**Supplementary materials**

**Supplementary Tables**

**Supplementary Table 1** Association between the candidate lncRNA SNPs and risk of gastric cancer.

**Supplementary Table 2** Association between the candidate SNPs and risk of gastric cancer.

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**Supplementary Figures**

**Supplementary figure 1** PRS normal distribution of lncRNA SNPs (A) and commom SNPs (B).

**Supplementary figure 2** Distribution of lncRNA SNPs (left) and commom SNPs (wGRS) (right) in cases and controls

**Supplementary figure 3** Distribution of lncRNA SNPs (left) and commom SNPs (PRS) (right) in cases and controls.

**Supplementary Table 1 Association between the candidate lncRNA SNPs and risk of gastric cancer**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SNP(rs#)** | **lncRNA** | **Risk allele/Ref.** | **Chr.** | **Location** |
| rs1859168 | lnc-EVX1-3:3 | C/A | Chr 7 | 27242359 |
| rs3815254 | lnc-MACC1-1:7 | A/G | Chr 7 | 19983014 |
| rs4784659 | lnc-AMFR-1:1 | C/T | Chr 16 | 56387000 |
| rs579501 | lnc-ZNF33B-2:1 | A/C | Chr 10 | 43246795 |
| rs77628730 | lnc-CCAT1 | A/T | Chr 8 | 128220966 |
| rs6989575 | lnc-CCAT1 | C/T | Chr 8 | 128226195 |
| rs7816475 | lnc-CCAT1 | A/G | Chr 8 | 128225440 |
| rs6470502 | lnc-CCAT1 | T/C | Chr 8 | 128221510 |
| rs1518338 | lncRNA-TUSC7 | C/G | Chr 3 | 116429325 |
| rs2867837 | lncRNA-TUSC7 | G/A | Chr 3 | 116436449 |
| rs12494960 | lncRNA-TUSC7 | A/C | Chr 3 | 116435140 |
| rs74798803 | lncRNA-CASC9 | T/C | Chr 8 | 76136496 |
| rs7818137 | lncRNA-CASC9 | T/C | Chr 8 | 76135674 |
| rs550894 | lncRNA-NEAT1 | T/G | Chr 11 | 65211940 |
| rs3825071 | lncRNA-NEAT1 | A/G | Chr 11 | 65212122 |
| rs580933 | lncRNA-NEAT1 | G/C | Chr 11 | 65196884 |
| rs7943779 | lncRNA-NEAT1 | A/G | Chr 11 | 65194586 |
| rs911157 | lncRNA-NKILA | T/C | Chr 20 | 56286443 |
| rs16981280 | lncRNA-NKILA | C/G | Chr 20 | 56287862 |
| rs2273534 | lncRNA-NKILA | C/T | Chr 20 | 56285540 |
| rs957313 | lncRNA-NKILA | T/G | Chr 20 | 56286812 |

**Supplementary Table 2 Association between the candidate SNPs and risk of gastric cancer**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SNP** | **Gene** | **Risk allele/Ref.** | **Chr.** | **Position** |
| rs861539 | *XRCC3* | G/A | Chr 14 | 104165753 |
| rs2294008 | *PSCA* | C/T | Chr 8 | 143761931 |
| rs731236 | *VDR* | G/A | Chr 12 | 48238757 |
| rs25487 | *XRCC1* | C/T | Chr 19 | 44055726 |
| rs751402 | *ERCC5* | G/A | Chr 13 | 103498198 |
| rs1801133 | *MTHFR* | G/A | Chr 1 | 11856378 |
| rs1799782 | *XRCC1* | G/A | Chr 19 | 44057574 |
| rs763780 | *IL17F* | C/T | Chr 6 | 52101739 |
| rs8193036 | *IL17A* | C/T | Chr 6 | 52050493 |
| rs4072037 | *MUC1* | C/T | Chr 1 | 155162067 |
| rs2274223 | *PLCE1* | G/A | Chr 10 | 96066341 |
| rs2275913 | *IL17A* | G/A | Chr 6 | 52051033 |
| rs1799929 | *NAT2* | C/T | Chr 8 | 18257994 |
| rs20417 | *PACERR* | G/C | Chr 1 | 186650321 |
| rs1800896 | *IL10* | C/T | Chr 1 | 206946897 |
| rs13361707 | *PRKAA1* | C/T | Chr 5 | 40791884 |
| rs3773651 | *TGFBR2* | G/A | Chr 3 | 30718532 |
| rs1799930 | *NAT2* | G/A | Chr 8 | 18258103 |
| GSTM1 | *GSTM1* | P/D | Chr 1 | 109694069 |
| GSTT1 | *GSTT1* | P/D | Chr 22 | 270452 |

*GSTM1* and *GSTT1* are the insertion or deletion of the whole gene, P represents gene insertion and D represents gene deletion

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**Supplementary Table 3 Association between GRS quantile group and susceptibility to gastric cancer**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **lncRNA SNPs****wGRS** | **Mean** | **Subjects** | ***OR*(*95%CI*)** | ***P*** | **Validation SNPs****wGRS** | **Mean** | **Subjects** | ***OR*(95%CI)** | ***P*** |
|  |  |  |  |  |  |  |  |  |  |  |
| 1 | [0-1] | 0.577 | 582 | 1.00 | - | [0-1] | 0.777 | 306 | 1.00 | - |
| 2 | (1-1.5] | 1.233 | 273 | 2.724(2.025,3.663) | <0.001 | (1-1.5] | 1.256 | 350 | 1.640(1.197,2.247) | 0.002 |
| 3 | (1.5-2] | 1.725 | 170 | 3.891(2.719,5.567) | <0.001 | (1.5-2] | 1.721 | 235 | 1.908(1.348,2.700) | <0.000 |
| 4 | (2-2.5] | 2.252 | 161 | 3.313(2.188,4.488) | <0.001 | (2-2.5] | 2.224 | 152 | 2.297(1.545,3.416) | <0.000 |
| 5 | (2.5-3] | 2.727 | 71 | 5.659(3.298,9.833) | <0.001 | (2.5-3] | 2.712 | 94 | 3.780(2.315,6.170) | <0.000 |
| 6 | (3-4] | 3.423 | 63 | 7.878(4.207,14.522) | <0.001 | (3-4] | 3.432 | 104 | 3.230(2.033,5.133) | <0.000 |
| 7 | >4 | 5.870 | 67 | 10.236(5.350,19.583) | <0.001 | >4 | 5.440 | 79 | 4.819(2.794,8.312) | <0.000 |

**Supplementary figure 1A and B** Cumulative frequency and distribution of 22 SNPs (A) and Q-Q normal distribution plots (B).



**Supplementary figure 1** PRS normal distribution of lncRNA SNPs (A) and commom SNPs (B).

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**Supplementary figure 2** Distribution of lncRNA SNPs (left) and commom SNPs (wGRS) (right) in cases and controls.



**Supplementary figure 3** Distribution of lncRNA SNPs (left) and commom SNPs (PRS) (right) in cases and controls.