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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 inteacting 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

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