Investigating the Molecular Mechanisms Involved in Skeletal Muscle Development: NF-κB and Skeletal Myogenesis

12/17/2009
105 BRT
10:00am
VITA

February 15th 1981............................... Born, Chicago, Illinois, USA

May 2003........................................ Bachelor of Science in Biology, Ashland University

2003 – Present............................... Ph.D. Candidate, Integrated Biomedical Science Graduate Program, The Ohio State University

COMMITTEE MEMBERS

Denis Guttridge, Ph.D., Advisor

Kay Huebner, Ph.D.

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AWARDS AND HONORS

2008  7th Annual Ohio State University Medical Center Research Day Travel Award
RECENT PUBLICATIONS


ABSTRACT

Classical NF-κB activity functions as an inhibitor of the skeletal muscle myogenic program. Recent findings reveal that even in newborn RelA/p65−/− mice, myofiber numbers are increased over that of wild type mice, suggesting that NF-κB may be a contributing factor in early postnatal skeletal muscle development. Here we show that in addition to p65 deficiency, repression of NF-κB with the IκBα-SR transdominant inhibitor or with muscle specific deletion of IKKβ resulted in similar increases in total fiber numbers, as well as an upregulation of myogenic gene products. Upon further characterization of early postnatal muscle, we observed that NF-κB activity progressively declines within the first few weeks of development. At birth, the majority of this activity is compartmentalized to muscle fibers, but by neonatal day 8 NF-κB activity from the myofibers diminishes and instead stromal fibroblasts become the main cellular compartment within the muscle which contains active NF-κB. We find that NF-κB functions in these fibroblasts to regulate iNOS expression, which
we show is important for myoblast fusion during the growth and maturation process of skeletal muscle. Together, these data broaden our understanding of NF-κB in development by showing that in addition to its role as a negative regulator of myogenesis, NF-κB also regulates iNOS expression within stromal fibroblasts to stimulate myoblast fusion and muscle hypertrophy.

RECENT ABSTRACTS AND PRESENTATION

2009  Seminar speaker; The Ohio State University; Integrated Biomedical Science Graduate Program; IBGP Student Seminar Series.

2009  Invited speaker; Ashland University; Department of Biological Sciences.

2008  American Physiological Society Intersociety Meeting: The Biology of Exercise