	9%
Recovery%, Average L2-L6	102%	96%	101%	55%	86%	110%	89%	104%	104%	84%	97%

5 Summary

New NeoBase2 Non-derivatized MSMS Kit provides a next generation easy-to-use assay for expanded newborn screening. All the new 14 analytes can be measured simultaneously with current NeoBase analyte panel, and with similar overall analytical performance.

Will be launched 2016 (CE/IVD):

3044-0010 NeoBase2 Non-derivatized MSMS Kit
3045-0010 NeoBase2 Non-derivatized Assay Solutions
3046-0010 NeoBase2 Succinylacetone Assay Solution