Universität Basel

Research Project

Exercise-based interventions in dysferlinopathies

Third-party funded project

Project title Exercise-based interventions in dysferlinopathies
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Dysferlin is a protein that is involved in different aspects of muscle cell biology, with a prominent role in damageinduced
membrane repair. Mutations in the dysferlin gene result in muscular dystrophies collectively referred to as dysferlinopathies. To date, efficient interventions for the prevention and treatment of these pathologies
remain elusive. Based on the known functions of dysferlin, exercisebased interventions could be expected to
alleviate many of the symptoms. However, since some specific exercise paradigms have been associated with a
detrimental outcome, at least in mouse models for this disease, the adaptations linked to exercise might have to
be achieved by alternative means to design safe therapeutic approaches. Our project aims at a better understanding of the function of dysferlin, the mechanisms that underlie the disease pathology and ultimately,
the use of genetic and pharmacological interventions that elicit potential beneficial effects. These interventions
are centered on the peroxisome proliferatoractivated receptor γ coactivator 1α (PGC1α), a key regulatory nexus
of endurance exercise adaptation of skeletal muscle. A comprehensive analysis using in silico, in vitro and in vivo
techniques will help to identify novel modalities to enhance membrane resealing, improve fiber repair, boost
muscle regeneration and eventually enhance muscle function in dysferlinopathies.

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