**Malignant vs Normal tissue**

* First result: ‘hepatobiliary disease’ (DOID: 3118)
  + 145 associated genes, p-value: 2.90 E-40, Bonferroni: 8.95 E-37

Lung cancer (DOID: 1324)🡪 40 associated genes, p-value: 1.73 E-12, Bonferroni: 5.34 E-9

|  |  |
| --- | --- |
| ABCB1 | [ "lung non-small cell carcinoma" ] |
| ABCC2 | [ "lung non-small cell carcinoma" ] |
| ADAM28 | [ "lung non-small cell carcinoma", "lung metastasis", "lung adenocarcinoma", "asbestos-related lung carcinoma" ] |
| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ALX4 | [ "lung adenocarcinoma", "bronchiolo-alveolar adenocarcinoma" ] |
| ARHGAP44 | [ "lung carcinoma", "lung large cell carcinoma", "lung adenocarcinoma", "lung squamous cell carcinoma" ] |
| BIRC5 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CBX7 | [ "lung adenocarcinoma" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CHGA | [ "lung non-small cell carcinoma" ] |
| CYP24A1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma", "lung carcinoma" ] |
| DNMT3B | [ "lung adenocarcinoma", "lung small cell carcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| FAP | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| FAT1 | [ "lung small cell carcinoma", "lung non-small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| GNPNAT1 | [ "lung adenocarcinoma" ] |
| LAMC2 | [ "lung squamous cell carcinoma", "lung small cell carcinoma", "lung non-small cell carcinoma" ] |
| MMP11 | [ "lung non-small cell carcinoma" ] |
| MMP9 | [ "lung non-small cell carcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| PHGDH | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| ROS1 | [ "lung adenocarcinoma", "lung sarcomatoid carcinoma", "lung non-small cell carcinoma" ] |
| SERPINA4 | [ "pleuropulmonary blastoma", "DICER1 syndrome" ] |
| SOX30 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung metastasis", "lung squamous cell carcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TIMP3 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| TNC | [ "lung cancer" ] |
| TP63 | [ "lung adenocarcinoma" ] |
| TP73 | [ "lung small cell carcinoma", "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| TRAF4 | [ "lung adenocarcinoma" ] |

**DEGs Control vs SC**

* First result: ‘endocrine system disease’ (DOID: 28)
  + 247 associated genes, p-value: 5.32 E-49, Bonferroni: 1.63 E-45

Lung cancer: 43 associated genes, 2.24 E-14, Bonferroni: 6.88 E-11

|  |  |
| --- | --- |
| ABCB1 | [ "lung non-small cell carcinoma" ] |
| ABCC2 | [ "lung non-small cell carcinoma" ] |
| ADAM28 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung metastasis", "asbestos-related lung carcinoma" ] |
| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ALX4 | [ "lung adenocarcinoma", "bronchiolo-alveolar adenocarcinoma" ] |
| ARHGAP44 | [ "lung squamous cell carcinoma", "lung large cell carcinoma", "lung carcinoma", "lung adenocarcinoma" ] |
| BIRC5 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CAPG | [ "lung adenocarcinoma" ] |
| CD74 | [ "lung non-small cell carcinoma" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CYP24A1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung carcinoma", "lung small cell carcinoma" ] |
| DNMT3B | [ "lung small cell carcinoma", "lung adenocarcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| FAP | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma" ] |
| FAT1 | [ "lung small cell carcinoma", "lung non-small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| FGFR3 | [ "lung squamous cell carcinoma" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| ICAM1 | [ "bronchus carcinoma", "lung non-small cell carcinoma" ] |
| LAMC2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma" ] |
| LTF | [ "lung non-small cell carcinoma" ] |
| MMP2 | [ "lung non-small cell carcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| NNAT | [ "lung non-small cell carcinoma" ] |
| NOTCH3 | [ "lung non-small cell carcinoma" ] |
| OTUB2 | [ "pleuropulmonary blastoma", "DICER1 syndrome" ] |
| PHGDH | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| ROS1 | [ "lung sarcomatoid carcinoma", "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| RUNX1T1 | [ "lung small cell carcinoma" ] |
| SLC4A4 | [ "lung adenocarcinoma" ] |
| SOX30 | [ "lung squamous cell carcinoma", "lung adenocarcinoma", "lung metastasis", "lung non-small cell carcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TNC | [ "lung cancer" ] |
| TP63 | [ "lung adenocarcinoma" ] |
| TP73 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma", "lung small cell carcinoma" ] |

**DEGs Control vs AC**

* First result: ‘endocrine system disease’
  + 239 associated genes, p-value: 5.34 E-44, Bonferroni 1.64 E-40

Lung cancer, 42 associated genes, p-value: 1.08 E-13, Bonferroni: 3.31 E-10

|  |  |
| --- | --- |
| ABCC2 | [ "lung non-small cell carcinoma" ] |
| ADAM28 | [ "lung metastasis", "lung adenocarcinoma", "lung non-small cell carcinoma", "asbestos-related lung carcinoma" ] |
| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ARHGAP44 | [ "lung squamous cell carcinoma", "lung large cell carcinoma", "lung carcinoma", "lung adenocarcinoma" ] |
| BIRC5 | [ "lung adenocarcinoma", "lung non-small cell carcinoma", "lung squamous cell carcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CBX7 | [ "lung adenocarcinoma" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CHGA | [ "lung non-small cell carcinoma" ] |
| CYP24A1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma", "lung carcinoma" ] |
| DNMT3B | [ "lung small cell carcinoma", "lung adenocarcinoma" ] |
| E2F1 | [ "lung non-small cell carcinoma", "lung small cell carcinoma", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| FAP | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma" ] |
| FAT1 | [ "lung non-small cell carcinoma", "lung small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| FGFR2 | [ "lung squamous cell carcinoma" ] |
| GATA1 | [ "lung cancer" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| GNPNAT1 | [ "lung adenocarcinoma" ] |
| LAMA3 | [ "lung small cell carcinoma" ] |
| LAMC2 | [ "lung non-small cell carcinoma", "lung small cell carcinoma", "lung squamous cell carcinoma" ] |
| MEOX1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| MMP11 | [ "lung non-small cell carcinoma" ] |
| MMP9 | [ "lung non-small cell carcinoma" ] |
| MPO | [ "lung cancer" ] |
| MXRA5 | [ "lung non-small cell carcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| RUNX1T1 | [ "lung small cell carcinoma" ] |
| SERPINA4 | [ "pleuropulmonary blastoma", "DICER1 syndrome" ] |
| SOX30 | [ "lung squamous cell carcinoma", "lung adenocarcinoma", "lung metastasis", "lung non-small cell carcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TIMP3 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| TNC | [ "lung cancer" ] |
| TRAF4 | [ "lung adenocarcinoma" ] |

**DEGs Control vs LC**

* First result: ‘endocrine system disease’
  + 237 associated genes, p-value: 7.66 E-43, Bonferroni: 2.27 E-39

Lung cancer: 38 associated genes, p-value: 3.24 E-11, Bonferroni: 9.60 E-8

|  |  |
| --- | --- |
| ABCB1 | [ "lung non-small cell carcinoma" ] |
| ABCC2 | [ "lung non-small cell carcinoma" ] |
| ADAM28 | [ "lung adenocarcinoma", "asbestos-related lung carcinoma", "lung metastasis", "lung non-small cell carcinoma" ] |
| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ARHGAP44 | [ "lung adenocarcinoma", "lung squamous cell carcinoma", "lung large cell carcinoma", "lung carcinoma" ] |
| BAMBI | [ "lung non-small cell carcinoma" ] |
| BIRC5 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung squamous cell carcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CYP24A1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma", "lung carcinoma" ] |
| DNMT3B | [ "lung adenocarcinoma", "lung small cell carcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| FAP | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| FAT1 | [ "lung non-small cell carcinoma", "lung small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| FGFR2 | [ "lung squamous cell carcinoma" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| IRAK3 | [ "lung adenocarcinoma" ] |
| LAMC2 | [ "lung non-small cell carcinoma", "lung small cell carcinoma", "lung squamous cell carcinoma" ] |
| MEOX1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| MMP11 | [ "lung non-small cell carcinoma" ] |
| MSH2 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| PHGDH | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| ROS1 | [ "lung adenocarcinoma", "lung sarcomatoid carcinoma", "lung non-small cell carcinoma" ] |
| RUNX1T1 | [ "lung small cell carcinoma" ] |
| SOX30 | [ "lung non-small cell carcinoma", "lung metastasis", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TNC | [ "lung cancer" ] |
| TP63 | [ "lung adenocarcinoma" ] |
| TRAF4 | [ "lung adenocarcinoma" ] |

**DEGs AC vs SC**

* First result: ‘endocrine system disease’
  + 247 associated genes, p-value: 5.32 E-49, Bonferroni: 1.63 E-45

Lung cancer: 43 associated genes, p-value: 2.24 E-14, Bonferroni 6.88 E-11

|  |  |
| --- | --- |
| ABCB1 | [ "lung non-small cell carcinoma" ] |
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| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ALX4 | [ "lung adenocarcinoma", "bronchiolo-alveolar adenocarcinoma" ] |
| ARHGAP44 | [ "lung squamous cell carcinoma", "lung large cell carcinoma", "lung carcinoma", "lung adenocarcinoma" ] |
| BIRC5 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CAPG | [ "lung adenocarcinoma" ] |
| CD74 | [ "lung non-small cell carcinoma" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CYP24A1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung carcinoma", "lung small cell carcinoma" ] |
| DNMT3B | [ "lung small cell carcinoma", "lung adenocarcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| FAP | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma" ] |
| FAT1 | [ "lung small cell carcinoma", "lung non-small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| FGFR3 | [ "lung squamous cell carcinoma" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| ICAM1 | [ "bronchus carcinoma", "lung non-small cell carcinoma" ] |
| LAMC2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma" ] |
| LTF | [ "lung non-small cell carcinoma" ] |
| MMP2 | [ "lung non-small cell carcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| NNAT | [ "lung non-small cell carcinoma" ] |
| NOTCH3 | [ "lung non-small cell carcinoma" ] |
| OTUB2 | [ "pleuropulmonary blastoma", "DICER1 syndrome" ] |
| PHGDH | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| ROS1 | [ "lung sarcomatoid carcinoma", "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| RUNX1T1 | [ "lung small cell carcinoma" ] |
| SLC4A4 | [ "lung adenocarcinoma" ] |
| SOX30 | [ "lung squamous cell carcinoma", "lung adenocarcinoma", "lung metastasis", "lung non-small cell carcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TNC | [ "lung cancer" ] |
| TP63 | [ "lung adenocarcinoma" ] |
| TP73 | [ "lung non-small cell carcinoma", "lung squamous cell carcinoma", "lung small cell carcinoma" ] |

**DEGs AC vs LC**

* First result: ‘endocrine system disease’
  + 237 associated genes, p-value: 7.66 E-43, 2.27 E-39

Lung cancer: 38 associated genes, p-value: 3.24 E-11, Bonferroni: 9.60 E-8

|  |  |
| --- | --- |
| ABCB1 | [ "lung non-small cell carcinoma" ] |
| ABCC2 | [ "lung non-small cell carcinoma" ] |
| ADAM28 | [ "lung adenocarcinoma", "asbestos-related lung carcinoma", "lung metastasis", "lung non-small cell carcinoma" ] |
| ALDH18A1 | [ "lung adenocarcinoma" ] |
| ALOX5 | [ "lung adenocarcinoma" ] |
| ARHGAP44 | [ "lung adenocarcinoma", "lung squamous cell carcinoma", "lung large cell carcinoma", "lung carcinoma" ] |
| BAMBI | [ "lung non-small cell carcinoma" ] |
| BIRC5 | [ "lung non-small cell carcinoma", "lung adenocarcinoma", "lung squamous cell carcinoma" ] |
| BRCA1 | [ "lung non-small cell carcinoma" ] |
| BTK | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| CA12 | [ "lung non-small cell carcinoma", "lung metastasis" ] |
| CDH1 | [ "lung adenocarcinoma" ] |
| CFTR | [ "lung cancer" ] |
| CYP24A1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma", "lung small cell carcinoma", "lung carcinoma" ] |
| DNMT3B | [ "lung adenocarcinoma", "lung small cell carcinoma" ] |
| E2F2 | [ "lung non-small cell carcinoma" ] |
| ENO1 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| FAP | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| FAT1 | [ "lung non-small cell carcinoma", "lung small cell carcinoma" ] |
| FGF10 | [ "lung adenocarcinoma" ] |
| FGFR2 | [ "lung squamous cell carcinoma" ] |
| GCLC | [ "lung non-small cell carcinoma" ] |
| IRAK3 | [ "lung adenocarcinoma" ] |
| LAMC2 | [ "lung non-small cell carcinoma", "lung small cell carcinoma", "lung squamous cell carcinoma" ] |
| MEOX1 | [ "lung adenocarcinoma", "lung non-small cell carcinoma" ] |
| MMP11 | [ "lung non-small cell carcinoma" ] |
| MSH2 | [ "lung non-small cell carcinoma", "lung adenocarcinoma" ] |
| NDC80 | [ "lung non-small cell carcinoma" ] |
| PHGDH | [ "lung non-small cell carcinoma" ] |
| PREX2 | [ "lung squamous cell carcinoma", "lung non-small cell carcinoma" ] |
| PTHLH | [ "lung non-small cell carcinoma" ] |
| ROS1 | [ "lung adenocarcinoma", "lung sarcomatoid carcinoma", "lung non-small cell carcinoma" ] |
| RUNX1T1 | [ "lung small cell carcinoma" ] |
| SOX30 | [ "lung non-small cell carcinoma", "lung metastasis", "lung squamous cell carcinoma", "lung adenocarcinoma" ] |
| TF | [ "lung adenocarcinoma" ] |
| TNC | [ "lung cancer" ] |
| TP63 | [ "lung adenocarcinoma" ] |
| TRAF4 | [ "lung adenocarcinoma" ] |