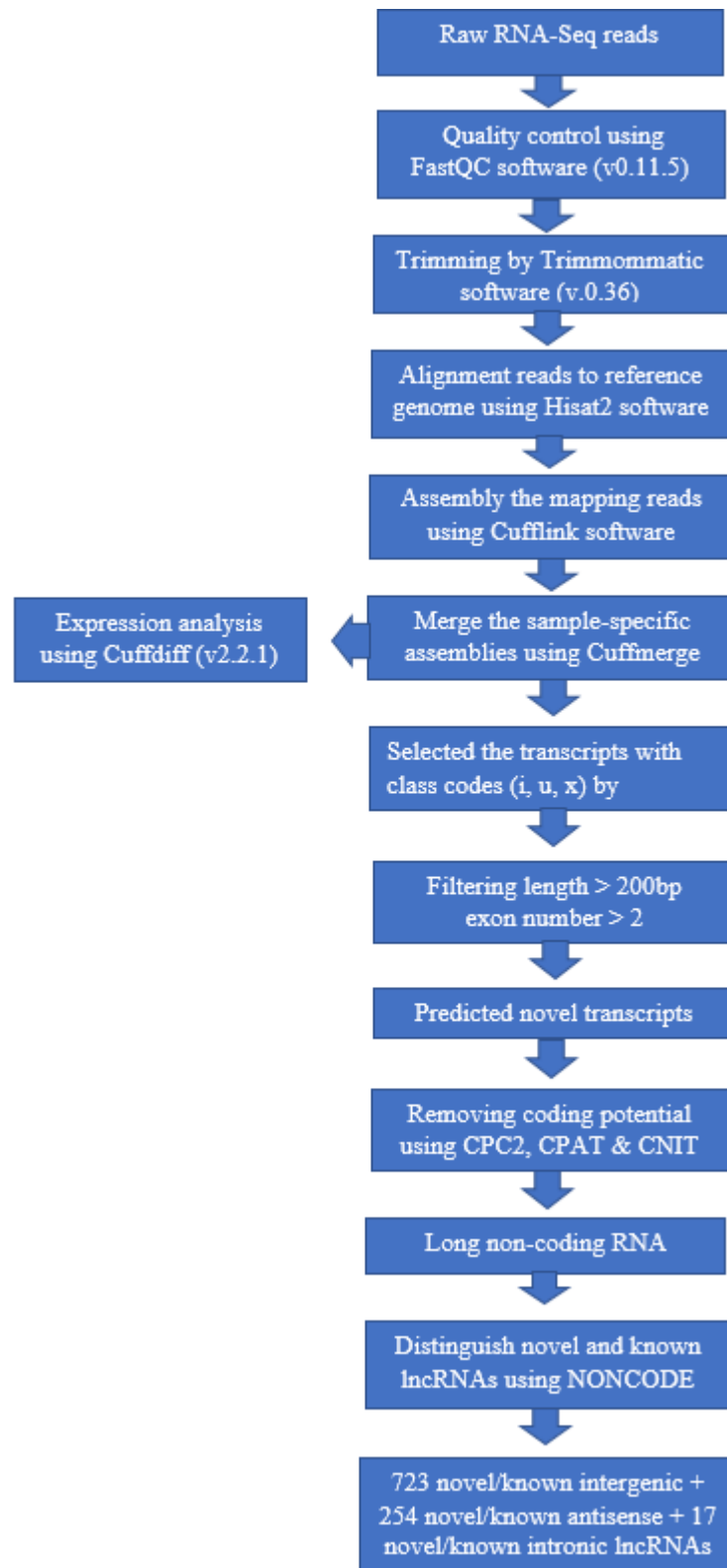


Supplementary Figure



**Fig. S1** Flow chart for novel lncRNA identification and classification

## Supplementary Tables

**Table S1** Quality control and clean raw reads results obtained per sample

| Sample        | Total reads before trimming | Total reads soft trimming | Exactly concordantly aligned (%) | Overall alignment rate (%) |
|---------------|-----------------------------|---------------------------|----------------------------------|----------------------------|
| C1/C2         | 8,647,125                   | 6,622,025                 | 42.20                            | 83.14                      |
| C3/C4         | 13,368,944                  | 10,132,560                | 51.08                            | 94.46                      |
| C5/C6         | 13,756,065                  | 10,454,415                | 51.17                            | 94.38                      |
| C7/C8         | 8,685,734                   | 6,641,245                 | 43.72                            | 84.72                      |
| C9/C10        | 13,374,250                  | 10,156,487                | 51.11                            | 94.52                      |
| C11/C12       | 13,831,915                  | 10,539,372                | 50.79                            | 94.49                      |
| C13/C14       | 19,697,023                  | 15,023,092                | 63.77                            | 94.04                      |
| C15/C16       | 19,792,913                  | 10,350,142                | 63.94                            | 94.22                      |
| C17/C18       | 9,016,506                   | 7,220,274                 | 50.03                            | 91.87                      |
| C19/C20       | 5,771,315                   | 4,633,682                 | 48.80                            | 89.71                      |
| C21/C22       | 9,285,314                   | 7,445,816                 | 50.25                            | 91.85                      |
| C23/C24       | 5,852,296                   | 4,703,164                 | 48.11                            | 89.99                      |
| Total/Average | Total = 141,079,400         | Total=103,922,274         | Ave=51.2475%                     | Ave= 91.44917%             |

**Table S2** Up- and down-regulated genes for 82 differentially expressed lncRNA genes

## Up-regulated

| No. | lncRNA gene | Gene_id     | Chromosome locus      | log2 Fold- change | Adjusted $p$ ( $p < 0.05$ ) |
|-----|-------------|-------------|-----------------------|-------------------|-----------------------------|
| 1   | ECHDC3      | XLOC_007402 | 13:15521880-15550769  | 1.00216           | 0.00518531                  |
| 2   | PPP1R10     | XLOC_019009 | 20:27415075-27454847  | 1.00246           | 0.00518531                  |
| 3   | B2M         | XLOC_032933 | 7:99939406-99945664   | 1.00795           | 0.00518531                  |
| 4   | SH3RF2      | XLOC_030071 | 5:54626089-54779977   | 1.08535           | 0.00518531                  |
| 5   | PRSS23      | XLOC_020229 | 21:8159944-8179745    | 1.18246           | 0.00518531                  |
| 6   | TOB2        | XLOC_026955 | 3:216547248-216556995 | 1.15016           | 0.00518531                  |
| 7   | IRF2BPL     | XLOC_033489 | 7:85197223-85201614   | 1.20471           | 0.00518531                  |
| 8   | FOS         | XLOC_032868 | 7:83397539-83400930   | 1.32209           | 0.00518531                  |
| 9   | HES1        | XLOC_002292 | 1:191624404-191627412 | 1.3503            | 0.00518531                  |
| 10  | SLC25A25    | XLOC_025856 | 3:8061276-8095159     | 1.3539            | 0.00518531                  |
| 11  | APOD        | XLOC_000970 | 1:190322030-190335306 | 1.3656            | 0.00518531                  |
| 12  | C7          | XLOC_012175 | 16:33481055-33542068  | 1.63463           | 0.00518531                  |
| 13  | DDIT4       | XLOC_023295 | 25:28192240-28194468  | 1.69527           | 0.00518531                  |
| 14  | TSPYL4      | XLOC_033990 | 8:21477848-21482100   | 1.70352           | 0.00518531                  |
| 15  | PVALB       | XLOC_026714 | 3:180006100-180067626 | 2.36872           | 0.005185                    |

## Down-regulated

| No. | lncRNA gene | Gene_id     | Chromosome locus      | log2 Fold- change | Adjusted $p$ ( $p < 0.05$ ) |
|-----|-------------|-------------|-----------------------|-------------------|-----------------------------|
| 1   | RCAN1       | XLOC_000708 | 1:119133329-119331913 | -4.15331          | 0.00518531                  |
| 2   | COL1A1      | XLOC_004856 | 11:35993781-36010837  | -2.80366          | 0.00518531                  |
| 3   | SIM1        | XLOC_034040 | 8:36567666-36648402   | -2.71556          | 0.00518531                  |
| 4   | COL3A1      | XLOC_017401 | 2:119229095-119270385 | -2.38032          | 0.00518531                  |
| 5   | RNF144B     | XLOC_019747 | 20:38121843-38199540  | -2.30581          | 0.00518531                  |
| 6   | ATF3        | XLOC_006996 | 12:69062518-69120648  | -2.15941          | 0.00518531                  |
| 7   | COL1A2      | XLOC_028001 | 4:11656365-11693515   | -2.14976          | 0.00518531                  |
| 8   | TMCO3       | XLOC_003982 | 10:86020770-86038251  | -1.97398          | 0.00518531                  |
| 9   | AQP4        | XLOC_021577 | 23:30335666-30350209  | -1.92449          | 0.00518531                  |
| 10  | ANO6        | XLOC_025167 | 3:140939684-141150748 | -1.90218          | 0.00518531                  |
| 11  | COL14A1     | XLOC_035200 | 9:93989137-94185933   | -1.84012          | 0.00518531                  |
| 12  | GNPTAB      | XLOC_026658 | 3:170615030-170667987 | -1.83991          | 0.00518531                  |

Table S2 Continued

| No. | lncRNA gene | Gene_id     | Chromosome locus      | log2 Fold- change | Adjusted $p$ ( $p < 0.05$ ) |
|-----|-------------|-------------|-----------------------|-------------------|-----------------------------|
| 13  | ADAMTS20    | XLOC_025174 | 3:142961376-143167544 | -1.79601          | 0.00518531                  |
| 14  | ALPK2       | XLOC_021694 | 23:57816965-58052876  | -1.76945          | 0.009715909                 |
| 15  | ANKRD1      | XLOC_021046 | 22:12266809-12276317  | -1.75828          | 0.00518531                  |
| 16  | XIRP2       | XLOC_017488 | 2:141115446-141191725 | -1.73976          | 0.00518531                  |
| 17  | NEXN        | XLOC_000276 | 1:53704978-53791734   | -1.58987          | 0.00518531                  |
| 18  | DIAPH1      | XLOC_031111 | 5:49974729-50091845   | -1.58533          | 0.00518531                  |
| 19  | KLF4        | XLOC_015920 | 2:15622344-15626534   | -1.57814          | 0.00518531                  |
| 20  | TRIB1       | XLOC_035318 | 9:27644959-27654355   | -1.57597          | 0.00518531                  |
| 21  | HBEGF       | XLOC_030735 | 5:48908042-48963445   | -1.57277          | 0.00518531                  |
| 22  | ADCY2       | XLOC_012505 | 16:65279517-65721184  | -1.52037          | 0.00518531                  |
| 23  | DUSP16      | XLOC_025487 | 3:202123163-202214042 | -1.50223          | 0.00518531                  |
| 24  | ADRB2       | XLOC_030090 | 5:57737928-57804381   | -1.48284          | 0.009715909                 |
| 25  | DUSP10      | XLOC_006716 | 12:23306540-23351045  | -1.48148          | 0.00518531                  |
| 26  | SLC16A7     | XLOC_026556 | 3:159532687-159666756 | -1.47583          | 0.00518531                  |
| 27  | CIB2        | XLOC_014115 | 18:29541390-29565327  | -1.43788          | 0.00518531                  |
| 28  | SLC7A2      | XLOC_024065 | 26:18435065-18464631  | -1.37547          | 0.00518531                  |
| 29  | KLHL34      | XLOC_037526 | X:18924772-18928108   | -1.36554          | 0.00518531                  |
| 30  | COL4A2      | XLOC_003967 | 10:84340392-84507447  | -1.35551          | 0.00518531                  |
| 31  | COL4A1      | XLOC_004272 | 10:84217230-84268143  | -1.35055          | 0.00518531                  |
| 32  | KLF6        | XLOC_007549 | 13:43752553-43762003  | -1.34234          | 0.00518531                  |
| 33  | MYLK3       | XLOC_009585 | 14:14547526-14606279  | -1.29969          | 0.00518531                  |
| 34  | ARID5B      | XLOC_023246 | 25:17796368-17989369  | -1.29342          | 0.00518531                  |
| 35  | ABHD4       | XLOC_033088 | 7:21810758-21823089   | -1.27357          | 0.00518531                  |
| 36  | ABRA        | XLOC_035118 | 9:70486229-70499604   | -1.27171          | 0.00518531                  |
| 37  | SLMAP       | XLOC_014843 | 19:43334277-43499282  | -1.26881          | 0.00518531                  |
| 38  | TPM2        | XLOC_016116 | 2:52537458-52544952   | -1.26596          | 0.00518531                  |
| 39  | TANC1       | XLOC_017508 | 2:149349739-149714670 | -1.26592          | 0.00518531                  |
| 40  | DNAJB4      | XLOC_000277 | 1:53821106-53836193   | -1.25772          | 0.00518531                  |
| 41  | TFRC        | XLOC_002272 | 1:188911080-188942263 | -1.24813          | 0.00518531                  |
| 42  | WFDC1       | XLOC_008833 | 14:10035411-10063184  | -1.24505          | 0.013484229                 |
| 43  | MICAL2      | XLOC_011147 | 15:39966159-40174174  | -1.23453          | 0.00518531                  |
| 44  | EEPD1       | XLOC_028150 | 4:60962475-61086480   | -1.23177          | 0.00518531                  |
| 45  | FN1         | XLOC_017687 | 2:216308635-216378396 | -1.22433          | 0.00518531                  |
| 46  | ART3        | XLOC_031515 | 6:90517574-90664108   | -1.2193           | 0.00518531                  |
| 47  | TET2        | XLOC_031708 | 6:20052679-20189158   | -1.2189           | 0.00518531                  |
| 48  | PALLD       | XLOC_018287 | 2:110866976-111249018 | -1.19593          | 0.00518531                  |
| 49  | MLF1        | XLOC_002437 | 1:226995674-227027148 | -1.1655           | 0.00518531                  |
| 50  | PGM2L1      | XLOC_011294 | 15:51879658-51940278  | -1.15198          | 0.00518531                  |
| 51  | PII6        | XLOC_018853 | 20:10946558-10960390  | -1.1223           | 0.00518531                  |
| 52  | CCDC69      | XLOC_030798 | 5:59964567-60000897   | -1.11107          | 0.00518531                  |
| 53  | PTPN14      | XLOC_006988 | 12:67166952-67360078  | -1.11073          | 0.00518531                  |
| 54  | TMEM38B     | XLOC_015923 | 2:17239648-17308066   | -1.10332          | 0.00518531                  |
| 55  | WDR91       | XLOC_028864 | 4:98800067-98825061   | -1.08334          | 0.00518531                  |
| 56  | COL6A3      | XLOC_000030 | 1:3548871-3642367     | -1.07726          | 0.00518531                  |
| 57  | ST7         | XLOC_028683 | 4:51108413-51361486   | -1.07136          | 0.00518531                  |
| 58  | FSTL1       | XLOC_002230 | 1:183428662-183449739 | -1.05675          | 0.00518531                  |
| 59  | FNIP1       | XLOC_030543 | 5:20299328-20373799   | -1.05166          | 0.00518531                  |
| 60  | HSPG2       | XLOC_016877 | 2:243785043-243859316 | -1.0401           | 0.00518531                  |

**Table S2** Continued

| No. | lncRNA gene | Gene_id     | Chromosome locus     | log2 Fold- change | Adjusted <i>p</i> ( <i>p</i> < 0.05) |
|-----|-------------|-------------|----------------------|-------------------|--------------------------------------|
| 61  | MYBPH       | XLOC_006241 | 12:344436-366834     | -1.0323           | 0.016986755                          |
| 62  | NID1        | XLOC_023417 | 25:8729637-8829119   | -1.02527          | 0.00518531                           |
| 63  | ZC3H12C     | XLOC_010487 | 15:19647455-19734973 | -1.0246           | 0.00518531                           |
| 64  | SIK3        | XLOC_011063 | 15:27001572-27122508 | -1.01641          | 0.00518531                           |
| 65  | FLNC        | XLOC_028293 | 4:92858801-92887441  | -1.01271          | 0.00518531                           |
| 66  | MMP2        | XLOC_008916 | 14:23102468-23341508 | -1.00391          | 0.016986755                          |
| 67  | SPARC       | XLOC_030802 | 5:60404914-60427915  | -1.00261          | 0.00518531                           |

**Table S3** Novel intergenic lncRNAs with strong correlation with mRNAs

| Novel intergenic transcripts (query) | Number of mRNAs (target) | Gene name of mRNAs (target)                                                                                                                                                                                                            | Gene name of mRNAs(target) reported by previous study                                                            | Description                                                                                                                                                        | Reference            |
|--------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| TCONS_00063730                       | 24                       | (ENSOARG00000018439, PPM1J, CHODL, EBPL, CCL11, DPEP3, TNPO1, ENSOARG00000017499, ENSOARG00000007170, EDEM1, RBM15B, UBE2R2, SERINC2, DLK2, RASGRP2, CTSE, TAF4B, GPATCH11, LRRC4, IMPDH1, ENSOARG00000018777, HNRNPD, PLA2G4F, RHPN1) | (PPM1J, CHODL, EBPL, DPEP3, TNPO1, EDEM1, RBM15B, UBE2R2, SERINC2, TAF4B, GPATCH11, IMPDH1, ENSOARG00000018777). | All these mRNAs were reported as differentially expressed genes (DE) between the purebred Texel and hybrid T × BF (Texel × Scottish Blackface) in skeletal muscle. | (Clark et al., 2017) |
| TCONS_00063387                       | 18                       | (MCL1, LMX1A, ENSOARG00000001815, ENSOARG00000006468, ENSOARG00000009490, ENSOARG00000006028, SIAE, ENSOARG00000004465, RIC8A, ENSOARG00000002277, CCDC85A, FOXRED2, CCDC151, ELAVL3, SHD, GNA15, KHNYN, ZIC3)                         | (MCL1, ENSOARG00000009490, SIAE, ENSOARG00000004465, RIC8A                                                       | All these mRNAs were reported as differentially expressed genes (DE) between the purebred Texel and hybrid T × BF (Texel × Scottish Blackface) in skeletal muscle. | (Clark et al., 2017) |
| TCONS_00063388                       | 18                       | (MCL1, LMX1A, ENSOARG00000001815, ENSOARG00000006468, ENSOARG00000009490, ENSOARG00000006028, SIAE, ENSOARG00000004465, RIC8A, ENSOARG00000002277, CCDC85A, FOXRED2, CCDC151, ELAVL3, SHD, GNA15, KHNYN, ZIC3)                         | (MCL1, ENSOARG00000009490, SIAE, ENSOARG00000004465, RIC8A).                                                     | All these mRNAs were reported as differentially expressed genes (DE) between the purebred Texel and hybrid T × BF (Texel × Scottish Blackface) in skeletal muscle. | (Clark et al., 2017) |

**Table S4** Novel antisense lncRNAs with strong correlation with mRNAs

| Novel antisense transcripts (query) | Number of mRNAs (target) | Gene name of mRNAs (target)                                                                                                            | Gene name of mRNAs (target) reported by previous study     | Description                                                                                                                                                        | Reference            |
|-------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| TCONS_00033181                      | 16                       | (LRRFIP1, UBQLN4, ITSNIESTY3, CEP63, ENSOARG00000012125, KCNJ6, TNS4, NUMBL, CASTOR1, EDEM1, TINAGL1, SERPINE1, HS1BP3, ECSIT, INSYN1) | (LRRFIP1, UBQLN4, ITSNI, CEP63, TINAGL1, SERPINE1, ECSIT). | All these mRNAs were reported as differentially expressed genes (DE) between the purebred Texel and hybrid T × BF (Texel × Scottish Blackface) in skeletal muscle. | (Clark et al., 2017) |

**Table S5** Summarized table for interaction between lncRNAs-miRNAs

| Novel intergenic transcripts (query) | Number of miRNAs (target) | Gene name of miRNAs (target) | Gene name of miRNAs(target) reported by previous study | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Reference                                                                                                                           |
|--------------------------------------|---------------------------|------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| TCONS_00040327                       | 2                         | oar-miR-432 and oar-miR-21   | oar-miR-432 and oar-miR-21                             | <p>Earlier studies found the high expression was abundant in miR-432 during the embryo stage of skeletal muscle in fetal sheep.</p> <p>Another study reported that oar-miR-432 inhibits myoblast differentiation and proliferation and could inhibit myogenesis by targeted P55PIK and E2F3 genes by signaling pathway PI3K/AKT/mTOR.</p> <p>These miRNAs miR-21, miR-155, miR-143, miR-221 and miR-23a, are involved in the proliferation, development, and/or differentiation of skeletal muscles.</p> <p>It was revealed that miR-21 was highly differentially expressed (log2 FC=4) in Bandur associated with sheep muscle growth and development.</p> | <p>(Yuan et al., 2020)</p> <p>(Ma et al., 2017)</p> <p>(Fatima and Morris, 2013; Zhang et al., 2017)</p> <p>(Kaur et al., 2020)</p> |
| TCONS_00061518                       | 2                         | oar-let-7b and oar- let-7c   | oar-let-7b and oar- let-7c                             | The family of let-7 miRNAs includes one of the vital regulatory factors in the developmental process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (Zhang et al., 2013)                                                                                                                |

**Table S5** Continued

| Novel intergenic transcripts (query)           | Number of miRNAs (target) | Gene name of miRNAs (target) | Gene name of miRNAs(target) reported by previous study | Description                                                                                                                                                                                             | Reference            |
|------------------------------------------------|---------------------------|------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| TCONS_00064968                                 | 2                         | oar-miR-21 and oar-miR-654   | oar-miR-21                                             | miRNA-21 is a new myogenic involved in the skeletal muscle development of pigs and targeting the TGF $\beta$ I gene can modulate PI3K/Akt/mTOR signaling.                                               | (Bai et al., 2015)   |
|                                                |                           |                              |                                                        | Previous findings noticed that miR-21-5p stimulates the proliferation and differentiation of SMSCs in chicken by targeting KLF3.                                                                        | (Zhang et al., 2021) |
|                                                |                           |                              |                                                        | miRNA-21 targeted mRNA (MEF2C) associated with sheep skeletal muscle.                                                                                                                                   | (Liu et al., 2019)   |
| TCONS_00035378 and TCONS_00056977              | 1                         | oar-miR-381                  | oar-miR-381                                            | Reported in other studies that targeted multiple muscle-related mRNAs such as MEF2C, IGF2, and MBNL1.                                                                                                   | (Liu et al., 2019)   |
|                                                |                           |                              |                                                        | oar-miR-381-3p is one of the most abundant miRNAs found in sheep skeletal muscle at different developmental stages.                                                                                     | (Zhao et al., 2016)  |
| TCONS_00033426, TCONS_00042182, TCONS_00063730 | 1                         | oar-miR-127                  | oar-miR-127                                            | Previous studies showed that miR-127 had a higher expression level in the before birth stage compared with the afterbirth stage, suggesting that miR-127 may play a vital role in embryonic myogenesis. | (Liu et al., 2019)   |
|                                                |                           |                              |                                                        | Detection of important upregulations of the high differentially expressed miRNAs, such as miR-136 and miR-127 in the skeletal muscle of embryonic sheep.                                                | (Yuan et al., 2020)  |
|                                                |                           |                              |                                                        | miR-127 was mainly expressed in the tissue of skeletal muscle and acts as an upregulator during the differentiation of satellite cell (SC) and C2C12.                                                   | (Zhai et al., 2017)  |

**Table S5** Continued

| Novel intergenic transcripts (query)                              | Number of miRNAs (target) | Gene name of miRNAs (target) | Gene name of miRNAs(target) reported by previous study | Description                                                                                                                               | Reference                                                          |
|-------------------------------------------------------------------|---------------------------|------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| TCONS_00047958, TCONS_00040369, TCONS_00048770 and TCONS_00055782 | 1                         | oar-miR-29a                  | oar-miR-29a                                            | miR-29a was reported by a previous study involved in the development and growth of skeletal muscle.                                       | (Galimov et al., 2016; Muluhngwi et al., 2017; Zhou et al., 2016). |
|                                                                   |                           |                              |                                                        | Previous results showed that miR-29a might inhibit proliferation and differentiation in Hu sheep skeletal muscle satellite cells (SMSCs). | (Wu et al., 2020)                                                  |
| TCONS_00052750, TCONS_00060737 and TCONS_00066388                 | 1                         | oar-miR-125b                 | oar-miR-125b                                           | oar-miR-125b mentioned in the previous study, differentially expressed in Bandur correlated with muscle growth and development in sheep.  | (Kaur et al., 2020)                                                |
|                                                                   |                           |                              |                                                        | Previous results demonstrated that miR-125b targeted many mRNAs associated with sheep skeletal muscle, such as MYEF2, MYBL2, and Sirt1.   | (Liu et al., 2019)                                                 |
| TCONS_00040351                                                    | 1                         | oar-miR-29a                  | oar-miR-29a                                            | miR-29a was reported by a previous study involved in the development and growth of skeletal muscle.                                       | (Galimov et al., 2016; Muluhngwi et al., 2017; Zhou et al., 2016). |
|                                                                   |                           |                              |                                                        | Previous results showed that miR-29a might inhibit proliferation and differentiation in Hu sheep Skeletal muscle satellite cells (SMSCs). | (Wu et al., 2020)                                                  |

**Table S6** Table for numbers of nodes and edges between lncRNAs-mRNAs interactions

| Source name    | Type   | Nerna_start | Nerna_end | Target_name | Gene_start | Gene_end | Strand | Free_energy |
|----------------|--------|-------------|-----------|-------------|------------|----------|--------|-------------|
| TCONS_00063223 | lncRNA | 12236       | 12275     | MCM3        | 1          | 40       | –      | -81.21      |
| TCONS_00053067 | lncRNA | 1799        | 1838      | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00063197 | lncRNA | 4042        | 4081      | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00052566 | lncRNA | 21379       | 21418     | MIS18BP1    | 1          | 40       | –      | -79.61      |
| TCONS_00052567 | lncRNA | 21386       | 21425     | MIS18BP1    | 1          | 40       | –      | -79.61      |
| TCONS_00052568 | lncRNA | 21381       | 21420     | MIS18BP1    | 1          | 40       | –      | -79.61      |
| TCONS_00052569 | lncRNA | 21402       | 21441     | MIS18BP1    | 1          | 40       | –      | -79.61      |
| TCONS_00064948 | lncRNA | 5466        | 5505      | MIS18BP1    | 1          | 40       | –      | -77.81      |
| TCONS_00064947 | lncRNA | 5466        | 5505      | MIS18BP1    | 1          | 40       | –      | -77.81      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | IDH1        | 3494       | 3533     | –      | -76.86      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | TMEM232     | 464        | 503      | –      | -76.86      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | ORC3        | 4887       | 4926     | –      | -76.86      |
| TCONS_00041608 | lncRNA | 6548        | 6587      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00053067 | lncRNA | 1814        | 1853      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00063197 | lncRNA | 4057        | 4096      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | NEK3        | 5278       | 5317     | –      | -76.86      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | ASGR1       | 2118       | 2157     | –      | -76.86      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | TEKT3       | 41         | 80       | –      | -76.86      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | IDH1        | 3494       | 3533     | –      | -76.86      |
| TCONS_00041608 | lncRNA | 6455        | 6492      | MCM3        | 1          | 38       | –      | -76.16      |
| TCONS_00052566 | lncRNA | 21394       | 21433     | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00052567 | lncRNA | 21401       | 21440     | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00052568 | lncRNA | 21396       | 21435     | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00052569 | lncRNA | 21417       | 21456     | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00053067 | lncRNA | 1822        | 1861      | ZMYND12     | 4125       | 4164     | –      | -75.16      |
| TCONS_00053067 | lncRNA | 1822        | 1861      | PM20D1      | 2321       | 2360     | –      | -75.26      |
| TCONS_00052752 | lncRNA | 3704        | 3743      | COX20       | 4          | 42       | –      | -75.58      |
| TCONS_00053067 | lncRNA | 1822        | 1861      | KBTBD12     | 163        | 202      | –      | -75.16      |
| TCONS_00043155 | lncRNA | 51770       | 51809     | RESF1       | 1          | 40       | –      | -75.01      |
| TCONS_00043156 | lncRNA | 51770       | 51809     | RESF1       | 1          | 40       | –      | -75.01      |
| TCONS_00053067 | lncRNA | 1822        | 1861      | GIN1        | 234        | 273      | –      | -75.16      |
| TCONS_00041608 | lncRNA | 6533        | 6572      | MIS18BP1    | 1          | 40       | –      | -74.71      |
| TCONS_00064948 | lncRNA | 5481        | 5520      | TAF9B       | 1          | 40       | –      | -74.11      |
| TCONS_00064947 | lncRNA | 5481        | 5520      | TAF9B       | 1          | 40       | –      | -74.11      |
| TCONS_00063222 | lncRNA | 12316       | 12355     | MIS18BP1    | 1          | 40       | –      | -73.21      |
| TCONS_00063223 | lncRNA | 12316       | 12355     | MIS18BP1    | 1          | 40       | –      | -73.21      |
| TCONS_00043155 | lncRNA | 78712       | 78751     | KBTBD12     | 1          | 40       | –      | -72.81      |
| TCONS_00043156 | lncRNA | 78712       | 78751     | KBTBD12     | 1          | 40       | –      | -72.81      |
| TCONS_00053067 | lncRNA | 1752        | 1789      | AARS2       | 1          | 38       | –      | -72.96      |
| TCONS_00060904 | lncRNA | 23040       | 23079     | AARS2       | 1          | 40       | –      | -72.11      |
| TCONS_00063197 | lncRNA | 3995        | 4032      | AARS2       | 1          | 38       | –      | -72.96      |
| TCONS_00063197 | lncRNA | 3962        | 4001      | MCM3        | 1          | 38       | –      | -72.61      |
| TCONS_00060904 | lncRNA | 13764       | 13803     | TMEM232     | 1          | 40       | –      | -72.41      |
| TCONS_00064946 | lncRNA | 26969       | 27008     | TMEM232     | 1          | 40       | –      | -72.31      |
| TCONS_00058863 | lncRNA | 15892       | 15931     | KBTBD12     | 4          | 43       | –      | -71.61      |
| TCONS_00061466 | lncRNA | 1427        | 1466      | RGL3        | 5487       | 5526     | –      | -71.46      |
| TCONS_00058863 | lncRNA | 16385       | 16424     | TAF9B       | 3          | 42       | –      | -71.86      |
| TCONS_00043156 | lncRNA | 83057       | 83096     | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00058863 | lncRNA | 16325       | 16362     | AARS2       | 1          | 38       | –      | -70.96      |
| TCONS_00053060 | lncRNA | 21588       | 21627     | SEC61A1     | 1          | 40       | –      | -88.21      |



Table S6 Continued

| Source name    | Type   | Nerna_start | Nerna_end | Target_name | Gene_start | Gene_end | Strand | Free_energy |
|----------------|--------|-------------|-----------|-------------|------------|----------|--------|-------------|
| TCONS_00058482 | lncRNA | 2727        | 2766      | NTHL1       | 1          | 40       | –      | -87.06      |
| TCONS_00053061 | lncRNA | 15161       | 15200     | TAF9B       | 34         | 73       | –      | -85.76      |
| TCONS_00037300 | lncRNA | 8916        | 8955      | TAF9B       | 8          | 47       | –      | -83.51      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | TAF9B       | 31         | 70       | –      | -83.81      |
| TCONS_00043126 | lncRNA | 6743        | 6782      | MCM3        | 1          | 40       | –      | -83.01      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | PM20D1      | 2359       | 2398     | –      | -83.81      |
| TCONS_00056974 | lncRNA | 1576        | 1615      | ABHD6       | 144        | 183      | –      | -82.21      |
| TCONS_00056133 | lncRNA | 4817        | 4856      | MCM3        | 1          | 40       | –      | -81.21      |
| TCONS_00053061 | lncRNA | 15161       | 15200     | GIN1        | 275        | 314      | –      | -81.36      |
| TCONS_00058483 | lncRNA | 58743       | 58782     | TAF9B       | 4          | 43       | –      | -80.66      |
| TCONS_00038990 | lncRNA | 2862        | 2900      | MEAF6       | 1          | 39       | –      | -80.13      |
| TCONS_00043126 | lncRNA | 6823        | 6862      | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00049625 | lncRNA | 11029       | 11068     | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00049897 | lncRNA | 2857        | 2896      | MIS18BP1    | 74         | 113      | –      | -80.66      |
| TCONS_00058282 | lncRNA | 11509       | 11548     | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00065476 | lncRNA | 4797        | 4836      | MIS18BP1    | 1          | 40       | –      | -80.41      |
| TCONS_00043129 | lncRNA | 4167        | 4204      | AARS2       | 1          | 38       | –      | -80.26      |
| TCONS_00047958 | lncRNA | 2384        | 2423      | ZMYND12     | 4116       | 4155     | –      | -79.11      |
| TCONS_00058283 | lncRNA | 18696       | 18735     | OTULINL     | 30         | 69       | –      | -79.56      |
| TCONS_00049516 | lncRNA | 8125        | 8164      | MIS18BP1    | 1          | 40       | –      | -79.71      |
| TCONS_00049514 | lncRNA | 8125        | 8164      | MIS18BP1    | 1          | 40       | –      | -79.71      |
| TCONS_00047958 | lncRNA | 2384        | 2423      | KBTBD12     | 154        | 193      | –      | -79.11      |
| TCONS_00047958 | lncRNA | 2384        | 2423      | GIN1        | 225        | 264      | –      | -79.11      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | GIN1        | 272        | 311      | –      | -79.41      |
| TCONS_00058201 | lncRNA | 5372        | 5411      | MIS18BP1    | 1          | 40       | –      | -78.11      |
| TCONS_00058483 | lncRNA | 58735       | 58770     | MIS18BP1    | 1          | 36       | –      | -78.66      |
| TCONS_00068220 | lncRNA | 3452        | 3491      | MIS18BP1    | 1          | 40       | –      | -78.11      |
| TCONS_00033074 | lncRNA | 16276       | 16315     | MCM3        | 3          | 42       | –      | -78.81      |
| TCONS_00033075 | lncRNA | 16471       | 16510     | MCM3        | 3          | 42       | –      | -78.81      |
| TCONS_00033076 | lncRNA | 16486       | 16525     | MCM3        | 3          | 42       | –      | -78.81      |
| TCONS_00058482 | lncRNA | 2729        | 2767      | HOXC13      | 1          | 39       | –      | -78.36      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | SGCB        | 1784       | 1823     | –      | -78.11      |
| TCONS_00033231 | lncRNA | 5446        | 5485      | FER1L6      | 377        | 416      | –      | -78.86      |
| TCONS_00033231 | lncRNA | 5446        | 5485      | FER1L6      | 377        | 416      | –      | -78.86      |
| TCONS_00037300 | lncRNA | 8912        | 8947      | MIS18BP1    | 1          | 36       | –      | -78.66      |
| TCONS_00065468 | lncRNA | 10670       | 10709     | MIS18BP1    | 1          | 40       | –      | -77.21      |
| TCONS_00056133 | lncRNA | 5063        | 5102      | KBTBD12     | 20         | 59       | –      | -77.96      |
| TCONS_00049516 | lncRNA | 8045        | 8084      | MCM3        | 1          | 40       | –      | -77.21      |
| TCONS_00049514 | lncRNA | 8045        | 8084      | MCM3        | 1          | 40       | –      | -77.21      |
| TCONS_00049515 | lncRNA | 8045        | 8084      | MCM3        | 1          | 40       | –      | -77.21      |
| TCONS_00049897 | lncRNA | 2850        | 2889      | MCM3        | 1          | 40       | –      | -77.71      |
| TCONS_00049898 | lncRNA | 5862        | 5901      | MCM3        | 1          | 40       | –      | -77.71      |
| TCONS_00049899 | lncRNA | 5867        | 5906      | MCM3        | 1          | 40       | –      | -77.71      |
| TCONS_00056133 | lncRNA | 5063        | 5102      | ESYT2       | 194        | 233      | –      | -77.96      |
| TCONS_00043128 | lncRNA | 452         | 491       | MIS18BP1    | 1          | 40       | –      | -77.71      |
| TCONS_00053061 | lncRNA | 15161       | 15200     | MIS18BP1    | 19         | 58       | –      | -77.76      |
| TCONS_00056133 | lncRNA | 4897        | 4936      | MIS18BP1    | 1          | 40       | –      | -77.41      |
| TCONS_00058200 | lncRNA | 5913        | 5952      | MIS18BP1    | 1          | 40       | –      | -77.71      |
| TCONS_00033072 | lncRNA | 19202       | 19241     | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00043126 | lncRNA | 6838        | 6877      | TAF9B       | 1          | 40       | –      | -76.71      |

Table S6 Continued

| Source name    | Type   | Nerna_start | Nerna_end | Target_name | Gene_start | Gene_end | Strand | Free_energy |
|----------------|--------|-------------|-----------|-------------|------------|----------|--------|-------------|
| TCONS_00043128 | lncRNA | 467         | 506       | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00049516 | lncRNA | 8140        | 8179      | TAF9B       | 1          | 40       | –      | -76.01      |
| TCONS_00049514 | lncRNA | 8140        | 8179      | TAF9B       | 1          | 40       | –      | -76.01      |
| TCONS_00049515 | lncRNA | 8140        | 8179      | TAF9B       | 1          | 40       | –      | -76.01      |
| TCONS_00049625 | lncRNA | 11044       | 11083     | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00056133 | lncRNA | 4912        | 4951      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00058201 | lncRNA | 5387        | 5426      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00058282 | lncRNA | 11524       | 11563     | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00065476 | lncRNA | 4812        | 4851      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00068220 | lncRNA | 3467        | 3506      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00043129 | lncRNA | 4214        | 4253      | MIS18BP1    | 1          | 40       | –      | -76.51      |
| TCONS_00031884 | lncRNA | 3408        | 3447      | TAF9B       | 1          | 40       | –      | -76.71      |
| TCONS_00065475 | lncRNA | 11701       | 11740     | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00049153 | lncRNA | 18818       | 18857     | GSTM3       | 1222       | 1261     | –      | -75.36      |
| TCONS_00033231 | lncRNA | 5446        | 5485      | DYNC2H1     | 551        | 590      | –      | -75.26      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | MIS18BP1    | 16         | 55       | –      | -75.81      |
| TCONS_00056798 | lncRNA | 13312       | 13351     | MIS18BP1    | 1          | 40       | –      | -75.91      |
| TCONS_00041903 | lncRNA | 11577       | 11616     | SEC61A1     | 1          | 40       | –      | -75.21      |
| TCONS_00041904 | lncRNA | 8949        | 8988      | SEC61A1     | 1          | 40       | –      | -75.21      |
| TCONS_00049654 | lncRNA | 16448       | 16487     | HOXC13      | 2          | 41       | –      | -75.86      |
| TCONS_00033070 | lncRNA | 9462        | 9501      | RESF1       | 1          | 40       | –      | -75.81      |
| TCONS_00058378 | lncRNA | 2342        | 2381      | GIN1        | 1          | 40       | –      | -75.51      |
| TCONS_00058311 | lncRNA | 6255        | 6294      | TMEM232     | 1          | 40       | –      | -75.21      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | RBBP7       | 2214       | 2253     | –      | -75.59      |
| TCONS_00052757 | lncRNA | 2990        | 3029      | RBBP7       | 2493       | 2532     | –      | -75.59      |
| TCONS_00056974 | lncRNA | 1576        | 1615      | ASGR1       | 2335       | 2374     | –      | -74.41      |
| TCONS_00047958 | lncRNA | 2352        | 2391      | MIS18BP1    | 1          | 40       | –      | -74.31      |
| TCONS_00064732 | lncRNA | 12144       | 12183     | ABHD6       | 2          | 41       | –      | -74.41      |
| TCONS_00033073 | lncRNA | 28959       | 28998     | TAF9B       | 1          | 40       | –      | -74.41      |
| TCONS_00033074 | lncRNA | 28979       | 29018     | TAF9B       | 1          | 40       | –      | -74.41      |
| TCONS_00033075 | lncRNA | 29174       | 29213     | TAF9B       | 1          | 40       | –      | -74.41      |
| TCONS_00033076 | lncRNA | 29189       | 29228     | TAF9B       | 1          | 40       | –      | -74.41      |
| TCONS_00056798 | lncRNA | 13327       | 13366     | TAF9B       | 1          | 40       | –      | -74.51      |
| TCONS_00058200 | lncRNA | 5928        | 5967      | TAF9B       | 1          | 40       | –      | -74.01      |
| TCONS_00056974 | lncRNA | 1576        | 1615      | ASGR1       | 2335       | 2374     | –      | -74.41      |
| TCONS_00049516 | lncRNA | 16903       | 16942     | KBTBD12     | 14         | 53       | –      | -73.91      |
| TCONS_00047958 | lncRNA | 2272        | 2311      | MCM3        | 1          | 40       | –      | -73.81      |
| TCONS_00049625 | lncRNA | 10949       | 10988     | MCM3        | 1          | 40       | –      | -73.91      |
| TCONS_00047958 | lncRNA | 2337        | 2376      | HOXC13      | 1          | 40       | –      | -73.29      |
| TCONS_00047958 | lncRNA | 2384        | 2423      | PM20D1      | 2312       | 2351     | –      | -73.31      |
| TCONS_00066560 | lncRNA | 438         | 476       | B3GALT6     | 33         | 69       | –      | -73.06      |
| TCONS_00056857 | lncRNA | 18619       | 18658     | KBTBD12     | 1          | 40       | –      | -72.11      |
| TCONS_00056858 | lncRNA | 29916       | 29955     | KBTBD12     | 1          | 40       | –      | -72.11      |
| TCONS_00058282 | lncRNA | 11693       | 11732     | KBTBD12     | 2          | 41       | –      | -72.36      |
| TCONS_00061404 | lncRNA | 74798       | 74837     | KBTBD12     | 1          | 40       | –      | -72.81      |
| TCONS_00031884 | lncRNA | 3346        | 3383      | AARS2       | 1          | 38       | –      | -72.96      |
| TCONS_00049625 | lncRNA | 10982       | 11019     | AARS2       | 1          | 38       | –      | -72.96      |
| TCONS_00033072 | lncRNA | 19107       | 19146     | MCM3        | 1          | 40       | –      | -72.71      |
| TCONS_00033070 | lncRNA | 9280        | 9319      | ZBTB43      | 1          | 40       | –      | -72.76      |
| TCONS_00056133 | lncRNA | 5063        | 5102      | IMMT        | 8          | 47       | –      | -72.56      |

Table S6 Continued

| Source name    | Type   | Nerna_start | Nerna_end | Target_name | Gene_start | Gene_end | Strand | Free_energy |
|----------------|--------|-------------|-----------|-------------|------------|----------|--------|-------------|
| TCONS_00058201 | lncRNA | 8238        | 8277      | TMEM232     | 1          | 40       | –      | -72.41      |
| TCONS_00061404 | lncRNA | 13513       | 13552     | TMEM232     | 1          | 40       | –      | -72.01      |
| TCONS_00068448 | lncRNA | 4166        | 4204      | TMEM232     | 1          | 39       | –      | -72.36      |
| TCONS_00068449 | lncRNA | 3314        | 3352      | TMEM232     | 1          | 39       | –      | -72.36      |
| TCONS_00043129 | lncRNA | 4229        | 4268      | TAF9B       | 1          | 40       | –      | -72.81      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | TAF9B       | 49         | 88       | –      | -72.81      |
| TCONS_00032735 | lncRNA | 18657       | 18696     | MEAF6       | 5          | 43       | –      | -72.71      |
| TCONS_00032736 | lncRNA | 19007       | 19046     | MEAF6       | 5          | 43       | –      | -72.71      |
| TCONS_00049518 | lncRNA | 2709        | 2748      | TEKT3       | 94         | 133      | –      | -72.01      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | PM20D1      | 2377       | 2416     | –      | -72.81      |
| TCONS_00068373 | lncRNA | 20757       | 20796     | SEC61A1     | 3          | 42       | –      | -72.14      |
| TCONS_00066560 | lncRNA | 441         | 476       | FRMPD1      | 2701       | 2739     | –      | -71.2       |
| TCONS_00048535 | lncRNA | 2048        | 2087      | SYCE1       | 2600       | 2639     | –      | -71.01      |
| TCONS_00048767 | lncRNA | 2733        | 2772      | CCDC68      | 1609       | 1648     | –      | -71.06      |
| TCONS_00048768 | lncRNA | 2733        | 2772      | CCDC68      | 1609       | 1648     | –      | -71.06      |
| TCONS_00048766 | lncRNA | 3299        | 3338      | CCDC68      | 1609       | 1648     | –      | -71.06      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | ESYT2       | 374        | 413      | –      | -71.01      |
| TCONS_00068377 | lncRNA | 5937        | 5976      | ESYT2       | 135        | 174      | –      | -71.31      |
| TCONS_00068378 | lncRNA | 5945        | 5984      | ESYT2       | 135        | 174      | –      | -71.31      |
| TCONS_00068379 | lncRNA | 7240        | 7279      | ESYT2       | 135        | 174      | –      | -71.31      |
| TCONS_00068377 | lncRNA | 5937        | 5976      | GIN1        | 32         | 71       | –      | -71.11      |
| TCONS_00068378 | lncRNA | 5945        | 5984      | GIN1        | 32         | 71       | –      | -71.11      |
| TCONS_00068379 | lncRNA | 7240        | 7279      | GIN1        | 32         | 71       | –      | -71.11      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | CHRD        | 4889       | 4928     | –      | -71.11      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | SMC4        | 6240       | 6279     | –      | -71.11      |
| TCONS_00031884 | lncRNA | 2922        | 2961      | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00043129 | lncRNA | 13312       | 13351     | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00049516 | lncRNA | 2018        | 2057      | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00049514 | lncRNA | 2018        | 2057      | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00049515 | lncRNA | 2018        | 2057      | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00049850 | lncRNA | 3513        | 3552      | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00058483 | lncRNA | 35780       | 35819     | OTULINL     | 1          | 40       | –      | -71.46      |
| TCONS_00044408 | lncRNA | 8410        | 8449      | MIS18BP1    | 66         | 105      | –      | -71.51      |
| TCONS_00049898 | lncRNA | 4539        | 4577      | MIS18BP1    | 1          | 39       | –      | -71.56      |
| TCONS_00049899 | lncRNA | 4544        | 4582      | MIS18BP1    | 1          | 39       | –      | -71.56      |
| TCONS_00047876 | lncRNA | 11201       | 11240     | SEC61A1     | 3          | 42       | –      | -71.74      |
| TCONS_00058864 | lncRNA | 2255        | 2294      | MCM3        | 1          | 40       | –      | -80.71      |
| TCONS_00058864 | lncRNA | 2333        | 2372      | MIS18BP1    | 1          | 40       | –      | -79.51      |
| TCONS_00049806 | lncRNA | 2524        | 2563      | RENB        | 213        | 252      | –      | -77.51      |
| TCONS_00049806 | lncRNA | 2524        | 2563      | C1QA        | 1726       | 1765     | –      | -75.49      |
| TCONS_00058864 | lncRNA | 2348        | 2387      | TAF9B       | 1          | 40       | –      | -75.81      |
| TCONS_00049806 | lncRNA | 2524        | 2563      | KIAA1841    | 2638       | 2677     | –      | -74.51      |
| TCONS_00049806 | lncRNA | 2524        | 2563      | NXPE4       | 1985       | 2024     | –      | -72.09      |
| TCONS_00049806 | lncRNA | 2524        | 2563      | MKKS        | 3154       | 3193     | –      | -71.99      |
| TCONS_00066560 | lncRNA | 437         | 476       | DNAAF5      | 887        | 923      | –      | -70.93      |
| TCONS_00053061 | lncRNA | 15161       | 15200     | KBTBD12     | 204        | 243      | –      | -70.96      |
| TCONS_00048535 | lncRNA | 2048        | 2087      | TMEM126A    | 220        | 259      | –      | -70.91      |
| TCONS_00066560 | lncRNA | 439         | 476       | NTHL1       | 5          | 44       | –      | -70.87      |
| TCONS_00061404 | lncRNA | 74639       | 74677     | MIS18BP1    | 1          | 39       | –      | -70.76      |
| TCONS_00065475 | lncRNA | 11687       | 11725     | MIS18BP1    | 1          | 39       | –      | -70.76      |

**Table S7** Numbers of nodes and edges between novel intergenic lncRNAs-miRNAs interactions

| No. | Novel intergenic transcript | miRNAs detected in sheep skeletal muscle | Energy <-20 / Score $\geq$ 150 |
|-----|-----------------------------|------------------------------------------|--------------------------------|
| 1   | TCONS_00032891              | miR-221                                  | -26.79 / 167                   |
| 2   | TCONS_00038667              | miR-412                                  | -21.53 / 165                   |
| 3   | TCONS_00040327              | miR-432                                  | -20.49 / 161                   |
|     | TCONS_00040327              | miR-21                                   | -23.66 / 170                   |
| 4   | TCONS_00044414              | miR-432                                  | -21.47 / 162                   |
| 5   | TCONS_00047958              | miR-29a                                  | -21.96 / 179                   |
| 6   | TCONS_00052750              | miR-125b                                 | -23.49 / 171                   |
| 7   | TCONS_00069211              | miR-299                                  | -21.70 / 168                   |
| 8   | TCONS_00031990              | miR-362                                  | -20.09 / 154                   |
| 9   | TCONS_00032133              | miR-21                                   | -21.30 / 150                   |
| 10  | TCONS_00032134              | miR-21                                   | -21.30 / 150                   |
| 11  | TCONS_00033426              | miR-127                                  | -23.35 / 151                   |
| 12  | TCONS_00035378              | miR-381                                  | -20.96 / 152                   |
| 13  | TCONS_00036202              | miR-299                                  | -20.79 / 150                   |
| 14  | TCONS_00038672              | miR-654                                  | -22.95 / 155                   |
| 15  | TCONS_00040366              | miR-487b                                 | -22.99 / 154                   |
| 16  | TCONS_00040369              | miR-29a                                  | -20.64 / 150                   |
| 17  | TCONS_00042182              | miR-127                                  | -26.64 / 153                   |
| 18  | TCONS_00043128              | miR-432                                  | -20.13 / 156                   |
| 19  | TCONS_00044405              | miR-99a                                  | -20.00 / 158                   |
| 20  | TCONS_00044413              | miR-654                                  | -21.06 / 155                   |
| 21  | TCONS_00047538              | miR-99a                                  | -21.17 / 152                   |
| 22  | TCONS_00047539              | miR-99a                                  | -21.17 / 152                   |
| 23  | TCONS_00047777              | oar- let-7b                              | -20.16 / 153                   |
| 24  | TCONS_00048770              | miR-29a                                  | -20.86 / 158                   |
| 25  | TCONS_00055782              | miR-29a                                  | -20.87 / 158                   |
| 26  | TCONS_00056548              | miR-485                                  | -20.23 / 158                   |
| 27  | TCONS_00056977              | miR-381                                  | -20.89 / 151                   |
| 28  | TCONS_00058287              | miR-25                                   | -20.63 / 152                   |
| 29  | TCONS_00060737              | miR-125b                                 | -20.07 / 150                   |
| 30  | TCONS_00061217              | miR-432                                  | -25.17 / 151                   |
| 31  | TCONS_00061518              | oar-let-7b                               | -20.58 / 153                   |
|     | TCONS_00061518              | oar- let-7c                              | -20.58 / 153                   |
| 32  | TCONS_00061711              | miR-432                                  | -23.09 / 150                   |
| 33  | TCONS_00061929              | miR-362                                  | -20.19 / 154                   |
| 34  | TCONS_00063730              | miR-127                                  | -24.22 / 159                   |
| 35  | TCONS_00064968              | miR-21                                   | -21.20 / 157                   |
|     | TCONS_00064968              | miR-654                                  | -23.83 / 155                   |
| 36  | TCONS_00064969              | miR-432                                  | -32.41 / 157                   |
| 37  | TCONS_00066388              | miR-125b                                 | -21.81 / 157                   |
| 38  | TCONS_00066715              | miR-493                                  | -20.28 / 156                   |
| 39  | TCONS_00069229              | miR-26b                                  | -20.35 / 151                   |

**Table S8** Numbers of nodes and edges between novel antisense lncRNAs-miRNAs interactions

| No | Novel antisense transcript | miRNAs detected in sheep skeletal muscle | Energy <-20 / score $\geq$ 150 |
|----|----------------------------|------------------------------------------|--------------------------------|
| 1  | TCONS_00031757             | miR-654                                  | -21.17 / 150.00                |
| 2  | TCONS_00033644             | miR-125b                                 | -25.02/158                     |
| 3  | TCONS_00033645             | miR-412                                  | -31.98/166                     |
|    | TCONS_00033645             | miR-432                                  | -24.36 / 150                   |
| 4  | TCONS_00033663             | miR-127                                  | -22.69/163                     |
| 5  | TCONS_00041908             | miR-21                                   | -23.53 / 155                   |
| 6  | TCONS_00050114             | miR-433                                  | -22.80/168                     |
| 7  | TCONS_00050115             | miR-433                                  | -22.80/168                     |
| 8  | TCONS_00050113             | miR-433                                  | -22.80/168                     |
| 9  | TCONS_00053067             | miR-127                                  | -20.36/152                     |
| 10 | TCONS_00055533             | miR-127                                  | -24.55 / 153                   |
| 11 | TCONS_00060693             | miR-382                                  | -23.39/160                     |
| 12 | TCONS_00061466             | miR-125b                                 | -20.79 /152                    |
| 13 | TCONS_00068387             | miR-127                                  | -20.23 / 154                   |