Abstract Submission

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Talk Title: Nutritional strategies to ameliorate muscle disuse atrophy

Skeletal muscle disuse atrophy (DA) which describes inactivity induced skeletal muscle loss, manifests for a variety of reasons in both clinical and athletic scenarios, including hospitalisation, enforced bed-rest or limb immobilisation for the purpose of recovery after illness or injury. Any prolonged period (>3–4 days) of disuse is linked with DA and also with an associated decline in muscle strength, metabolic dysfunction and disability. Moreover, repeated bouts of DA are associated with progressive punctuated decreases in physical function, and in older adults for example, the development of sarcopenia. Despite these clear detrimental impacts of DA, the full underlying mechanisms of DA are not yet well-defined, and as such efficacious mechanisms to counteract them have not been established. There is however a significant body of evidence, including that based on new methodologies to determine "free-living" rates of muscle protein metabolism, to suggest that reduced muscle protein synthesis (MPS) has a significant role to play in DA. In addition, although past DA studies have largely focussed on the quadriceps muscles; perhaps due to historical recognition of its susceptibility to DA, superficial location and ease of biopsy sampling, we now know that that magnitude and time-course of DA differs markedly between individual muscles (including those with similar anatomical location and functions) and as such is an additional consideration for the development of mitigation strategies. This talk will highlight recent evidence for the atrophy resistant versus atrophy susceptible (aRaS) nature of human skeletal muscle and the temporal aspects of this in both health and disease. It will also highlight some of the available evidence pertaining to potential environmental strategies (i.e., nutrition and/or contractile activity) to lessen DA in both health and disease, including those emerging from pre-clinical studies.