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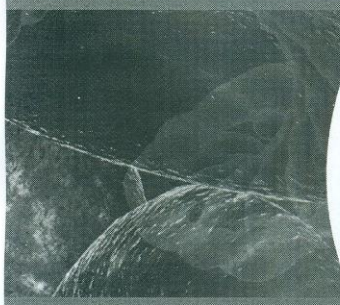

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БИОТЕХНОЛОГИЯ: СОСТОЯНИЕ И ПЕРСПЕКТИВЫ РАЗВИТИЯ

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PROPERTIES OF THE BINDING SITES OF miR-4763-3P WITH mRNA OF *NR2F6* ORTHOLOGS

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The highly homologous binding sites of miR-4763-3p were established in the mRNA of the NR2F6 gene and its orthologs in animals. mRNA of NR2F1, NR2F2 and NR2E3 genes, which are paralogs of NR2F6, are not affected by miR-4763-3p.

Key words: miR-4763-3p, mRNA, *NR2F6* gene, orthologous genes, diagnostics

Use of miRNA in the diagnosis of diseases caused by changes in expression of miRNA and their target genes largely depends on the prediction of miRNA interaction sites in mRNA. We have shown that miRNA binding sites are located in the protein coding region (CDS) of mRNA [1]. *NR2F6* gene involved in the development of colorectal cancer, prostate cancer, breast cancer, cervical cancer and leukemia [2]. Among 2565 miRNAs, available in GenBank, we identified miR-4763-3p which has binding sites in the CDS of mRNA of *NR2F6* gene with use the MirTarget program [3]. The interaction of miR-4763-3p with mRNA binding site of NR2F6 gene is characterized by the ΔG equal to -129,5 kJ/mole. Identified miR-4763-3p binding sites encode oligopeptides including octapeptide PALRAVPA that corresponds to nucleotide sequence of the binding site (table). PALRAVPA oligopeptide is flanked by conserved amino acids in a large group of animal species and in seven species serine is replaced by alanine and in three species serine is replaced by asparagine. However, this change slightly reduces parameters of miR-4763-3p interaction with mRNA of *NR2F6* gene. The binding site is deleted in *A.forsteri* and *M.unicolor.* In *O.aries* and *N.nippon* the binding site contains an insert of an oligonucleotide which prevents interaction with miR-4763-3p. Proteins of the paralogous *NR2F1, NR2F2, NR2F3* genes have low homology comparing with the octapeptide of *NR2F6* human gene. Therefore, the expression of paralogs of NR2F6 is not affected by miR-4763-3p and this miRNA can be offered for the diagnostics of diseases associated with dysregulation of *NR2F6* gene.

Table *- Oligopeptides of NR2F6 protein (italics) encoded by miRNA-4763-3p binding sites in various species of animals and in human.*

Oligopeptides	The species of animals
RFGRLLLRLPALRAVPASLISQLFFMR	Homo sapiens*
RFGRLLLRLPALRAVPAALISQLFFMR	Calypte anna**
RFGRLLLRLPALRAVPANLISQLFFMR	Danio rerio, Takifugu rubripes, Maylandia zebra
RFGRLLLRLPGLRAVPAALISQLFFMR RFGRLLLRLPSLRAVPANLISQLFFMR	Erinaceus europaeus Astyanax mexicanus
RFGRLLLRLPALGARRA-RAVPASLISQLFFMR RFGRLLSR-PALVRLPAPRAVPAALISQLFFMR	Ovis aries Nipponia nippon
DSAEYSCLKAIALFTPAPLISQLFFMR RFGRLLLRLPX--------SQLFFMR	Mesitornis unicolor Aptenodytes forsteri
QRFGRLLLRLPALRAVPASLISQLFFMR SRFGKLLLRLPSLRTVSSSVIEQLFFVR TRFGKLLLRLPSLRTVSSSVIEQLFFVR VRFGKLLLLLPSLRFITAERIELLFFRK	NR2F6 Homo sapiens NR2F1 Homo sapiens NR2F2 Homo sapiens NR2E3 Homo sapiens

** - Ailuropodamelanoleuca, Alligator sinensis, Alligator mississippiensis, Balaenoptera acutorostrata scammoni, Bos mutus, Bos taurus, Camelus dromedaries, Chelonia mydas, Clupea harengus, Condylura cristata, Mus musculus, Ornithorhynchus anatinus, Pan troglodytes, Physeter catodon, Propithecus coquereli, Pteropus alecto, Rattus norvegicus, ... Ursus maritimus, Xenopus laevis, Xenopus tropicalis;*
*** - Aquila chrysaetoscanadensis, Calypte anna, Cuculus canorus, Falco cherrug, Falco peregrines, Monodelphis domestica, Taeniopygia guttata*