

**Supplementary Table 3A. Results of knockdown of trans-regulators in fibroblasts**

Regulator-Target gene*	Changes in expression levels of		
	Regulator†	Target Gene†	Control (GAPDH) ‡
<i>BLM-NUSAP1</i>	-39.1±8.7	13.8±2.2	0.6±5.1
<i>ITGB4BP-SLC25A11</i>	-44.5±3.6	20.6±5.3	0.8±1.5

**Supplementary Table 3B Results showing that knockdown of GPHN was achieved with two oligonucleotides (a and b) that target different portions of GPHN and a pool of 4 oligonucleotides (p) that target different parts of GPHN as in Table 2 in main text. Following GPHN knockdown, significant changes in expression of its target gene, RALB, were observed but the expression of a non-target control gene, GAPDH, did not change significantly.**

Regulator-Target gene*	Changes in expression levels of		
	Regulator†	Target Gene†	Control (GAPDH) ‡
<i>GPHN(p)-RALB</i>	-72.6±4.6	40.7±8.7	14.7±12.0
<i>GPHN(a)-RALB</i>	-75.3±3.1	58.2±3.7	9.0±24.2
<i>GPHN(b)-RALB</i>	-88.9±1.0	59.8±15.9	20.9±7.3

\* All experiments were based on independent siRNA knockdown of 2 samples.

† Expression levels of the regulators and target genes changed significantly ( $P < 0.05$ , t-test) compared to baseline (without siRNA knockdown).

‡ Expression level of a control, *GAPDH*, did not change significantly ( $P > 0.05$ ) upon siRNA knockdown of the regulators.

GPHN p a pool of 4 siRNA was used (sequences in Supplementary Table 5)  
 GPHN a CCAUUGACCUUUUACGUGA  
 GPHN b CGAUUUGGAUAAAAGUUGA