

Precision intervention strategies to combat obesity and cardiometabolic diseases

OBJECTIVE

Generate knowledge to develop more effective, personalized strategies to prevent or delay the onset of chronic cardiometabolic diseases in humans.

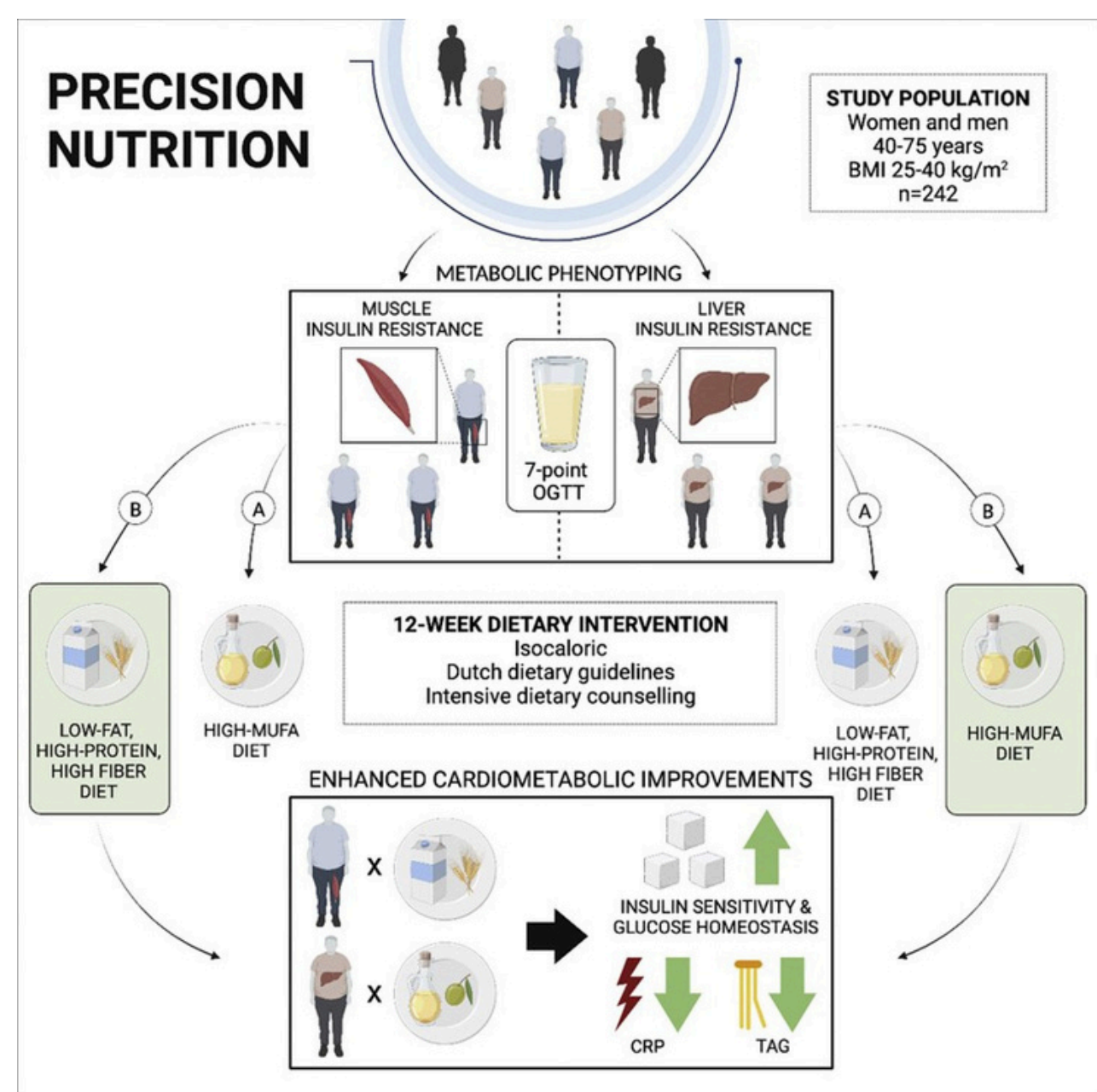
It is increasingly evident that distinct phenotypes can be identified in the etiology towards non-communicable diseases. Lifestyle interventions have proven effective in preventing or delaying the onset of chronic cardiometabolic diseases, yet the response to lifestyle interventions differs between individuals. The currently used one-size-fits-all approach, which is based on general nutritional and physical activity guidelines reliant on the group mean, ignores this heterogeneity. A better understanding of the mechanisms the response to lifestyle and/or pharmacological interventions is essential to achieve results that can be translated into personalized, evidence-based interventions and guidelines.

METHODOLOGY

- Investigating metabolic inter-organ crosstalk between the gut, adipose tissue, liver, and skeletal muscle in the etiology of cardiometabolic complications
- Combining state of the art in vivo physiological phenotyping in humans with molecular characterization of pathways involved in energy and substrate metabolism in tissue biopsies, in vitro studies, assessment of gut microbial composition/functionality.

KEY FINDINGS

- We demonstrated that individuals with overweight/obesity and either more pronounced liver (LIR) or muscle (MIR) insulin resistance are characterized by a distinct metabolome, lipidome, adipose tissue transcriptome and microbiome.
- Modulation of dietary macronutrient content according to an individual's tissue-specific insulin resistance phenotype, within the context of dietary guidelines, results in a clinically relevant further improvement in insulin sensitivity and cardiometabolic health in individuals with overweight/obesity, independent of body weight change.
- These results show the potential of applying precision nutrition based on the metabolic phenotype of an individual.



SCIENTIFIC AND/OR SOCIETAL IMPACT

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MORE INFORMATION

The Nutrition, Integrative Metabolism and Obesity (NIMO) lab (www.nimolab.nl)

Who's Involved

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