

Differential gene expression in skeletal muscle cells after membrane depolarization

Jureti?, Nevenka

Urzúa, Ulises

Munroe, David J.

Jaimovich, Enrique

Riveros, Nora

Skeletal muscle is a highly plastic tissue with a remarkable capacity to adapt itself to challenges imposed by contractile activity. Adaptive response, that include hypertrophy and activation of oxidative mechanisms have been associated with transient changes in transcriptional activity of specific genes. To define the set of genes regulated by a depolarizing stimulus, we used 22 K mouse oligonucleotide microarrays. Total RNA from C2C12 myotubes was obtained at 2, 4, 18, and 24 h after high K⁺ stimulation. cDNA from control and depolarized samples was labeled with cyanine 3 or 5 dyes prior to microarray hybridization. Loess normalization followed by statistical analysis resulted in 423 differentially expressed genes using an unadjusted P-value ≤ 0.01 as cut off. Depolarization affects transcriptional activity of a limited number of genes, mainly associated with metabolism, cell communication and response to stress. A number of genes related to Ca²⁺ signaling pathways are induced at 4 h