Effects of progressive resistance training on the expression of long non-coding RNAs in skeletal muscle of young adults

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## Abstract

The benefits of progressive resistance exercise training (RT) are largely known and relatively well-researched. RT is a potent way of stimulating an increase in muscle strength and mass which contribute to an individual’s quality of life. Loss of muscle strength and mass tend to occur as a result of aging and certain disease conditions. The challenge often lies in personalizing an individual’s regimen as different individuals respond differently to the same RT program. As per today, a one-size-fits-all approach is in use. This means it is necessary to not only understand the responses to RT, but also understand what regulates those responses. Lon non-coding RNAs (lncRNAs) are said to play regulatory roles in different aspects of cellular physiology. Most studies today are focused on their roles in diseases, especially cancers. This study is focused on understanding the effects of RT on the expression of long non-coding RNAs in skeletal muscle of young adults; as a step towards understanding how responses to RT are regulated. lncRNAs expressed in the *vastus lateralis* muscle of young adults were modeled using glmmTMB to analyse the effects of RT in trained versus untrained legs, and the effects of volume of RT on trained legs. lmer was used to build a model that predicted protein-coding genes that are coexpressed with the differentially expressed lncRNAs based on the correlation of their expression patterns.