Alleviating Atrophy

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Genetic treatment of myopathy, through the inhibition of the MuRF1 and Atrogin-1 genes, appear to demonstrate a dramatic reduction in skeletal muscle degradation for short term treatments. Although these genes appear to be an effective treatment, little is known about whether apoptotic genes such as caspases, are being blocked or only delayed due to inhibition of these genes. It is also not understood whether the inhibition of these genes could affect the differentiation of regenerating skeletal muscle cells. C2C12 myoblasts were cultured with growth media in cell culture flasks. The myoblasts were subcultured into a 96-well plate to begin testing. The myoblasts were transfected into the following siRNA treatments: Atrogin-1, MuRF1, Atrogin-1 and MuRF1, Fluorescent Control, and no siRNA. Each siRNA treatment was divided into a differentiated and undifferentiated group. The cells were analyzed for myotube formation and compared with the control group. Another group of myoblasts was subcultured into a 24-well plate. The same siRNA groups were transfected but each treatment was divided into atrophied and non-atrophied groups. The cells were differentiated for four days, then transfected with the appropriate siRNA. Two days after transfection, the media was refreshed in only the non-atrophied group. At the four day period, caspase detection was performed for each well. The cells were analyzed for caspase expression. The data collected indicated that MuRF1 and Atrogin-1 gene inhibition does not affect the differentiation process of C2C12 myotubes. Also, the inhibition of the MuRF1 and Atrogin-1 genes did not result in a reduction in caspase expression.