biocrates
The future of research and health

Standardized metabolomics kits for quantitative and reproducible results

Kit workflow in the laboratory and the MetIDQ™ software

biocrates.com

For research use only | not for diagnostic procedures

Kit workflow and the MetIDQ™ software

Content

- Company overview
- Targeted metabolomics
- Standardized assay technology
- AbsoluteIDQ® p180 kit I
  - Key benefits
  - Analytical coverage and performance
  - How it works
- AbsoluteIDQ® p180 kit II
  - Setup
  - Workflow
  - Assay preparation
- MetIDQ™ software – live demo

Company overview

Company profile
Technology

Company profile

Biotech company for targeted metabolomics kit technology in Innsbruck, Austria

> 15 years of experience, biocrates technology was applied for thousands of publications and by hundreds of clients in pharma, academia and health institutions

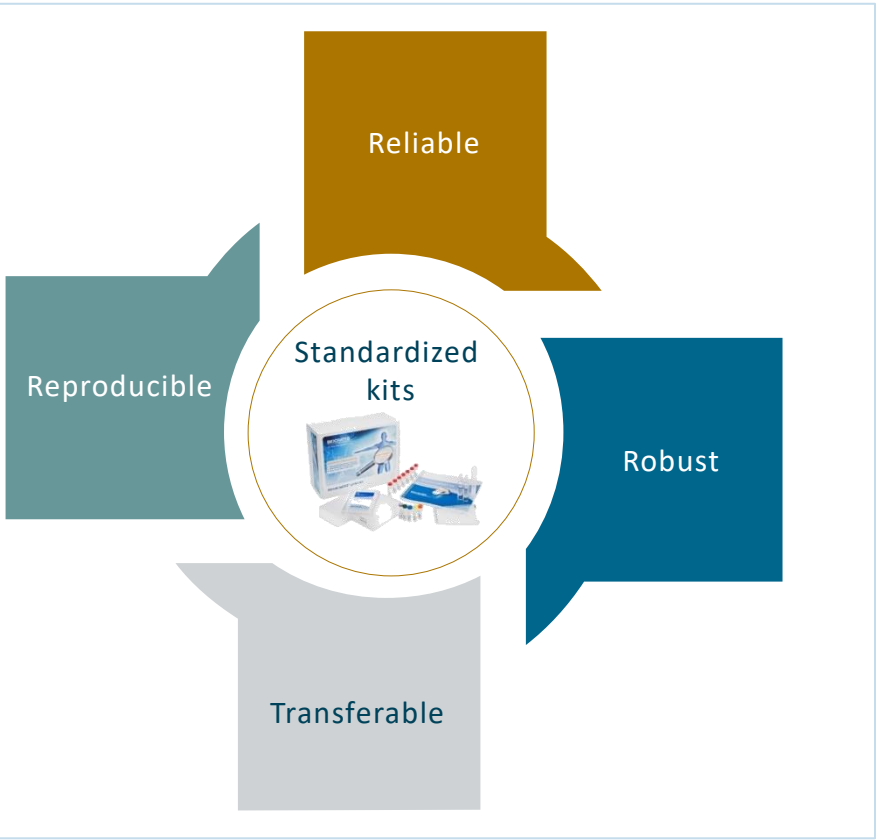
Fully integrated mass spectrometry-based solutions for metabolic & functional microbial phenotyping across all indication areas

Kit technology empowers quantitative analysis of thousands of endogenous metabolites.
Statistical analysis and biological interpretation is available.

Our customer base includes global tier one pharma and academic customer as well as national health organizations.
A global community of more than 100 core facilities, CRO's, service customers & kit users to accelerate your science

Technology

biocrates develops, produces and distributes robust and high-performance kit tools for research purposes. This is THE standard for future diagnostic applications.



Running cost savings

Comparability between MS platforms

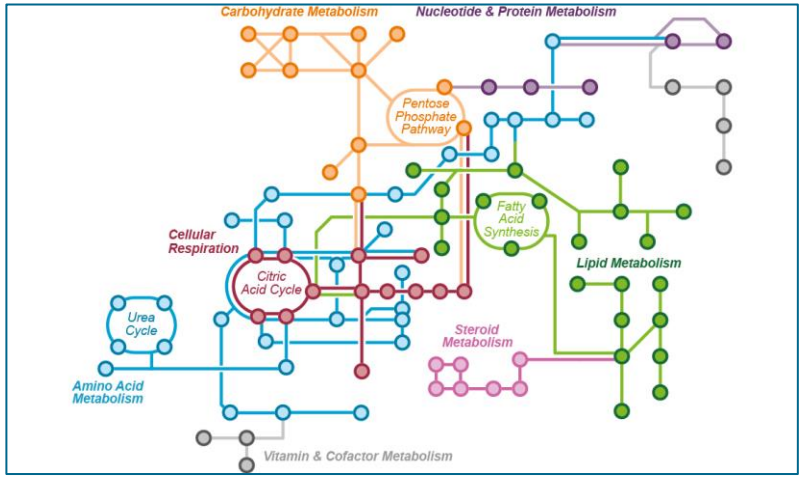
Standardization between labs

Targeted metabolomics

Metabolomics research
Why metabolomics matters
Metabolomic data interpretation

Metabolomics research

Metabolomics is the analysis of the transition of small molecules along defined pathways

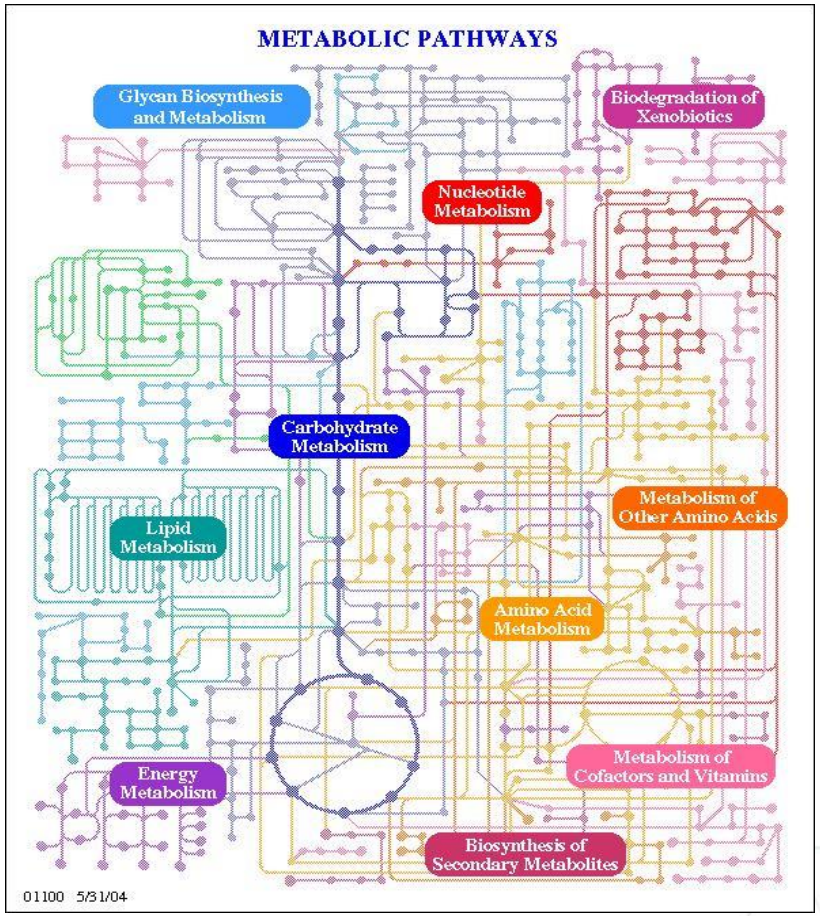


- Metabolomics is the study/analysis of metabolites in biological systems
- Metabolites are low molecular weight organic molecules
- Metabolome is the total metabolites pool

Typical metabolites

- Sugars
- Nucleosides
- Organic acids
- Ketones
- Aldehydes
- Amines

- Amino acids
- Small peptides
- Lipids
- Sterols
- Terpenes
- Alkaloids



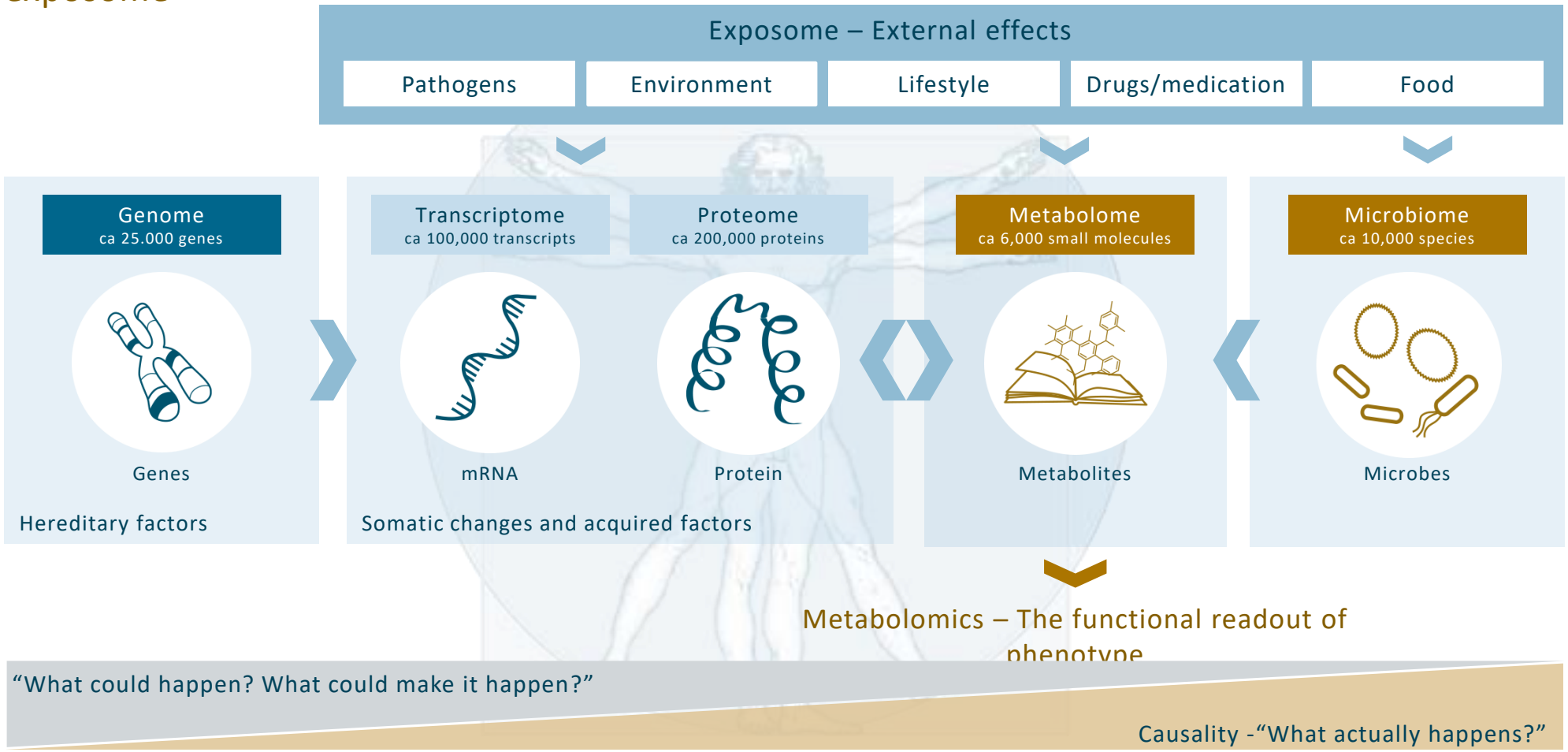
Why target metabolomics matters

Our approach

- Metabolomics is the most relevant tool to answer the multidimensional questions of system biology.
- From just a few microliters of sample material, the phenotype of an individual can be uncovered.
- Quantitative, standardized, and quality-controlled targeted metabolomics methods guarantee robust and reproducible results that are the cornerstones of all clinical research.
- biocrates provides mass spectrometry-based targeted metabolite analysis, with assays covering over 1,000 metabolites from more than 30 metabolite classes.

Why metabolomics matters – The omics map

Metabolomics is functional readout of integrated genomic information under impact from exposome

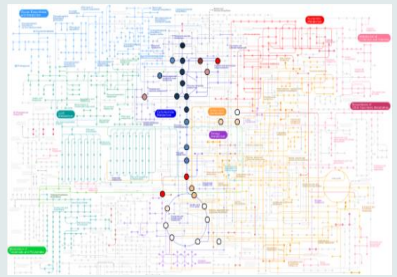


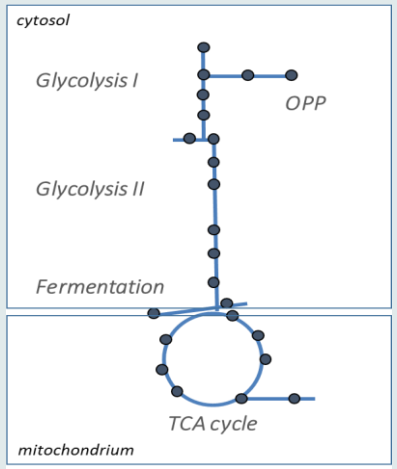
Why metabolomics matters – The source

Liquid biopsies provide access to pathophysiological status of individuals

Cellular metabolism

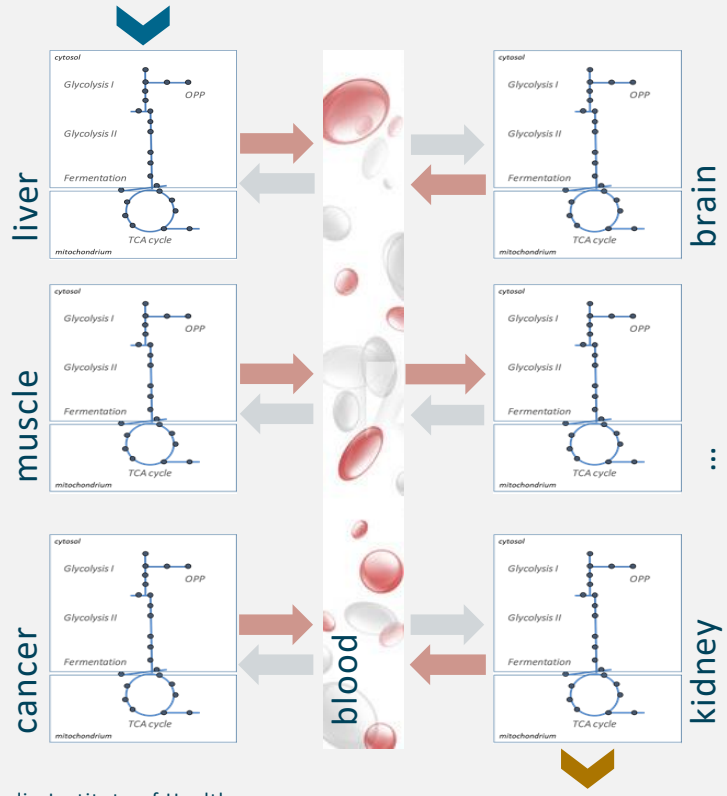
Tissue





Systemic metabolism

Blood



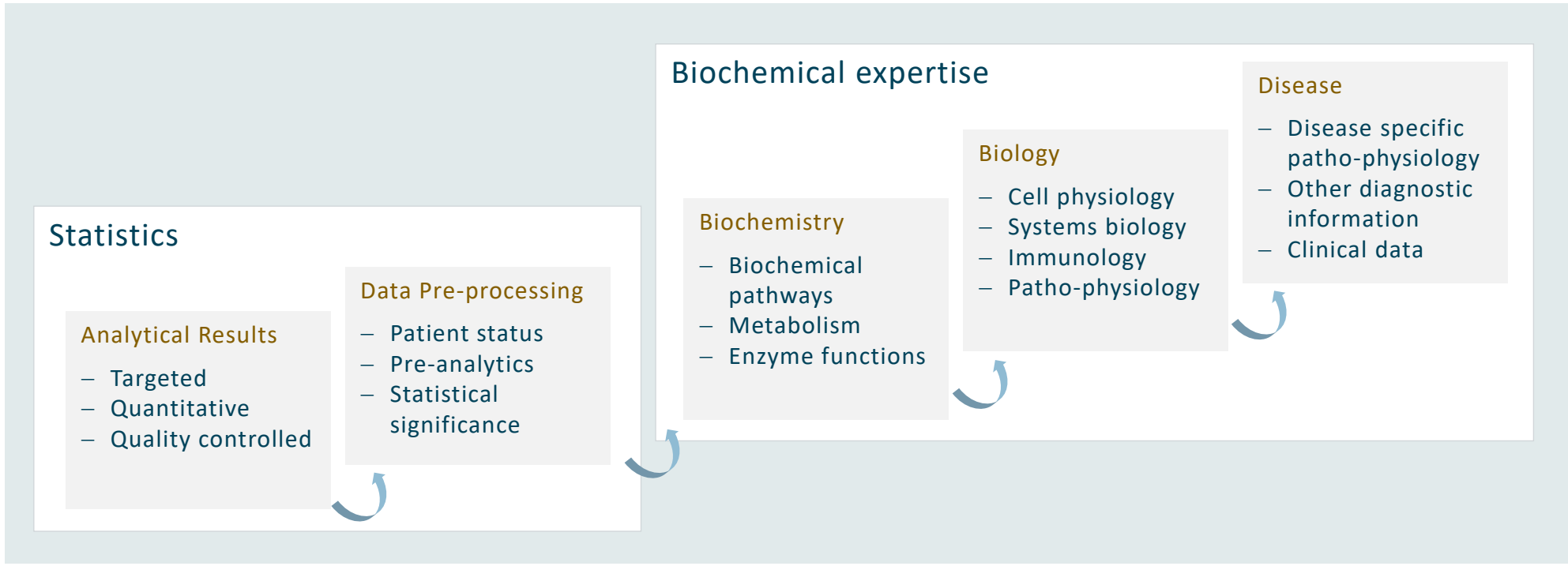
Dr. Stefan Kempa, Berlin Institute of Health

Systemic metabolism reflects energy homeostasis, immune response to disease and also functional impact of the

Metabolomics data interpretation

Disease know-how drives “metabolic signature”

Combined statistics and biochemical expertise required for state-of-the-art analysis



Standardized assay technology

Technological benefits
We standardized metabolomics
Scientific impact
Metabolomics benchmark

Technological benefits

Connect the dots to bring research to a new level – Measure locally and connect science globally

biocrates ready to use kits

Standardized & reproduceable	Harmonized data format & data storage; simplified and biology-driven data analysis
Robust & quantitative	Comparability across instruments, labs and users Use in longitudinal, large-scale and validation cohorts
Decentralized multi-lab and multi-instrument approach Local availability of platform	Pool data from multiple experiments, instruments & laboratory in one combined data base Independent validation of third-party results

Total ownership of the results within a global network – Realizing the FAIR principles

Standardized targeted metabolomics

Standardized metabolomic data connect science globally

Kit components

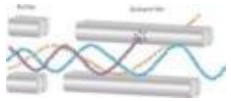
- Reagents & consumables
- Methods & protocols
- Workflow manager MetIDQ

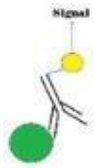
Laboratory environment

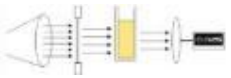
- Inter-laboratory

- Inter-MS instrument

- All different technologies delivering absolute concentrations







Database MetIDQ

Harmonized & standardized data format in one data base

long time reliable for re-analysis

Combined analysis with other omics data (e.g. GWAS)

Scientific impact

> 1,000 publications, > 27,000 citations and h-Index 79 support strong scientific impact of our technology

2018	European Heart Journal	Tomas et al.	Cardiology
2018	Cell Metabolism	Della Torre et al.	Hepatology
2018	Cell Metabolism	Raud et al.	Immunology
2018	Gut	Mayerle et al.	Oncology
2018	Alzheimer‘s & Dementia	Mahmoudian Dehkordi et al.	Neuroscience
2018	Alzheimer‘s & Dementia	Tynkkynen et al.	Neuroscience
2018	J Cachexia Sarcopenia Muscle	Pin et al.	Oncology
2018	Nature Communications	Mao et al.	Aging

Impact factor
> 12.000

2018	PLoS Medicine	Varma et al.	Neuroscience
2018	JNCI	Lu et al.	Oncology
2018	PNAS	Willis et al.	Systems Biology
2018	PNAS	Skene et al.	Lifestyle
2017	Journal of Experimental Medicine	Bakiri et al.	Oncology
2017	European Respiratory Journal	Naz et al.	Pulmonology

Impact factor
> 9.500

2018	EMBO Molecular Medicine	Jia et al.	Pulmonology
2018	PLoS Biology	Diessler et al.	Somnology
2018	Cancer Research	Mycielska et al.	Oncology
2018	BMC Medicine	DiBattista et al.	Epidemiology
2018	BMC Medicine	Lau et al.	Epidemiology
2018	Am J of Human Genetics	Romano et al.	Systems Biology
2018	EMBO Reports	Audano et al.	Systems Biology
2018	JASN	Li et al.	Nephrology
2018	Theranostics	Schaarschmidt et al.	Hepatology
2018	Int Journal of Epidemiology	Iqbal et al.	Epidemiology
2018	Cell Reports	Walters et al.	Aging
2018	International Journal of Cancer	Yuan et al.	Oncology

Impact factor
> 7.000

AbsoluteIDQ® p180 kit I

Key benefits
Analytical coverage
How it works
Analytical performance
Matrices

p180 kit – Key benefits

Standardized quantitative metabolomics – Up to 188 quantitative metabolic features

Key benefits	Features
1 Connecting	Data comparable in space in time. pooling of data sets for larger cohorts
2 Revealing	Unique coverage: 188 metabolites/lipids from 7 analyte classes
3 Translatable	High-quality, reproducible results at small sample volume of 10 µL
4 Straight forward	Ready-to-use kit

p180 kit – Key benefits

All in one box

Excellent longitudinal & inter-laboratory reproducibility

High throughput & small sample volume of 10 µL

Standardized, simple & automated workflow

Kit components:

- Reagents & Consumables
  - Kit plate
  - Standardized samples:
    internal standards, calibration standards, and QCs
- Instrument methods
  - Ready to use LC-MS methods
  - **Method optimization not required**
- Documentation and support
  - Detailed user manuals
  - Video tutorials
  - Application notes for multiple sample matrices
  - biocrates support by specialists
- Workflow manager MetIDQ™ software
  - Project, sample, and plate management
  - Automated quantification and quality assessment
  - Data normalization
  - Export of results for easy data analysis

p180 kit – Analytical coverage

188 metabolites | lipids from 7 analyte classes

LC part

42 small molecules (2 classes)

- Amino acids (21)
- Biogenic amines (21)

analytical column

FIA part

146 lipids & hexose (5 classes)

- Acylcarnitines (40)
- Phosphatidylcholines (76)
- Lysophosphatidylcholines (14)
- Sphingomyelins (15)
- Monosaccharide (1)

Quant 500 kit – Analytical coverage

630 metabolites/lipids from 26 analyte classes

Nutrition-microbiome-host interaction

107 small molecules (14 classes)

- Alkaloids (1)
- Amine oxides (1)
- Amino acids (20)
- Amino acid related (30)
- Bile acids (14)
- Biogenic amines (9)
- Carbohydrates and related (1)
- Carboxylic acids (7)
- Cresols (1)
- Fatty acids (12)
- Hormones and related (4)
- Indoles and derivatives (4)
- Nucleobases and related (2)
- Vitamins and cofactors (1)

produced or modified by gut microbiota

523 lipids (12 classes)

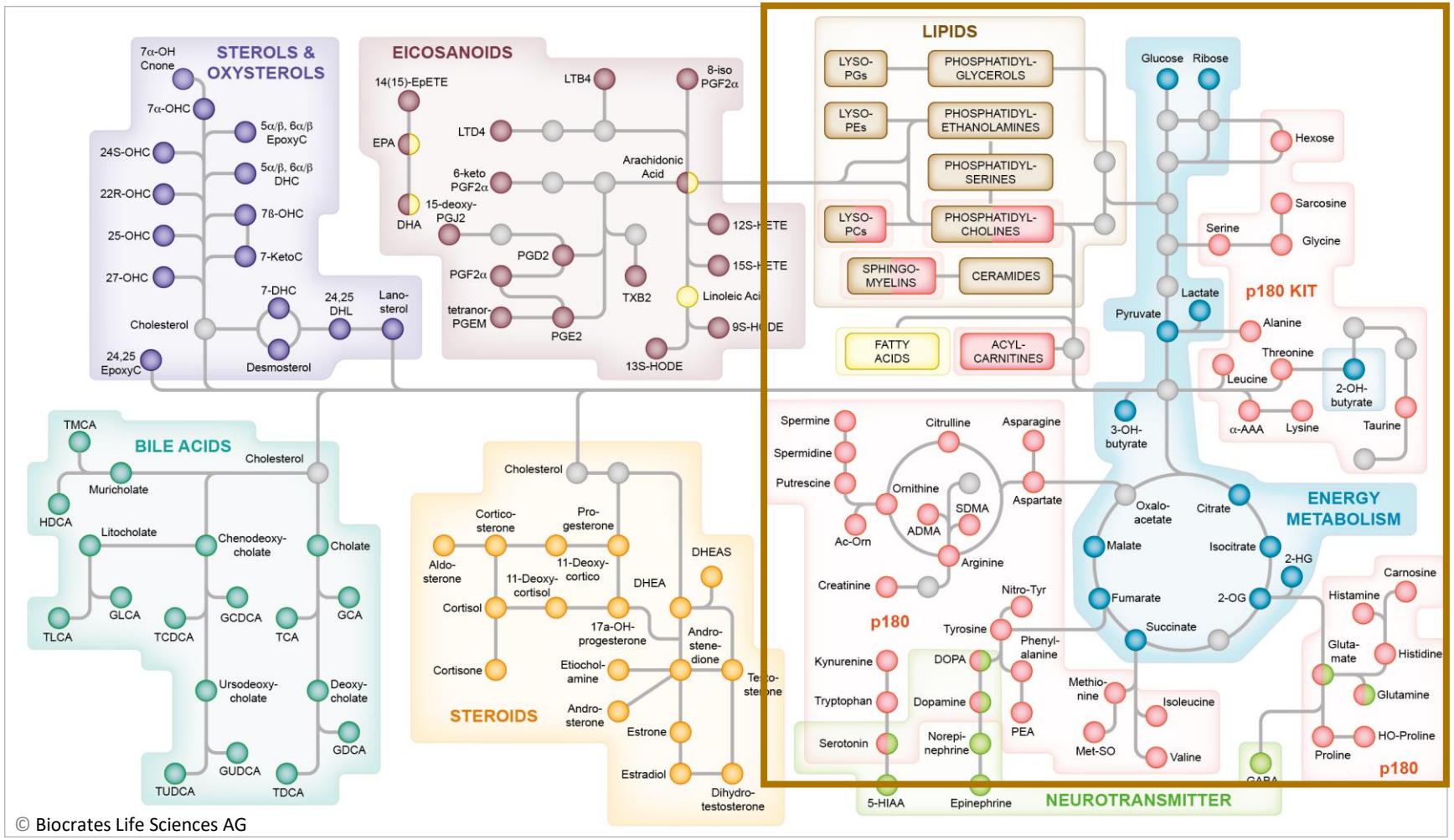
- Acylcarnitines (40)
- Phosphatidylcholines (76)
- Lysophosphatidylcholines (14)
- Sphingomyelins (15)
- Cholesteryl esters (22)
- Ceramides (28)
- Dihydroceramides (8)
- Hexosylceramides (19)
- Dihexosylceramides (9)
- Trihexosylceramides (6)
- Diglycerides (44)
- Triglycerides (242)

+ 234 Sums & Ratios

MetaboINDICATOR

p180 kit – Analytical coverage – Pathways

Broad coverage of metabolic pathways



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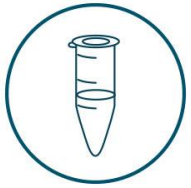
p180 kit

p180 kit – How it works, the workflow

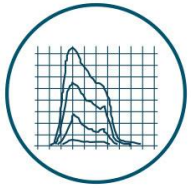
80 samples in 22 hours

Workflow initiation
- Create a new project workflow in MetIDQ™
- Register your samples

Sample preparation
- Perform system suitability test
- Derivatize and extract your samples
- Pipette samples, standards, and QCs onto the plate



Data collection
- Run plates with LC- and FIA-MS
- Instrument-specific methods are provided



Quantitation & Validation
- Automated peak identification and quantification
- Automated sensitivity & accuracy check
- In-built data normalization suite

Statistics & Interpretation
- Perform advanced statistics: export from MetIDQ™ to statistics software of choice

Insight & Understanding
- Make decisions based on standardized and reproducible metabolomic data
- Compare your results with published kit data from other laboratories

Quant 500 kit – How it works, the workflow

80 samples in 42 hours

Workflow initiation
- Create a new project workflow in MetIDQ™
- Register your samples

Sample preparation
- Perform system suitability test
- Derivatize and extract your samples
- Pipette samples, standards, and QCs onto the plate

Data collection
- Run plates with LC- and FIA-MS
- Instrument-specific methods are provided

Quantitation & Validation
- Automated peak identification and quantification
- Automated sensitivity & accuracy check
- In-built data normalization suite

Statistics & Interpretation
- Perform advanced statistics: export from MetIDQ™ to statistics software of choice

Insight & Understanding
- Make decisions based on standardized and reproducible metabolomic data
- Compare your results with published kit data from other laboratories

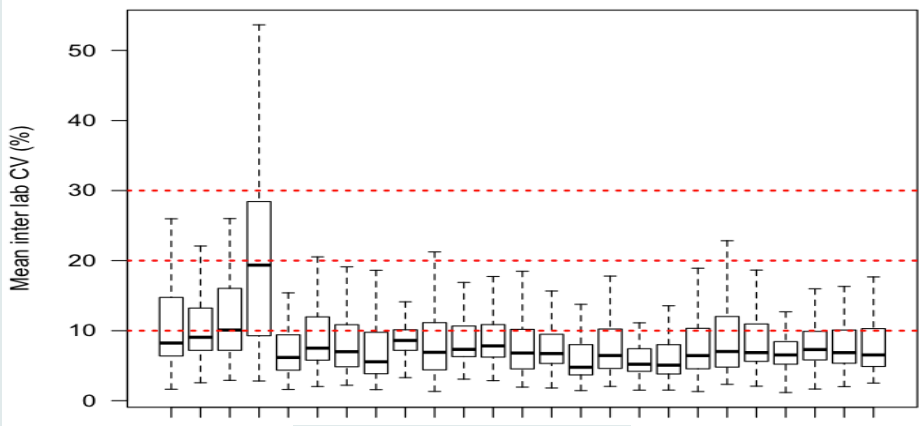
p180 kit – Analytical performance

Ring trial across 6 international laboratories

Inter-laboratory reproducibility of a targeted metabolomics platform for analysis of human serum and plasma

Alexandros P. Siskos,[1§] Pooja Jain,[1§] Werner Römisch-Margl,[2] Mark Bennett,[3] David Achaintre,[4] Yasmin Asad,[5] Luke Marney,[6] Larissa Richardson,[6] Albert Koulman,[6] Julian L. Griffin,[6] Florence Raynaud,[5] Augustin Scalbert,[4] Jerzy Adamski,[7,8,9] Cornelia Prehn,[7] Hector C. Keun[1*]

Inter-Laboratory Precision (CV in %)



Number of laboratories: 6

- Imperial College, UK
- Cambridge University, UK
- Institute of Cancer Research, UK
- Intern. Agency for Research on Cancer, France
- Helmholtz Zentrum München, Germany
- Biocrates, Innsbruck, Austria

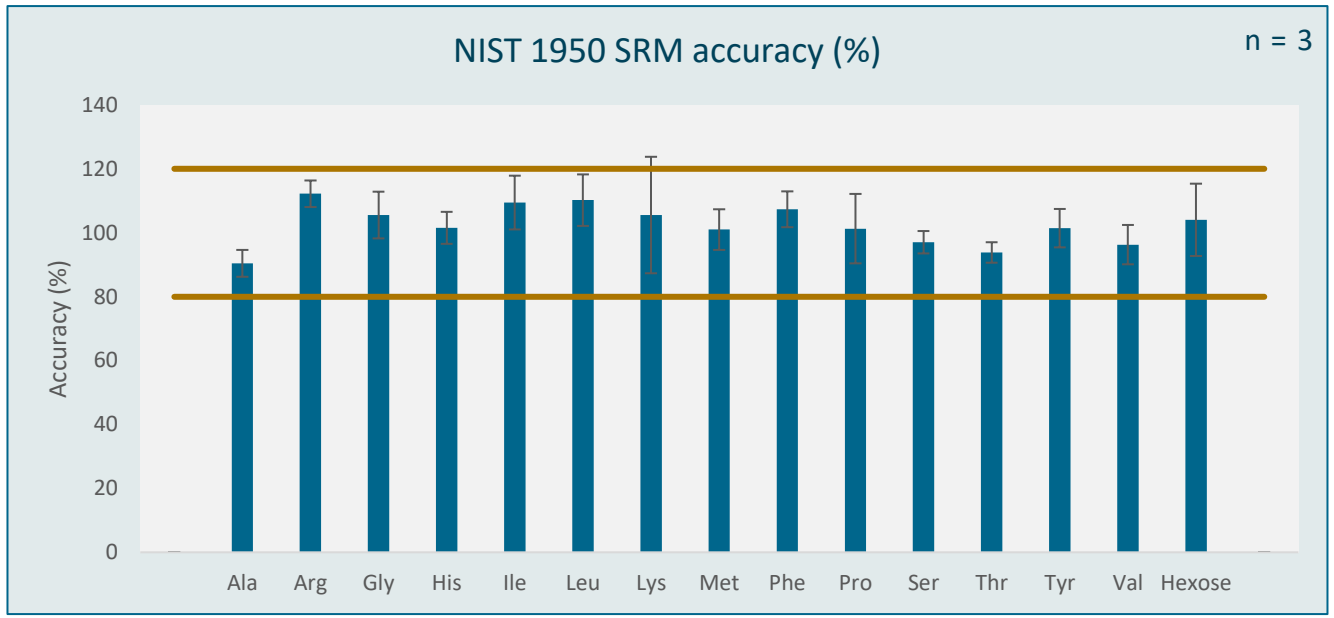
Inter-laboratory performance:

CV 7.6 %

Anal. Chem. 2017, 89, 656−665

p180 kit – Analytical performance

Proven analytical accuracy



NIST SRM 1950

> "The field MUST become more quantitative if findings are to be translated to practical, clinical applications."
>
> David Wishart (2015)

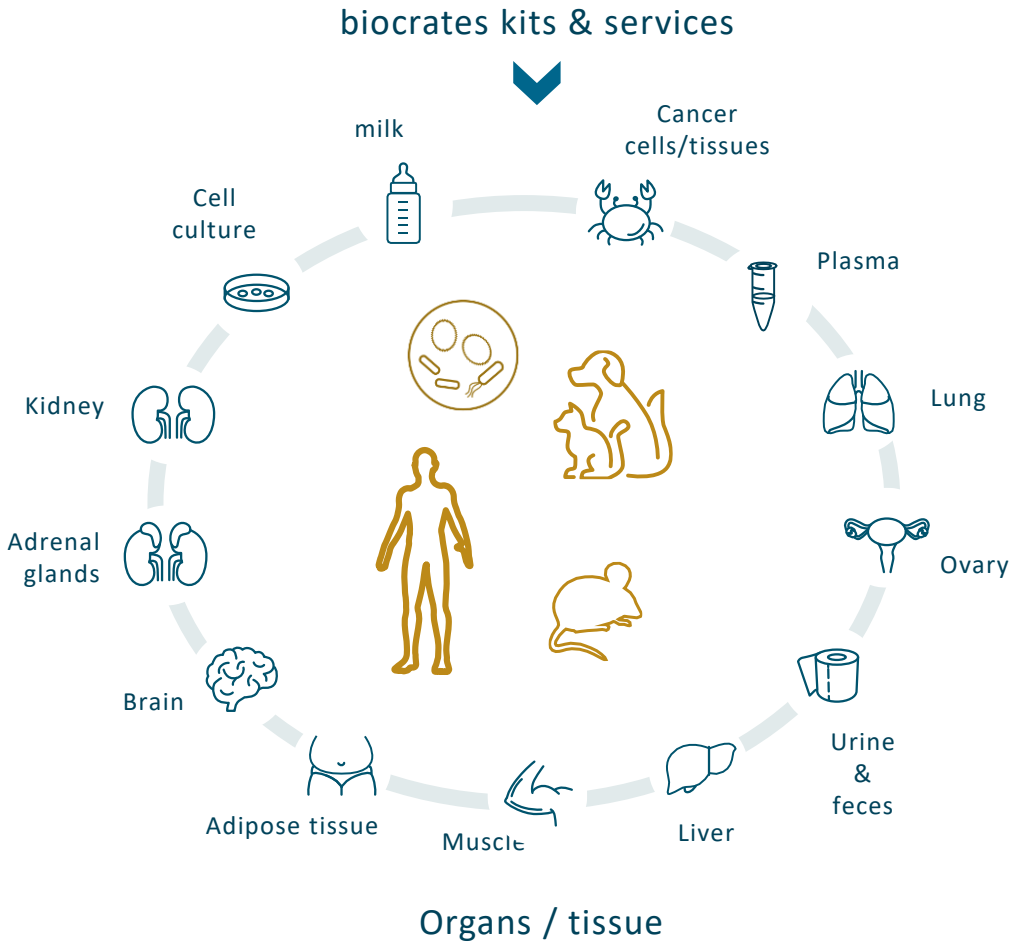
> "If we could get over this barrier [to not quantitate our data] then it will make exchanging data between labs and studies so much easier, and we could really move forward as a community."
>
> Jules Griffin (MetaboNEWS, Sept 2017)

p180 kit – Matrices and species

Connecting biological systems

Matrices

- Plasma, serum (only 10 µL)
- Dried blood spots
- Cell culture medium
- Tissue
- Tumor tissue:
- Lung lavage (BALF)
- Skin samples
- Blister liquid / skins
- Feces
- Follicular fluid
- Milk
- Urine
- CSF
- Saliva
- Cells
- Cell culture supplements



Species

- Human
- Mouse
- Rat
- Monkey
- Cow
- Sheep
- Pig
- Dog
- Chicken
- Horse
- Rabbit
- Zebrafish
- Chinese hamster
- C. elegans
- Soy
- Yeast: Pichia pastoris
- E. coli

p180 kit – Matrices and species

Connecting biological systems

Matrices

- Plasma, serum (only 10 µL)
- Dried blood spots
- Cell culture medium
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- Tumor tissue:
- Lung lavage (BALF)
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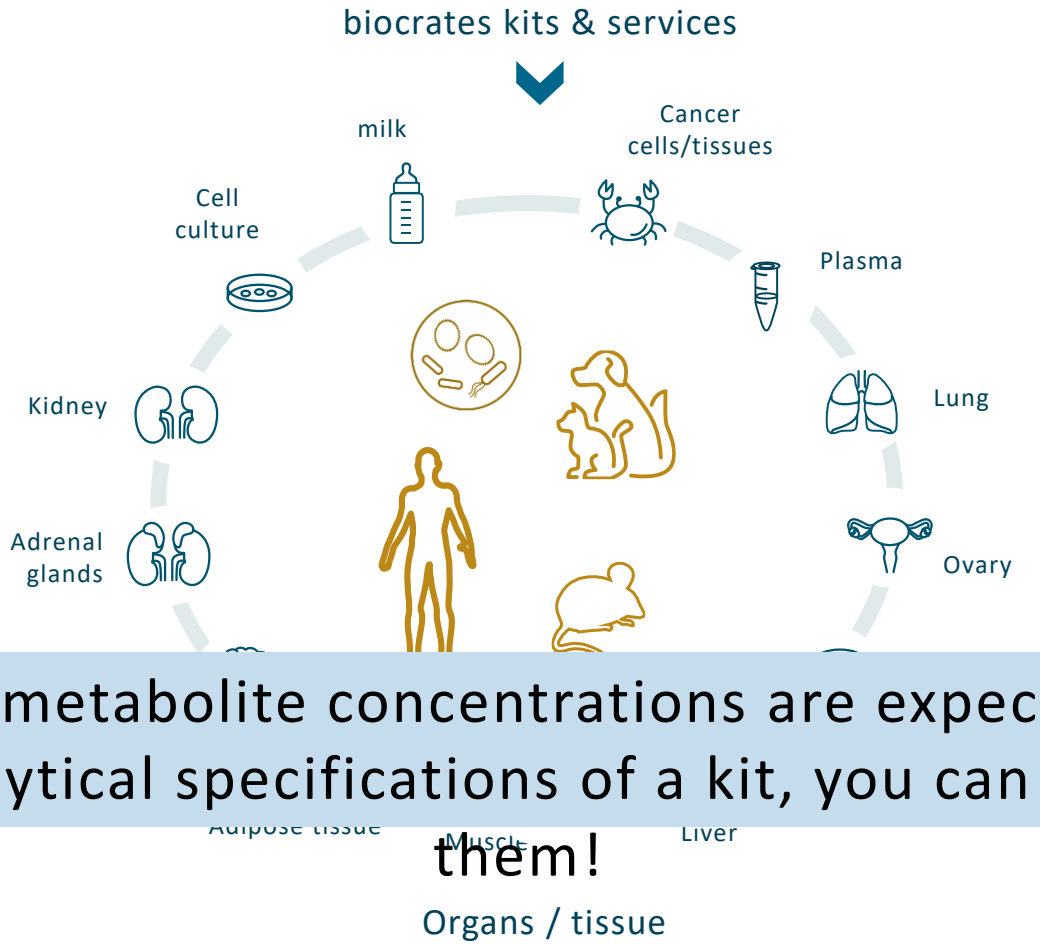
- Urine
- CSF
- Saliva
- Cells
- Cell culture supplements



Wherever metabolite concentrations are expected within the analytical specifications of a kit, you can analyze them!

Species

- Human
- Mouse
- Rat
- Monkey
- Cow
- Sheep
- Pig
- Dog
- Chicken
- Horse
- Rabbit
- Yeast: Pichia pastoris
- E. coli

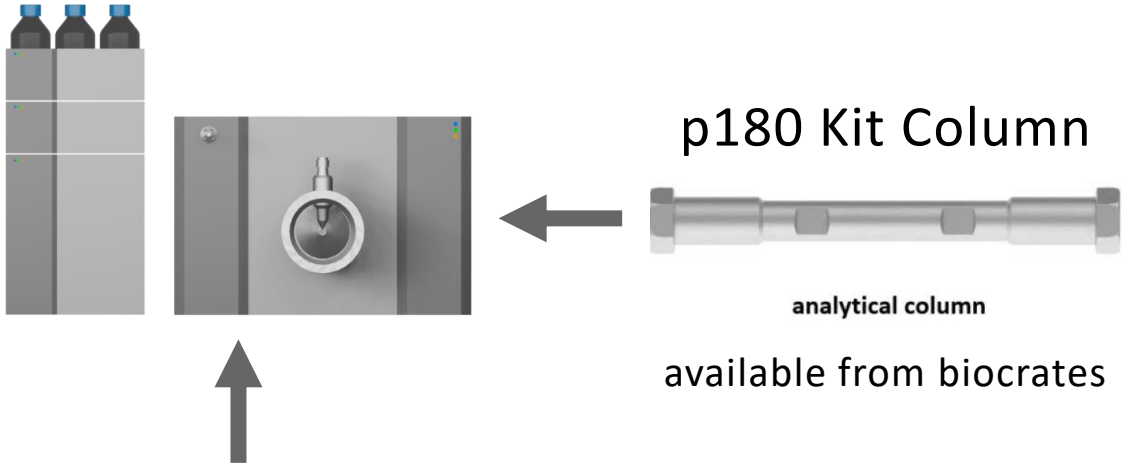
AbsoluteIDQ® p180 kit II

Setup
Workflow – preparation, measurements, data processing
Assay preparation – hints and tricks

p180 kit – Workflow

Setup – first time kit use only:

I. LC-MS instrument method setup



p180 Kit Column

analytical column

available from biocrates

MS methods included

Method setup:

- ✓ Instrument methods included in kit
  No tuning or optimization required
- ✓ Install methods according to user manual
- ✓ Assistance by customer support on request

p180 kit – Workflow

Setup – first time kit use only:

II. System suitability test (SST)

testmix
LC

testmix
FIA

Method setup:

- ✓ Ready to use testmix
- ✓ Instrument cleaning instructions

1. Inject testmix
2. Adjust retention times (RTs)
3. Check instrument performance (SST)
4. Performance assessment together with customer support
5. Run the starter kit

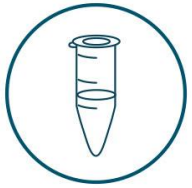
p180 kit – Workflow

1. Plate layout

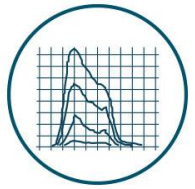
2. SST & kit preparation

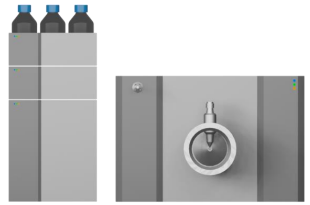
3. LC-/FIA-MS run

30 min



4 h





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15.5 h

MetIDQ
Oxygen

2 h

Total time: 22 h

6. Interpretation

5. Performance assessment & export of results

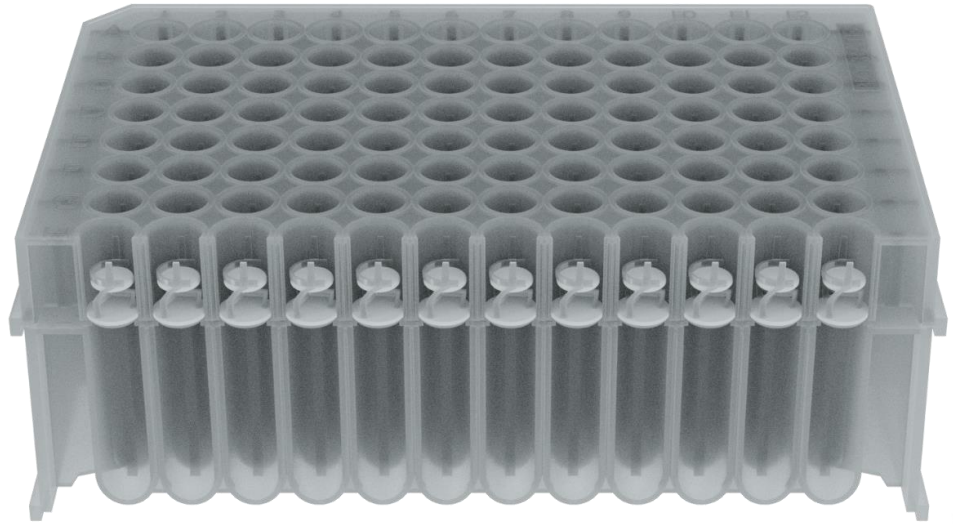
4. MS data processing

p180 kit – Workflow

1. Plate layout

Kit plate design:

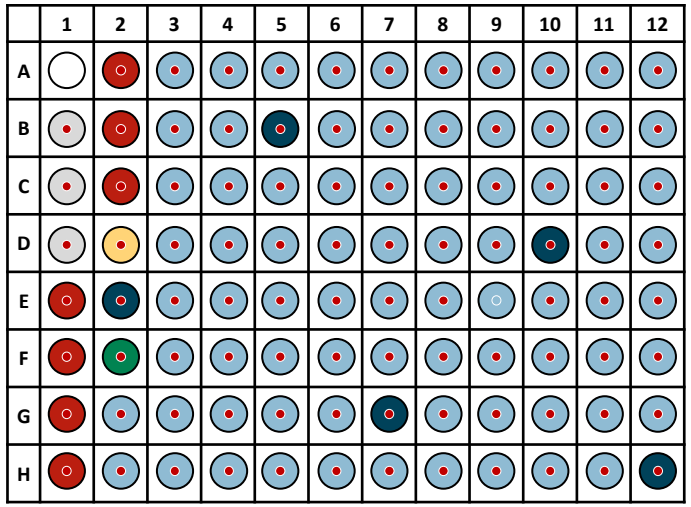
- All kits use 96 well plates
- Some wells are used for kit specific samples
  - blank
  - zero
  - calibration standards
  - quality controls (QCs)



p180 kit – Workflow

1. Plate layout

Kit plate design:



- blank
- zero samples
- calibration standards
- internal standards
- up to 82 samples

QCs in 3 levels:

- low
- medium
- high

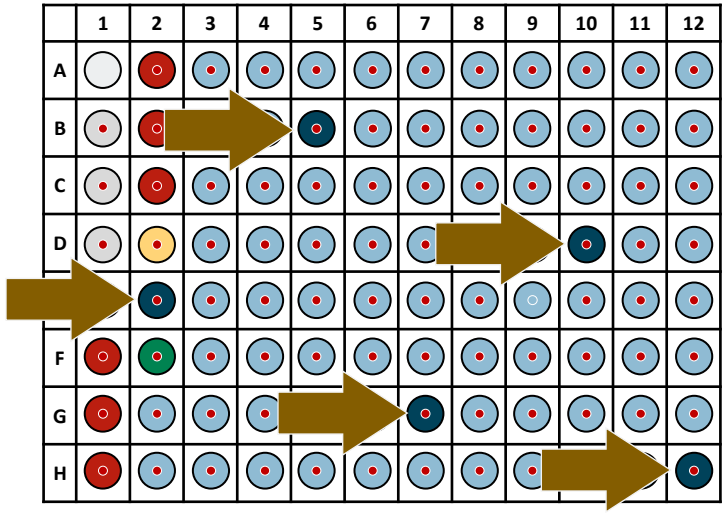
78 – 82 samples can be analyzed per kit

p180 kit – Workflow

1. Plate layout

Recommended: 5x QCs replicates

Best normalization performance = best longitudinal comparability



78 samples can be analyzed per kit

p180 kit – Workflow

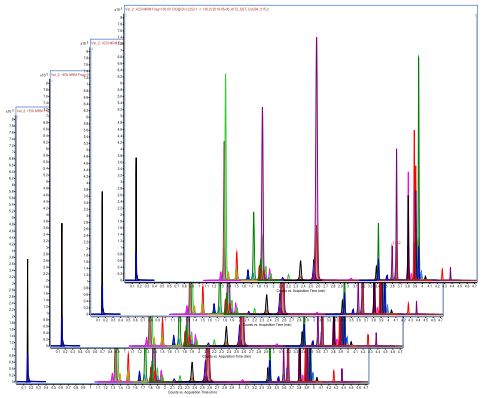
1. Plate layout

5x QCs replicates required for:

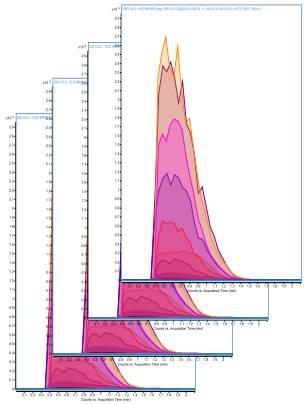
- Highly robust, quantitative results
- Excellent accuracy & precision

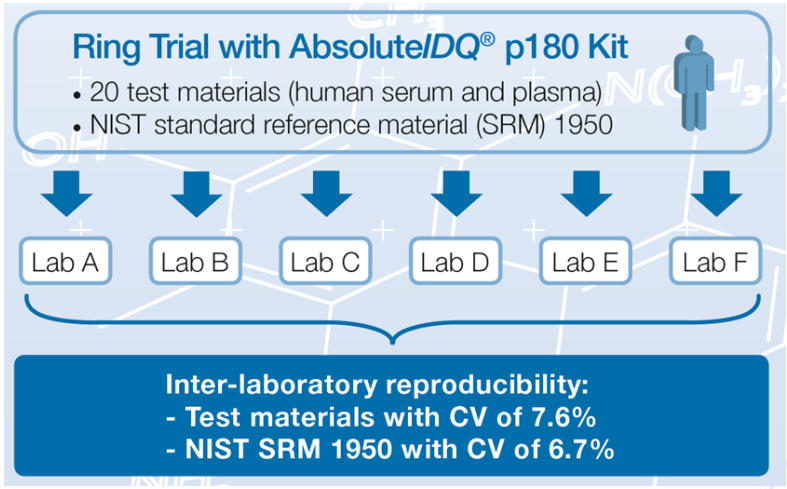
- Outstanding inter-instrument, inter-laboratory, long-term reproducibility
- Applicable to multi-center, longitudinal epidemiological studies

LC-MS



FIA-MS





Siskos et al., Anal Chem 2017; 89(1):656-65

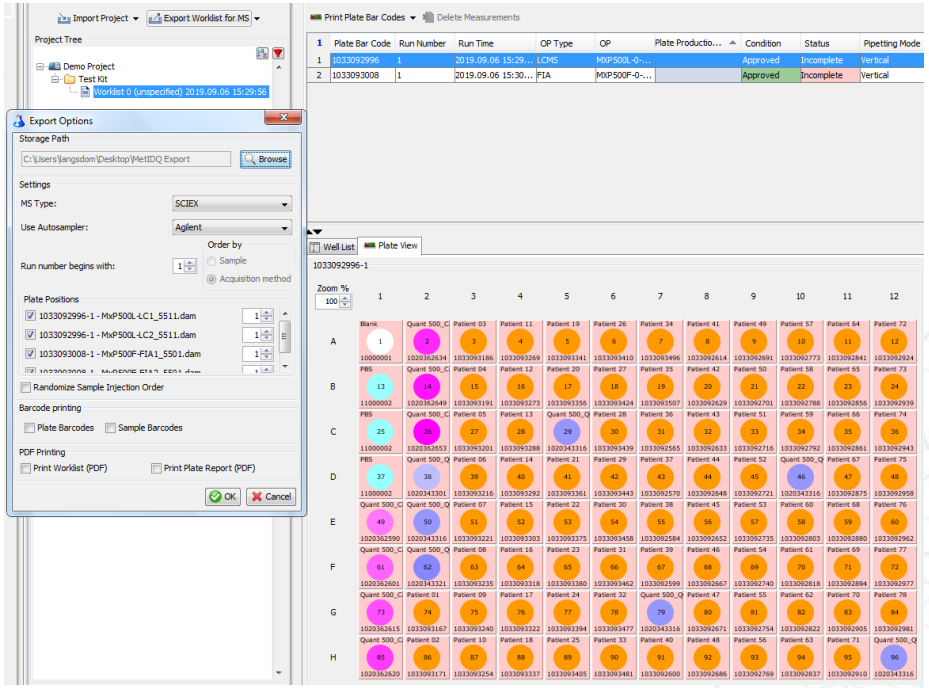
p180 kit – Workflow

1. Plate layout

MetIDQ

1. Register samples
2. Create plate layout
3. Export layout for kit pipetting and LC-MS runs

MetIDQ™ software



p180 kit – Workflow

2. SST & kit preparation

System suitability test (SST)

testmix
LC

testmix
FIA

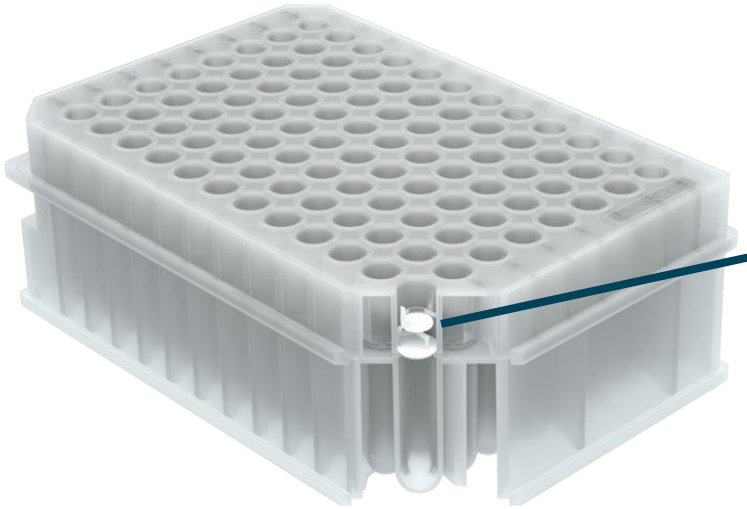
- ✓ If required, follow instrument cleaning instructions
- ✓ Use testmix

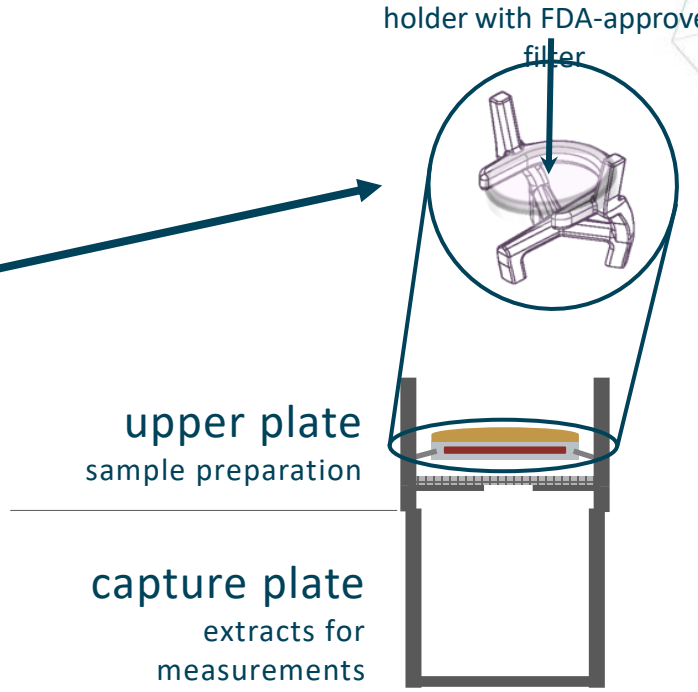
1. Inject testmix
2. Check retention times (RTs)
3. Check instrument performance (SST)
4. Run the kit

p180 kit – Workflow

2. SST & kit preparation

Kit plate and components





Advantages:

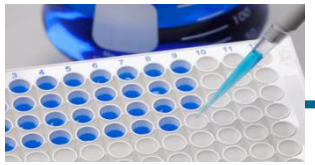
- Internal standards on plate
- Easy and fast sample preparation
- Efficient derivatization, drying and extraction
- Precipitated proteins are filtered

- Calibration standards (7 levels)
- Quality controls (3 levels)
- Testmix (2 vials)

p180 kit – Workflow

2. SST & kit preparation

Kit preparation



4 h

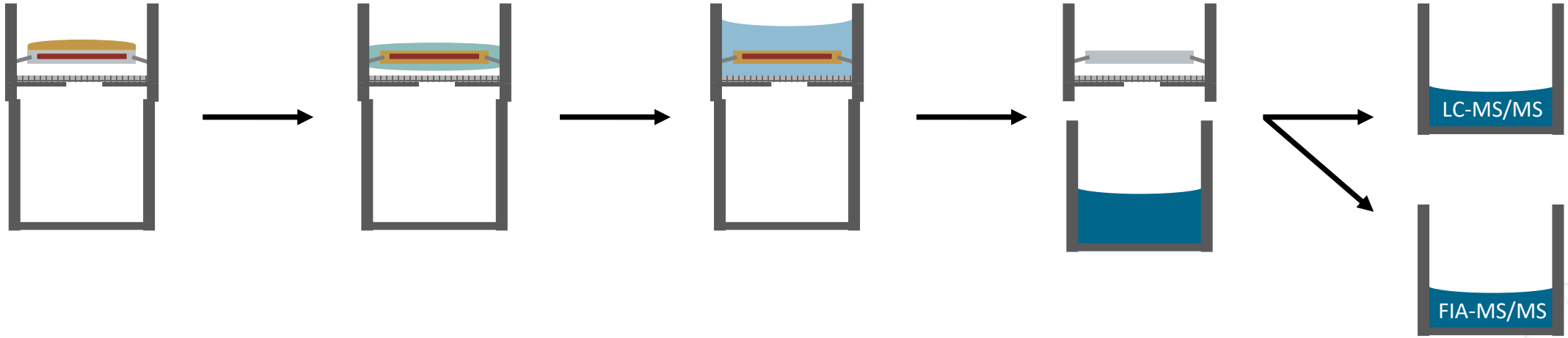
- 10 µL sample
- 10 µL ISTDs
- 30 min N_2 drying

- PITC derivatization
- 25 min incubation
- 60 min N_2 drying

- Extraction
- 30 min shaking

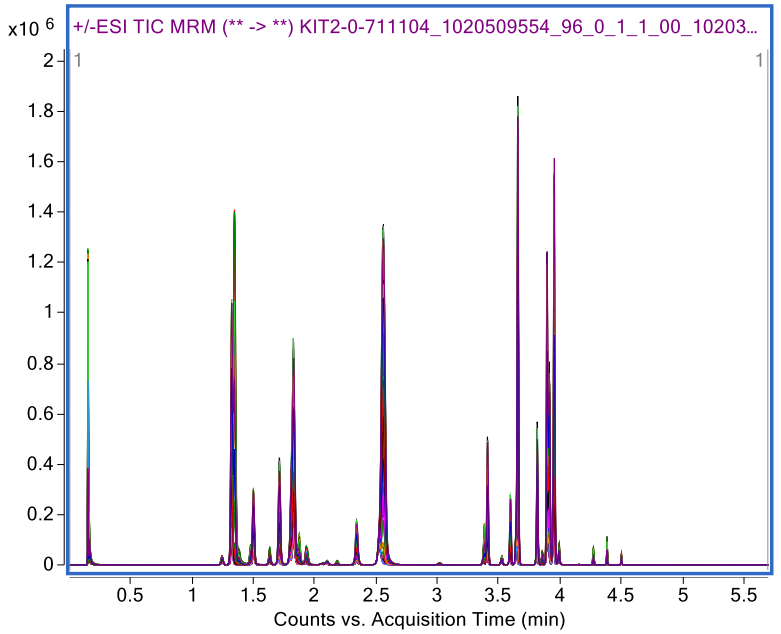
- Filtration
- Centrifugation or positive pressure

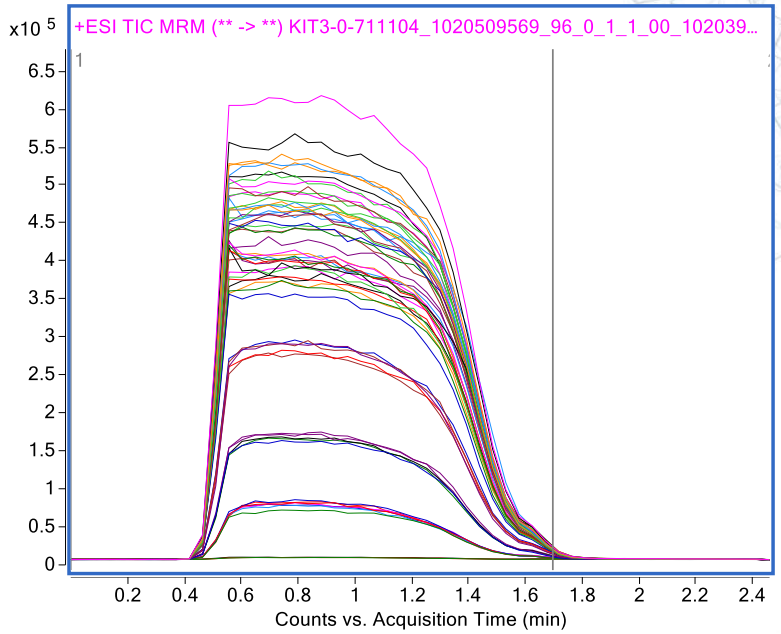
- Split extract
- Transfer to empty plates and dilute separately



p180 kit – Workflow

3. LC-/FIA-MS run





MS methods included

LC-MS

- 6 min / sample
- 42 analytes
  amino acids, biogenic amines

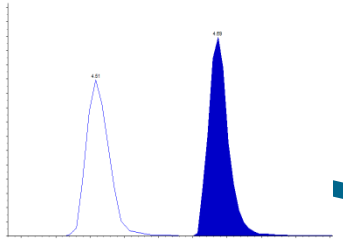
FIA-MS

- 3 min / sample
- 146 analytes
  acylcarnitines, hexose, glycol-& lysophospholipids, sphingomyelins

p180 kit – Workflow

4. MS data processing

LC data

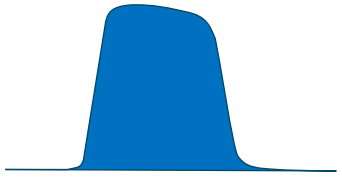


by

MetIDQ

MetIDQ™ software

FIA data



automated by

MetIDQ

MetIDQ™ software

LC and FIA results

biocrates
The future of research and health

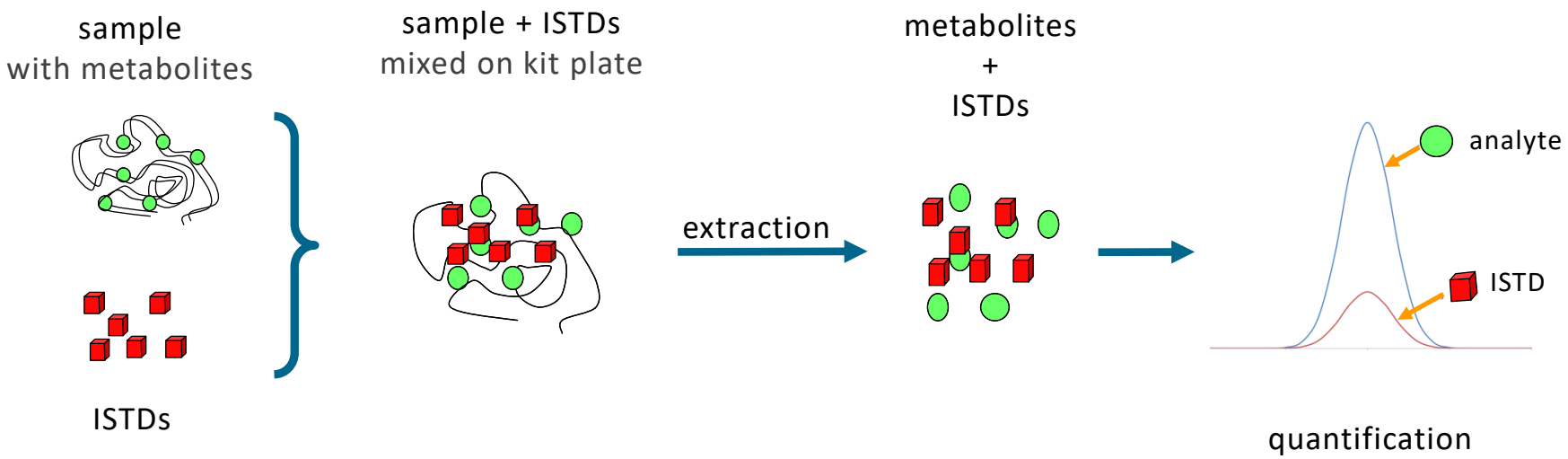
O Oxygen MetIDQ

p180 kit – Workflow

4. MS data processing

Quantification uses internal standards (ISTDs)

= “automated” intra-plate normalization

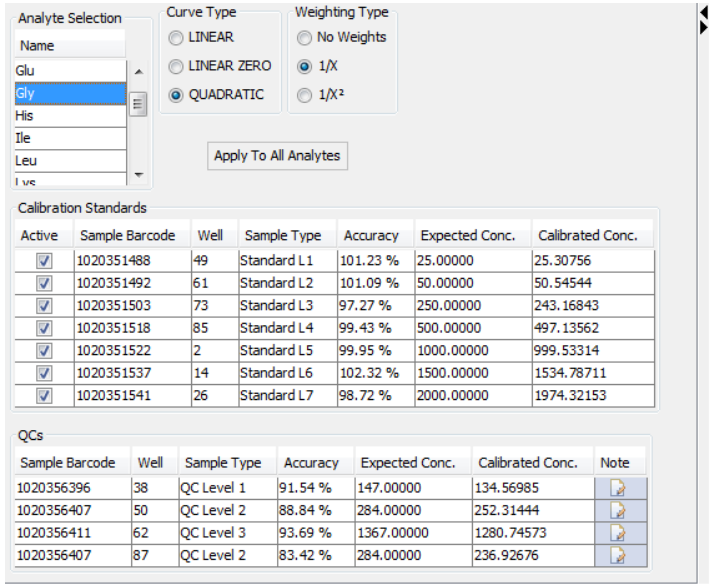


p180 kit – Workflow

4. MS data processing

LC part:

- 7-point calibration + internal standards
- Internal standards → intra-plate normalization
- External standards (pure metabolites) → 7-point calibration
- Quality controls → performance assessment + inter-plate normalization



Analyte Selection

Name

Glu
Gly
His
Ile
Leu
Lys

Curve Type: LINEAR, LINEAR ZERO, QUADRATIC

Weighting Type: No Weights, 1/X, 1/X²

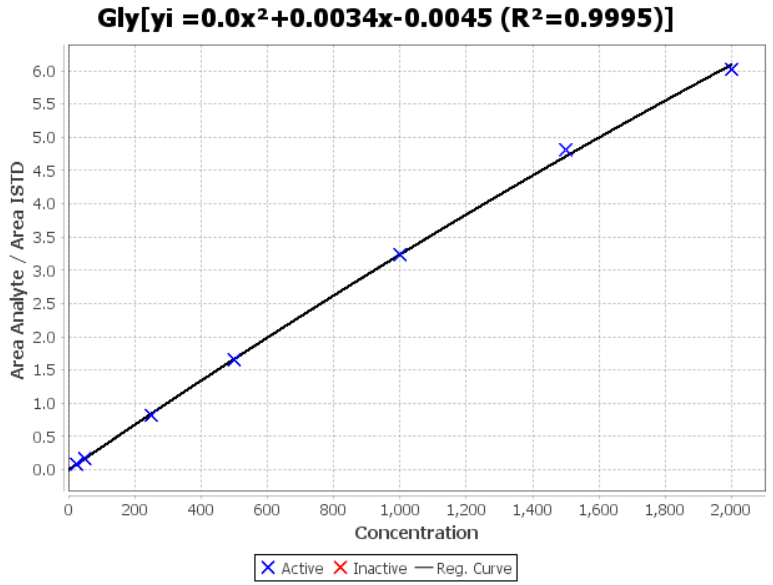
Apply To All Analytes

Calibration Standards

Active	Sample Barcode	Well	Sample Type	Accuracy	Expected Conc.	Calibrated Conc.
☑	1020351488	49	Standard L1	101.23 %	25.00000	25.30756
☑	1020351492	61	Standard L2	101.09 %	50.00000	50.54544
☑	1020351503	73	Standard L3	97.27 %	250.00000	243.16843
☑	1020351518	85	Standard L4	99.43 %	500.00000	497.13562
☑	1020351522	2	Standard L5	99.95 %	1000.00000	999.53314
☑	1020351537	14	Standard L6	102.32 %	1500.00000	1534.78711
☑	1020351541	26	Standard L7	98.72 %	2000.00000	1974.32153

QCs

Sample Barcode	Well	Sample Type	Accuracy	Expected Conc.	Calibrated Conc.	Note
1020356396	38	QC Level 1	91.54 %	147.00000	134.56985	
1020356407	50	QC Level 2	88.84 %	284.00000	252.31444	
1020356411	62	QC Level 3	93.69 %	1367.00000	1280.74573	
1020356407	87	QC Level 2	83.42 %	284.00000	236.92676	

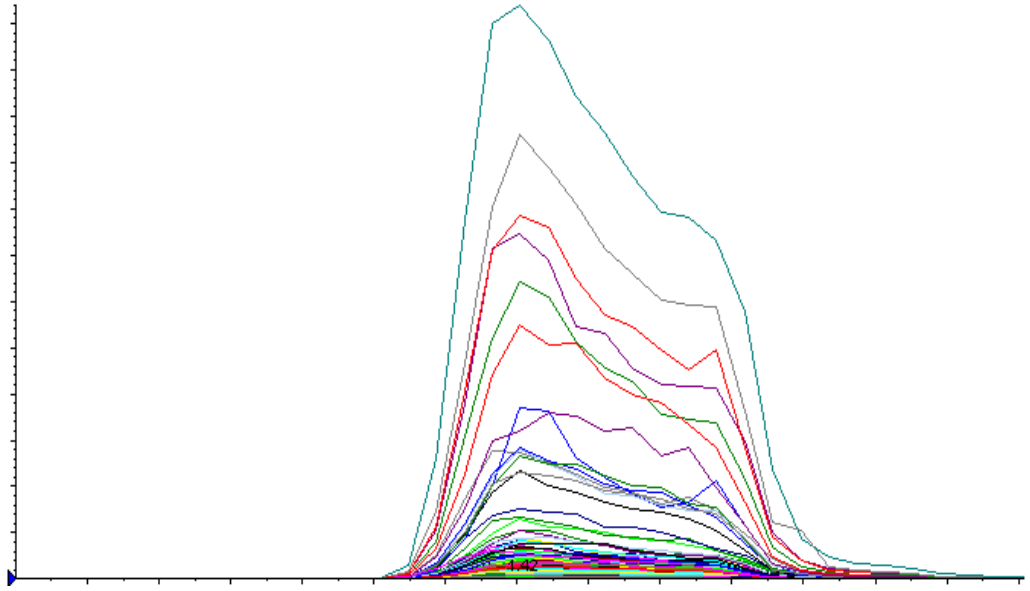


p180 kit – Workflow

4. MS data processing

FIA part:

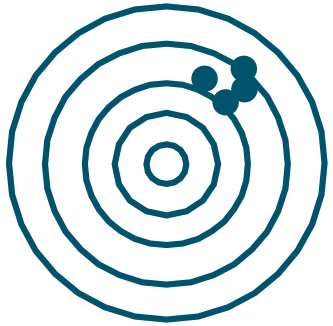
- 1-point calibration + internal standards
- Internal standards → intra-plate normalization
- Quality controls → performance assessment + inter-plate normalization



p180 kit – Workflow

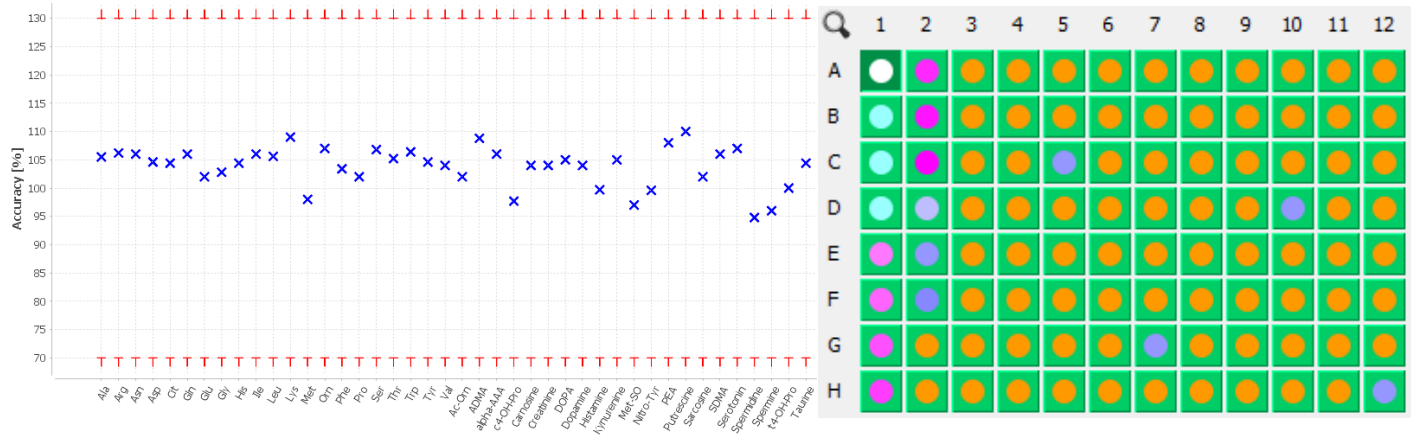
4. MS data processing

Performance:

LC part	FIA part	
		
quantitative accurate & precise	**quantitative** accurate & precise	**relative-quantitative** precise! accuracy?
Inter-plate data comparability: - QC normalization recommended	Inter-plate data comparability: - QC normalization required	

p180 kit – Workflow

5. Performance assessment & export of results



Thr	Trp	Tyr	Val	1-Met-His	3-Met-His	5-AVA	AABA
Aminoacids	Aminoacids	Aminoacids	Aminoacids	Aminoacids ...	Aminoacids ...	Aminoacids ...	Aminoacids ...
1.69	1.62	1.36	5.07	0.015	0.004	0.043	0.696
148	48.6	69.7	197	4.86	5.51	2.51	17.3
306	230	239	411	9.87	11.5	4.79	32.9
150	50.4	66.8	153	7.04	2.54	0.671	4.83
111	39.6	103	121	3.90	1.88	0.259	10.1
160	72.2	69.3	162	9.10	3.49	0.072	6.27
123	51.9	63.1	167	6.89	2.34	0.026	5.70
91.5	46.6	40.3	107	7.78	2.92	0.082	8.43
182	72.3	57.0	150	4.84	1.80	0.043	4.80
122	42.5	42.3	123	4.10	1.44	1.18	4.91
115	56.5	41.7	113	6.42	2.22	0.025	8.21
161	59.0	87.4	177	6.01	2.67	0.043	8.16
117	41.2	75.6	153	7.28	2.85	0.020	3.54

Automated technical validation:

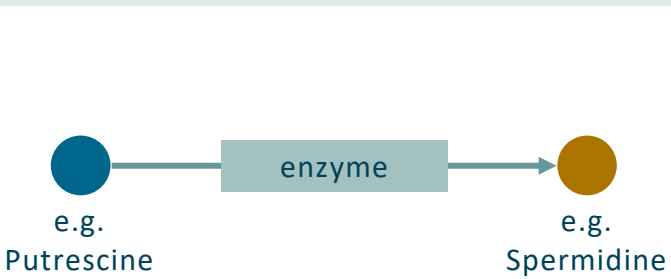
- ✓ blank — checking cleanliness of system
- ✓ sensitivity — checking internal standard intensities
- ✓ accuracy — checking quality control results
- ✓ monitoring — inter-plate monitoring of QC results and CVs

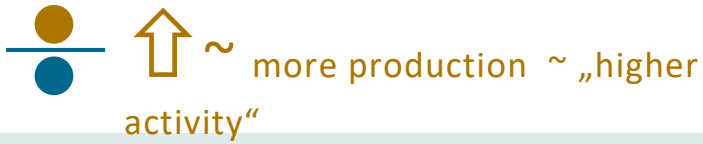
Analytical approval of the plate
Data normalization (recommended)
Export of results table in various file formats

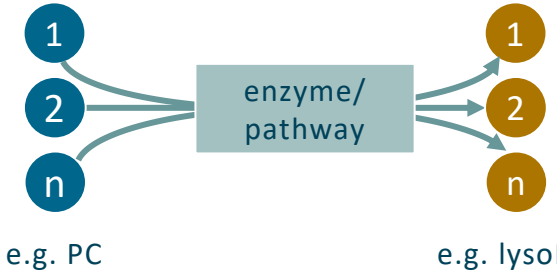
p180 kit – Workflow

6. Interpretation

What is a metabolism indicator?







$$\frac{\sum(1 \sim 2 \sim n)}{\sum(1 \sim 2 \sim n)}$$

A metabolism indicator can act as a proxy for enzyme activity

≠

Metabolism indicators allow to measure enzymatic activity with metabolomics

p180 kit – Workflow

6. Interpretation

Make data coherent – Why quantitation matters

Fischer ratio

↓ ratio

↑ severity of liver failure

$$\frac{\textbf{BCAA}\ (\text{Val} + \text{Leu} + \text{Ile})}{\textbf{AAA}\ (\text{Phe} + \text{Tyr} + \text{Trp})}$$

Fischer et al., Am J Surg 1974;127:40.

IDO activity

↑ ratio

↑ cancer invasiveness and progression

$$\frac{\textbf{Kynurenine (Kyn)}}{\textbf{Tryptophan (Trp)}}$$

Hornyák et al. 2018, Front Immunol 2018; 9:151.

Phospholipase A2 activity

↑ ratio

↑ inflammation and CVD

$$\frac{\textbf{Lysophosphatidylcholines (LPCs)}}{\textbf{Phosphatidylcholines (PCs)}}$$

Paapstel et al. Nutr Metab Cardiovasc Dis 2018; 28(1):44–52.

AAA: aromatic amino acids, BCAA: branched-chain amino acids, IDO: indoleamine 2,3-dioxygenase, CVD: cardiovascular disease

p180 kit – Workflow

Assay preparation – hints and tricks

p180 kit – Workflow

Assay preparation – hints and tricks

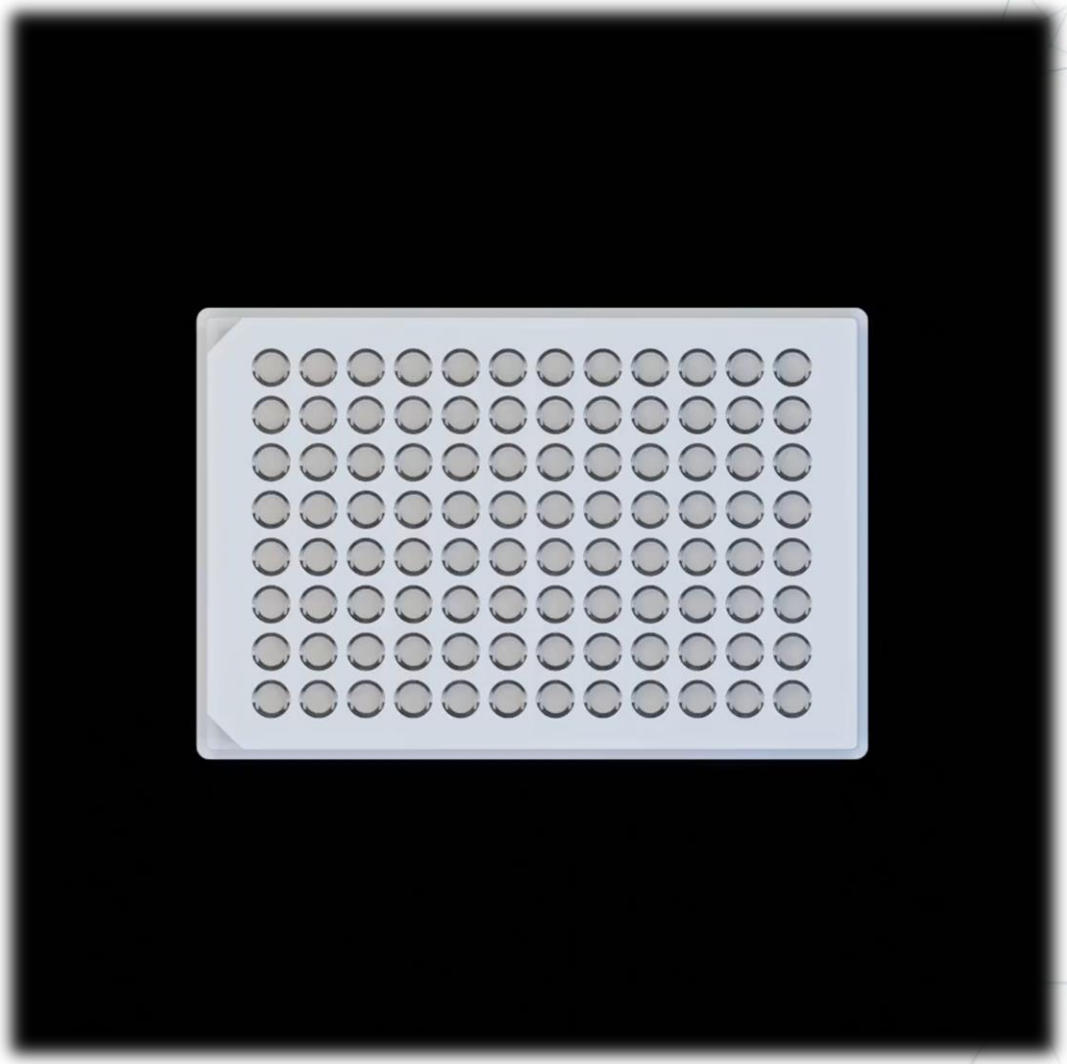
Kit plate - pipetting of samples:

- biocrates kit plate used
- sample volume: 10 µL

Let’s have a look at the pipetting of biocrates kit plates

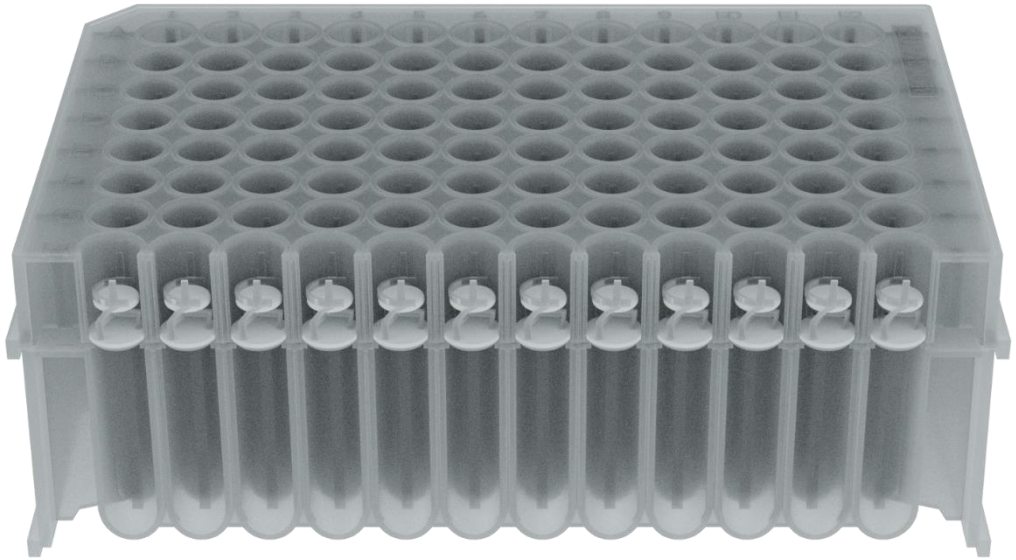
p180 kit – Workflow

Assay preparation – hints and tricks



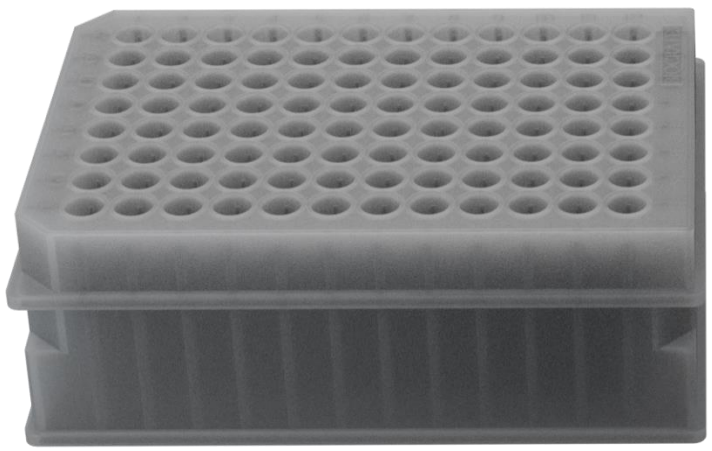
p180 kit – Workflow

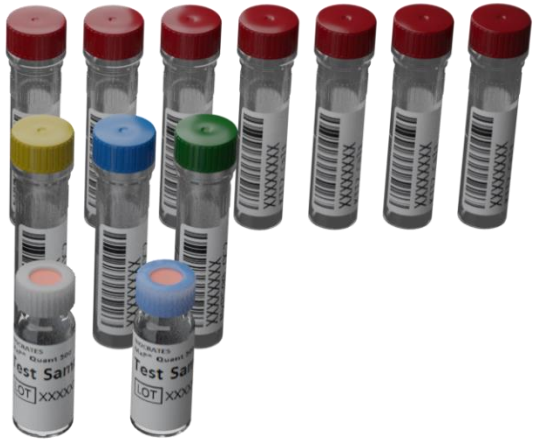
Assay preparation – hints and tricks



p180 kit – Workflow

Assay preparation – hints and tricks



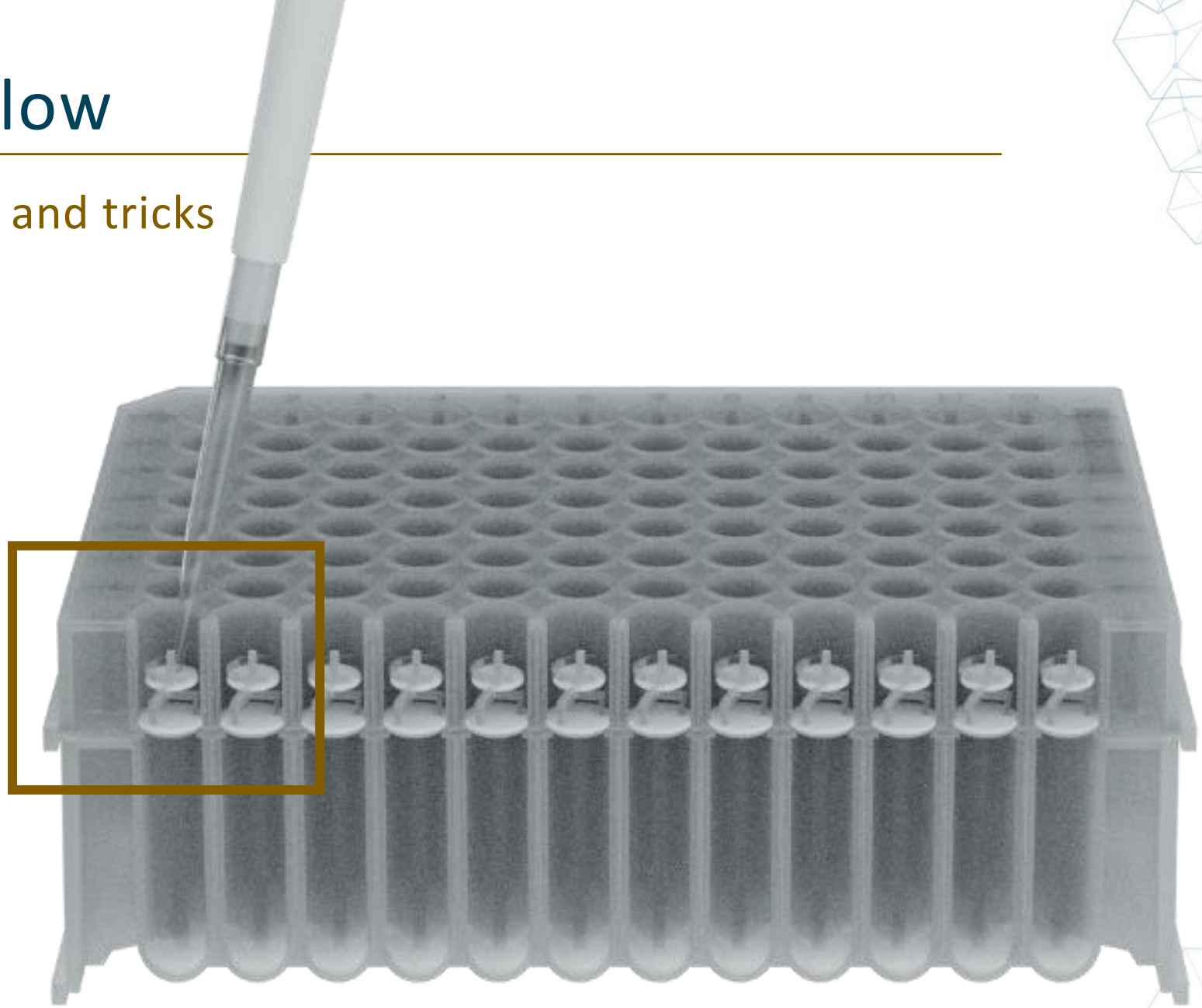


p180 kit – Workflow

Assay preparation – hints and tricks

p180 kit – Workflow

Assay preparation – hints and tricks



p180 kit – Workflow

Assay preparation – hints and tricks

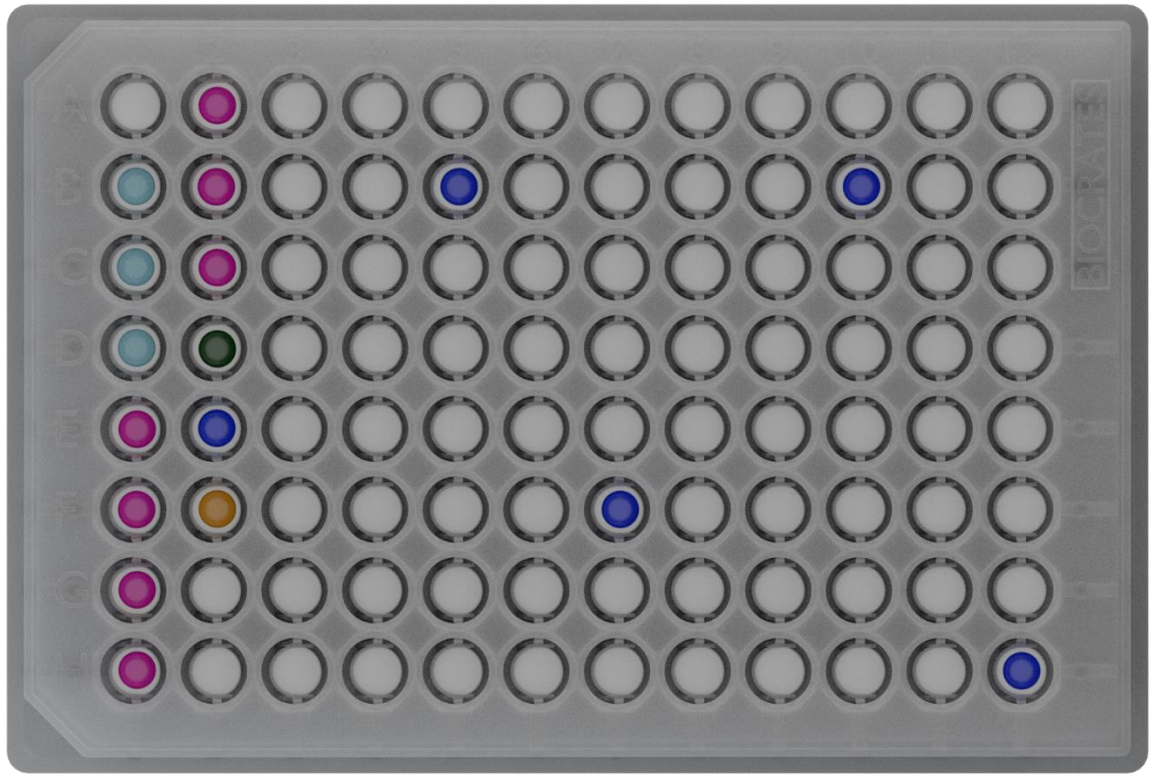
Standard and maximum sample volumes:

- Standard sample volume: 10 µL
  - for plasma and serum
  - unless otherwise noted in SOP
- Further matrices: what is the optimal sample volume?
  - perform pilot test using a small number of samples
  - try different sample volumes, e.g. 10, 20, 30 µL
  - for assistance, customer should contact customer support

p180 kit – Workflow

Assay preparation – hints and tricks

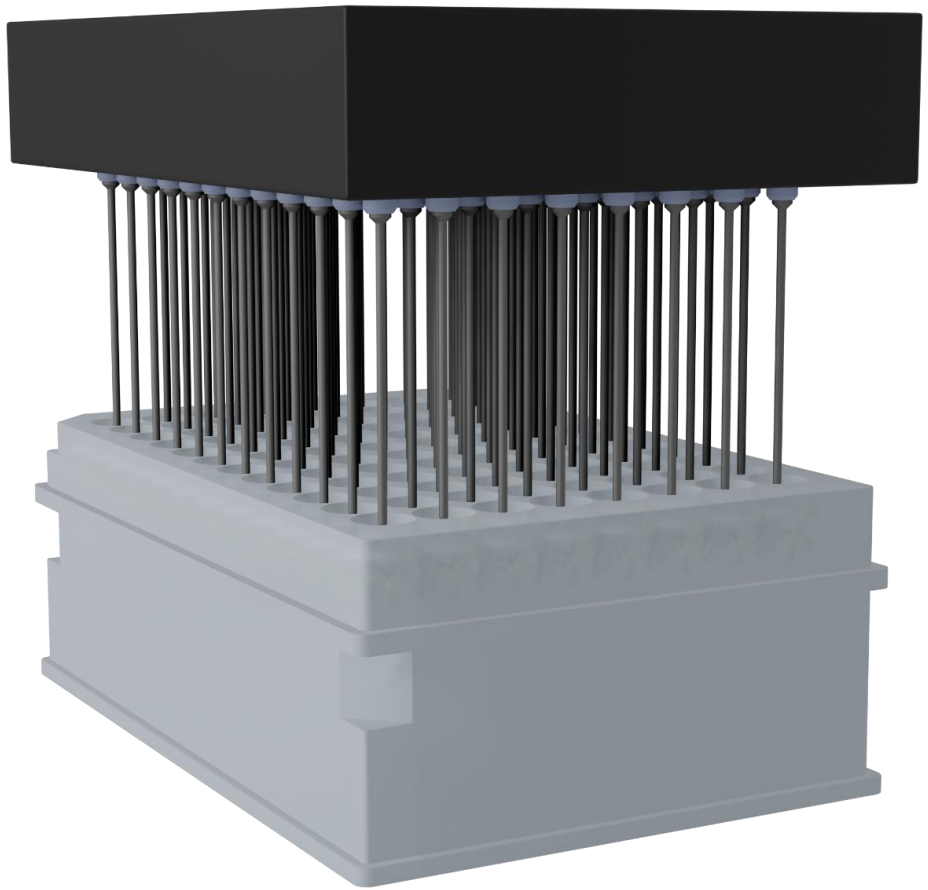
After sample preparation…



p180 kit – Workflow

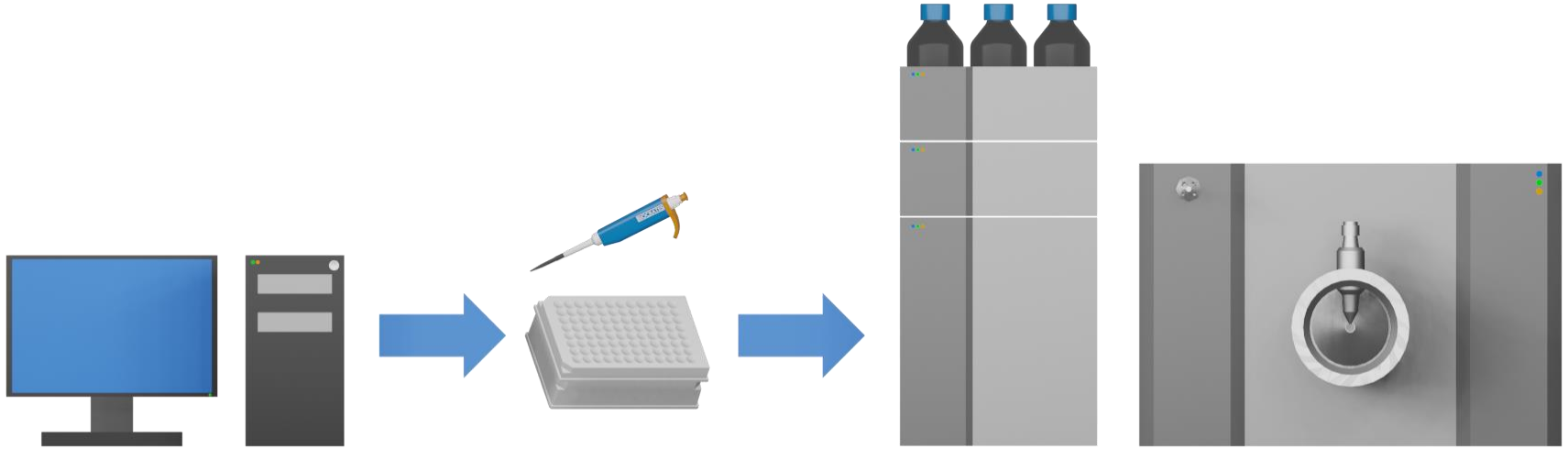
Assay preparation – hints and tricks

…drying of kit plate



p180 kit – summary

Lab workflow



p180 kit – summary

Measurements

MS methods included

Instrument methods included in kit:

- Ready to use
- No tuning or optimization required

Method setup:

- Install methods according to user manual
- Adjust retention times (RTs) using testmix
- Instrument test: perform SST
- Assistance by customer support on request

p180 kit – summary

All in one box

Excellent longitudinal & inter-laboratory reproducibility

High throughput & small sample volume of 10 µL

Standardized, simple & automated workflow

Key features:

- 10 µL sample volume
- multiple matrices per plate
- up to 80 samples per kit
- 4 h sample preparation time, 2 hours hands-on
- one day sample analysis run time
- 2 h data automatized analysis time

high throughput

p180: up to 500 samples per week

MetIDQ™ software live demo

Workflow manager for targeted metabolomics

- Before sample measurement:
  - register samples and projects,
  - generate plate layout and worklist for mass spectrometer
- After sample measurement:
  - quantification and data processing
  - export of results

MetIDQ™ software live demo

3 minutes break...

3 2 1

Stay tuned!

Contact

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