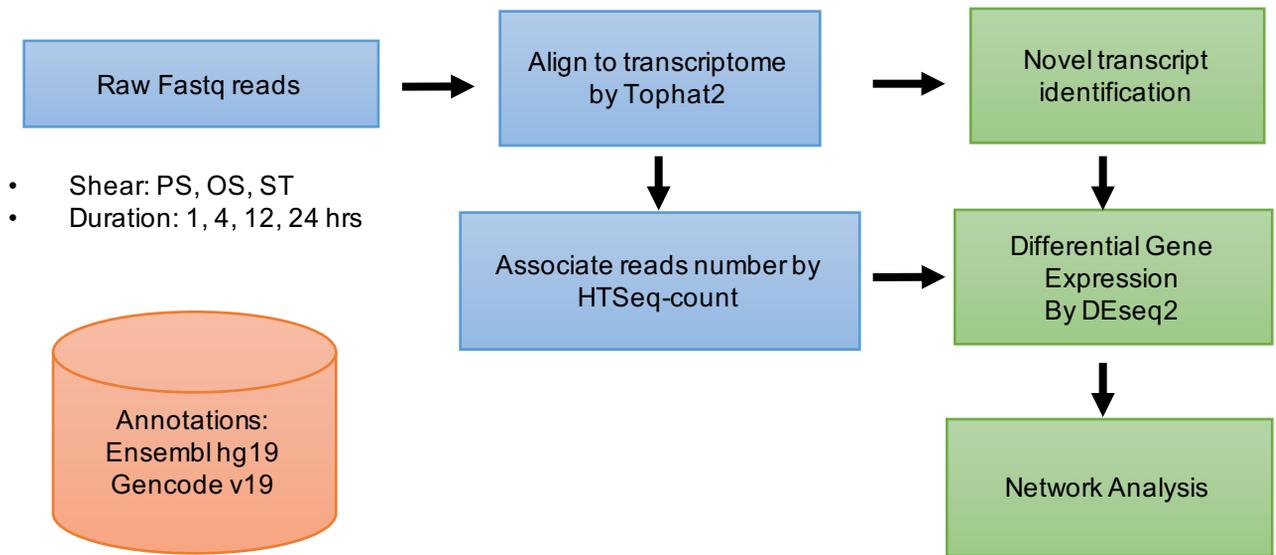
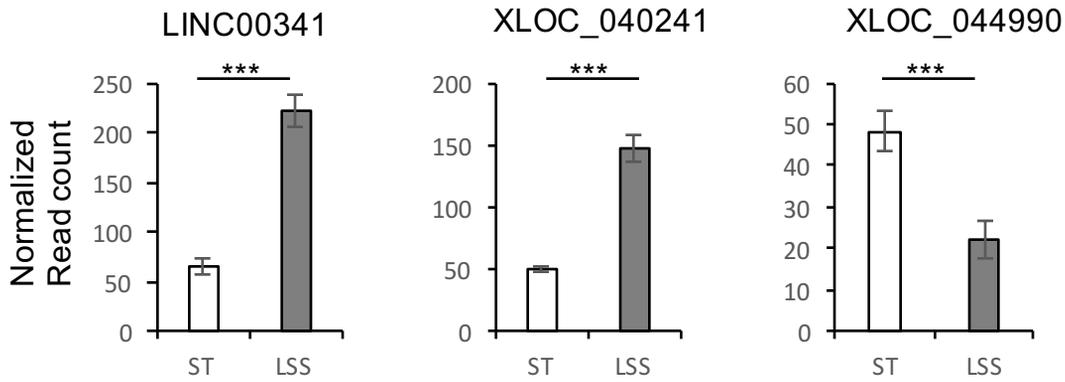


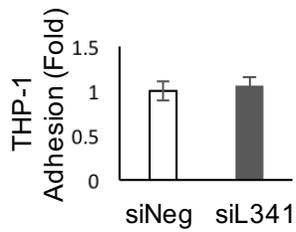
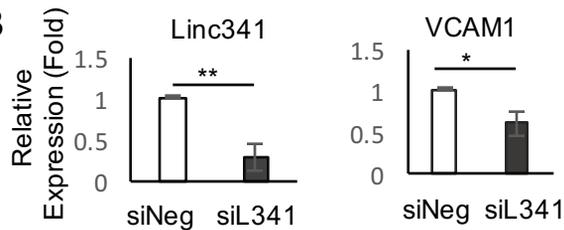
A**B**

Flow pattern	Duration (hour)	RNAseq aligned read pairs (million)	
		batch1	batch2
Pulsatile	1	40.84	41.05
Pulsatile	4	43.71	57.82
Pulsatile	12	45.94	59.09
Pulsatile	24	41.46	57.95
Oscillatory	1	44.21	57.72
Oscillatory	4	45.21	43.88
Oscillatory	12	47.09	69.50
Oscillatory	24	44.09	43.27
Static	1	41.99	48.44
Static	4	41.85	43.17
Static	12	39.92	63.68
Static	24	43.44	56.27

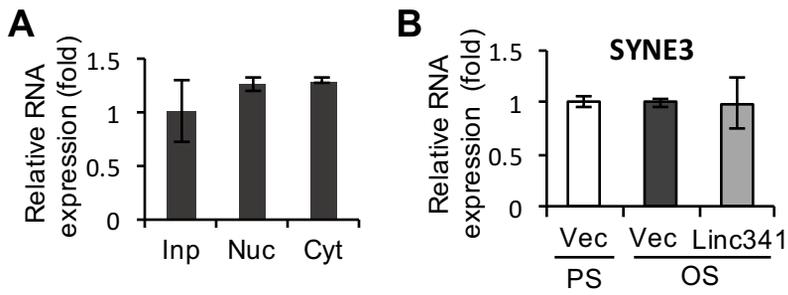
Supplementary Figure 1. Analysis on RNA-seq data. (A) The analysis pipeline used in this study. (B) Number of reads obtained in each samples.



Supplementary Figure 2. Reads of novel lincRNAs in independent RNA-seq dataset. Reanalysis of EC RNA-seq data in GSE71164 (Maleszewska, *et al* 2016) demonstrated the shear-responsive known and novel lincRNAs identified in our study are also presented in the ECs from different individuals. ST, Scr-static (GEO accession number GSM1828760, GSM1828761 and GSM1828762); LSS: Scr-flow shear stress 20 dyne/cm² (GSM1828766, GSM1828767 and GSM1828768), ***, $p_{adj} < 10^{-5}$, false discover rate by Benjamini-Hochberg method.

A**B**

Supplementary Figure 3. Knockdown of LINC00341 in PS-treated ECs. (A) LINC00341 knockdown in ECs subjected to PS didn't significantly change the monocyte adhered to the ECs. (B) RNA expression levels of LINC00341 and VCAM1 were evaluated by RT-qPCR. *, $p < 0.05$, **, $p < 0.01$, Student's t test.



Supplementary Figure 4. Distribution and downstream gene of LINC00341. (A) The subcellular localization of LINC00341 is determined by RT-qPCR in different fractions of EC lysates. (B) LINC00341 were overexpressed in ECs subjected to shear stress and RNA expression level were determined by RT-qPCR. Bars are represented as mean \pm SEM

A

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human ---AG-----AAACAAATTCCTC-CTTGTTCTTACTTTGAAAAACAGAAGTCGTTTCTC 50
mouse ---AA-----AAAAAAACCTCC-CTTGCTCTT-CTTTGATAAACGGAAGGCCTTCTC 49
bovine TTTAACTTCTTAAAAATGATTTCCACTTTTCTCACTTTGACAAACAGGAGGCCTTCTC 120
      *      *** *      * *** ** * ** ** * ** * ** * ** * ** * ** * ** *

human TCATACACAGAAGCTAAGGGAGAAACGACAGCTGGTTTTAAGTCCTCTTTGACTCTGGGC 110
mouse TCATTCTTTGGGGCTGAGGAAGAAATGTCAGCTGATTGGAAGTCCT--TTGGTTGCAACC 107
bovine TTATA-ATTGAAACT----AAGAAGTGATGG-----TCTAAGTCTT--CTGAATCTGCCC 168
      * *      * *      * * * * * * * * * * * * * * * * * * * * *

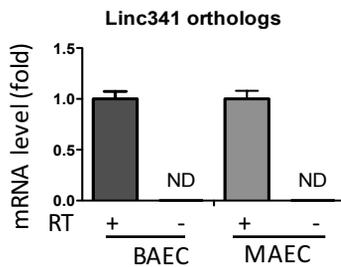
human CTCTGCTGAAGCAGCCTGCAGGCACTGGCAATTGGGTGATGAGGGCCACCTGTGGGGTGC 170
mouse TTGTACTGGAG-AGGCTCCAAGCTCTGTCTATTAGGTGATG-----GTGGG---- 152
bovine CTCTGCTGGAG-GCGCCGTGGGCTCCATCAGGCGGATGCTGGGAGCCACC--TGGGCTGT 225
      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

human CCCCACCCACTTTCCTTTTCAAAGCCTC----AATTGTCT-GCTACAAAAC---AAAGAG 222
mouse -----TCTC---AGTGACCT-GCTAGAAGGT---CAGAGG 180
bovine G-----TGCTCTCCCAAGTCTCTTTTGGGGGCTTAGCTGGAAAATGGGCGGGGG 275
      * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

human CTGGCCTGGAAAGGCTCAGAGATCC---TCATTTTCCAAGATTTGCACCCAGGAGCTCCT 279
mouse CTGGTCTGAAAAAGCT-ATGGCTCTCTTTCCCTTCCAGGATTTGCTCCCAGGAGCTCCT 239
bovine GAAGCCTGGAAAAGCTCAGAAAAGCT---TCTCTTTTCAAGATGTGTCCCAGGAGTAACT 332
      * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

human CAAGCTCAAGAAGAAATGAAAGCAAATATGCATTGCCTGGGCTGAATCCAAACACAAAAGA 339
mouse TGTGGCTAGGAGTGGCTGGAAGTTATTGTGAACCTCCAGAG--AGATCTGAACACAAAA- 296
bovine CATGTTCCAGAAGAAATTGAAGGAATAAAATTTCTGGGCTGAATTCAAACACA---- 388
      *      **      * * * * * * * * * * * * * * * * * * * * * *

```

B

Supplementary Figure 6. Bovine and murine ortholog of LINC00341 (A) the murine and bovine ortholog of first segments of LINC00341 found in the UCSC MAF format of pairwise alignment. (B) Bovine- and murine-specific primers of LINC00341 orthologs were used to verify their expressions in commercially available artery endothelial cell of bovine (BAEC) and mouse (MAEC) by RT-qPCR. The no-RT control demonstrate the specificity of PCR primers. RT, reverse transcriptase. Bars represent mean \pm SEM.