Special Issue

Metabolic Reprogramming in Health and Aging-Related Diseases

Message from the Guest Editor

Metabolism, the intricate network of biochemical reactions in living organisms, serves as the foundation for life by providing energy and essential building blocks for cellular functions. Such a metabolic network is highly dynamic and adaptable, enabling cells to adapt to physiological or pathophysiological changes and demands. Reprogramming the metabolism allow cells to adapt to specific needs. It is vital for the maintenance of normal health. Under normal conditions, cells reprogram their metabolism in response to developmental, environmental, or energetic cues. For instance, immune cells undergo metabolic shifts during activation. Likewise, the activation of macrophages from a resting state to a pro-inflammatory phenotype is accompanied by a shift from oxidative phosphorylation to glycolysis. Fasting induces metabolic reprogramming in the liver, upregulating gluconeogenesis and ketogenesis to maintain blood glucose levels and provide alternative energy sources for brain and other tissues. Metabolic dysregulation is implicated in the pathogenesis of numerous diseases.

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