1. **KEGG Pathway Recognition (String)**

(1) "Which genes are involved in "x"?"

(2) "Which genes are involved in x?"

(3) "Which genes are related to x?"

Question: Which genes are involved in "Adherens junction"?

| **Model** | **Gene 1** | **Gene 2** | **Gene 3** | **Gene 4** | **Gene 5** | **Gene 6** | **Gene 7** | **Gene 8** | **Gene 9** | **Gene 10** | **Gene 11** | **Gene 12** | **Gene 13** | **Gene 14** | **Gene 15** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **weight** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **answer\_true** | CDH1 | CTNNB1 | CTNNA | CTNND1 | CDC42 | CDH3 | ACTN4 | ACTB | EP300 | FGFR1 | LEF1 | PARD3 | MET | LEF1 | SMAD4 |
| **Weight** | 5 | 3 | 3 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Claude** | CDH1 | CTNNB1 | CTNNA | CTDNND1 | CDC | CDH3 | ACTN1 | ACT | PVRL1 | MLLT4 | LIMA1 | PRKCA | MLLT4 | VCL | DSP |
| **Weight** | 5 | 4 | 2 | 1 |  | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **claude\_instant\_ans** | CDH1 | CTNNB1 | CTNNA | CTNND1 | CDC | CDH3 | ACTN | ACT | PLEKHA7 | RHOA | LMO7 | DSG1 | RAC1 | VCL | AFADIN |
| **Weight** | 4 | 2 | 0 | 2 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| **cohere** | CDH1 | CTNNB1 | CTNNA1 | CTNND1 | CD42 | CDH3 | ACTN4 | ACB | EPHA2 | FBLN1 | LED1 | PARD3 | MYC | PLXNA2 | SND1 |
| **Weight** | 5 | 3 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **chat\_gpt\_3\_5** | CDH1 | CTNNB1 | CTNNA1 | CTNND1 | CDC42 | JUP | Rac1 | ZO-2 | JAM | ARVCF | ZO-2 | Zo1 | RHOA | VCL | AFADN |
| **Weight** | 5 | 4 | 0 | 4 | 3 | 5 | 0 | 3 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| **chat\_gpt4** | CDH1 | CTNNB1 | CAV2 | CTNND1 | CDC42 | CDH3 | PAK1 | ACTB | AMOT | FGFR1 | RHOC | PARD3 | PAK2 | CAV1 | IQGAP1 |
| **Weight** | 5 | 4 | 0 | 4 | 3 | 5 | 0 | 3 | 2 | 2 | 0 | 2 | 0 | 0 | 0 |
| **claude\_2pro** | CDH1 | CTNNB1 | TJP1 | CTNND1 | CDC42 | CDH3 | ACTG1 | ACTB | EP300 | FGFR1 | CREBBP | PARD3 | AFDN | SRC | VCL |
| **Weight** | 3 | 0 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **palm\_2** | CDH1 | CTNN | CDH20 | CTNND1 | CDH25 | CDH3 | ACTG | ACTB | CTNN | CDH30 | CDH15 | CDH25 | RHO | PLXN | VC |
| **Weight** | 5 | 4 | 0 | 3 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| **bard** | CDH1 | CTNNB1 | CTNNA1 | CTNND1 | ACTN1 | CDH3 | F11R | ACTB | CDH24 | TJP1 | ZO | PARD3 | JAM | PLXN | AF |
| **Weight** | 3 | 2 | 0 | 2 | 0 | 3 | c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **codellama\_34instruct** | CDH1 | CTNNB1 | CTNNA1 | CTNND1 | CDH7 | CDH3 | CTNN | CDH30 | CDH15 | CDH25 | RHO | PLXN | CTNN | FBLN1 | LED1 |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **wizardlm\_70b** | CDH1 | CTNNB1 | JUP | Rac1 | ZO-2 | JUP | ARVCF | ZO-2 | Zo1 | RHOA | VCL | AFADIN | ARVCF | ZO-2 | Zo1 |
| **Weight** | 3 | 3 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **wizardlm\_13b** | CDH1 | CTNNB1 | CTNNA1 | Rac1 | ZO-2 | CDH3 | Zo1 | ZO-2 | JAM | ARVCF | ZO-2 | Zo1 | RHOA | VCL | AFADIN |
| **Weight** | 3 | 2 | 0 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **falcon\_180b\_chat** | CDH1 | CTNNB1 | CTNNA1 | CTNND1 | CDC42 | CDH3 | ITGB | MLLT4 | F11R | CDH30 | CDH15 | CDH25 | RHO | PLXN | VC |
| **Weight** | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **mistral\_7b\_instruct** | CDH1 | CTNNB1 | CDH6 | Rac1 | ZO-2 | CDH3 | AMOT | FGFR1 | ZO-2 | PLEKHA7 | RHOA | LMO7 | DSG1 | RAC1 | VCL |
| **Weight** | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **chatglm2\_6b** | CDH1 | CTNNB1 | JUP | Rac1 | ZO-2 | JAM | ARVCF | ZO-2 | Zo1 | RHOA | VCL | AFADIN | JUP | Rac1 | ZO-2 |
| **Weight** | 4 | 3 | 2 | 3 | 0 | 4 | c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_7b** | CDH1 | CTNNB1 | CTNNA | CTNND1 | Ra1 | CDH3 | ZO-2 | CDH7 | DH30 | ZO-2 | RHOA | VCL | PLXN | CTNN | LXN |
| **Weight** | 3 | 2 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_33b** | CDH1 | CTNNB1 | CTNNA | CTNND1 | CD42 | CDH3 | ITGB | MLLT4 | F11R | CDH30 | CDH15 | CDH25 | RHO | PLXN | VC |
| **Weight** | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_13b** | CDH1 | CTNNB1 | CTNNA | Rac1 | ZO-2 | JM | ARVCF | ACTB | ARVCF | ZO-2 | Zo1 | RHOA | VCL | AFADIN | ARVCF |
| **Weight** | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_70b** | CDH1 | CTNN1 | CTNNA | CTND1 | ZO-2 | CD3 | AMOT | ATB | RHOA | VCL | AFADIN | ARVCF | ZO-2 | Zo1 | RHOA |
| **Weight** | 3 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_13b** | CDH1 | CTNNB1 | CTNNA | RVC | ITGB | CDH3 | F1R | CDH30 | CDH15 | CDH25 | RHO | PLXN | VC | CDH3 | ITGB |
| **weight** | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_7b** | CDH1 | CTNNB1 | CTNNA | CTNND1 | ZO-2 | CD3 | F11R | CDH30 | CDH15 | CDH25 | RHO | PLXN | VC | PLXN | VC |
| **Weight** | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **qwen\_14b** | CDH1 | CTNNB1 | ZO-2 | ITGB | MLLT4 | RHOA | VCL | AFADIN | JUP | Rac1 | ZO-2 | CDH30 | CDH15 | CDH25 | RHO |

**Tight Junctions:**

Question: Which genes are involved in "Tight junction"?

| **Model** | **Gene 1** | **Gene 2** | **Gene 3** | **Gene 4** | **Gene 5** | **Gene 6** | **Gene 7** | **Gene 8** | **Gene 9** | **Gene 10** | **Gene 11** | **Gene 12** | **Gene 13** | **Gene 14** | **Gene 15** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| true\_answer | CLDN1 | CDC42 | CDN1 | PARD6 | INADL | CRB3 | JAM | CGN | CGNL1 | RAB13 | ACTN1 | CTTN | EPB41 | F11R | OCLN |
| **Weight** | 5 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 3 |
| Claude | CLDN1 | OCL | TJP1 | CGN | ACTB | CTNNB1 | JAM1 | CTN | M9 | RAB13 | ACT | PTPN1 | PTPN2 | PRKCA | OCLN |
| **Weight** | 5 | 3 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| claude\_instant\_ans | CLDN1 | CDC42 | TJP1 | CGN | 7H6 | CRB3 | JAM1 | MYH9 | RHOA | Rac1 | CRB2 | CAV1 | TJP2 | MAGI1 | TJP2 |
| **Weight** | 4 | 4 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| cohere | CLDN1 | CDC42 | CLDN1 | PARP2 | pod | CRB3 | JAM1 | CGN | CAV1 | RAB13 | KAI1 | CLRN3 | GZMB | F1R | TTLL7 |
| **Weight** | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| chat\_gpt\_3\_5 | CLDN1 | OCLN | Zo | TJP1 | TJP2 | MAGI1 | JA-1 | CGN | CGAL1 | MLLT4 | MPP5 | CASK | Abc | F11R | xyz |
| **Weight** | 5 | 3 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 0 |
| chat\_gpt4 | CLDN1 | CDC42 | MPP5 | PARD6 | CASK | CRB3 | JAM1 | CTNNA1 | MPP5 | RAB13 | PARD6G | TJP1 | MAGI1 | F11R | ZO-2 |
| **Weight** | 5 | 3 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 3 | 0 |
| claude\_2pro | CLDN1 | CDC42 | TJP1 | PARD6 | Zo1 | CRB3 | JAM1 | NNA1 | PP5 | RAB13 | RD6G | JP1 | TJP1 | F11R | ZO-2 |
| **Weight** | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| palm\_2 | CLDN1 | ACTB | CDN1 | AFANP | BCL1 | CKND5 | JAM1 | AMB | ADG | ACTA2 | ACTA3 | CLD20 | BCL | ATP | CLND3 |
| **Weight** | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 3 | 0 | 0 | 0 | 0 |
| bard | CLDN1 | DLG3 | ZO-1 | MYL12B | CLDN8 | CKND | JAM1 | CGN | BCL | RAB13 | ACTN1 | PARD6G | TJP1 | MAGI1 | CLND |
| **Weight** | 3 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| codellama\_34instruct | CLDN1 | pod | CDN1 | CD2 | MPP5 | PARD6 | JAM1 | CN | CG | RA3 | TJP1 | MAGI1 | TJP1 | F11R | CAV1 |
| **Weight** | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| wizardlm\_70b | CLDN1 | MPP5 | PARD6 | CASK | MPP5 | PARD6 | JAM1 | CGN | CGAL1 | MLLT4 | MPP5 | CASK | CGN | F11R | abc |
| **Weight** | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| wizardlm\_13b | CLDN1 | CLDN2 | CLDN3 | CLDN4 | CLDN5 | ABC | JAM1 | AMB | CTNNA1 | MPP5 | RAB13 | PARD6G | TJP1 | MAGI1 | TJP1 |
| **Weight** | 4 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| falcon\_180b\_chat | CLDN1 | CDC42 | TJP1 | PARD6 | Zo1 | CTNNB1 | JAM1 | ABC | ACTN1 | RAB13 | TJP1 | MAGI1 | CLND | RA3 | ACTN1 |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| mistral\_7b\_instruct | CLDN1 | CDC42 | CLDN4 | CLDN4 | ACTB | CRB3 | JAM1 | AMB | ABC | CRB2 | CAV1 | TJP2 | MAGI1 | TJP2 | CRB2 |
| **Weight** | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| chatglm2\_6b | CLDN1 | CDC42 | MPP5 | PARD6 | CDC42 | MPP5 | JAM1 | NNA1 | PP5 | NNA1 | CASK | Xyz | CASK | Abc | CASK |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_7b | CLDN1 | CDC42 | CLDN1 | ACTB | MPP5 | PARD6 | JAM | AMB | ADG | RD6G | JP1 | TJP1 | ADG | MAGI1 | TJP2 |
| **Weight** | 2 | 3 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_33b | CLDN1 | CDC42 | CLD1 | MPP5 | ACTB | CRB3 | JAM | NNA1 | PP5 | NNA1 | CASK | Xyz | CASK | Abc | CASK |
| **Weight** | 2 | 3 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_13b | CLDN1 | CDC42 | CLD1 | MPP5 | ACTB | CRB3 | JAM | NNA1 | PP5 | NNA1 | CASK | Xyz | CASK | Abc | CASK |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 0 |
| llama\_2\_70b | CLDN1 | CDC2 | CDN1 | CD2 | MPP5 | PAR | JAM1 | MPP5 | RAB13 | PARD6 | TJP1 | MAGI1 | TJP1 | F11R | TJP2 |
| **Weight** | 2 | 2 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| llama\_2\_13b | CLDN1 | CDC42 | PAR6 | Zo1 | CTNNB1 | PARD6 | JAM | PP5 | PP5 | NNA1 | CASK | Xyz | CASK | Abc | CASK |
| **Weight** | 3 | 3 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| llama\_2\_7b | CLDN1 | CDC42 | CDN1 | CD2 | MPP5 | CRB3 | JAM | PP5 | NNA1 | CASK | Xyz | CASK | Abc | CASK | CASK |
| **Weight** | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| qwen\_14b | CLDN1 | CDC2 | CD1 | TJP2 | MAGI1 | JA | CGN | CGAL1 | MLLT4 | MPP5 | CASK | Abc | F11R | xyz | TJP2 |

**Gap Junctions:**

Question: Which genes are involved in "GAP junction"?

| **Model** | **Gene 1** | **Gene 2** | **Gene 3** | **Gene 4** | | **Gene 5** | **Gene 6** | **Gene 7** | **Gene 8** | **Gene 9** | **Gene 10** | **Gene 11** | **Gene 12** | **Gene 13** | **Gene 14** | **Gene 15** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| answer\_true | GJA1 | GJB1 | GJC1 | GJD2 | | ADCY1 | ADRB1 | CSNK1D | DRD1 | EGF | EGFR | GNA11 | PRKCA | GJA5 | HRAS | MAP2K1 |
| **Weight** | 5 | 4 | 4 | 0 | | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| Clauda | GJA1 | GJB1 | GJC1 | GJD1 | | CX33 | CX36 | CX45 | GJA4 | CX59 | CX62 | GJA8 | CX40 | GJA5 | CX47 | ABC |
| **Weight** | 4 | 3 | 3 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 00 | 0 |
| claude\_instant\_ans | GJA1 | GJB1 | GJC1 | GJC3 | SLC24A3 | | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | SLC2 | GJB | GJA5 | C24A3 | LIM |
| **Weight** | 4 | 4 | 3 | 3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| cohere | GJA1 | GJB1 | GJC1 | GJD2 | | GJC3 | SLC24A6 | ITGB1 | GJA8 | CL3 | CLCN3 | CLCN1 | GJB6 | GJA5 | C24A3 | GJA10 |
| **Weight** | 5 | 4 | 4 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| chat\_gpt\_3\_5 | GJA1 | GJB1 | GJC1 | GJA12 | | GJB10 | GJB7 | GJA7 | GJB | GJB2 | GJB3 | GJAC | GJA8 | GJA5 | GDD | GJAA |
| **Weight** | 5 | 5 | 4 | 4 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 |
| chat\_gpt4 | GJA1 | GJB1 | GJC1 | GJD2 | | GJB6 | GJB8 | GJB3 | GJA4 | GJB | GJDD | GJB | PRKCA | GJA5 | CLCN | GJA |
| **Weight** | 5 | 4 | 4 | 3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 |
| claude\_2pro | GJA1 | GJB1 | GJC1 | GJD2 | | GJB6 | GJB8 | GJB3 | GJA4 | GJB | GJDD | GJB | PRKG1 | GJA5 | HRAS | GJA |
| **Weight** | 3 | 3 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| palm\_2 | GJA1 | GJB1 | GJC1 | GJ2 | | CX33 | PRPH2 | LIM | CLP | COROM1 | CLSC3 | BCAP3 | CA | COPORS | COROS | CORODS |
| **Weight** | 4 | 4 | 3 | 3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| bard | GJA1 | GJB1 | GJC1 | GJD2 | | PANXI | PANX2 | PANX3 | GJML | GJB | SLC24A6 | ITGB1 | GJA8 | GJA5 | CLCN | GJA |
| **Weight** | 4 | 4 | 3 | 3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| codellama\_34instruct | GJA1 | GJB1 | GJC1 | GJD2 | | GJC3 | SLC24A3 | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | SLC2 | GJA5 | SLC2 | GJB |
| **Weight** | 3 | 3 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| wizardlm\_70b | GJA1 | GJB1 | GJC1 | GJA1 | | GJB1 | SLC24A3 | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | SLC2 | GJA5 | SLC2 | GJB |
| **Weight** | 4 | 4 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| wizardlm\_13b | GJA1 | GJB1 | GJC1 | abc | | GJB7 | GJA7 | GJB | GJB2 | GJB3 | GJAC | GJB7 | xyz | GJA5 | GJB7 | GJA7 |
| **Weight** | 3 | 3 | 2 | 2 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| falcon\_180b\_chat | GJA1 | GJB1 | GJC1 | GJD2 | | GJC3 | SLC24A3 | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | SLC2 | GJA5 | CLCN | GJA |
| **Weight** | 3 | 3 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| mistral\_7b\_instruct | GJA1 | GJB1 | GJC1 | GJC3 | | SLC24A3 | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | GJC3 | SLC24A3 | GJA5 | GJB7 | GJA7 |
| **Weight** | 3 | 2 | 1 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| chatglm2\_6b | GJA1 | GJB1 | GJC1 | GJB10 | | GJB7 | GJA7 | GJB | GJB2 | GJB3 | GJAC | GJA8 | GJB10 | GJB7 | GJA7 | GJB |
| **Weight** | 3 | 2 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| vicuna\_7b | GJA1 | GJB1 | GJC1 | GJB1 | | SLC24A3 | SLC24A6 | PRPH2 | LIM2 | CX62 | GJB6 | SLC2 | GJB1 | GJA5 | GJA7 | GJB |
|  | 4 | 3 | 3 | 0 | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 |
| vicuna\_33b | GJA1 | GJB1 | GJC1 | GJB1 | | GJB1 | SLC24A3 | SLC24A6 | PRPH2 | EGF | SLC24A6 | ITGB1 | GJA8 | GJA5 | CLCN | GJA |
| **Weight** | 3 | 2 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_13b | GJA1 | GJB1 | GJC1 | GJB1 | | GJB1 | GJA7 | GJB | GJB2 | GJB3 | GJAC | GJA8 | GJB10 | GJB7 | GJA7 | GJB |
| **Weight** | 3 | 3 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| llama\_2\_70b | GJA1 | GJB1 | GJC1 | GJB7 | | GJA7 | GJB | GJB2 | GJB3 | GJAC | GJB7 | xyz | GJB7 | GJA5 | CLCN | GJA |
| **Weight** | 4 | 3 | 2 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| llama\_2\_13b | GJA1 | GJB1 | GJC1 | GJ2 | | GJB1 | GJC1 | GJB | GJB2 | GJB3 | GJAC | GJA8 | GJB10 | GJA5 | GJA7 | GJB |
| **Weight** | 3 | 2 | 2 | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| llama\_2\_7b | GJA1 | GJB1 | GJC1 | GJD2 | | GJC1 | GJB | GJB2 | GJB3 | GJAC | GJA8 | GJB10 | GJC1 | GJA5 | CLCN | GJA |
| **Weight** | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| qwen\_14b | GJA1 | GJB | GJC | GJB10 | | G7 | GJA7 | GJB | GJ2 | GJB3 | GJAC | GJA8 | GA5 | GDD | GJAA | GJB10 |

**Question: Which genes are involved in “Cellular senescence”?**

| **Model** | **Gene 1** | **Gene 2** | **Gene 3** | **Gene 4** | **Gene 5** | **Gene 6** | **Gene 7** | **Gene 8** | **Gene 9** | **Gene 10** | **Gene 11** | **Gene 12** | **Gene 13** | **Gene 14** | **Gene 15** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **true\_answer** | CDKN2A | CDKN2B | CDKN1A | ATM | CDK1 | CDC25A | E2F2 | E2F4\_5 | ATR | CHEK1 | GJA1 | GJD2 | TUBA | SOS | TUBB |
| **Weight** | 4 | 0 | 4 | 3 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **claude\_genes** | CDKN2A | CDKN1B | CDKN1A | ATM | DEC1 | TP53 | ETS2 | ETS1/2 | IL6 | DEC1 | PAI-1 | DEC1 | LMNB1 | SO | CCNA2 |
| **Weight** | 4 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **claude\_instant\_genes** | CDKN2A | TP53 | CDKN1A | TGFB1 | CDK1 | RELA | IGF1R | IL1A | IKBKB | FOXO1 | CREB1 | MDM2 | PAI1 | IKBKB | MDM2 |
| **Weight** | 4 | 3 | 3 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **cohere\_genes** | CDKN2A | CDKN2B | CDKN1A | ATM | CDK4 | COX4II | MMP11 | FOXO4 | ATR | RBL2 | TIMP | MYC | TUG | SKP2 | RPL10A |
| **Weight** | 5 |  | 5 | 4 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **chat\_gpt3\_genes** | CDKN2A | XYZ | CDKN1A | ATM | CHEK2 | HMGA1 | RB1 | FOXO | NRF2 | BCL2: | AKT1 | HIF1A | PTEN | IL-6 | NFKB |
| **Weight** | 5 | 4 | 4 | 5 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| **chat\_gpt4\_genes** | CDKN2A | CDKN2B | CDKN1A | ATM | CDK4 | mTOR | NF-κB | NRF2 | ATR | CHEK1 | p38 | CCNA2 | IL-6 | SIRT7 | CCNE2 |
| **Weight** | 5 | 5 | 4 | 4 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| **claude2\_pro\_genes** | CDKN2A | CDKN2B | CDKN1A | ATM | TERT | CDC2 | NF | IL6/IL8 | ATR | CHEK1 | RB1 | ETSI | TP53 | PTEN | PML |
| **Weight** | 3 | 2 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **palm\_2\_genes** | CDKN2A | CDKN2B | CDKN1A | P53 | CDK1 | P16INK | SODI | BCL | FOXO3A | NRF2 | Mkk9 | AKT2 | DDB2 | E2F6 | FAS |
| **Weight** | 4 | 3 | 2 | 0 | 3 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 |
| **bard\_genes** | CDKN2A | CDKN2B | CDKN1A | AM | CDK1 | mTOR | NF-κB | P16INK | ATR | CHEK1 | RB1 | ETSI | TP53 | PTEN | PML |
| **Weight** | 4 | 3 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **codellama\_34instruct\_genes** | CDKN2A | CDKN2B | CDKN1A | ATM | TERT | CDC2 | NF | IL6/IL8 | p38 | CCNA2 | IL-6 | SIRT7 | CCNE2 | p38 | CCNA2 |
| **Weight** | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **wizardlm\_70b\_genes** | CDK2A | CDKN2B | abc | ATM | FOXO3A | NRF2 | Mkk9 | FOXO3A | ATR | RB1 | ETSI | TP53 | PTEN | PML | RB1 |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **wizardlm\_13b\_genes** | CDKN2A | CDKN2B | CDKN2A | ATM | CDK4 | mTOR | NFKB | NRF2 | CDK4 | mTOR | TIMP | MYC | TUG | SKP2 | RPL10A |
| **Weight** | 4 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **falcon\_180b\_chat\_genes** | CDKN2A | CDKN1B | CDKN1A | ATM | CDK4 | COX4II | MMP11 | CDK4 | ATR | BCL | FOXO3A | NRF2 | Mkk9 | AKT2 | DDB2 |
| **Weight** | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| **mistral\_7b\_instruct\_genes** | CDKN2A | CDKN1B | CDKN2A | CDKN1B | mTOR | NF-κB | P16INK | ATR | CHEK1 | RB1 | ETSI | TP53 | PTEN | PML | mTOR |
| **weight** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **chatglm2\_6b\_genes** | CDKN2A | CHEK2 | HMGA1 | RB1 | FOXO | NRF2 | BCL2: | AKT1 | HIF1A | PTEN | IL-6 | NFKB | CHEK2 | HMGA1 | RB1 |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_7b** | CDKN2A | CDKN2B | CDKNA | ATM | COX4II | MMP11 | CDK4 | MP11 | ATR | BCL | FOXO3A | NRF2 | Mkk9 | BCL | BCL |
| **Weight** | 4 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_33b** | CDKN2A | CDKN2B | CDKNA | AM | CDK1 | NF-κB | P16INK | ATR | CHEK1 | RB1 | ETSI | TP53 | PTEN | PML | mTOR |
| **Weight** | 4 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **vicuna\_13b** | CDKN2A | CDKN2B | CDKN1A | ATM | CDK4 | mTOR | NF-κB | NRF2 | CDK4 | mTOR | TIMP | MYC | TUG | SKP2 | RPL10A |
| **weight** | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_70b** | CDKN2A | CDKN2B | CDKN1A | ATM | RELA | IGF1R | IL1A | IKBKB | FOXO1 | CREB1 | MDM2 | PAI1 | IKBKB | MDM2 | RELA |
| **Weight** | 3 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_13b** | CDKN2A | CDKN2B | CDKN1A | ATM | mTOR | NF-κB | NRF2 | CDK4 | mTOR | TIMP | MYC | TUG | SKP2 | RPL10A | mTOR |
| **Weight** | 3 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **llama\_2\_7b** | CDKN2A | CDKN2B | CDKN1A | ATM | IGF1R | mTOR | NF-κB | NRF2 | CDK4 | mTOR | TIMP | MYC | TUG | SKP2 | RPL10A |
| **Weight** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **qwen\_14b** | CDKN2A | CHEK2 | HMGA1 | RB1 | FOXO | NRF2 | BCL2: | AKT1 | HIF1A | PTEN | IL-6 | NFKB | CHEK2 | HMGA1 | RB1 |

**Question: Which genes are involved in “Phagosome”?**

| Model | Gene 1 | Gene 2 | Gene 3 | Gene 4 | Gene 5 | Gene 6 | Gene 7 | Gene 8 | Gene 9 | Gene 10 | Gene 11 | Gene 12 | Gene 13 | Gene 14 | Gene 15 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| true\_answer | RAB5A | RAB7A | ATP6G | RAC1 | CANX | CALR | MPO | NCF1 | STX7 | STX12 | ITGB1 | VAMP3 | ACTB | DYN2 | B1N1 |
| **Weight** | 5 | 5 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| claude\_genes | RAB5A | RAB7A | ATP6V1B2 | RAC1 | NCF1 | HLA-DRA | TUBB | HYAL1 | ATP6V0D1 | PIK3C3 | ACTB | TUBB | AMP2 | abc | bbb |
| **Weight** | 5 | 5 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| claude\_instant\_genes | RAB5A | RAB7A | CD14 | RAC1 | RAB5C | LR4 | ADRA | NCF1 | YAL1 | TY6V0D1 | RAK4 | FKB2 | GALS3 | IRS1 | ITGB2 |
| **Weight** | 5 | 5 | 0 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| cohere\_genes | RAB5A | RAB7A | ATP6AP1 | RAC1 | THBS1 | HS3ST3 | MPP1 | NCF1 | ELABELA | C17orf99 | AP3M1 | RAB7 | ACTB | ADRA | COPA |
| **Weight** | 4 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| chat\_gpt3\_genes | RAB5A | RAB7A | CD14 | RAC1 | CD68 | CD14 | RAB11A | PLD | SRC | TLRs | PI3K | LAMP1 | NADPH | ITGAM | bbbb |
| **Weight** | 5 | 5 | 0 | 4 | 0 | 0 | 0 | 3 | 2 | 2 | 0 | 0 | 4 | 0 | 0 |
| chat\_gpt4\_genes | RAB5A | RAB7A | ATP6V1H | RAC1 | PLCG2 | MO | CTSD | NCF1 | STX7 | STX12 | VTI1B | CTS | ACTB | CYBA | LAMP1 |
| **Weight** | 5 | 5 | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |
| claude2\_pro\_genes | RAB5A | RAB7A | CDC42 | RAC1 | CAT | CYBB | MPO | NCF | FOXO4 | STX12 | IL6 | VAM | ACTB | GA | GAM |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| palm\_2\_genes | RAB5A | RAB7A | ATG | RAC1 | ATG9 | ATG | ATG6A | ATG16R | YAL1 | TLRs | PI3K | LAMP1 | LAMP1 | NADPH | ITGAM |
| **Weight** | 4 | 4 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| bard\_genes | RAB5A | RAB7A | CDC42 | RAC1 | PLCG2 | MPO | CTSD | ELABELA | C17orf99 | AP3M1 | RAB7 | ELABELA | ACTB | IRS1 | IRS |
| **Weight** | 4 | 4 | 0 | 0 |  | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| codellama\_34instruct\_genes | RAB5A | RAB7A | THBS1 | HS3ST3 | MPP1 | NCF1 | ELABELA | C17orf99 | AP3M1 | RAB7 | THBS1 | HS3ST3 | IRS1 | ITGB2 | IRS1 |
| **Weight** | 4 | 4 | 0 | 2 | 0 |  | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| wizardlm\_70b\_genes | RAB5A | RAB7A | Abc | RAC1 | HS3ST3 | MPP1 | NCF1 | ELABELA | C17orf99 | AP3M1 | RAB7 | ACT | ADRA | COPA | HS3ST3 |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| wizardlm\_13b\_genes | RAB5A | RAB7A | Abc | RAC1 | HS3ST3 | MPP1 | NCF1 | HS3ST3 | MPP1 | VTI1B | CTS | VTI1B | ACTB | IRS1 | ITGB2 |
| **Weight** | 4 | 4 | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| falcon\_180b\_chat\_genes | RAB5A | RAB7A | ATP6AP1 | RAC1 | THBS1 | HS3ST3 | MPO | NCF1 | TLRs | PI3K | LAMP1 | LAMP1 | ACTB | NADPH | ITGAM |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| mistral\_7b\_instruct\_genes | RAB5A | RAB7A | ABC | RAC1 | PLCG2 | MO | CTSD | NCF1 | YAL1 | TLRs | PI3K | LAMP1 | ACTB | IRS1 | ITGB2 |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| chatglm2\_6b\_genes | RAB5A | RAB7A | CD14 | RAC1 | CD68 | CD14 | RAB11A | PLD | SRC | TLRs | PI3K | LAMP1 | LAMP1 | NADPH | ITGAM |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_7b\_genes | RAB5A | RAB7A | ABC | RAC1 | HS3ST3 | MP | NF1 | YAL1 | TLRs | STX12 | LAMP1 | AB | ACB | NADPH | ITGAM |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| vicuna\_33b\_genes | RAB5A | RAB7A | ITGB2 | RA1 | CD4 | CD68 | RAB11A | PLD | SRC | CD14 | ACTB | IRS1 | ITGB2 | abc | bbb |
| **Weight** | 3 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| vicuna\_13b\_genes | RAB5A | RAB7A | ITGB2 | RA1 | HS3ST3 | MPO | NC | YAL1 | TLRs | STX12 | LAMP1 | AB | ACTB | NADPH | ITGAM |
| **Weight** | 4 | 4 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| llama\_2\_70b\_genes | RAB5A | RAB7A | ABC | RAC1 | HS3ST3 | MPP1 | NCF1 | ELABELA | C17orf99 | AP3M1 | RAB7 | ACT | ACTB | LAMP1 | AB |
|  | 4 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| llama\_2\_13b\_genes | RAB5A | RAB7A | HS3ST3 | MPP1 | NCF1 | ELABELA | C17orf99 | AP3M1 | RAB7 | ACT | CD68 | CD14 | ACTB | IRS1 | ITGB2 |
| **Weight** | 3 | 3 | 0 | 3 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| llama\_2\_7b\_genes | RAB5A | RAB7A | ITGB2 | RAC1 | HS3ST3 | MPO | NCF1 | YAL1 | TLRs | STX12 | LAMP1 | AB | ATB | NADPH | ITGAM |
| **Weight** | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| qwen\_14b\_genes | RAB5A | RAB7A | CD14 | RA1 | CD68 | CD14 | RAB11A | PLD | SRC | TLRs | PI3K | LAMP1 | LAMP1 | NADPH | ITGAM |

**Question: Which genes are involved in “Proteoglycans in cancer”?**

| **Model** | **Gene 1** | **Gene 2** | **Gene 3** | **Gene 4** | **Gene 5** | **Gene 6** | **Gene 7** | **Gene 8** | **Gene 9** | **Gene 10** | **Gene 11** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| true\_answer | CD63 | CDKN1A | PLAUR | CDC42 | CD44 | PLAU | GAB1 | PLCE1 | HPSE1 | AKT1 | GRB2 |
| **Weight** | 4 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 3 | 0 |
| claude\_genes | CD63 | DCN | CHSY1 | CDC42 | CD44 | GPC3 | BCAN | YLT1 | HAS3 | AKT1 | TGB3 |
| **Weight** | 4 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 4 | 0 |
| claude\_instant\_genes | CSPG4 | SDC4 | HST3 | CDC42 | CD44 | LT25D1 | GPC | PRG4 | YLT1 | AKT1 | GPC3 |
| **Weight** | 3 | 0 | 0 | 4 | 4 | 0 | 2 | 0 | 0 | 0 | 0 |
| cohere\_genes | CD63 | PTX3 | OLFM4 | CDC42 | CD44 | LRP1 | GAB1 | VSIG4 | ITGB5 | PRG4 | GFB1I1 |
| **Weight** | 0 | 0 | 0 |  | 2 | 0 | 0 | 0 | 0 | 3 | 0 |
| chat\_gpt3\_genes | EGFR | CDKN2A | PIK3CA | HIF1A | CD44 | PAX3 | VEGFA | WNT | TGFBR | AKT1 | NF1 |
| **Weight** | 3 | 0 | 0 | 5 | 5 | 0 | 4 | 0 | 0 | 3 | 0 |
| chat\_gpt4\_genes | CD63 | AGRN | ITGA2 | CDC42 | CD44 | MMP9 | GAB1 | HSPG2 | GPC1 | AKT1 | EXT2 |
| **Weight** | 4 | 0 | 0 | 5 | 5 | 0 | 3 | 0 | 0 | 2 | 0 |
| claude2\_pro\_genes | CD63 | CHSY3 | CHST11 | CDC42 | CD44 | NDST1 | GAB1 | EXT1 | SULF1 | AKT1 | HSY3 |
| **Weight** | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 00 | 0 | 0 |
| palm\_2\_genes | CD63 | ADAMA | TGFB1 | MMP2 | CD44 | TGF | WNTB | WNT3A | RAS | SPO1 | CTGF |
| **Weight** | 3 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| bard\_genes | CD63 | VCAM | NCAM | CDC42 | CD44 | PLU | HYAL | HS33 | GPC3 | AKT1 | GPC1 |
| **Weight** | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 |  |
| codellama\_34instruct\_genes | CD63 | PIK3CA | HIF1A | C44 | CD44 | PAX3 | VEGFA | WNT | TGFBR | AKT1 | ABC |
| **Weight** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| wizardlm\_70b\_genes | CD63 | Abc | XYZ | MMP9 | HSPG2 | GPC1 | HSPG2 | ITGB5 | PRG4 | AKT1 | GFB1I1 |
| **Weight** | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| wizardlm\_13b\_genes | CD63 | PLU | HYAL | CDC42 | PLU | HYAL | HS33 | GPC3 | PLU | AKT1 | Xyz |
| **Weight** | 3 |  |  | 2 |  |  | 2 |  |  | 3 |  |
| falcon\_180b\_chat\_genes | CD63 | ADAMA | TGFB1 | CDC42 | EXT1 | SULF1 | GAB1 | EXT1 | SULF1 | AKT1 | Abc |
| **Weight** | 2 | 0 | 0 | 2 |  | 3 | 0 | 0 | 0 | 0 | 0 |
| mistral\_7b\_instruct\_genes | CD63 | ADAMA | TGFB1 | CDC42 | CD | GAB1 | EXT1 | SULF1 | GAB1 | ABC | Xyz |
| **Weight** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| chatglm2\_6b\_genes | EGFR | CDKN2A | PIK3CA | HIF1A | CD4 | PAX3 | VEGFA | WNT | TGFBR | AKT1 | ABC |
| **Weight** | 3 | 0 | 0 | 2 | 2 |  | 2 | 0 | 0 | 0 | 0 |
| vicuna\_7b\_genes | CD63 | ADAMA | TGFB1 | CDC42 | CD44 | SULF1 | GAB1 | EXT1 | SULF1 | SPO1 | CTGF |
| **Weight** | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| vicuna\_33b\_genes | CD63 | ADAMA | TGFB1 | CDC42 | CD4 | GAB1 | EXT1 | SULF1 | GAB1 | AK1 | Xyz |
| **Weight** | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_13b\_genes | CD63 | CDKN2A | PIK3CA | HIF1A | CD4 | HYAL | HS33 | GPC3 | PLU | AT1 | Xyz |
| **Weight** | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| llama\_2\_70b\_genes | CD63 | ADAMA | TGFB1 | CDC2 | CD44 | LT25D1 | GPC | PRG4 | YLT1 | AKT | SULF1 |
| **Weight** | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| llama\_2\_13b\_genes | CD63 | ADAMA | TGFB1 | CDC2 | CD44 | SULF1 | GAB1 | EXT1 | SULF1 | AK1 | CTGF |
| **Weight** | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| llama\_2\_7b\_genes | CD63 | ADAMA | TGFB1 | CDC42 | CD4 | T25D | GAB1 | GPC | PRG4 | AKT1 | SULF |
| **Weight** | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| qwen\_14b\_genes | D63 | ADAMA | TGFB1 | CDC42 | PAX3 | VEGFA | WNT | TGFBR | AKT1 | NF1 | PAX3 |

**Question: Which genes are involved in “Autoimmune thyroid disease”?**

| Model | Gene 1 | Gene 2 | Gene 3 | Gene 4 | Gene 5 | Gene 6 | Gene 7 | Gene 8 | Gene 9 | Gene 10 | Gene 11 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| true\_answer | TSHR | PTPN22 | FOXP3 | TG | CD40 | IL2RA | TRAF6 | IL10 | STAT | NFKB1 | SLC26A4 |
| **Weight** | 5 | 0 | 0 | 5 | 4 | 3 | 0 | 0 | 3 | 0 | 0 |
| claude\_genes | TSHR | VDR | IL21 | TG | CD40 | IL2RA | IRF4 | IL | STAT | IFNG | FCGR3A |
| **Weight** | 4 | 0 | 0 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| claude\_instant\_genes | TSHR | PRKCQ | H2B3 | TG | C40 | IL2RA | CCR6 | RKCQ | CD25 | CD80 | BACH2 |
| **Weight** | 4 | 0 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| cohere\_genes | TSHR | OLFM4 | IL21 | TG | C40 | IL2RA | BACH2 | IL10 | STA4 | CTLA4 | FASLG |
| **Weight** | 4 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| chat\_gpt3\_genes | TSHR | PTPN22 | PADI4 | Ta | CD40 | BACH2 | CD25 | IL | FCRL3 | IKZF1 | IL-23R |
| **Weight** | 5 | 0 | 3 | 5 | 4 | 3 | 0 | 0 | 0 | 0 | 0 |
| chat\_gpt4\_genes | TSHR | CTLA4 | FOXP3 | TG | CD40 | IL2RA | VDR | IL0 | VDR | ABCB1 | IFNG |
| **Weight** | 5 | 0 | 3 | 5 | 3 | 4 | 0 | 0 | 0 | 0 | 0 |
| claude2\_pro\_genes | TSHR | TO | FOXP3 | TG | CD40 | IL2RA | AF6 | L1B | ST4 | L17F | CGR3A |
| **Weight** | 5 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| palm\_2\_genes | TSHR | PTPN22 | PADI4 | TG | IFNG | AIRE | HLA | CTLN | XIAP | TYP | XIAP |
| **Weight** | 4 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| bard genes | TSHR | PTPN22 | FM4 | TG | CD0 | ACH2 | TAT25 | IL1 | AITD | C25 | TNF |
| **Weight** | 4 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| codellama\_34instruct\_genes | TSHR | CCR6 | RKCQ | TG | CD40 | IRF1 | H2B3 | ITA | ISG15 | CD80 | BACH2 |
| **Weight** | 4 | 2 |  | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| wizardlm\_70b\_genes | TSHR | PTPN22 | PAD | TG | AIRE | HLA | CTLN | XIAP | TYP | XIAP | AIRE |
| **Weight** | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| wizardlm\_13b\_genes | TSHR | OLFM4 | IL21 | TG | XYZ | AIRE | HLA | IL10 | H2B3 | ITA | ISG15 |
| **Weight** | 3 | 3 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| falcon\_180b\_chat\_genes | TSHR | PTPN22 | IL2 | TG | CD40 | AIRE | HLA | IL1 | XIAP | AIRE | XIAP |
| **Weight** | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| mistral\_7b\_instruct\_genes | TSHR | PTPN22 | PADI4 | TG | HLA | CTLN | XIAP | IL0 | STT4 | CTLN | XIAP |
| **Weight** | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| chatglm2\_6b\_genes | TSHR | PTPN22 | PAD | Ta | CD4 | BACH2 | CD25 | IL0 | FCRL3 | IKZF1 | IL-23R |
| **Weight** | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| vicuna\_7b\_genes | TSHR | CCR6 | RKCQ | TG | AIRE | HLA | CTLN | IL10 | TYP | XIAP | TYP |
| **Weight** | 3 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| vicuna\_33b\_genes | TSHR | PTPN22 | PAD | TG | CD40 | CD4 | BACH2 | IL0 | FCRL3 | IKZF1 | IL-23R |
| **Weight** | 2 | 3 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| vicuna\_13b\_genes | TSHR | PTPN22 | PADI4 | TG | HLA | CTLN | XIAP | IL10 | XIAP | AIRE | XIAP |
| **Weight** | 4 | 0 | 0 | 3 | 2 | 0 | 0 | 3 | 0 | 0 | 0 |
| llama\_2\_70b\_genes | TSHR | OLFM4 | IL21 | TG | CD40 | CTLN | XIAP | IL10 | TYP | XIAP | TP |
| **Weight** | 3 | 2 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| llama\_2\_13b\_genes | TSHR | PTPN22 | PADI4 | TG | HLA | CTLN | XIAP | IL10 | XIAP | AIRE | XIAP |
| **Weight** | 3 | 2 | 0 | 3 | 0 | 0 | 2 | 2 | 0 | 0 | 0 |
| llama\_2\_7b\_genes | TSHR | PTPN22 | PADI4 | TG | HLA | CTLN | CD40 | IL10 | XIAP | AIRE | XIAP |
| **Weight** | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| qwen\_14b\_genes | TSHR | PADI4 | ToG | CD0 | BACH2 | CD25 | IL10 | FL3 | IKZF1 | IL-23R | PADI4 |