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NMR CLINICAL RESEARCH SOLUTIONS

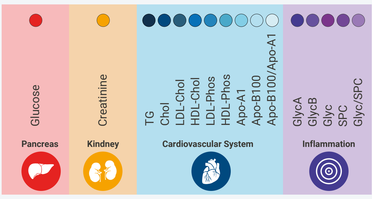
Molecular-Phenomics Multi-organ Risk Screen In PACS

Bruker's NMR based Post Acute COVID-19 Syndrome Product Solution: PhenoRisk PACS™ RuO*

Post-Acute COVID-19 Syndrome: A multi-organ Disease with Heterogenous Signs and Symptoms

More than 1 in 5 adult COVID survivors, thus millions of patients may suffer from post COVID conditions, also commonly known as Post Acute COVID syndrome (PACS). Post COVID condition involves damage to a variety of organ systems (e.g. lungs, heart, kidneys, pancreas), along with mental health impairment.

Multi-organ molecular Phenomics



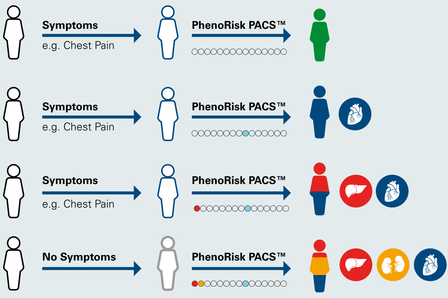
SARS-CoV-2 infection causes a complex range of immunologically driven systemic effects, which manifest in multiple biochemical pathway disruptions, causing changes in the metabolic signature affecting multiple organs. A set of metabolites characterizes those changes: amongst other studying lipoprotein and small molecules. In addition PhenoRisk PACS™ is used to quantify a set of composite signals for groups of glycoproteins (Glyc A and B) and phospholipids (SPC) which are either elevated or reduced in infection survivors indicating inflammation and cardiovascular disease risk. These analytes show excellent discrimination of SARS-CoV-2 / PACS patients from healthy or recovered individuals. PhenoRisk PACS™ is a RuO* solution for Bruker's standardized and automated Avance IVDr NMR platform*. Results are produced in less than 20 minutes from a single measurement and may help researchers by providing a solution for in-depth characterization of pathomechanisms of SARS-CoV-2 potentially enabling multi-risk screening for organ dysfunction in a single laboratory test.

Legende:
Secondary Disease
- Pancreas
- Kindney
- Cardiovascular system
- Inflammation

Phenotype Based on Symptoms
- Healthy
- Asymptomatic
- Signs of diabetes
- Signs of kidney disorder
- Signs of CVD
- Signs of inflammation
- Signs of diabetes and kidney disorder
- Signs of kidney disorder and inflammation
- Signs of diabetes, kidney disorder, CVD
- Signs of diabetes, kidney disorder, CVD, inflammation

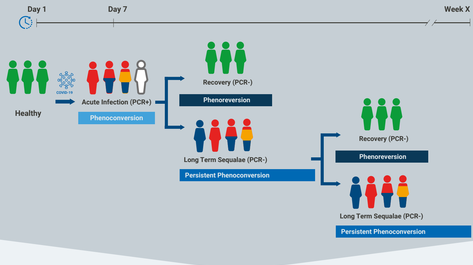
Molecular Phenotype Based on PhenoRisk PACS™ Results
- Healthy
- Risk of diabetes
- Risk of kidney disorder
- Risk of CVD
- Risk of inflammation
- Risk of diabetes and kidney disorder
- Risk of kidney disorder and inflammation
- Risk of diabetes, kidney disorder, CVD
- Risk of diabetes, kidney disorder, CVD, inflammation

Potential Molecular-Phenotypes in PACS



Phenoconversion and Phenoreversion in PACS

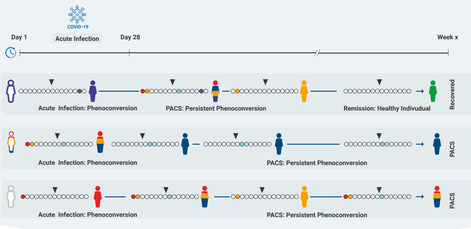
The SARS-CoV2 infection triggers metabolic phenoconversion, defined as transient or persistent systemic changes of the molecular signatures in human blood, which may also persist post-acute infection. This metabolomic phenoconversion correlates with PACS symptoms and is present during acute infection and up to months after the acute disease. In addition, a subsequent phenoreversion indicated by normalization of the metabolic signature and detected by PhenoRisk PACS™ may mark SARS-CoV-2 recovery associated with disease remission.



Personalized Molecular-Phenomics Multi-organ Risk Screen

The longitudinal molecular-phenomic monitoring▼ allows the discrimination of SARS-CoV-2 / PACS patients from healthy or recovered individuals, may reveal disease progression but may also provide a measure of a patient's partial recovery, or of emerging chronic PACS risk.

Longitudinal analysis of PACS patients examples:



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