Development of a new nucleic acid medicine that suppresses genes related to sarcopenia and blocks muscle atrophy

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Maintaining muscle mass is important for elderly people to keep a healthy lifestyle. Muscle is the largest organ in the body, but muscle mass declines with aging. Sarcopenia is a disease characterized by a significant loss of muscle mass. If we can suppress the loss of muscle mass with aging, we can expect healthy aging (that is, an extension of the human health span). MicroRNAs (miRNAs) are non-coding RNAs that do not encode proteins and are functional RNAs that suppress the expression of multiple target genes. In the previous study examining cell-free miRNAs in young and old mice, we found miRNA199 (miR-199) that has a strong ability to induce muscle differentiation, among miRNAs in the blood. This suggests that miR-199 may be an anti-aging factor. Therefore, in this study, we attempted to elucidate the mechanism of action and the effect of this miRNA and to establish an effective drug delivery system (Drug delivery system: DDS) for miRNA. From a series of studies, we found a promising effect of miR-199 on muscle fibers and an effective DDS agent.