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Data Article

Diabetic Zucker rat Tibialis anterior muscle high-frequency electrical stimulation (HFES) data: Regulation of MAPKs associated proteins

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ABSTRACT

Anaerobic exercise has been advocated as a prescribed treatment for the management of diabetes: however, alterations in exercise-induced signaling remain largely unexplored in the diabetic muscle. Here, we compare the basal and the in situ contraction-induced phosphorylation of the mitogen-activated protein kinases (MAPKs) ERK 1/2, p38, and JNK in the lean and obese (fa/fa) Zucker rat tibialus anterior (TA) muscle following a single bout of contractile stimuli. This article represents data associated with prior

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High-frequency electrical stimulation (HFES)
Zucker rat
Tibialus anterior
MAPK

publications from our lab (Katta et al., 2009, Katta et al., 2009, Tullgren et al., 1991) [1–3] and concurrent Data in Brief articles (Ginjupalli et al., 2017, Rice et al., 2017, Rice et al., 2017, Rice et al., 2017) [4–7].

Specifications Table

Subject area	*Biology*
More specific subject area	*Diabetic skeletal muscle response to exercise*
Type of data	*graph, figure*
How data was acquired	*immunoblotting*
Data format	*analyzed*
Experimental factors	*A high-frequency electrical stimulation (HFES) was used to produce 10 sets of 6 contractions over a 22-minute period. Tissues were collected and protein was then isolated from tissue for western blot analysis.*
Experimental features	*TA obtained from Lean and Obese male Zucker rats were used in this experiment*
Data source location	*Huntington, WV USA*
Data accessibility	*Data is with this article and is related to articles published and in review* [1–7]

Value of the data

- The data presented in this brief is vital to understanding the effect of diabetes on skeletal muscle mechanotransduction.
- This data sheds light on how diabetes alters tissue response to stimuli.
- This data provides a more thorough understanding of the MAPKs involvement in exercise mediated signaling in both diabetic and non-diabetic muscle tissue.

1. Data

1.1. ERK 1/2

To determine the effect of high-frequency electrical stimulation (HFES) on TA in diabetic male obese syndrome-X Zucker (OSXZ) animals and nondiabetic male lean Zucker (LNZ) animals we evaluated the expression of extracellular-signal-regulated kinase (ERK 1/2 – p44/p42). TA basal p42 content was lower ($19.5 \pm 1.8\%$, $p < 0.05$) in the OSXZ when compared to LNZ. HFES resulted in a decrease in p42 in the LNZ TA ($11.8 \pm 1.5\%$, $15.2 \pm 1.9\%$, and $16.2 \pm 1.3\%$, at 0, 1,and 3 h, $p < 0.05$) when compared to LNZ contralateral control. However HFES did not elicit a response in the OSZX TA when compared to contralateral OXSZ control. TA basal p44 content demonstrated no significant difference in the OSXZ when compared to LNZ. HFES did not elicit a change in p44 in the LNZ TA when compared to LNZ contralateral control. However HFES resulted in a decrease ($19.5 \pm 7.7\%$, at 3 h, $p < 0.05$) in the OSZX TA when compared to contralateral OXSZ control (Fig. 1).

To determine the effect of HFES on TA in OSXZ and LNZ animals we evaluated the phosphorylation of ERK 1/2 at threonine 202 and tyrosine 204 (p44/p42 thr 202/tyr 204). TA basal phosphorylation of