Metabolic biomarker profiles for improved patient care

Our product pipeline of diagnostic biomarkers contains metabolic biomarker panels for prognosis and diagnosis in areas of high unmet medical need, such as congestive heart failure (CHF), pancreatic cancer (PDAC), prostate cancer (PCA), lung cancer (LCA), breast cancer (BCA), non-alcoholic steatohepatitis (NASH), type-2 diabetes (T2D), and multiple sclerosis (MS).

Congestive heart failure

Congestive heart failure (CHF) is a progressive disorder in which the heart fails to pump oxygenated blood at a rate sufficient to meet the metabolic needs of organs and tissues.
CHF is the final common stage of many cardiovascular diseases and is defined as a clinical syndrome in which patients show typical signs and symptoms of effort intolerance and/or fluid retention resulting from an abnormality of cardiac structure or function.

The goal of our CHF biomarker program is to identify and validate new metabolic biomarker panels that improve early diagnosis and prognosis of CHF.

Through metabolic profiling of plasma samples from heart failure patients, Metanomics Health together with Prof. Dr. Katus from the University of Heidelberg, Germany, have identified and validated a novel metabolic biomarker panel that adds significant diagnostic value when measured in combination with the gold standard biomarker NT-proBNP. Most importantly, superior clinical performance has been observed in patients with reduced ejection fraction before the onset of clinical heart failure symptoms. Market introduction of this metabolic biomarker panel can lead to a paradigm shift in primary care of heart failure patients.

For more information see our latest publications:

Metabolic profiles in heart failure due to non-ischemic cardiomyopathy at rest and under exercise

A Novel Lipid Biomarker Panel for the Detection of Heart Failure with Reduced Ejection Fraction

Pancreatic cancer

Differential diagnosis of pancreatic ductal adenocarcinoma (PDAC) and chronic pancreatitis (CP) using plasma samples is a major diagnostic challenge. Metanomics Health has identified a new metabolic biomarker panel for the differential diagnosis of PDAC and CP.

The panel was successfully validated in separate training and testing studies. Assuming an estimated incidence of 1.95% for pancreatic cancer in a CP population, negative predictive values of 99.9% (training set) and 99.8% (test set) were observed, allowing development of a plasma-based diagnostic assay for early detection of pancreatic cancer in high risk CP patients.

For more information see our latest publication:
Metabolic biomarker signature to differentiate pancreatic ductal adenocarcinoma from chronic pancreatitis

Lung cancer

Most lung cancer patients show poor prognosis because of the tumor's ability to develop metastases at an early point in time. Thus, chemotherapy treatment is standard of care in most cases.

The objective of our lung cancer project is to identify a metabolic biomarker panel in plasma or urine samples that allows stratification of responders/non responders to first line platinum-based chemotherapy treatment prior to imaging analysis (e.g. CT). The study is conducted in cooperation with the pulmunology department of HELIOS Clinic in Berlin.

Find out more about our lung cancer project here.

Non-alcoholic steatohepatitis

25% of all adults in the US and EU are affected by non-alcoholic fatty liver disease (NAFLD) and 1–5% by its inflammatory form, non-alcoholic steatohepatitis (NASH). NASH is linked to diabetes, insulin resistance and metabolic syndrome, and it is a major cause of liver-related morbidity and mortality. The lack of a minimal invasive differentiation between benign NAFLD and progressive NASH greatly hampers the development of effective NASH therapies.

Metanomics Health is intending to partner with pharmaceutical clients in the development of diagnostic tools and drug development for NASH. Such collaboration may result in three value outlets:

- Enrichment of clinical patient recruitment for NASH drug development
- Metabolic biomarker profiling based NASH diagnosis replacing hepatic biopsies
- Sensitive disease monitoring of NASH progression using metabolic biomarker profiling
Prostate cancer

Current management of prostate cancer patients is characterized by over-diagnosis and over-treatment of many patients with low risk carcinomas. Thus, new prognostic biomarkers are needed for personalized treatment and improved early detection of prostate cancer risk.

Metanomics Health biomarker program aims to evaluate the potential of metabolic biomarker panels for the prognosis of prostate cancer.

Study results from a retrospective study conducted with our partner at Charité, Berlin, show that metabolic biomarker panels in prostate cancer tissue add significant prognostic information to traditional clinicopathological factors such as Gleason score or age.

For more information see our latest publications:

Integration of tissue metabolomics, transcriptomics and immunohistochemistry reveals ERG-and gleason score-specific metabolomic alterations in prostate cancer

Tissue metabolite profiling identifies differentiating and prognostic biomarkers for prostate carcinoma

Sarcosine in prostate cancer tissue is not a differential metabolite for prostate cancer aggressiveness and biochemical progression

Type 2 diabetes

Reliable diagnosis of early diabetes, comorbidity risk assessment and unbiased assignment of optimal therapies have great value in the combat of diabetes.

Our team of experts at Metanomics Health is enabling our partners to develop more effective and economic solutions based on reliable and reproducible metabolic profiling.

Through analysis of independent clinical cohorts, Metanomics Health has identified and validated a novel metabolic biomarker panel for early diagnosis of type-2 diabetes. This biomarker panel contains several metabolites and exhibits performance data beyond today’s clinical gold standards.
For more information see our latest publications:

*Validation of a metabolite panel for early diagnosis of type 2 diabetes*

*Metabolite profiling in plasma and tissues of ob/ob and db/db mice identifies novel markers of obesity and type 2 diabetes*

*A new metabolic signature in type-2 diabetes mellitus and its pathophysiology*

**Multiple sclerosis**

Multiple sclerosis is a chronic autoimmune disease of the central nervous systems, affecting more women than men. The disease is characterized by a high level of heterogeneity in clinical, radiological and pathological features and response to therapeutic interventions. Therefore, novel biomarkers are needed for improved diagnosis, prognosis and prediction of treatment response.

Together with the Neurological Department of the Charité, Berlin, Metanomics Health is analyzing retrospectively blood serum and cerebrospinal fluid samples from MS patients and controls to identify a novel metabolic biomarker panel that allows diagnosis of MS.