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Metabolomic & lipidomic information contained in Dried Blood Spot (DBS) vs. serum

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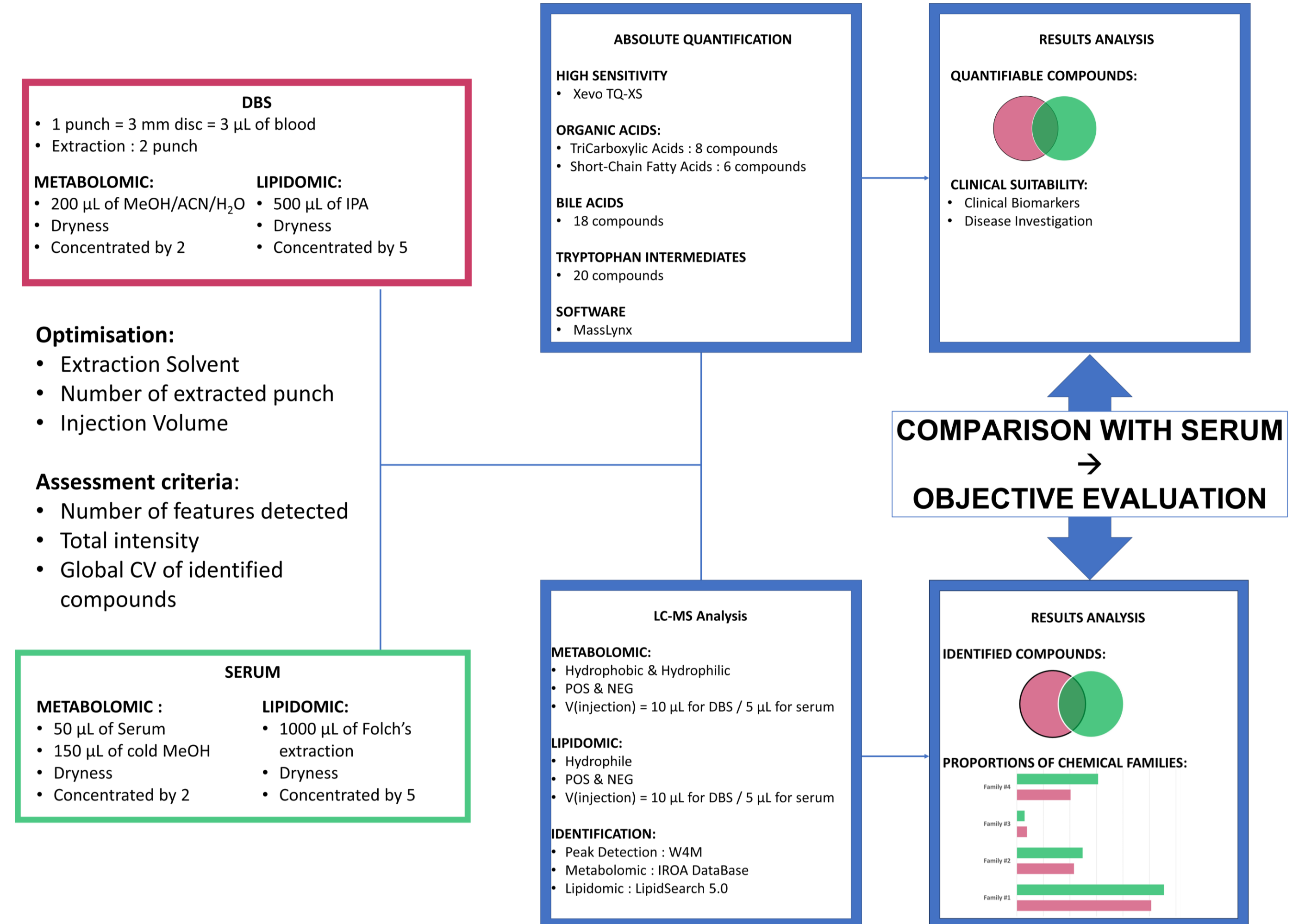
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INTRODUCTION

- Challenges of the personalized medicine are to make the right diagnosis in order to provide the right treatment at the right time to the right patient.
- Metabolomic approach allows to enhance patient biological data to describe the individual health status and to enhance the clinical biology parameters.
- Currently, several medical biology analyses are performed using blood samples.
- DBS (Dried Blood Spot) are used in clinical settings to detect neonatal diseases.
- DBS could be a self-sampling device, possibly sent by mail to the hospital, allowing everyone to easily access to biological analysis even in a remote area or for elderly patients with mobility problems.

The aim of this study is to evaluate the metabolomic and lipidomic information obtained from blood samples compared to DBS

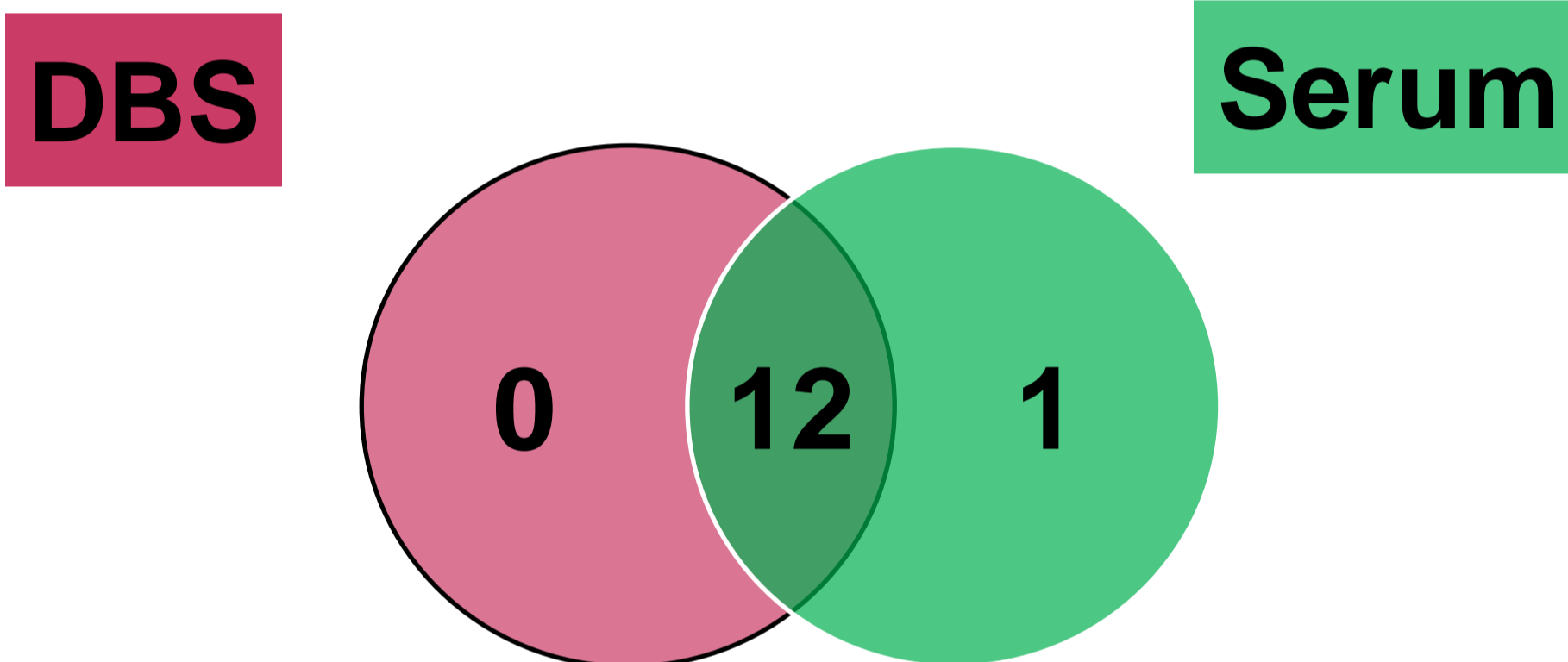
MATERIAL & METHODS



ABSOLUTE QUANTITATIVE DATA

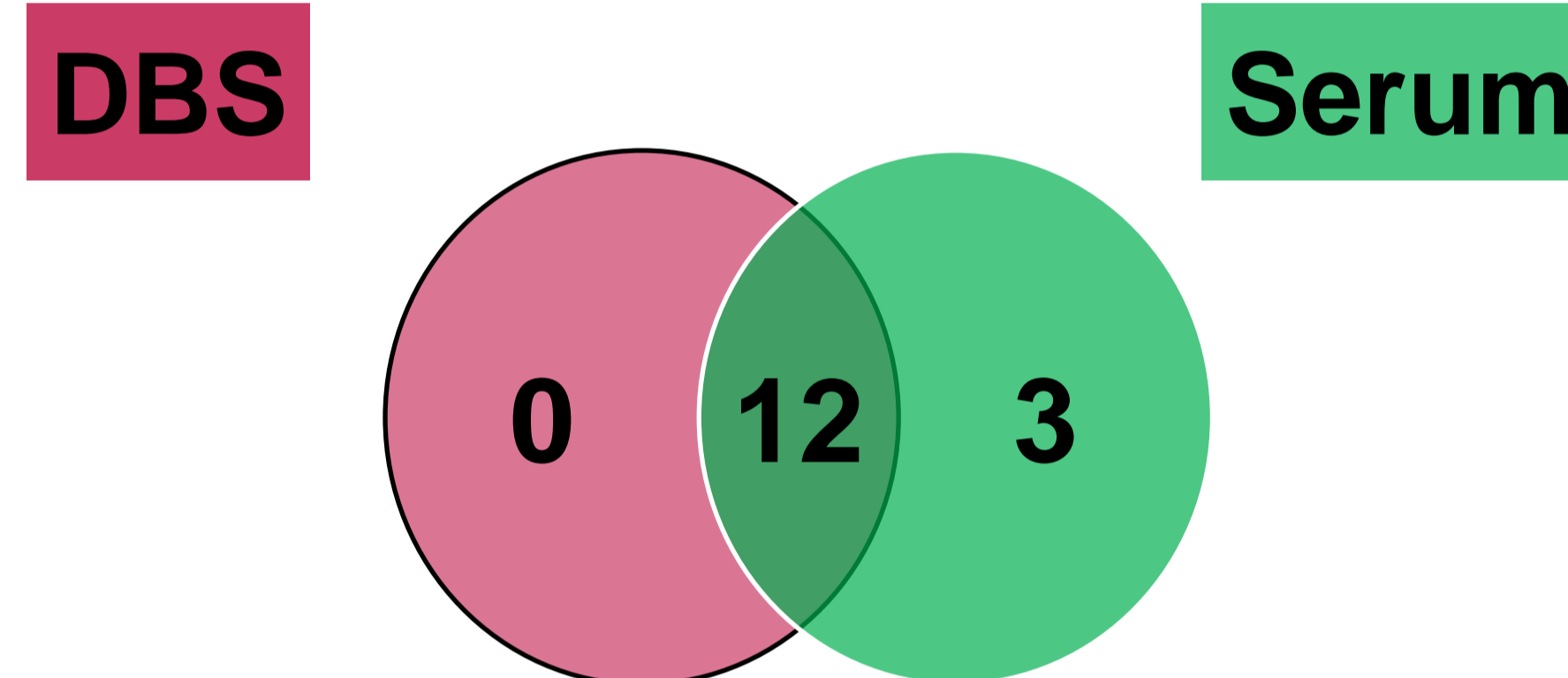
Organic Acids (14)

Clinical Biomarkers of Acidosis or Cancers



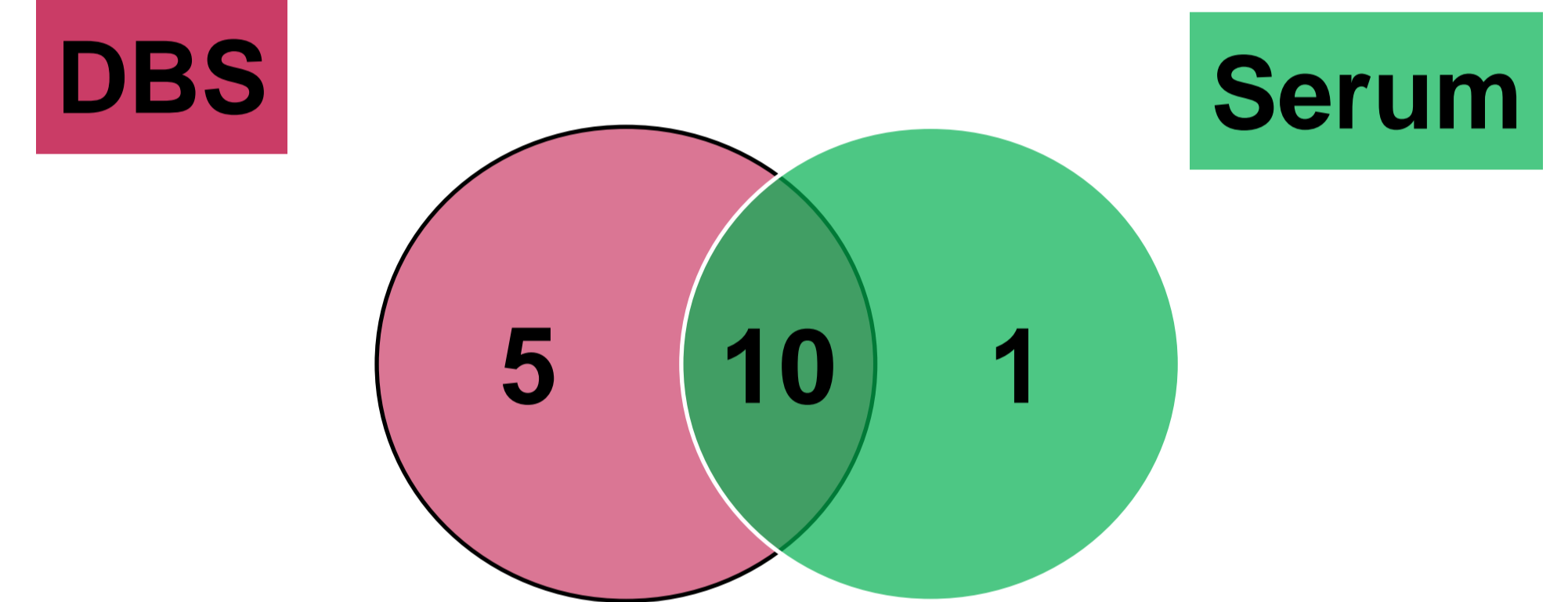
Bile Acids (18)

Clinical Biomarkers of Gestational Cholestasis



Tryptophan Metabolism (20)

Biomarker Candidates for Inflammation

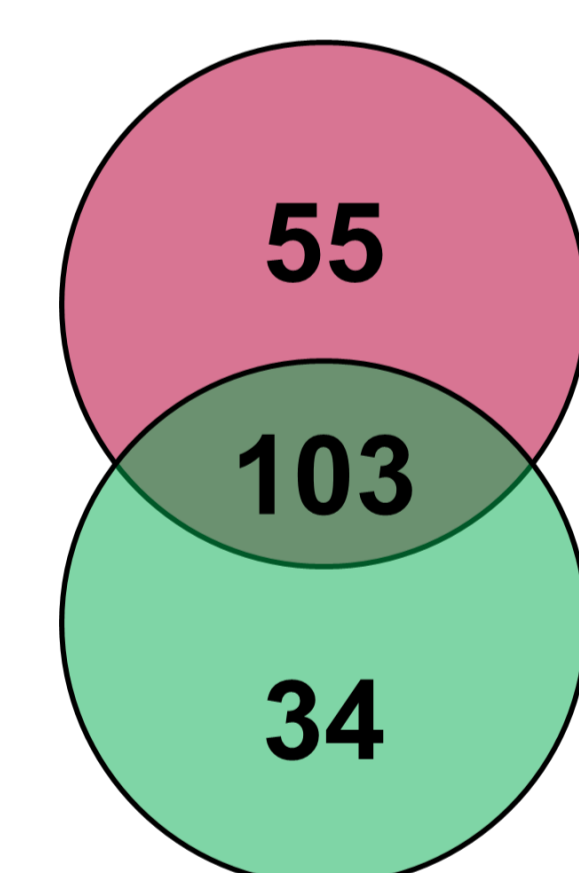
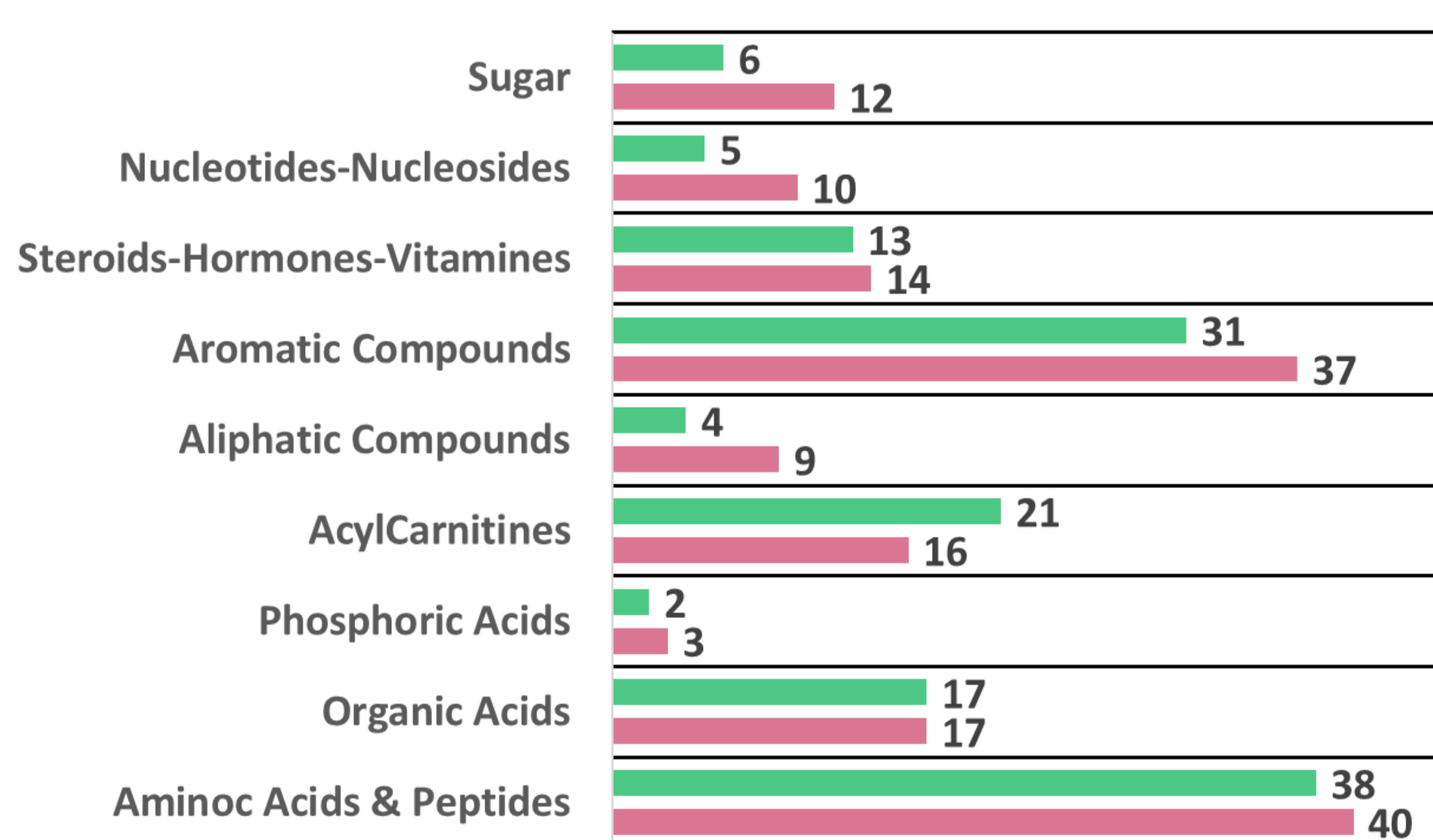


The absolute quantifications of organic acids, bile acids and tryptophan intermediates on DBS and serum are similar

UNTARGETED ANALYSIS → FEATURES & IDENTIFIED COMPOUNDS

METABOLOMIC (IROA-DataBase)

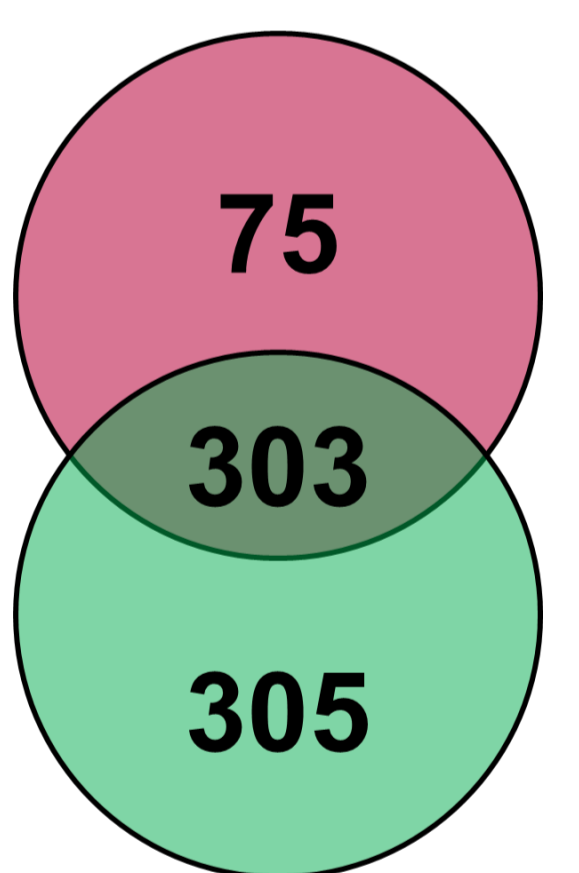
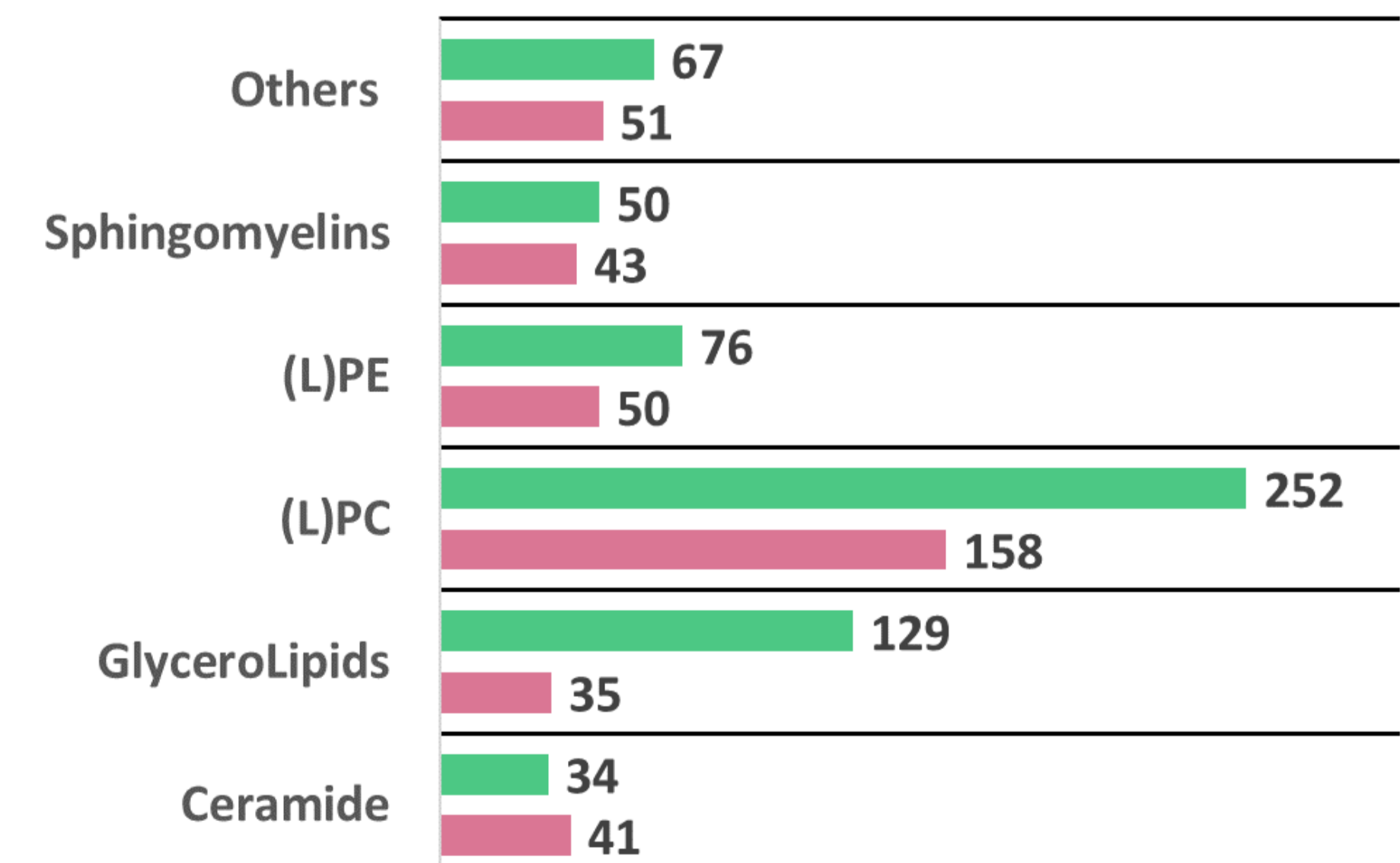
	DBS	Serum
Features Detected	11 314	8 826
Identified Compounds – Level 1	158	137
CV(mean) of Identified	9.91 %	10.74 %



- DBS is as informative as serum with metabolomic approach
- The compound number in all chemical classes are equivalent

LIPIDOMIC (LipidSearch 5.0)

	DBS	Serum
Features Detected	2 258	10 841
Identified Compounds	A	39
	B	37
	C	302
	TOT	378
CV(mean) of Identified	10.44 %	11.54 %



- DBS is less informative than serum with lipidomic approach
- The compound number in all chemical classes are not equivalent

CONCLUSION & PERSPECTIVES

- Using a metabolomic workflow, the metabolic information of DBS is superior to serum (features: 11 314 vs 8 826 respectively), while maintaining a similar molecular diversity and complying with objective assessment criteria (CV < 10% obtained with n=10).
- Using a lipidomic workflow, the lipidic information of DBS is lower than serum information (features: 2 258 vs 10 841 respectively).

Furthermore, DBS are self-sampling devices, inexpensive & can be sent by post to the laboratory, so they could be used in clinical studies, for patient monitoring and to connect people living in remote area with healthcare.