

A Lipid Challenge Test in Personalized Medicine Diagnosis of Type 2 Diabetes

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Type 2 Diabetes (T2D) is a “systems disease”. Focus in treatment should be on optimizing the physiological system, although current medical practice is focused on reducing risk factors and fighting symptoms . Multiple physiological processes and molecular biochemical and regulatory mechanisms are involved in maintaining optimal phenotypic flexibility under a constantly changing caloric availability. Chronic caloric overload results in impaired flexibility, usually because one or more of the above mentioned processes fails to optimally perform. An optimal personalized medicine approach in T2D treatment (and related complications) thus requires a quantification of all related processes. Since the processes that need quantification of their flexibility, we have developed a series of challenge tests (stress response assays) based on lipidome, metabolome and proteome, that quantify all relevant aspects of phenotypic flexibility in gut, liver, vasculature, kidney, adipose and muscle, pancreas. Processes targeted are (a.o.) insulin sensitivity, core metabolism, inflammatory homeostasis, oxidative stress, lipid metabolism and lipotoxicity.

I will demonstrate how these assays function in practice and how these are integrating in practical healthcare.