



Automation for NeoMass AAAC Plus

Detection of Amino Acids, Acylcarnitines, Succinylacetone
and Argininosuccinic Acid by Tandem Mass Spectrometry

Expanded Newborn Screening by LC-MS/MS

Inborn Errors of Metabolism (IEM) are a genetically heterogeneous group of disorders caused by enzyme defects in the various metabolic pathways. The result is an accumulation of toxic metabolic intermediates and associated metabolic disorders. These concentration changes of metabolites of the amino acid and fatty acid metabolism as well as organic acidurias and those of the urea cycle can be determined with the NeoMass AAAC Plus Kit. The LC-MS/MS NeoMass AAAC Plus kit can be used for the quantitative determination of 15 amino acids, free carnitine, 12 acylcarnitines,

argininosuccinic acid (ASA) and succinylacetone (SUAC) in whole blood dried on filter paper. The determination requires the extraction of Dried Blood Spot samples with a solution containing stable isotope labelled Internal Standards and analysis on a tandem mass spectrometer (MS/MS). The response of each analyte with respect to its Internal Standard is proportional to the concentration of the analyte in the sample. Data is acquired using MRM (Multiple Reaction Monitoring) acquisition. The acquisition and processing of data are carried out by software supplied with the LC-MS/MS system.

- ◆ Ready-to-use CE-IVD kit for 960 analyses
- ◆ Multiple diagnosis (> 50 disorders) in a single run
- ◆ Sample preparation without derivatisation
- ◆ No use of cancerogenic hydrazine or derivatives of it
- ◆ 30 Isotopically labelled Internal Standards
- ◆ With argininosuccinic acid for detection of complete urea cycle disorders
- ◆ All components are also separately available including Internal Standards and Controls
- ◆ Three levels of Dried Blood Spot Controls covering the clinically relevant range
- ◆ Complete Automated Sample Preparation with NS 2400 and in combination with all Fluorescence Immunoassays possible

Automated Sample Preparation Procedure

1. Place the U-bottomed Sample Preparation Plates containing punched DBS discs and the empty V-bottomed Sample Analysis plate in their designated places (hotels) on the NS2400.
2. Fill Extraction Solution A & daily Working Solution (contains Internal Standards) into the respective reservoirs.

Start NS2400
and run up to 480
samples within
70 min.

Transfer the
Analysis Plates
to the
LC-MS/MS

Inject
5-10 µl to
LC-MS/MS

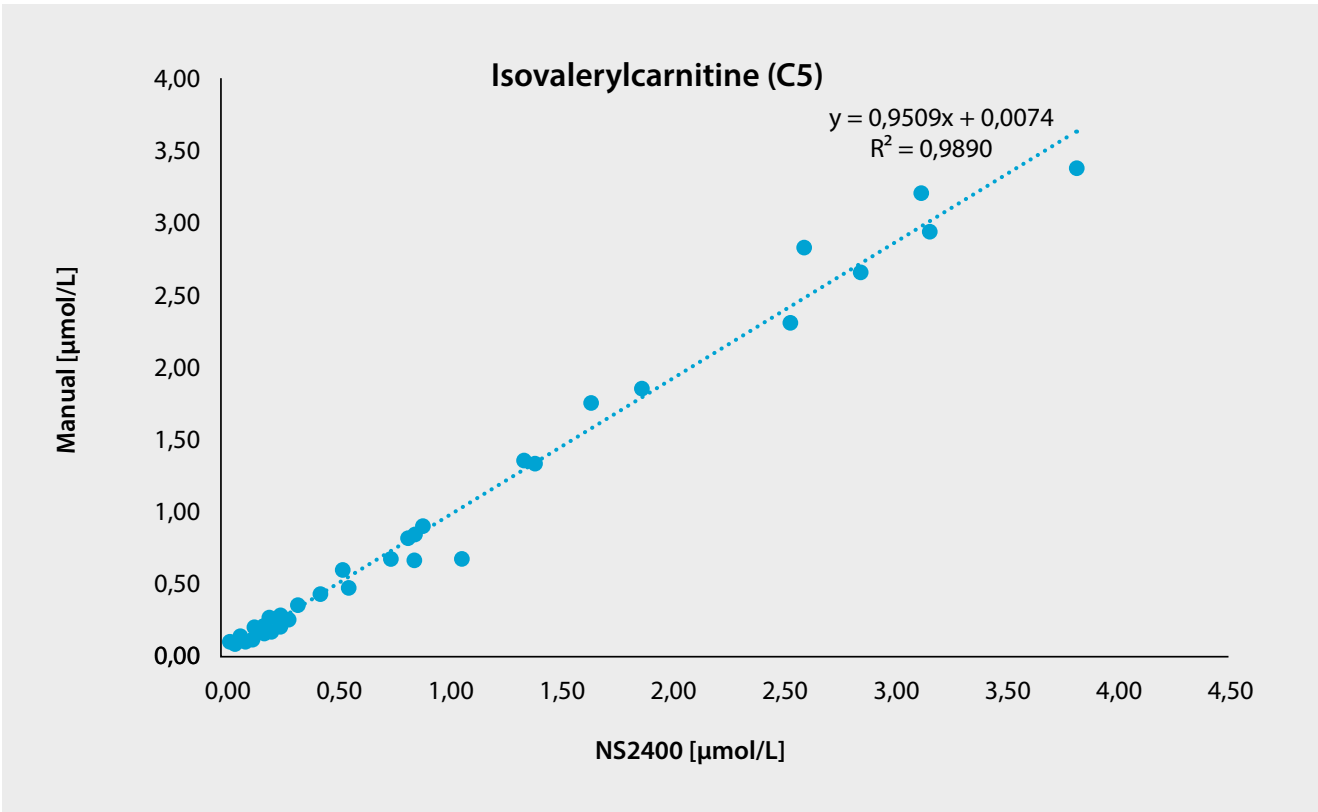
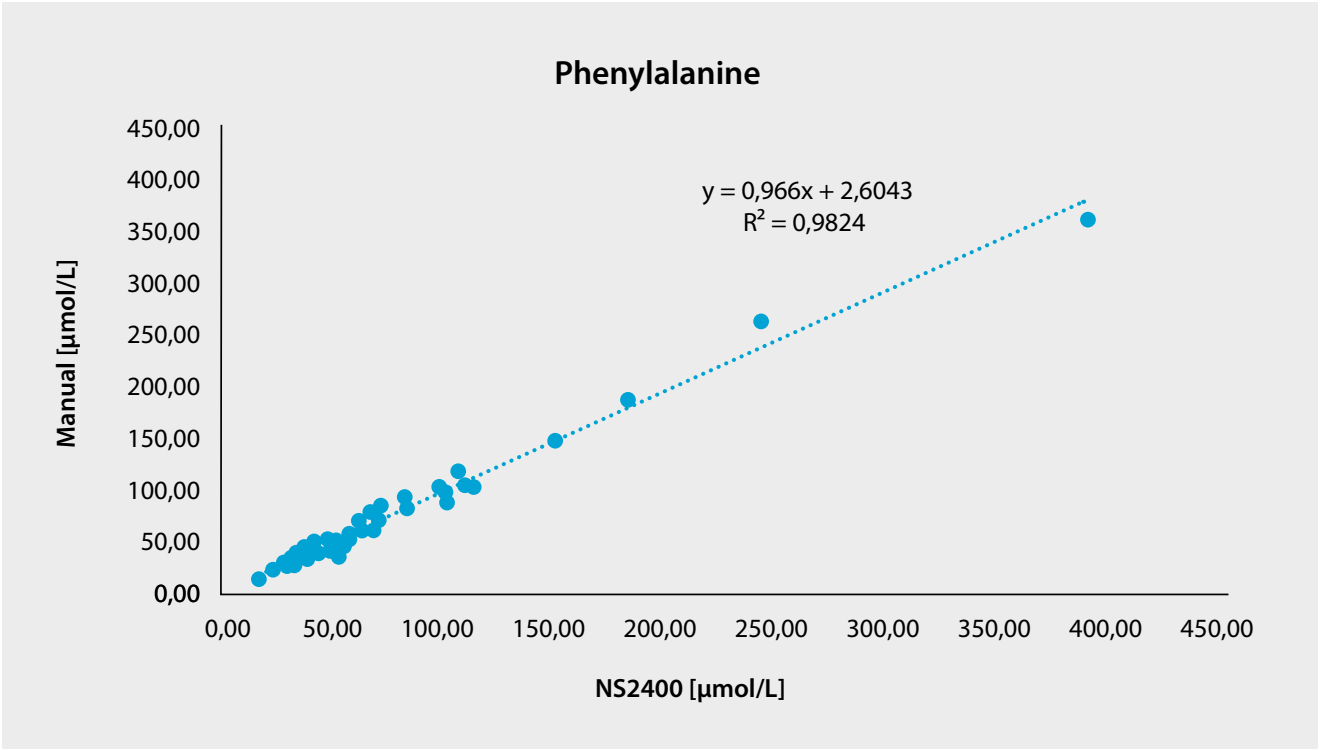


Comparison of QC Samples

ANALYTE	R ²	ANALYTE	R ²	ANALYTE	R ²
Ala	0.9945	Phe	0.9999	C8	0.9994
Arg	0.9999	Pro	0.9996	C10	0.9977
Asp	0.9998	Ser	0.9891	C12	0.9993
Cit	0.9999	Tyr	0.9999	C14	0.9986
Glu	0.9997	Val	1.0000	C16	0.9982
Gly	0.9884	C0	0.9988	C18	0.9981
Leu/Ile/Pro-OH	0.9974	C2	0.9960	C5DC/C6OH	0.9970
Lys/Gln	0.9999	C3	0.9991	ASA	1.0000
Met	1.0000	C4	1.0000	SUAC	0.9985
Orn	1.0000	C6	0.9981	C8	0.9994

All manual sample preparation steps were transferred to the NS2400 without any differences in the procedure. Comparison of the determination results of the QC samples (I-III) of both methods showed a very high correlation for all analytes (R^2 between 0.9884 and 1).

Comparison of Patient Samples



The comparison of samples from healthy newborns and samples from newborns with a proven inborn error of metabolism also showed a high degree of agreement when results of manual and automated sample preparation (NS2400) were analyzed. Shown here for Phenylalanine and Isovalerylcarnitine (C5).

Ordering Information

Product Code	Product
7100110	NeoMass AAAC Plus For 960 tests
Kit Contents	Extraction Plate, 10 plates Analysis Plate, 10 plates Dried Blood Spot Controls Level, C1-C2-C3, 5 x 3 spots Internal Standard, labelled amino acids Internal Standard, labelled acylcarnitines Internal Standard, labelled succinylacetone Internal Standard, labelled argininosuccinic acid Extraction Solution A, 50 ml Extraction Solution B, 150 ml Eluent Solution, 1000 ml Extraction Plate Covers, 10 pcs Analysis Plate Covers, 10 pcs Instruction for use

Kit components are available separately

710011003	DBS Controls, C1-C2-C3, 3 x 3 spots
710011004	Internal Standard, labelled amino acids, 1 Vial
710011005	Internal Standard, labelled acylcarnitines, 1 Vial
710011006	Internal Standard, labelled succinylacetone, 1 Vial
710011007	Internal Standard, labelled argininosuccinic acid, 1 Vial
710011008	Extraction Solution A, 50 ml
710011009	Extraction Solution B, 150 ml
710011010	Eluent Solution, 1000 ml
2205	Sample Preparation Plates, U-bottomed, 10 plates
2605	Sample Analysis Plates, V-bottomed, 10 plates
1541891	Extraction Plate Cover, 10 pcs
1541850	Analysis Plate Cover, 10 pcs



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