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## G Allele of the IGF2 ApaI Polymorphism Is Associated With Judo Status

(IGF2 遺伝子 ApaI 多型の G アレルは柔道競技能力と関係する)

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### Abstract

Previous studies have reported that the insulin-like growth factor 2 (IGF2) ApaI polymorphism is associated with body mass index, fat mass, and grip strength. Competitive judo requires high levels of strength and power. The purpose of this study was to investigate the association between the IGF2 ApaI and ACTN3 R577X polymorphisms and judo status. The subjects were 156 male judo athletes from a top-level university in Japan. They were divided into 3 groups based on their competitive history: international-level athletes, national-level athletes, and others. Genomic DNA was extracted from the saliva of each athlete, and the maximal isometric strength of the trunk muscles and handgrip strength were measured. Genotyping by polymerase chain reaction-restriction fragment length polymorphism was used to detect IGF2 (rs680) and  $\alpha$ -actinin-3 (ACTN3) (rs1815739) gene polymorphisms. The genotype frequencies of the 2 gene polymorphisms were compared among the 3 groups of judo athletes and controls. International-level judo athletes showed a higher frequency of the GG + GA genotype of the IGF2 gene than that of the national-level athletes and others. There was an inverse linear correlation between the frequency of the IGF2 AA genotype and level of judo performance ( $p = 0.041$ ). Back muscle strength relative to height and weight was higher in subjects with the GG + GA genotype than in those with the AA genotype. Conversely, the ACTN3 R577X polymorphism was not associated with judo status. Additionally, no differences were found in back muscle or handgrip strength among the ACTN3 genotypes. In conclusion, the results indicate that the IGF2 gene polymorphism may be associated with judo status.