

Cancer and chemotherapy induce cachexia in up to 80% of cancer patients. This syndrome significantly impairs quality of life and survival in patients. There is currently no cure for cachexia and even the use of nutritional supplements, such as the branched-chain amino acids are ineffective. This ineffectiveness may be related to altered metabolism of these amino acids in skeletal muscle. Therefore, we evaluated the effects of chemotherapy on intracellular amino acid concentrations and metabolism in skeletal muscle myotubes. Treatment with chemotherapy led to atrophy in myotubes. This occurred in parallel to reduced intracellular amino acid concentrations and expression of their transporter. Simple supplementation with amino acids showed no improvement in these myotubes. However, genetic manipulation that resulted in higher expression of an amino acid transporter, rescued chemotherapy-induced atrophy in myotubes. Our findings suggest that interventions regulating muscle amino acid transporters might represent a promising strategy to treat cachexia.