Non-scientific abstract

Adipose tissue is a central organ responsible for energy storage in the organism. In the time when nutrients are available in excess, adipocytes store energy in the form of triglycerides in lipid droplets. Conversely, during food deprivation or increased demand for energy in the periphery, adipocytes released stored depots. For this, the degradation of triglycerides (lipolysis) into free fatty acids and glycerol is required. In addition to the function of the energy storage compartment, specialized types of adipose tissue, namely brown and beige adipose tissue can utilize stored depots to drive energy dissipation in the form of heat to maintain core body temperature. Neurotransmitters released by the sympathetic nervous system (adrenaline) promote the induction of lipolysis and stimulate energy dissipation by beige and brown adipocytes. Stimulation of adipocytes by adrenergic hormones induces a series of signaling events that ultimately promote lipolysis and/or thermogenesis. Importantly, dysregulation of this signing machinery results in the impairment of adipose tissue function which might lead to obesity and related disorders. Our preliminary results indicate that despite well-described signaling events, adrenergic stimulation of adipocytes evokes also degradation of certain specific proteins which is required induction of lipolysis. In the framework of this proposal, we will investigate in detail this pathway. We will define its role in the regulation of adipose tissue function and investigate its relation to the previously described pathways. Finally, we will test its impact on the development of obesity and related disorders.