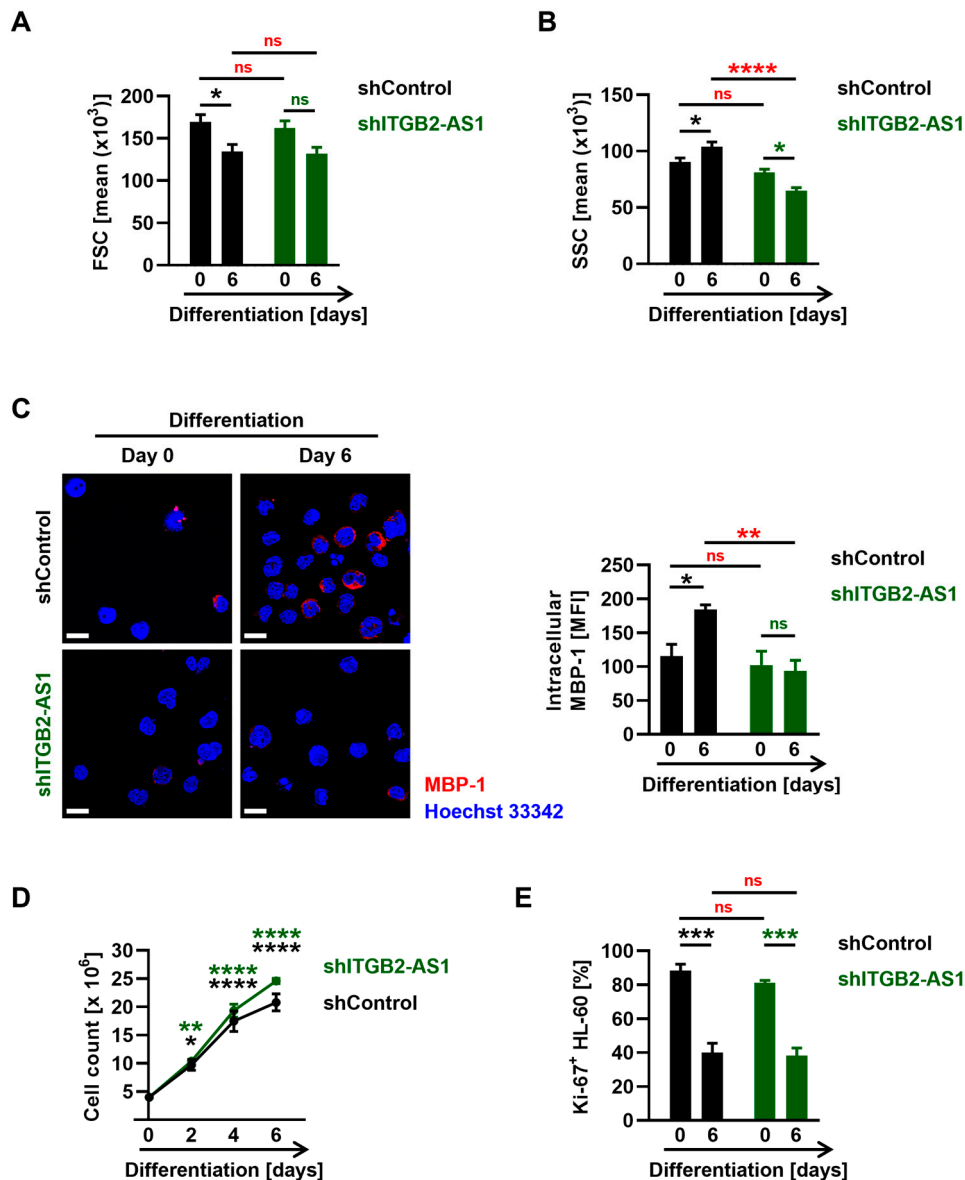


## Supplementary Materials



**Figure S1.** The impact of *ITGB2-AS1* lncRNA deficiency on eosinophil differentiation, MBP-1 expression, and proliferation. (A-E) HL-60c15 cells were differentiated into eosinophils in the presence of sodium butyrate and IL-5 for up to 6 days. (A,B) Flow cytometry. Cell morphology was assessed by measuring the mean of FSC (A) and SSC (B) ( $n = 7$ ). (C) Confocal microscopy. Differentiating HL-60c15 cells were stained for the eosinophil granule protein MBP-1 and the nuclei using monoclonal mouse anti-PRG2 antibody and Hoechst 33342, respectively. (Left) Representative images of the presence of MBP-1 in HL-60c15 cells at the indicated days of differentiation. (Right) Quantification of MFI of intracellular EPX. Cells were delimited using “Surfaces” mode in Imaris followed by MBP-1 (red channel) MFI quantification ( $n = 4$ , with  $\geq 41$  cells per condition). Scale bars, 10  $\mu$ m. (D,E) Cell proliferation. The proliferative status of differentiating HL-60c15 cells was evaluated by absolute cell count (D) at the indicated days of differentiation using an automated hematology analyzer (Sysmex Digitana), and by determining the frequency of cells expressing Ki-67 via flow cytometry (E) ( $n = 3$ ). Values are means  $\pm$  SEM. ns, not significant; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; \*\*\*\*  $p < 0.0001$ . Significances in black illustrate a significance of shControl cells compared to undifferentiated (day 0) shControl cells. Significances in green denote a significance of shITGB2-AS1 cells compared to undifferentiated shITGB2-AS1 cells. Significances in red illustrate a significant difference between the shControl and shITGB2-AS1 cells. Abbreviations: FSC, forward scatter; ITGB2-AS1, ITGB2 antisense RNA 1; MBP-1, major basic protein 1; MFI, mean fluorescence intensity; SSC, side scatter.

**Table S1.** List of eosinophil-related protein-coding genes by category with references.

<b>Regulators of eosinophil maturation</b> [23,24]	<b>Secretory Mediators</b> [27-29]	<b>Surface markers</b> [25,26]			<b>Granule and other proteins</b> [7,29]
<i>CEBPA</i>	<i>CCL11</i>	<i>ADAM8</i>	<i>CXCR4</i>	<i>IL5RA</i>	<i>CLC</i>
<i>CEPBE</i>	<i>CCL13</i>	<i>ADGRE5</i>	<i>CYSLTR1</i>	<i>IL9R</i>	<i>EPX</i>
<i>GATA1</i>	<i>CCL17</i>	<i>C3AR1</i>	<i>CYSLTR2</i>	<i>ITGA4</i>	<i>MMP9</i>
<i>GATA2</i>	<i>CCL2</i>	<i>CCR1</i>	<i>ENTPD1</i>	<i>ITGA6</i>	<i>PRG2</i>
<i>GFI1</i>	<i>CCL22</i>	<i>CCR2</i>	<i>F2RL1</i>	<i>ITGAD</i>	<i>RNASE2</i>
<i>ID2</i>	<i>CCL23</i>	<i>CCR3</i>	<i>FAS</i>	<i>ITGAL</i>	<i>RNASE3</i>
<i>IL33</i>	<i>CCL3</i>	<i>CD151</i>	<i>FCAR</i>	<i>ITGAM</i>	<i>TIMP1</i>
<i>IL5</i>	<i>CCL5</i>	<i>CD24</i>	<i>FCER1A</i>	<i>ITGAX</i>	
<i>IRF8</i>	<i>CSF2</i>	<i>CD28</i>	<i>FCER1G</i>	<i>ITGB1</i>	
<i>KLF5</i>	<i>CXCL1</i>	<i>CD33</i>	<i>FCGR2A</i>	<i>ITGB2</i>	
<i>PU.1</i>	<i>CXCL10</i>	<i>CD37</i>	<i>FCGR2B</i>	<i>ITGB7</i>	
<i>RhoH</i>	<i>CXCL5</i>	<i>CD4</i>	<i>FCGR2C</i>	<i>KIT</i>	
<i>TRIB1</i>	<i>CXCL8</i>	<i>CD44</i>	<i>FCGR3A</i>	<i>KLRB1</i>	
<i>XBP1</i>	<i>CXCL9</i>	<i>CD47</i>	<i>FCGR3B</i>	<i>LILRA2</i>	
<i>ZFPM1</i>	<i>IFNG</i>	<i>CD48</i>	<i>FPR1</i>	<i>LILRB1</i>	
	<i>IL10</i>	<i>CD52</i>	<i>FUT3</i>	<i>LILRB2</i>	
	<i>IL11</i>	<i>CD53</i>	<i>GPR135</i>	<i>LILRB3</i>	
	<i>IL12A</i>	<i>CD58</i>	<i>GSF2RB</i>	<i>LTB4R</i>	
	<i>IL12B</i>	<i>CD63</i>	<i>HLA-A</i>	<i>LTB4R2</i>	
	<i>IL13</i>	<i>CD69</i>	<i>HLA-B</i>	<i>PTGDR2</i>	
	<i>IL16</i>	<i>CD81</i>	<i>HLA-C</i>	<i>PTPRJ</i>	
	<i>IL17A</i>	<i>CD82</i>	<i>HLA-DRA</i>	<i>SELL</i>	
	<i>IL1A</i>	<i>CD86</i>	<i>HLA-DRB</i>	<i>SELPLG</i>	
	<i>IL1B</i>	<i>CD88</i>	<i>HRH1</i>	<i>SIGLEC10</i>	
	<i>IL2</i>	<i>CD9</i>	<i>HRH2</i>	<i>SIGLEC8</i>	
	<i>IL25</i>	<i>CD99</i>	<i>HRH4</i>	<i>SLC44A1</i>	
	<i>IL3</i>	<i>CEACAM1</i>	<i>ICAM1</i>	<i>SLC7A5</i>	
	<i>IL4</i>	<i>CEACAM5</i>	<i>IFNGR1</i>	<i>SPN</i>	
	<i>IL5</i>	<i>CEACAM6</i>	<i>IL13RA</i>	<i>TGFBR1</i>	
	<i>IL6</i>	<i>CEACAM8</i>	<i>IL2RA</i>	<i>TLR7</i>	
	<i>IL9</i>	<i>CR1</i>	<i>IL3R</i>	<i>TLR8</i>	
	<i>KITLG</i>	<i>CSF2RA</i>	<i>IL4R</i>	<i>TNFRSF1A</i>	
	<i>NGF</i>	<i>CXCR3</i>			
	<i>PDGFB</i>				
	<i>TGFA</i>				
	<i>TGFB1</i>				
	<i>TNF</i>				
	<i>TNFSF13</i>				
	<i>VEGFA</i>				

**Table S2.** List of shRNAs obtained from OBiO Technology (Shanghai, China).

shRNA	Targeted gene	gene ID	sequence
shITGB2-AS1	<i>ITGB2-AS1</i>	100505746	AGGCAGAAAGGGCACCCATTACTC GAGTAATGGGTGCCCTTTCTGCCT
shControl	---	---	Scrambled (exact sequence not provided)

**Table S3.** Primer sequences for quantitative RT-qPCR assays.

Target gene	Primer	Sequence
human <i>PTPRN2-AS1</i>	Forward:	5'-GAACAGACAGGACGTTTTCACAG-3'
	Reverse:	5'-TTCTCAGGGCCTCAGCAG-3'
human <i>RRN3P2</i>	Forward:	5'-GGAAGACATGAGTGCTGAAGAG-3'
	Reverse:	5'-TGGTTGATGGAATACAGGAATGA-3'
human <i>MIR210HG</i>	Forward:	5'-CCTGGCATGGACTCGGAC-3'
	Reverse:	5'-GGACCCCAAGACCACACAC-3'
human <i>ITGB2-AS1</i>	Forward:	5'-GACCTGCTTCCATCAGATTAC-3'
	Reverse:	5'-GTTCTCTCCGCTCCATTCTCT-3'
human <i>AL1009809.1</i>	Forward:	5'-CCACTTCTATCCCGCCCAC-3'
	Reverse:	5'-GACCACCCAGCAAGCAAACCTCA-3'
human <i>LINC00298</i>	Forward:	5'-AGTGCCAGTTTGAATGAAGGA-3'
	Reverse:	5'-CAATGTGTGATATTATGTGCAGAG-3'
human <i>LINC01146</i>	Forward:	5'-GCCCCACCTTCTGCTACTA-3'
	Reverse:	5'-TTATTCTTCCTTTCTTCTTCCTGC-3'
human <i>LINC02285</i>	Forward:	5'-CCCTCTGATGCTGAAGCCTTT-3'
	Reverse:	5'-GACTTGCACTGACTCCATGATGAT-3'
human <i>UBC</i>	Forward:	5'-CGGGATTGTTGGTTCGCACT-3'
	Reverse:	5'-CGAAGATCTGCATTGTCAAGT-3'
human <i>GAPDH</i>	Forward:	5'-CAACAGCCTCAAGATCATCAGCAA-3'
	Reverse:	5'-CATGAGTCCTTCCACGATACC-3'
human <i>HPRT1</i>	Forward:	5'-ATGGTCAAGGTCGCAAG-3'
	Reverse:	5'-AAGTATTCATTATAGTCAAGGGCATATC-3'
human <i>EPX</i>	Forward:	5'-CTTTGGCCACACAATGCT-3'
	Reverse:	5'-TCCTCCTCACTTGCCGAAAC-3'