miR-720

Exosomes are vesicles released by many eukaryotic cells; their cargo includes proteins, mRNA and microRNA (miR) that can be transferred to recipient cells and regulate cellular processes in an autocrine or paracrine manner. While cells of the myoblast lineage secrete exosomes, it is not known whether skeletal muscle fibers (myofibers) release exosomes. In this study, we found that cultured myofibers release nanovesicles that have bilamellar membranes and an average size of 60-130 nm, contain typical exosomal proteins and MicroRNAs and are taken up by C2C12 cells. miR-133a was found to be the most abundant myomiR in these vesicles while miR-720 was most enriched in exosomes compared to parent myofibers. Treatment of NIH 3T3 cells with myofiber-derived exosomes downregulated the miR-133a targets proteins Smarcd1 and Runx2, confirming that these exosomes have biologically relevant effects on recipient cells. Denervation resulted in a marked increase in miR-206 and reduced expression of miRs 1, 133a, and 133b in myofiber-derived exosomes. These findings demonstrate that skeletal muscle fibers release exosomes which can exert biologically significant effects on recipient cells, and that pathological muscle conditions such as denervation induce alterations in exosomal miR profile which could influence responses to disease states through autocrine or paracrine mechanisms [1)].

Chen et al. enrolled 122 patients with glioma who received surgery treatment in our hospital from June 2010 to May 2012, and 60 healthy individuals. We found that the plasma miR-720 in the glioma group was significantly higher than that in the healthy control group (3.19 ± 1.26 vs 0.98 ± 0.65, P<0.001). The sensitivity and specificity were 71.3% (95%CI: 62.4-79.1%) and 83.3% (71.5-91.7%), respectively. The results indicated that the plasma miR-720 level was associated with tumor grade (t = 104.418, P<0.001). The advanced tumor tended to have higher miR-720 expression level. No significant association was found between miR-720 and age, sex, tumor size, KPS and tumor position (P=0.438, 0.514, 0.518, 0.058, 0.226). The multivariate cox analysis indicated that the high expression of miR-720 (HR = 1.48, 95%CI: 1.12-2.97, P=0.023) was independently predictors of adverse prognosis in patients with glioma. The high expression of miR-720 was also associated with recurrence or development in patients with glioma (HR = 1.47, 95%CI: 1.18-3.14, P=0.012). Plasma miR-720 has a moderate diagnostic ability in early diagnostic of glioma and may be a potential tumor biomarker. The high plasma miR-720 was related to adverse prognosis in patients with glioma and could be a prognosis predictor of glioma patients [2)].

Liu et al. demonstrated that microRNA-720 (miR-720) was significantly upregulated in glioma tissues and cells. Functional experiments showed that overexpression of miR-720 promotes glioma migration and invasion, while downregulation of miR-720 inhibits glioma migration and invasion. Meanwhile, they found that threonyl-tRNA synthetase like-2 (TARSL2) was a direct and functional target of miR-720 in glioma. Reintroduction of TARSL2 into glioma cells repressed the invasion promoting function of miR-720, whereas downregulation of TARSL2 reversed the anti-invasion function of anti-miR-720. Furthermore, quantitative real-time polymerase chain reaction results showed that miR-720 was inversely correlated with TARSL2 expression in 40 Glioblastoma tissues. Finally, in vivo experiments showed that miR-720 promotes glioma growth and upregulates invasion-related genes in nude mice. Overall, our findings suggest increasing miR-720 enhances glioma migration and invasion through downregulation of TARSL2, which may provide novel insight into the treatment of glioma [3)].

1)
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