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New role of TIEG1 gene in mechanical muscle function

Malek Kammoun¹

¹Sorbonne University, Université de Technologie de Compiègne, UMR CNRS 7338 Biomechanics and Bioengineering, Centre de Recherche de Royallieu, France

TGF β inducible early gene-1 (TIEG1) is a member of the Krüppel-like family of transcription factors (KLF10). As TIEG1 is highly expressed in skeletal muscle, it was of interest to analyze the effect of TIEG1 gene deletion on the mechanical and ultrastructural properties. Twenty five muscle fibers were harvested from slow fiber (soleus) and fast fiber (EDL) from TIEG1^{-/-} and control mice. Mechanical tests were performed and the dynamic and static stresses were measured. The mechanical results demonstrate that TIEG1 deficiency alters functional properties in a muscle-type specific manner. In parallel, TEM analysis were realized and revealed for TIEG1^{-/-} muscle: structural disorganization, shorter sarcomeres, disappearance of I bands, changes in mitochondrial shape and increase of myosin diameter. TIEG1 are tired more quickly than controls mice in treadmill exercise. Our findings lay the groundwork for better understanding the role of TIEG1 gene in muscle disease.