Mining Skeletal Muscle for Optimal Metabolic Health and Well-Being in Type 2 Diabetes

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People with type 2 diabetes are characterized by skeletal muscle insulin resistance and exercise can counteract this defect. Thus, there is great therapeutic potential in prescribing exercise to prevent and treat insulin resistance. Type 2 diabetes shares many features of accelerated/secondary aging including insulin resistance, defective oxidative metabolism/mitochondrial function, and loss of muscle mass. Strikingly, long-term participation in vigorous exercise programs mitigates secondary aging and reduces disability and mortality. Here I will present a multi-faceted approach to validate exercise-responsive treatment targets to mitigate secondary aging and prevent metabolic disease. This work leverages a deep dive into exercise biology to discover new inroads into prevention and treatment of type 2 diabetes. The overarching goal of our research is to identify and validate molecules, pathways, and ultimately new treatments that confer the benefits of exercise to improve insulin sensitivity, preserve mitochondrial energetics and attenuate muscle function and metabolism.