

## **Carnitinomic and metabolomic studies in translational research**

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Metabolomics is the global analysis of metabolites within various tissues and biological fluids. The metabolome more closely represents the phenotype than the genome or proteome as metabolite fluxes are a product of both genetic and environmental influences. Thus, metabolomics may provide insight into the nutritional, metabolic, and general health status during different stages of the life cycle and during pathological conditions. The workflow is as follows: formulate hypothesis – design study – collect samples – prepare and analyze samples to identify compounds – analyze data – evaluate hypothesis and generate hypotheses – apply to patient care. Although experts in each area of the workflow are needed, at least one team member must provide continuity from formulation of hypotheses to patient care. We are testing the hypotheses that the plasma carnitinome will change in piglets between days 2 through 8 of life, in young healthy adults before and after being placed on a trial ketogenic diet, and in patients with epilepsy when treated with ketogenic therapy. The long term goal is to more effectively and efficiently translate research concerning changes in the carnitinome and metabolome into practical solutions for patients with various pathological conditions. This continuity and integration of knowledge from basic science to the clinic will accelerate research from discovery to improved patient care.