Muscle hypertrophy and vascularization induction using human recombinant proteins

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Met-Activating Genetically Improved Chimeric Factor-1 (Magic-F1) is an engineered protein that contains two human Met-binding domains. Previous experiments in both homozygous and hemizygous transgenic mice demonstrated that the skeletal muscle specific expression of Magic-F1 can induce a constitutive muscular hypertrophy, increasing the vessel number in fast twitch fibers, also improving running performance and accelerating muscle regeneration after injury [1]. We also found that Magic-F1 could be responsible of muscular hypertrophy interacting with Pax3 signal pathway in skeletal muscle precursor cells [2]. In order to evaluate the therapeutic potential of Magic-F1, we tested its effect on multipotent and pluripotent stem cells [3]. Murine mesoangioblasts (adult vessel-associated stem cells) expressing Magic-F1 were able to differentiate spontaneously forming myotubes. In addition, in Magic-F1 inducible murine embryonic stem cells subjected to myogenic differentiation, the presence of recombinant protein resulted in improved myogenic commitment. Finally, the microarray analysis of Magic-F1+/+ satellite cells evidenced transcriptomic changes in genes involved in the control of muscle growth, development and vascularisation [4]. Taken together our results candidate Magic-F1 as a potent myogenic inducer, able to affect positively the vascular network, increasing vessel number in fast twitch fibers and modulating the gene expression profile in myogenic progenitors.

References


Keywords
Embryonic stem cells, Magic-F1, mesoangioblast, myogenic differentiation, recombinant protein.