

Supplementary Files 1

for

lncRNA *TUG1* as a ceRNA promotes PM exposure-induced airway hyper-reactivity

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Fig. S1.

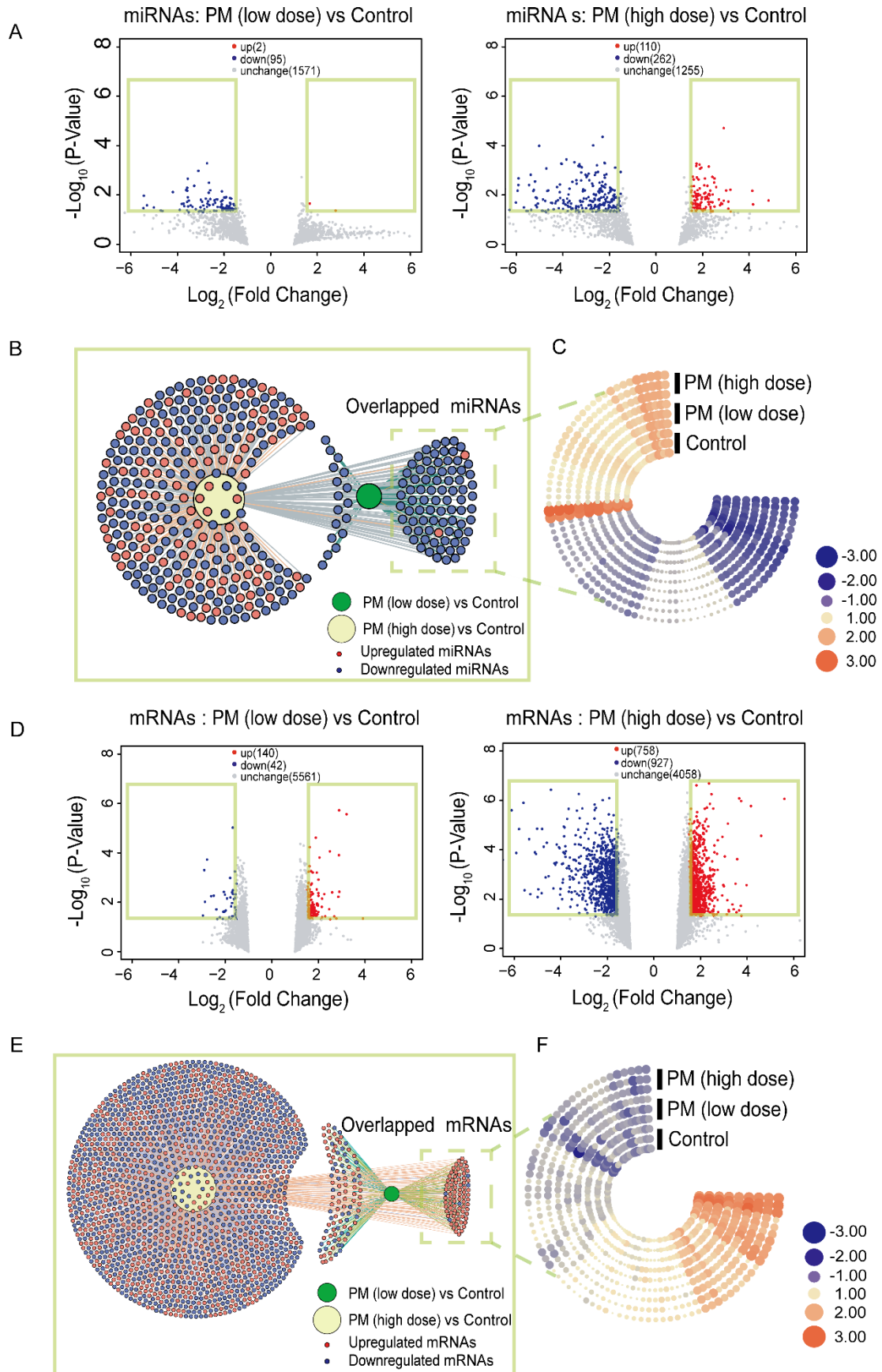


Fig. S1. Differentially expressed miRNAs and mRNAs in HBE cells following PM exposure

(A, D) The volcano plots revealed differentially expressed miRNAs and mRNAs in HBE cells between the PM-treated and control groups, with a cut-off as fold change ≥ 1.5 and P -value < 0.05 .

(B, E) Network diagram showed the overlapped differentially expressed miRNAs and mRNAs between PM (low dose) and PM (high dose) group. Each red or blue point represent a single upregulated or downregulated miRNA or mRNA, respectively.

(C, F) The heatmap showed expression levels of overlapped miRNAs and mRNAs in HBE cells. Each arc represents a cellular sample, each column represents a miRNA or mRNA. The color code represents expression level: red or blue color represent higher or lower expression levels relative to the control, respectively.

Fig. S2.

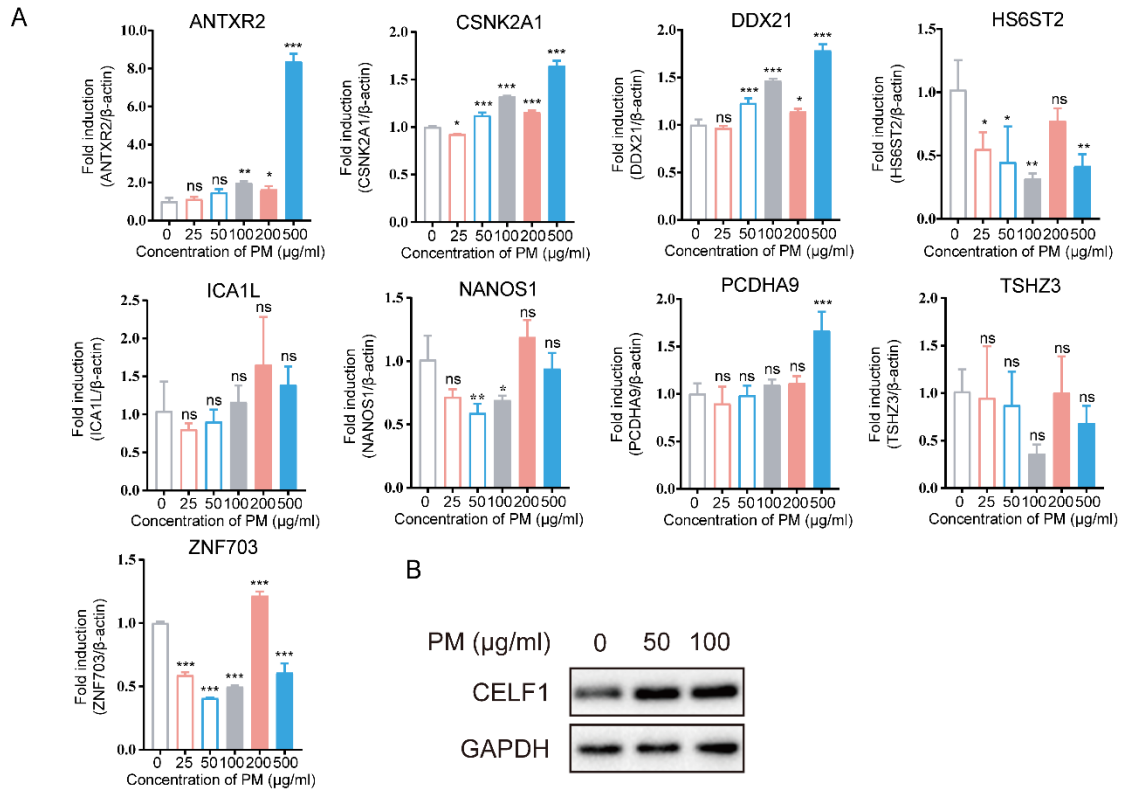


Fig. S2. Expression levels of mRNAs in HBE cells following PM exposure

(A) Quantitative RT-PCR analysis of 9 mRNAs expression levels in HBE cells. β -actin was used as a normalization control. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, compared with control.

(B) Protein levels of CELF1 in HBE cells exposed to PM (0, 50 or 100 $\mu\text{g/ml}$).

Fig. S3.

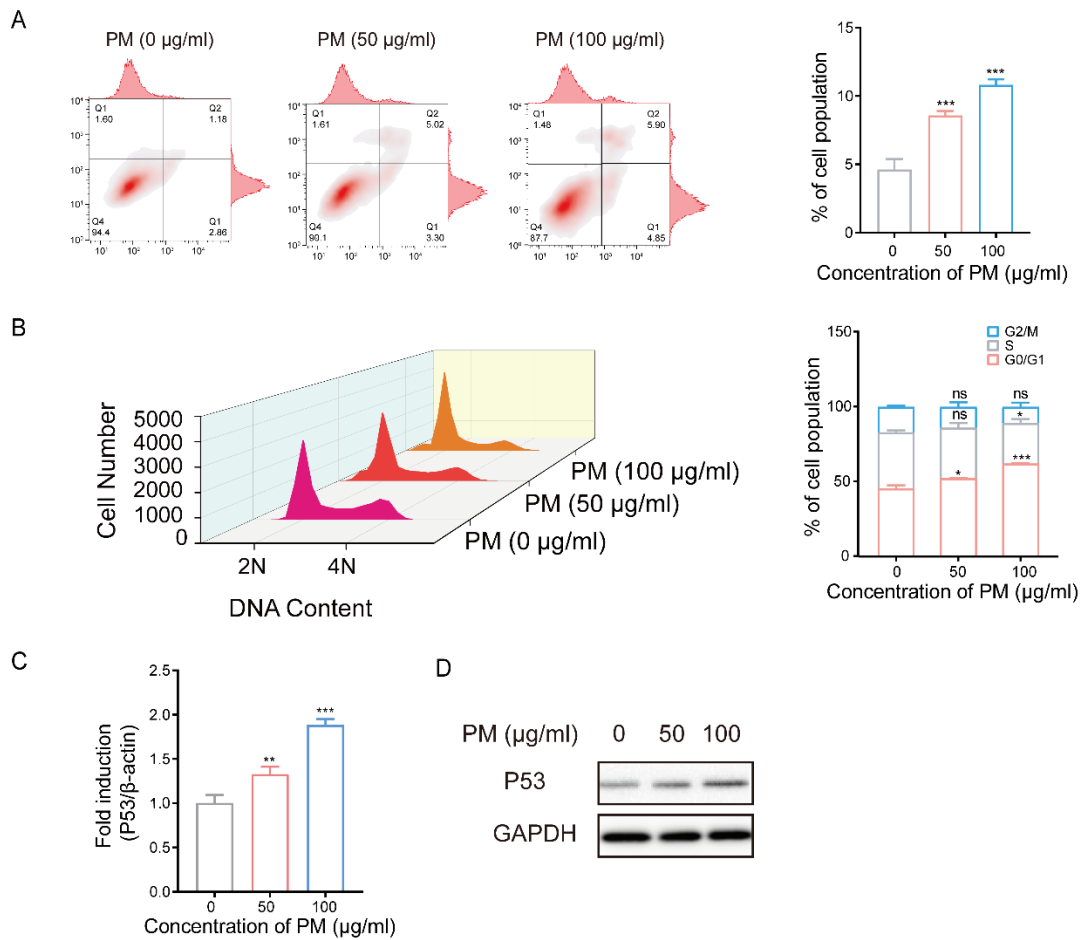


Fig. S3. PM exposure-induced apoptosis, cell cycle arrest, and activation of p53 in HBE cells

(A-B) Flow cytometric analysis of apoptosis and cell cycle in HBE cells exposed to PM (0, 50 or 100 µg/ml). * $P < 0.05$, *** $P < 0.001$, compared with control. The cell cycle is divided into distinct consecutive phases defined as quiescent state and first gap phase(G0/G1), DNA synthesis phase (S), second gap phase and mitosis phase (G2/M). 2N represents G0/G1 and 4N represents G2/M while 2N-4N represents S.

(C-D) mRNA and protein levels of p53 in HBE cells exposed to PM (0, 50 or 100 µg/ml). ** $P < 0.01$, *** $P < 0.001$, compared with control.

Fig. S4.

A

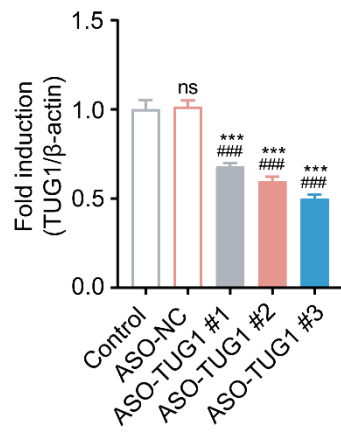


Fig. S4. Evaluating the knockdown efficiency of ASOs

(A) Quantitative RT-PCR analysis of *TUG1* expression levels in HBE cells treated with different

ASO-TUG1. *** $P < 0.001$, compared with control; ### $P < 0.001$, compared with *ASO-NC*.

Fig. S5.

A

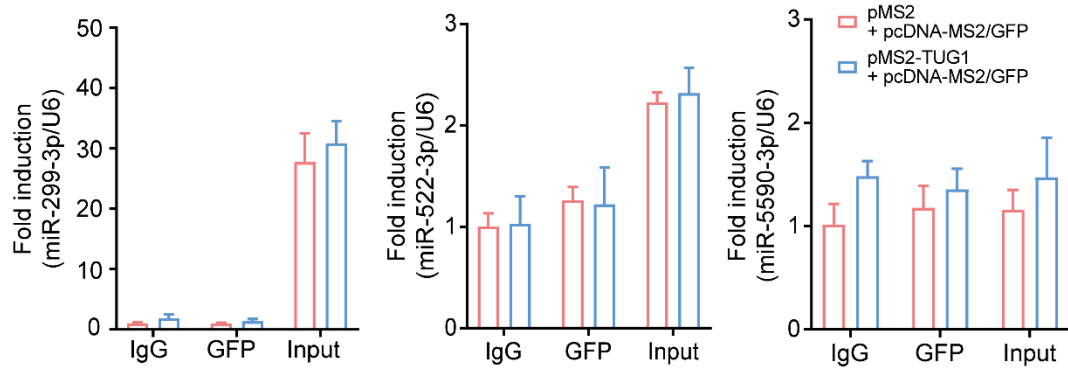


Fig. S5. Identification of miRNAs bound to *TUG1*

(A) miRNAs levels bound to GFP in HBE cells.

Fig. S6.

A

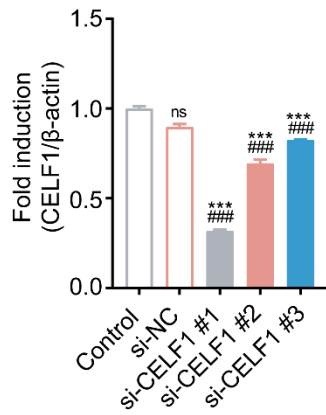


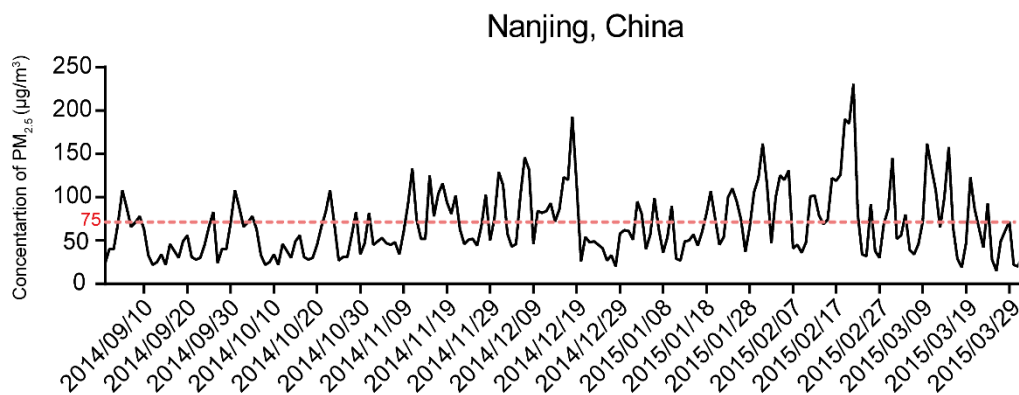
Fig. S6. Knockdown efficiency of siRNAs

(A) Quantitative RT-PCR analysis of *CELF1* expression levels in HBE cells treated with different

si-CELF1. *** $P < 0.001$, compared with control; ### $P < 0.001$, compared with *si-NC*.

Fig. S7.

A



B

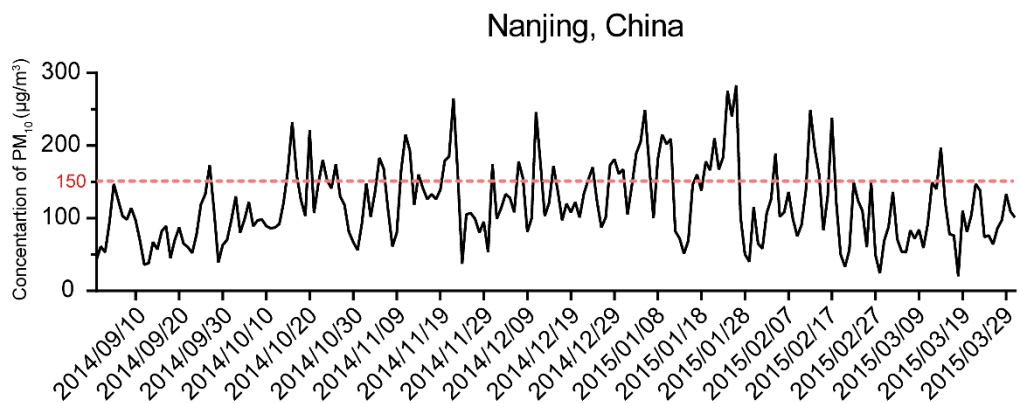


Fig. S7. Daily concentration of PM in Nanjing, China, from September 2014 to March 2015

(A) Daily concentration of PM_{2.5} in Nanjing, China, from September 2014 to March 2015. The grade II limit value (75 µg/m³) of Daily PM_{2.5} was set by National Ambient Air Quality Standards of China (GB3095-2012).

(B) Daily concentration of PM₁₀ in Nanjing, China, from September 2014 to March 2015. The grade II limit value (150 µg/m³) of Daily PM₁₀ was set by National Ambient Air Quality Standards of China (GB3095-2012).

Table S1. The differentially expressed lncRNAs in HBE cells following PM exposure

lncRNAs	Regulation	Fold change		<i>P</i> -value	
		PM (low dose) vs Control	PM (high dose) vs Control	PM (low dose) vs Control	PM (high dose) vs Control
<i>LOC100506895</i>	down	1.562	1.666	0.004	< 0.001
<i>RP11-382B18.3</i>	down	1.569	1.642	0.033	0.003
<i>RP11-385M4.1</i>	down	1.682	2.967	< 0.001	< 0.001
<i>RP4-773N10.4</i>	down	1.502	1.528	0.014	0.006
<i>AC002066.1</i>	up	1.595	2.470	0.015	0.002
<i>AC006538.1</i>	up	1.604	1.886	0.032	0.010
<i>AC012307.2</i>	up	1.661	2.047	0.047	< 0.001
<i>AC018642.1</i>	up	2.112	1.680	0.004	0.006
<i>AC025627.7</i>	up	2.068	2.729	0.027	< 0.001
<i>AC098971.2</i>	up	1.569	1.508	0.036	0.041
<i>ANKRD36B</i>	up	2.760	3.123	0.007	0.002
<i>BC021061</i>	up	1.607	2.146	0.022	< 0.001
<i>BC133032</i>	up	1.759	2.335	0.021	0.005
<i>CD27-AS1</i>	up	2.261	1.799	< 0.001	0.004
<i>chr13:104871700-104904225</i>	up	1.896	2.265	0.002	0.003
<i>chr3:72052025-72073225</i>	up	1.652	1.750	0.041	0.030
<i>chr8:66160600-66171525</i>	up	2.181	1.895	0.002	< 0.001
<i>chrX:115315750-115327875</i>	up	2.406	1.752	0.003	< 0.001
<i>CTB-174D11.1</i>	up	1.775	2.409	0.040	0.004
<i>CTD-2071N1.1</i>	up	1.746	1.619	0.042	0.032
<i>CTD-2517M22.14</i>	up	2.532	1.944	0.023	0.037
<i>DKFZp686L08115</i>	up	1.886	1.967	0.005	< 0.001
<i>DLX6-AS1</i>	up	1.696	1.667	0.033	< 0.001
<i>FLJ36000</i>	up	1.617	1.716	0.032	0.002
<i>GPC5-IT1</i>	up	1.835	2.162	0.009	0.033
<i>HMlincRNA463</i>	up	1.922	2.282	0.019	< 0.001
<i>HMlincRNA937</i>	up	2.594	2.303	< 0.001	< 0.001
<i>HV041854</i>	up	1.702	1.904	0.006	< 0.001
<i>JA040725</i>	up	1.726	1.665	0.029	< 0.001
<i>LOC100292680</i>	up	1.582	3.177	0.004	< 0.001
<i>LOC100499489</i>	up	1.769	2.279	0.031	0.001
<i>LOC100506451</i>	up	1.777	1.998	0.012	< 0.001
<i>LOC399744</i>	up	1.805	2.268	0.021	< 0.001
<i>LOC400084</i>	up	1.918	2.502	0.045	< 0.001
<i>MEG3</i>	up	1.763	1.702	0.010	0.001

<i>MGC21881</i>	up	1.572	1.817	0.008	< 0.001
<i>MT1DP</i>	up	1.571	3.981	0.001	< 0.001
<i>MT1P2</i>	up	1.769	4.005	< 0.001	< 0.001
<i>MTE</i>	up	1.707	4.823	0.040	< 0.001
<i>NCOR1P1</i>	up	1.782	2.221	0.035	< 0.001
<i>RP11-1078H9.6</i>	up	1.945	2.122	0.009	< 0.001
<i>RP11-111F5.4</i>	up	1.745	2.177	0.028	0.003
<i>RP11-116G8.5</i>	up	2.170	1.902	0.018	0.018
<i>RP11-122C21.1</i>	up	5.244	3.678	0.004	< 0.001
<i>RP11-211N8.2</i>	up	1.513	1.574	0.009	< 0.001
<i>RP11-228B15.4</i>	up	1.680	1.836	0.025	< 0.001
<i>RP11-244H18.2</i>	up	1.884	1.953	0.024	< 0.001
<i>RP11-261C10.3</i>	up	1.781	2.306	0.039	< 0.001
<i>RP11-289F5.1</i>	up	1.592	2.142	0.043	0.004
<i>RP11-294K24.4</i>	up	1.527	1.833	0.037	< 0.001
<i>RP11-305E6.1</i>	up	1.714	2.243	0.037	< 0.001
<i>RP11-323P17.1</i>	up	1.738	2.474	0.025	0.001
<i>RP11-356C4.2</i>	up	1.602	1.632	0.027	0.007
<i>RP11-395B7.4</i>	up	1.802	2.112	0.039	< 0.001
<i>RP11-407A16.3</i>	up	1.502	2.027	0.038	< 0.001
<i>RP11-442N24_B.1</i>	up	1.693	1.583	0.007	0.003
<i>RP11-475I24.3</i>	up	1.590	2.161	0.032	< 0.001
<i>RP11-524K14.1</i>	up	1.792	2.461	0.023	< 0.001
<i>RP11-545P7.4</i>	up	1.793	1.779	0.005	0.003
<i>RP11-552E20.1</i>	up	2.469	2.013	< 0.001	< 0.001
<i>RP11-631B21.1</i>	up	1.773	2.278	0.042	< 0.001
<i>RP11-693N9.2</i>	up	1.944	1.818	0.037	0.010
<i>RP11-756P10.5</i>	up	1.782	2.996	0.014	0.001
<i>RP11-818F20.5</i>	up	1.612	2.025	0.004	0.002
<i>RP11-89M22.3</i>	up	2.172	2.268	0.008	< 0.001
<i>RP11-8P11.3</i>	up	1.642	1.636	0.003	< 0.001
<i>RP1-276N6.2</i>	up	1.820	2.319	0.007	< 0.001
<i>RP3-475N16.1</i>	up	1.823	2.103	0.024	< 0.001
<i>RP4-738P15.1</i>	up	2.007	2.334	0.013	< 0.001
<i>RP4-758J18.10</i>	up	2.389	2.297	0.041	0.034
<i>SCARNA9</i>	up	2.298	1.682	< 0.001	0.002
<i>tAKR</i>	up	2.282	2.061	0.017	< 0.001
<i>TPT1-AS1</i>	up	1.928	1.782	0.008	0.002
<i>TUG1</i>	up	1.559	1.520	0.010	0.008
<i>XLOC_000535</i>	up	1.779	2.639	0.040	< 0.001
<i>XLOC_001195</i>	up	1.685	2.142	0.035	< 0.001
<i>XLOC_001223</i>	up	1.906	2.319	0.018	< 0.001
<i>XLOC_001341</i>	up	2.589	2.003	0.038	0.033
<i>XLOC_001943</i>	up	1.586	2.588	0.026	0.002

<i>XLOC_002727</i>	up	1.723	1.857	0.010	< 0.001
<i>XLOC_006039</i>	up	1.613	1.734	< 0.001	0.012
<i>XLOC_006348</i>	up	1.679	2.029	0.032	< 0.001
<i>XLOC_006486</i>	up	1.880	1.644	< 0.001	0.039
<i>XLOC_006978</i>	up	1.778	1.672	< 0.001	< 0.001
<i>XLOC_007865</i>	up	1.746	2.037	0.018	< 0.001
<i>XLOC_008852</i>	up	2.016	2.509	0.046	< 0.001
<i>XLOC_009952</i>	up	2.860	3.930	0.012	0.007
<i>XLOC_011660</i>	up	2.042	2.593	0.018	0.023
<i>XLOC_011751</i>	up	2.926	4.102	0.025	0.010
<i>XLOC_012111</i>	up	1.651	1.819	0.002	< 0.001
<i>XLOC_012216</i>	up	1.928	1.975	0.031	0.002
<i>XLOC_012626</i>	up	1.659	1.794	0.015	< 0.001
<i>XLOC_012840</i>	up	1.924	2.290	0.006	< 0.001
<i>XLOC_013448</i>	up	1.681	1.682	0.020	0.021
<i>XLOC_013778</i>	up	1.719	2.128	0.010	< 0.001
<i>XLOC_014105</i>	up	1.522	1.839	0.048	< 0.001
<i>ZNF876P</i>	up	1.743	1.611	0.006	0.005
<i>ZNRD1-AS1</i>	up	1.767	2.418	0.029	< 0.001
<i>ZNRD1-AS1</i>	up	1.558	1.797	0.034	< 0.001
<i>ZSCAN18</i>	up	1.672	1.945	0.028	0.002

Table S2. The differentially expressed miRNAs in HBE cells following PM exposure

miRNAs	Regulation	Fold change		P-value	
		PM (low dose) vs Control	PM (high dose) vs Control	PM (low dose) vs Control	PM (high dose) vs Control
<i>bkv-miR-B1-5p</i>	down	3.740	7.098	0.023	0.012
<i>ebv-miR-BART1-3p</i>	down	1.934	4.676	0.034	0.007
<i>ebv-miR-BART3-3p</i>	down	1.880	3.409	0.027	0.003
<i>ebv-miR-BART4-3p</i>	down	2.784	6.501	0.014	0.006
<i>hsa-miR-126-3p</i>	down	1.905	2.303	0.038	0.007
<i>hsa-miR-1286</i>	down	2.715	4.135	0.022	0.008
<i>hsa-miR-1301-3p</i>	down	1.600	2.102	0.037	0.013
<i>hsa-miR-1307-5p</i>	down	1.660	2.953	0.038	0.002
<i>hsa-miR-138-1-3p</i>	down	2.595	5.273	0.015	0.007
<i>hsa-miR-143-3p</i>	down	2.733	5.194	0.030	0.003
<i>hsa-miR-148a-5p</i>	down	3.584	5.201	0.005	0.003
<i>hsa-miR-152-5p</i>	down	3.077	5.163	0.047	0.026
<i>hsa-miR-16-1-3p</i>	down	1.549	3.419	0.027	0.003
<i>hsa-miR-16-2-3p</i>	down	1.671	2.303	0.034	0.003
<i>hsa-miR-182-3p</i>	down	2.435	8.420	0.043	0.002
<i>hsa-miR-185-5p</i>	down	2.069	2.842	0.037	0.017
<i>hsa-miR-188-3p</i>	down	5.018	11.718	0.032	0.013
<i>hsa-miR-190a-5p</i>	down	2.596	7.142	0.006	<0.001
<i>hsa-miR-194-3p</i>	down	1.697	1.781	0.035	0.007
<i>hsa-miR-222-3p</i>	down	1.912	2.628	0.012	0.002
<i>hsa-miR-24-2-5p</i>	down	1.722	2.263	0.023	0.004
<i>hsa-miR-299-3p</i>	down	2.661	2.445	0.008	0.007
<i>hsa-miR-301a-3p</i>	down	2.733	5.020	<0.001	<0.001
<i>hsa-miR-30c-1-3p</i>	down	1.810	1.982	0.029	0.020
<i>hsa-miR-30c-2-3p</i>	down	2.288	4.067	0.015	<0.001
<i>hsa-miR-3156-5p</i>	down	3.592	7.599	0.042	0.008
<i>hsa-miR-32-5p</i>	down	2.385	7.769	0.021	0.004
<i>hsa-miR-330-3p</i>	down	2.337	2.468	0.044	0.026
<i>hsa-miR-33a-3p</i>	down	1.828	2.587	0.035	0.001
<i>hsa-miR-345-5p</i>	down	2.072	2.893	0.016	0.001
<i>hsa-miR-3619-3p</i>	down	1.773	2.247	0.028	0.012
<i>hsa-miR-3660</i>	down	1.978	3.714	0.037	0.006
<i>hsa-miR-3663-5p</i>	down	3.709	7.090	0.029	0.012
<i>hsa-miR-370-5p</i>	down	2.943	11.566	0.019	0.006
<i>hsa-miR-374a-3p</i>	down	2.151	8.992	0.031	<0.001
<i>hsa-miR-374b-5p</i>	down	1.580	1.831	0.026	0.027
<i>hsa-miR-3934-5p</i>	down	3.544	8.596	0.029	0.014
<i>hsa-miR-4436a</i>	down	2.473	2.715	0.025	0.018

<i>hsa-miR-4474-5p</i>	down	3.560	5.383	0.002	0.002
<i>hsa-miR-4476</i>	down	3.908	6.520	0.041	0.022
<i>hsa-miR-4489</i>	down	2.604	6.977	0.050	0.008
<i>hsa-miR-4490</i>	down	2.886	3.978	0.048	0.022
<i>hsa-miR-4501</i>	down	1.931	2.201	0.013	0.002
<i>hsa-miR-4504</i>	down	3.435	8.866	0.026	0.005
<i>hsa-miR-4506</i>	down	3.014	2.433	0.032	0.027
<i>hsa-miR-4520-2-3p</i>	down	5.446	16.993	0.011	0.004
<i>hsa-miR-4520-3p</i>	down	5.312	21.082	0.026	0.012
<i>hsa-miR-4522</i>	down	3.521	4.856	0.049	0.015
<i>hsa-miR-452-5p</i>	down	1.603	1.959	0.039	0.006
<i>hsa-miR-466</i>	down	3.589	17.156	0.019	0.005
<i>hsa-miR-4691-3p</i>	down	4.201	10.599	0.008	<0.001
<i>hsa-miR-4694-3p</i>	down	1.746	2.353	0.021	0.007
<i>hsa-miR-4755-3p</i>	down	2.904	7.500	0.050	0.003
<i>hsa-miR-4758-5p</i>	down	3.358	2.894	0.030	0.026
<i>hsa-miR-4999-3p</i>	down	2.632	7.356	0.026	0.002
<i>hsa-miR-5009-3p</i>	down	3.584	10.959	0.007	0.003
<i>hsa-miR-500a-5p</i>	down	2.128	3.131	0.018	0.006
<i>hsa-miR-5011-3p</i>	down	3.002	3.262	0.016	0.017
<i>hsa-miR-505-5p</i>	down	1.500	2.213	0.036	0.002
<i>hsa-miR-5095</i>	down	2.689	5.244	0.018	0.006
<i>hsa-miR-5189-5p</i>	down	3.515	4.629	0.017	0.007
<i>hsa-miR-522-3p</i>	down	1.828	3.216	0.041	0.003
<i>hsa-miR-551b-3p</i>	down	1.630	3.295	0.040	<0.001
<i>hsa-miR-552-3p</i>	down	2.095	2.711	0.007	0.004
<i>hsa-miR-5590-3p</i>	down	2.099	2.315	0.024	0.025
<i>hsa-miR-582-3p</i>	down	2.330	3.848	0.015	<0.001
<i>hsa-miR-598-3p</i>	down	2.410	3.055	0.016	0.007
<i>hsa-miR-604</i>	down	3.285	5.904	0.004	0.002
<i>hsa-miR-618</i>	down	1.996	2.191	0.013	0.009
<i>hsa-miR-7-5p</i>	down	1.744	2.702	0.013	<0.001
<i>hsa-miR-760</i>	down	2.073	2.898	0.042	0.012
<i>hsa-miR-802</i>	down	3.558	5.912	0.012	0.004
<i>hsa-miR-875-3p</i>	down	3.815	29.930	0.023	0.005
<i>hsa-miR-93-3p</i>	down	3.029	5.074	0.044	0.022
<i>hsa-miR-93-5p</i>	down	2.043	3.292	0.032	<0.001
<i>hsa-miR-96-5p</i>	down	1.723	3.212	0.034	0.001
<i>hsa-miRPlus-C1100</i>	down	3.630	5.451	0.006	0.004
<i>kshv-miR-K12-7-5p</i>	down	2.849	10.478	0.038	0.003
<i>hsa-miR-2113</i>	up	1.677	1.864	0.022	<0.001

<i>hsa-miR-548aa/hsa-miR-548ap-3p/hsa-miR-548t-3p</i>	up	2.788	2.906	0.043	<0.001
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Table S3. The differentially expressed mRNAs in HBE cells following PM exposure

mRNAs	Regulation	Fold change		P-value	
		PM (low dose) vs Control	PM (high dose) vs Control	PM (low dose) vs Control	PM (high dose) vs Control
<i>ARSI</i>	down	1.663	1.586	0.037	0.009
<i>CENPW</i>	down	1.567	1.939	0.007	0.002
<i>HS6ST2</i>	down	1.579	1.522	0.016	0.025
<i>NME1</i>	down	1.581	1.577	<0.001	<0.001
<i>SMARCA4</i>	down	1.562	1.700	0.030	0.024
<i>ABCF1</i>	up	1.507	1.889	0.003	<0.001
<i>AMPD1</i>	up	1.836	2.979	0.018	0.003
<i>ANTXR2</i>	up	1.652	1.515	0.031	0.021
<i>APIB1</i>	up	1.807	2.142	0.019	<0.001
<i>BTNL2</i>	up	1.979	2.010	0.014	<0.001
<i>C9orf86</i>	up	2.900	2.397	0.004	0.007
<i>CCDC47</i>	up	1.553	1.665	0.013	<0.001
<i>CCL1</i>	up	1.790	2.241	0.033	<0.001
<i>CEACAM21</i>	up	1.702	2.119	0.040	<0.001
<i>CEBPD</i>	up	1.700	2.185	<0.001	<0.001
<i>CELF1</i>	up	1.710	2.130	0.016	<0.001
<i>CHRFAM7A</i>	up	3.915	3.756	0.046	0.048
<i>CLEC1B</i>	up	1.725	2.165	0.038	<0.001
<i>COASY</i>	up	1.935	1.652	<0.001	0.002
<i>CSNK2A1</i>	up	1.655	1.974	0.019	0.016
<i>CYP11A1</i>	up	1.546	2.356	0.041	0.002
<i>DDX21</i>	up	1.685	1.511	<0.001	<0.001
<i>ELOVL5</i>	up	1.586	1.842	0.019	<0.001
<i>FAM174B</i>	up	1.596	1.758	0.009	0.002
<i>FCAR</i>	up	1.591	1.717	0.011	<0.001
<i>FCAR</i>	up	1.696	1.809	0.027	<0.001
<i>FCAR</i>	up	1.581	2.002	0.041	0.001
<i>FKBP6</i>	up	2.681	2.587	0.038	0.019
<i>GDF5</i>	up	1.998	2.743	0.025	<0.001
<i>GSDMA</i>	up	1.544	1.912	0.002	<0.001
<i>HDAC1</i>	up	1.940	1.952	0.013	0.001
<i>HFE</i>	up	1.520	1.820	0.017	<0.001
<i>HIST1H1C</i>	up	1.618	1.765	<0.001	<0.001
<i>ICAIL</i>	up	1.714	2.102	0.022	<0.001
<i>JUN</i>	up	1.601	2.368	0.005	<0.001
<i>KANSL2</i>	up	1.580	2.113	0.006	<0.001
<i>KIAA1161</i>	up	1.565	2.109	0.037	<0.001
<i>L3MBTL2</i>	up	1.564	1.697	0.020	0.010
<i>LLPH</i>	up	1.582	1.844	<0.001	0.001

<i>LYL1</i>	up	2.000	1.939	0.004	0.005
<i>LYZL4</i>	up	2.049	1.687	<0.001	<0.001
<i>MAGOH</i>	up	2.495	3.177	<0.001	<0.001
<i>MBIP</i>	up	1.627	1.731	0.003	<0.001
<i>MCHR1</i>	up	1.620	2.141	0.024	<0.001
<i>MCM7</i>	up	2.589	2.184	0.004	0.001
<i>MON1A</i>	up	1.700	1.996	0.008	<0.001
<i>MSH5</i>	up	1.634	2.196	0.026	<0.001
<i>MT1F</i>	up	3.212	5.601	<0.001	<0.001
<i>MT1G</i>	up	2.888	4.972	<0.001	<0.001
<i>MT1X</i>	up	2.881	4.606	<0.001	<0.001
<i>NANOS1</i>	up	1.554	1.570	0.024	0.033
<i>NIT1</i>	up	1.540	1.602	0.014	0.011
<i>NLRP7</i>	up	1.756	2.258	0.019	<0.001
<i>NR0B1</i>	up	1.761	2.547	<0.001	<0.001
<i>NR1I2</i>	up	2.254	2.259	0.005	<0.001
<i>OCIAD2</i>	up	1.729	2.474	0.038	<0.001
<i>PAX9</i>	up	1.574	1.542	0.034	0.027
<i>PCDHA9</i>	up	2.159	1.887	0.007	0.004
<i>PI4K2B</i>	up	1.929	1.513	0.003	0.009
<i>PIH1D1</i>	up	1.895	2.404	0.023	<0.001
<i>PILRA</i>	up	1.670	2.279	0.036	<0.001
<i>RASGRP1</i>	up	1.652	1.729	0.006	<0.001
<i>REG3A</i>	up	1.696	1.991	0.015	<0.001
<i>RHBDL2</i>	up	2.859	2.523	0.006	0.001
<i>SAA1</i>	up	2.116	3.153	0.049	0.011
<i>SEPT8</i>	up	1.794	2.333	0.017	<0.001
<i>SIRPB1</i>	up	1.595	1.779	0.021	<0.001
<i>SLC25A5</i>	up	1.516	2.151	0.028	<0.001
<i>SPRR2B</i>	up	1.505	1.676	0.024	<0.001
<i>SRFBP1</i>	up	1.653	2.374	0.048	0.002
<i>TLR3</i>	up	1.785	2.267	0.036	<0.001
<i>TMEM249</i>	up	2.772	2.129	0.045	0.028
<i>TOMM40</i>	up	1.946	2.133	0.011	<0.001
<i>TPPI</i>	up	1.800	1.636	0.018	0.011
<i>TSHZ3</i>	up	1.881	2.256	0.036	<0.001
<i>TUBA1C</i>	up	1.557	1.759	0.030	<0.001
<i>VEPH1</i>	up	1.798	2.172	0.013	<0.001
<i>ZNF34</i>	up	1.685	1.602	0.002	<0.001
<i>ZNF534</i>	up	1.651	1.964	0.023	<0.001
<i>ZNF678</i>	up	1.571	1.614	0.005	<0.001
<i>ZNF703</i>	up	1.555	1.886	0.018	<0.001

Table S4. Primer sequences used for qRT-PCR assay

RNAs	Forward Primer (5'-3')	Reverse Primer (5'-3')
<i>hsa-TUG1</i>	AGGTAGAACCTCTATGCATTTTGTG	ACTCTTGCTTCACTACTTCATCCAG
<i>hsa-MEG3</i>	GGGCATTAAGCCCTGACCTT	CCTTGGGGAGGGGAAACACTC
<i>hsa-CELF1</i>	ATGGCACAGACGGCTATCAAGG	CACAGATGCTGCGCTGATTTGC
<i>hsa-JUN</i>	CCTTGAAAGCTCAGAACTCGGAG	TGCTGCGTTAGCATGAGTTGGC
<i>hsa-ICAIL</i>	TCATGTGGCTGGAGCGTTCAAC	CTTTGGACTCTGTGAAGGCACTG
<i>hsa-HS6ST2</i>	CTCTCCGTCATCCACAAAGACC	CAGGGATGCTTTCCATGTTGCC
<i>hsa-CSNK2A1</i>	GGTGAGGATAGCCAAGGTTCTG	TCACTGTGGACAAAGCGTTCCC
<i>hsa-PCDHA9</i>	CTGCCACATCTTCACGGTGTCT	TGCACTGACACGTAGCTCGACA
<i>hsa-DDX21</i>	TGGACTCAGAGGGCAGCAGTTA	TGTCTCCATGCAAGGACTGAGC
<i>hsa-NANOS1</i>	GCTCTACACCACCCATATCCTC	GTACTTGATGGTGTGCGCGTTG
<i>hsa-ANTXR2</i>	TCGGAATGGCAGTGTCTCTGC	CAGGATAGGTGCAGGACAAAGC
<i>hsa-ZNF703</i>	TGCAGCCGCTGTCCTCCACTC	CACCGAGTTGAGTTTGGAGGAG
<i>hsa-TSHZ3</i>	CACCTACCATCACAACCCTGCT	CGACTTCCTTCTTGACCTCCAC
<i>hsa-p53</i>	ACCTATGGAAACTACTTCTGAAA	ACATCTTGTTGAGGGCAGGG
<i>hsa-β-actin</i>	ATCCGCAAAGACCTGT	GGGTGTAACGCAACTAAG
<i>hsa-U6</i>	CTCGCTTCGGCAGCACA	AACGCTTCACGAATTTGCGT
<i>mmu-Tug1</i>	CTCTGGAGGTGGACGTTTTGT	GTGAGTCGTGTCTCTCTTTTCTC
<i>mmu-Celf1</i>	CAGGCGTATTCTGGTATCCAGC	GAACAGGTTGGCTCCTTCTGGA
<i>mmu-p53</i>	CCCCTGAAGACTGGATAACTGT	GGACGGAAGATGACAGAGGC
<i>mmu-β-actin</i>	GGCTGTATTCCCCTCCATCG	CCAGTTGGTAACAATGCCATGT

Table S5. Target sequences of ASOs or siRNAs

ASOs/siRNAs	Target Sequence (5'-3')
<i>ASO-TUG1 #1</i>	CTCAAATGATTGAAATTCATG
<i>ASO-TUG1 #2</i>	AATCTTTGAACAGCACCATT
<i>ASO-TUG1 #3</i>	ATCTAGGAGTCTGTATACTG
<i>si-CELF1 #1</i>	CTTCGTTTGGACAGATTGA
<i>si-CELF1 #2</i>	CTCAGCGTGCTCACTAGTT
<i>si-CELF1 #3</i>	TGGCACAGACGGCTATCAA
<i>ASO-mmu-Tug1</i>	CAGTCTGAGGTCTTGACTTG