

# Global Metabolomics and Lipidomics at Oslo University Hospital and the University of Oslo

Aleš Kvasnička<sup>1,2</sup>, Hanne B. Skogvold<sup>1,2</sup>, Sander J.T. Guttorm<sup>1,2</sup>, Elise S. Sand<sup>1,2</sup>, Anja Ø. Vassli<sup>1,2</sup>, Barbora Pisklákóvá,<sup>1,2</sup> Mazyar Yazdani<sup>1</sup>, Helge Rootwelt<sup>1,2</sup>, Katja B. P. Elgstøen<sup>1,2</sup>

<sup>1</sup>Section for Metabolomics and Lipidomics, Oslo University Hospital, Oslo, Norway

<sup>2</sup>Core Facility for Global Metabolomics and Lipidomics, Faculty of Medicine, University of Oslo, Oslo, Norway



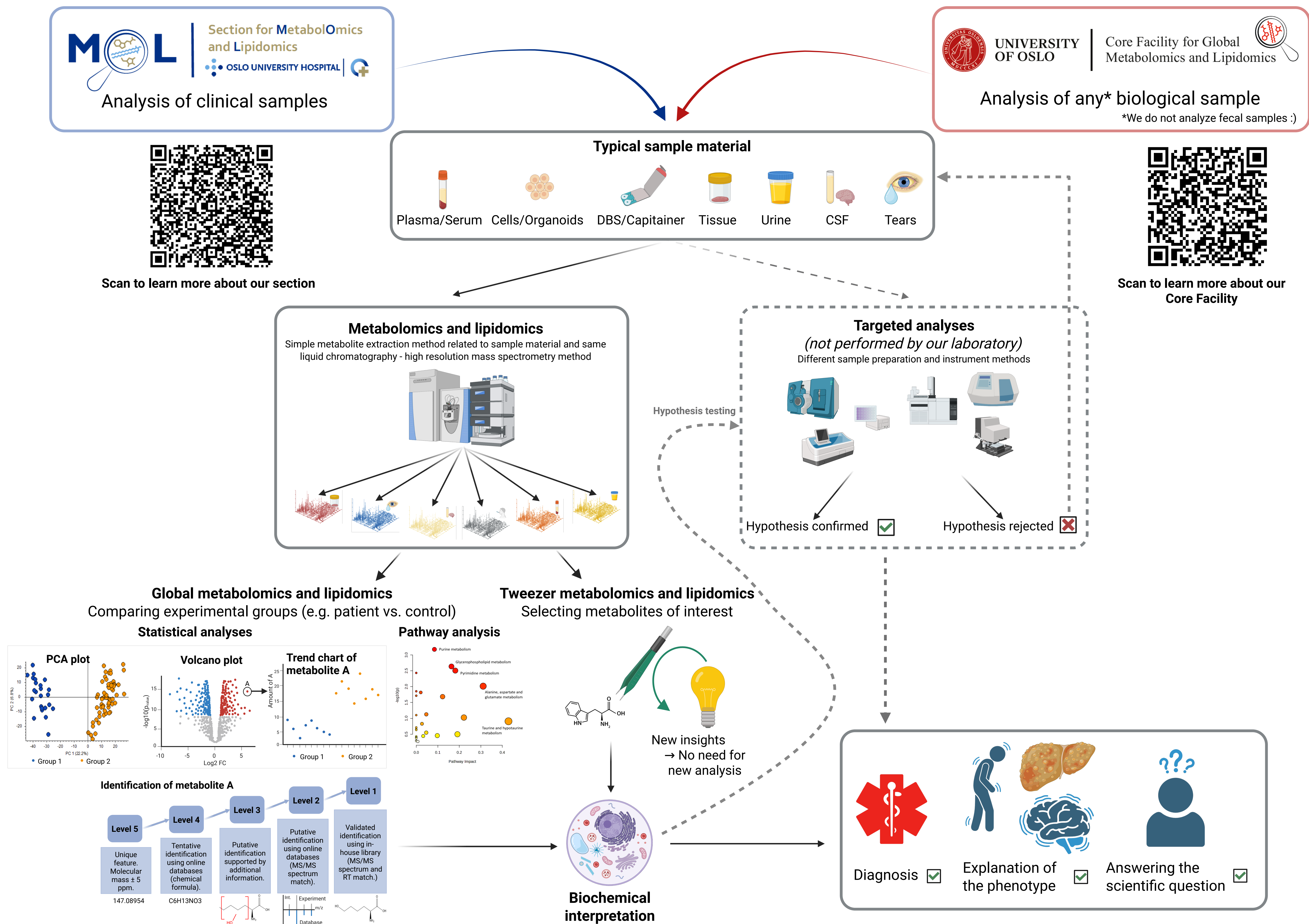
## Characteristics, uses and possibilities of global metabolomics

- Thousands of metabolites (known and unknown) in a single drop/mg of sample
- Detailed snapshot of the biochemical status
- The dynamic biochemical profile of the patient/organism
- Unravelling pathophysiological processes and interconnected biochemical networks
- Biomarker discovery
- Diagnostics: Precisely identify the cause of the disease
- Personalized treatment:
  - Identify therapeutic targets
  - Choose best treatment options
- Monitoring of:
  - Disease progression, remission and recovery
  - Effect of treatment
  - Adherence or non-compliance to treatment

## Challenges related to clinical applications of global metabolomics

- Robust analytical platform and methodology needed
- Documentation of quality assurance
- Awareness of and handling of biological variation
- Control of preanalytical factors
  - Sampling procedures and materials/additives
  - Sample processing, transport and storage
- Controls and reference ranges needed
  - Local reference range database
  - and/or compare with matched controls
  - and/or patient as her own control (longitudinal samples)
- Standardized postanalytical processing
  - Quality assurance
  - Address and answer physician's explicit request
  - Standardized report with all necessary information

## Methods: Standardized and quality-assured preanalytical, analytical and postanalytical workflow



**Figure 1:** Schematic illustration of the analytical workflow performed at the Section for Metabolomics and Lipidomics (Oslo University Hospital) and the Core Facility for Metabolomics and Lipidomics (University of Oslo).

## Conclusions

Global metabolomics and lipidomics offer immense opportunities for novel understanding of the biochemistry and physiology of health and disease and discovery of biomarkers for diagnostics, choice of therapy and monitoring of disease processes and effect of treatment, and detecting non-adherence to treatment (2-6). However, there is a long way from global metabolomics and lipidomics as research tools to quality-assured provision of clinical diagnostics and personalized treatment recommendations and monitoring (2, 5, 7).

## References

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