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Mutated WWP1 Induces an Aberrant Expression of Myosin Heavy Chain Gene in C2C12 Skeletal Muscle Cells

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Abstarc :

The WW domain containing E3 ubiquitin protein ligase 1 (WWP1), an enzyme to degrade unneeded or damaged proteins, was recently identified as the responsible for chicken muscular dystrophy. Despite of intensive studies on oncogenic characters, the role of WWP1 to muscular diseases has not yet been fully understood. Since it is generally known that the switching of myosin heavy chain (MyHC) isoforms from neonatal isoform to adult one is inhibited in chicken muscular dystrophy, we transfected either of wild and mutated types of *WWP1* gene into C_2C_{12} cells to monitor the expression pattern of muscle-differentiation markers including *MyHC*s by real-time PCR. Excessive *WWP1* expression enhanced the expression of the *MyHC Ia* gene but lowered the expression of the *MyHC IIb* gene. On the other hand, mutated *WWP1* gene transfected into myoblasts was distinct from these cases in that the *MyHC* gene or genes expression inhibited the normal myoblast differentiation. The present data suggest that WWP1 promotes myoblast differentiation from embryonic into fast twitch phase while a mutation in WWP1 results to retain slow and fast twitch isoforms characteristic of dystrophic fast twitch muscles.

Key Word :
chicken, gene expression, muscular dystrophy, myosin heavy chain, WWP1

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