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**Институт молекулярной биологии и биохимии  
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**Академик Мұрат Әбенұлы Айтхожинның  
туғанына 80 жыл толуына байланысты  
«МОЛЕКУЛАЛЫҚ БИОЛОГИЯ,  
БИОТЕХНОЛОГИЯ, БИОХИМИЯ  
САЛАСЫНДАҒЫ ІРГЕЛІ ЗЕРТТЕУЛЕР МЕН  
ИННОВАЦИЯЛАР»**

**Жас ғалымдардың халықаралық ғылыми  
конференциясы  
28-29 қараша**

**Международная научная конференция  
молодых ученых  
«ФУНДАМЕНТАЛЬНЫЕ ИССЛЕДОВАНИЯ И  
ИННОВАЦИИ В МОЛЕКУЛЯРНОЙ БИОЛОГИИ,  
БИОТЕХНОЛОГИИ, БИОХИМИИ»  
к 80-летию со дня рождения  
академика Мурата Абеновича Айтхожина  
28-29 ноября**

**Алматы 2019**

# FEATURES OF THE BINDING SITES OF miRNA WITH GENES OF BOS TAURUS ZNF TRANSCRIPTION FACTORS

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**Keywords:** miRNA, mRNA, binding site, transcription factor

**Introduction.** Transcription factors play an essential role in altering gene expression. A great progress about transcription factors has been made towards the understanding of normal physiological processes, embryonic development, and human diseases. Here we studied characteristics of zinc-finger transcription factors (ZNF) genes binding with miRNAs of animals. According to Animal TFDB 3.0 database, the *Bos Taurus* ZNF transcription factors family includes 315 genes.

**Methods.** The nucleotide sequences of mRNAs transcription factors of ZNF Bos taurus family were downloaded from Animal TFDB (<http://www.bioguo.org/AnimalTFDB/>). The nucleotide sequences miRNAs were downloaded from the mirBase database (<http://mirbase.org>). The miRNA binding sites (BS) in 5`untranslated regions (5`UTRs), coding domain sequences (CDSs) and 3`untranslated regions (3UTRs) of several genes were predicted using the MirTarget program. Only miRNA BS with  $\Delta G/\Delta G_m$  ratios of 85% or more were considered.

**Results.** We studied binding characteristics between 1025 *B. taurus* miRNAs and 315 mRNAs genes of ZNF transcription factors family. The free binding energy  $\Delta G$  values were equal to -83 to -127 kJ/mole. Was established 442 binding sites: 196 are located in CDS, 164 in 3`UTR, 82 in 5`UTR. mRNA of *ZNF628* gene has the largest number of binding sites with ten miRNAs, all binding sites are located in CDS. mRNA of *BCL11B*, *ZNF592* genes have BS for eight miRNAs. mRNA of *PRDM2* gene has BS for seven miRNAs. mRNA of *RREB1-v-7*, *ZNF142*, *ZNF236-v-4*, *ZNF710-v-3* genes have BS for six miRNAs. Five miRNAs can bind to mRNAs of *ZNF687-v-2*, *ZNF652*, *ZFP91*, *SP4*, *ZNF467-v-4* genes. *ZFP91* mRNA has polysites located through 2, 3 nucleotides for miR-11976, miR-11975, miR-11988, miR-574 in CDS and in 3`UTR. miR-574 has multiple sites in mRNA of *ZNF710-v-3*, *HIVEP2*, *KLF7*, *SNAI2*, *ZFP91*, *ZNF677* genes which are located through two nucleotides in 3`UTR. Four miRNAs can bind to mRNA of *HIVEP1*, *HIVEP2*, *PRDM13*, *PRDM16*, *PRDM6-v-3*, *SP1-v-3*, *SP3-v-1*, *SP8-v-1*, *TRERF1*, *ZNF385A-v-3*, *ZNF514-v-5*, *ZNF592*, *ZNF599*, *ZNF699*, *ZNF771*, *ZNF366-v-2*, *FEZF1*, *ZIC4-v-1* genes. Of them, mRNA of *SP8-v-1* gene contains polysites in CDS for miR-11975, miR-11976, miR-2885, miR-935. mRNAs of *EGR2*, *IKZF1*, *KLF11*, *KLF15*, *KLF8*, *PRDM1-v-3*, *RBAK*, *REST*, *SCRT1-v-1*, *WIZ-v-1*, *ZNF175*, *ZNF322-v-1*, *ZNF335*, *ZNF398*, *ZNF407*, *ZNF407*, *ZNF407*, *ZNF48*, *ZNF526*, *ZNF532-v-4*, *ZNF618-v-1*, *ZSCAN26*, *EGR4*, *KLF7*, *VEZF1-v-7*, *ZFAT*, *ZKSCAN4* genes have BS for three miRNAs. Of them, mRNA of *VEZF1-v-7* gene contains polysites for miR-11975, miR-11976, miR-2885 located in 5`UTR. 34 mRNAs have BS for two miRNAs, one miRNA can bind to 66 mRNAs with  $\Delta G/\Delta G_m$  from 87% to 94%.

**Conclusion.** The largest number of miRNAs BS was predicted in mRNA of *SP8-v-1*, *ZFP91*, *VEZF1-v-7* genes. In mRNAs of these genes established polysites of miRNAs. miR-574 has multiple sites. The results obtained indicate that mRNA of *B. taurus* ZNF gene family can bind miRNAs to varying degrees.

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