Analysis of hypoxia-induced noncoding RNAs reveals MALAT1 as an important regulator of vascular smooth muscle cell proliferation

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Short Title: MALAT1 as novel target in pulmonary vascular biology

Supplementary Material

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30 Supplementary Table 1

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Gene expression primer	
β-actin fwd (hsa, mmu)	5’ – TCA AGA TCA TTG CTC CTC CTG AG – 3’
β-actin rev (hsa, mmu)	5’ – TCC TGC TTG CTG ATC CAC ATC – 3’
MALAT1 fwd (hsa) (1)	5’ – GTG ATG CGA GTT GTT CTC CG – 3’
MALAT1 rev (hsa) (1)	5’ – CTG GCT GCC TCA ATG CCT AC – 3’
MALAT1 fwd (mmu) (1)	5’ – GGC GGA ATT GCT GGT AGT TT – 3’
MALAT1 rev (mmu) (1)	5’ – AGC ATA GCA GTA CAC GCC TT – 3’
mascRNA fwd (hsa) (2)	5’ - ATG CTG GTG GTT GGC ACT C - 3’
mascRNA rev (hsa) (2)	5’ - ACG CCG CAG GGA TTT GAA C - 3’
HIF1α fwd (hsa)	5’ - GGA TGC TGG TGA TTT GGA TAT TG – 3’
HIF1α rev (hsa)	5’ - ATC TGT GAG AAC CAT AAC AAA ACC – 3’
HIF2α fwd (hsa)	5’ – TCC TCA GTT TGC TCT GAA AAC G – 3’
HIF2α rev (hsa)	5’ – CAA GGC TTT CAG GTA CAA GTT G – 3’
CDKN1A fwd (hsa)	5’ - AGC ATG ACA GAT TTC TAC CAC TC – 3’
CDKN1A rev (hsa)	5’ - GGC TTC CTC TTG GAG AAG ATC – 3’
CDKN1B fwd (hsa)	5’ - ACC TGC AAC CGA CGA TTC TTC - 3’
CDKN1B rev (hsa)	5’ - CAT TTG GGG AAC CGT CTG AAA C - 3’
CDKN1C fwd (hsa)	5’ - CCT CTG ATC TCC GAT TTC TTC - 3’
CDKN1C rev (hsa)	5’ - ACT TCT CAG GCG CTG ATC TC - 3’
CDKN2A fwd (hsa)	5’ - CTC AGA CAT CCC CGA TTG AAA G - 3’
CDKN2A rev (hsa)	5’ - CTT CGG TGA CTG ATG ATC TAA G - 3’
CDKN2B fwd (hsa)	5’ - TCA CCA TGA AGC GAA ACA CAG - 3’
CDKN2B rev (hsa)	5’ - GAA AAC CCT GAA AAG CAA ACG AC - 3’
CDKN2C fwd (hsa)	5’ - CGC TGC AGG TTA TGA AAC TTG - 3’

CDKN2C rev (hsa)	5’ - GGG ATT AGC ACC TCT AAG TAG - 3’
CDKN2D fwd (hsa)	5’ - CGC TGC AGG TCA TGA TGT TTG - 3’
CDKN2D rev (hsa)	5’ - GTC ATG GAC TGG ACT GGT AC - 3’

References

1. Michalik KM, You X, Manavski Y, Doddaballapur A, Zornig M, Braun T, John D, Ponomareva Y, Chen W, Uchida S, Boon RA, Dimmeler S. Long noncoding RNA MALAT1 regulates endothelial cell function and vessel growth. Circ Res. 2014;114(9):1389-97.

2. Gast M, Schroen B, Voigt A, Haas J, Kuehl U, Lassner D, Skurk C, Escher F, Wang X, Kratzer A, Michalik K, Papageorgiou A, Peters T, Loebel M, Wilk S, Althof N, Prasanth KV, Katus H, Meder B, Nakagawa S, Scheibenbogen C, Schultheiss HP, Landmesser U, Dimmeler S, Heymans S, Poller W. Long noncoding RNA MALAT1-derived mascRNA is involved in cardiovascular innate immunity. J Mol Cell Biol. 2016.