

Supplementary materials:
Super-resolved spatial transcriptomics by
deep data fusion

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2020-03-12

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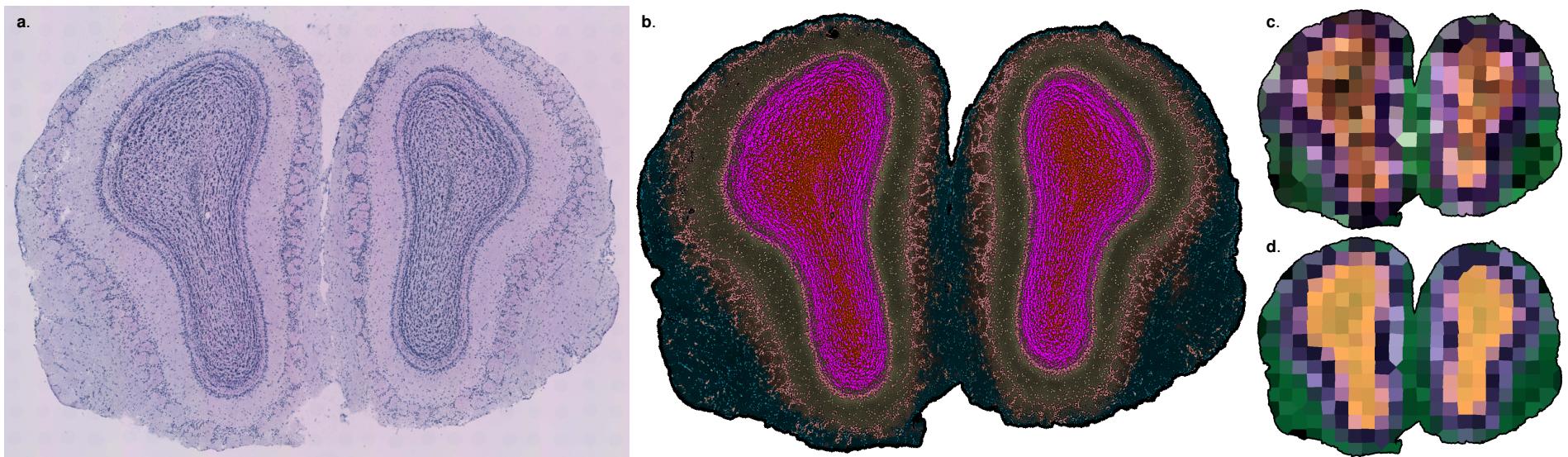


Figure S1: In silico spatial transcriptomics. (a) Histological image data of the held-out section. (b) Summarized expression map of the predicted metagene expression associated with (a). (c), (d) Comparison of summarized expression maps constructed from (c) normalized log ground truth gene expression in the held-out section and (d) normalized log predicted gene expression at the ground truth measurement locations using data from (b).

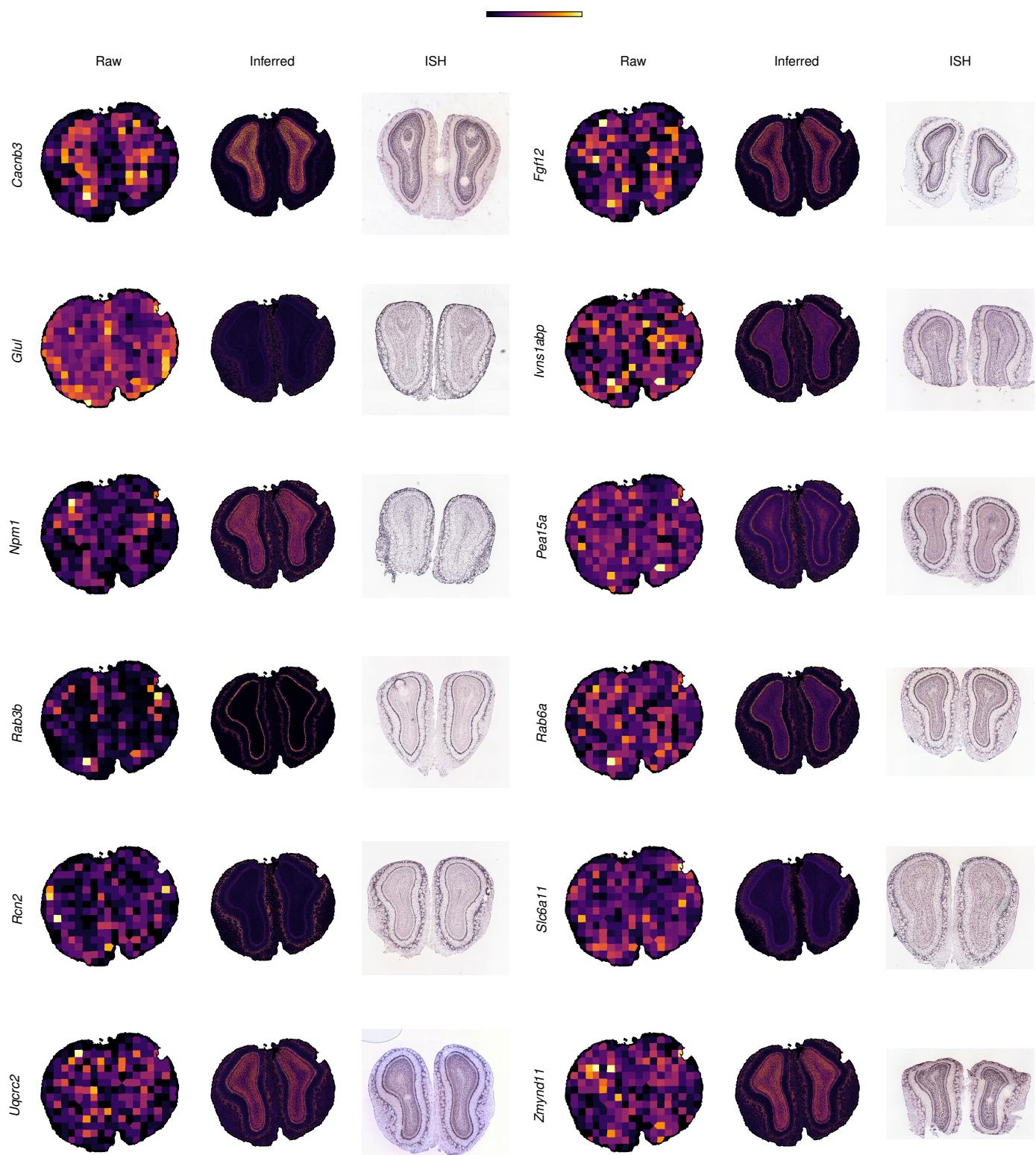


Figure S2: Comparison of inferred high-resolution expression maps to in situ hybridization reference data from the Allen Mouse Brain Atlas. Random samples from the 1000 most expressed genes. Raw: Raw expression data (Voronoi tessellation). Inferred: Inferred high-resolution expression maps. ISH: In situ hybridization reference data.

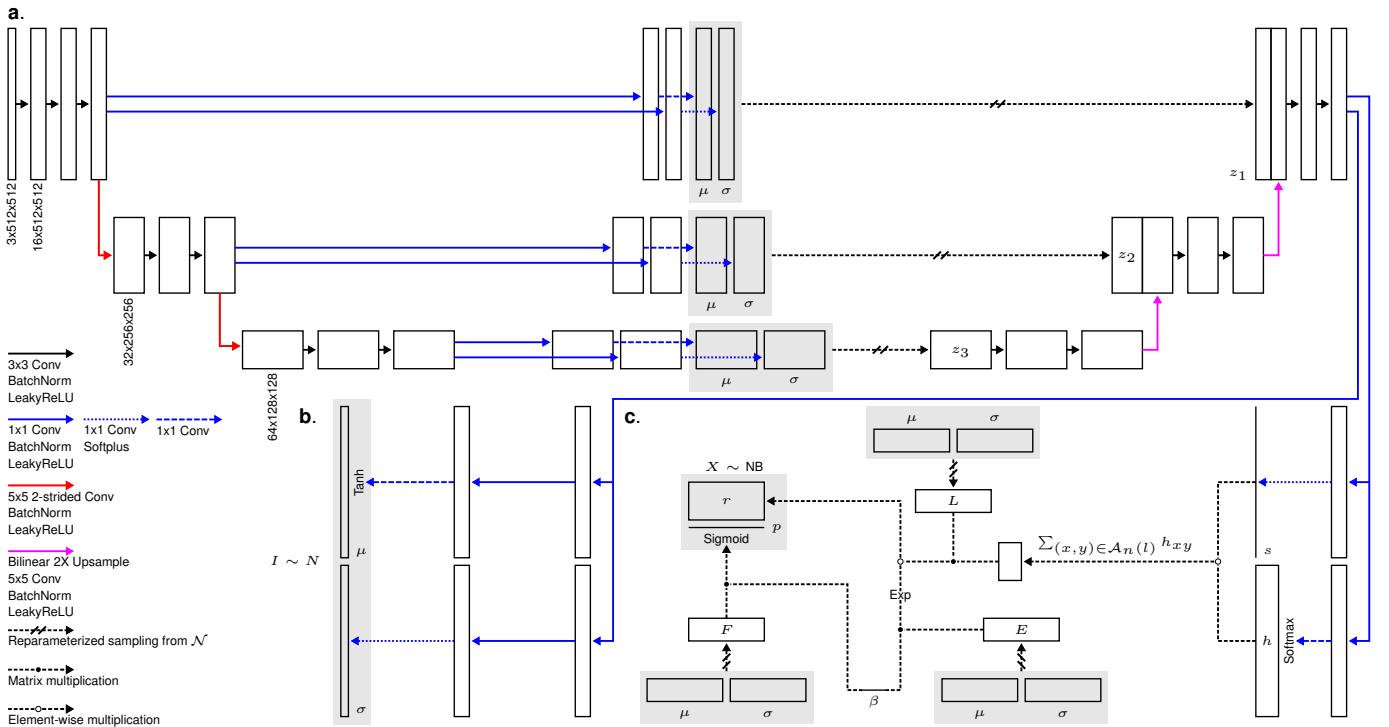


Figure S3: Architecture. **(a)** Fusion network. **(b)** Image data decoder. **(c)** Expression data decoder. Volume dimensions and number of down- and upsampling steps are exemplative.

Table S1: Upregulated pathways at DCIS tumor border

Biological process	Adjusted p-value	Intersecting genes
Extracellular Structure Organization	2.10×10^{-18}	<i>APOE, APOC1, SPARC, COL6A1, SFRP2, AEBP1, COL1A1, LUM, A2M, POSTN, ITGB2, BGN, COL1A2, FN1, COL3A1, COL6A2, TIMP1, MMP11, CTSS, EMILIN1, DCN, COMP, LRP1, COL6A3, HSPG2, FBN1</i>
Extracellular Matrix Organization	2.81×10^{-17}	<i>SPARC, COL6A1, SFRP2, AEBP1, COL1A1, LUM, A2M, POSTN, ITGB2, BGN, COL1A2, FN1, COL3A1, COL6A2, TIMP1, MMP11, CTSS, EMILIN1, DCN, COMP, LRP1, COL6A3, HSPG2, FBN1</i>
Immune System Process	1.37×10^{-11}	<i>APOE, CD74, C1QB, FTL, C1QA, LGALS1, C1QC, CRIP1, CYBA, SFRP2, CRIP2, COL1A1, MDK, A2M, GPNMB, PTMS, LYZ, MUC1, CTSD, VIM, ITGB2, C3, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, COL3A1, SERPING1, CORO1A, CTSS, LGMN, EMILIN1, FLNA, B2M, CD68, CD14, FCER1G, C1S, LRP1, RARRES2, ACTB, TAPBP, SPI1, PSMB8, FBN1</i>
Defense Response	2.15×10^{-11}	<i>APOE, CD74, C1QB, C1QA, C1QC, CYBA, MDK, A2M, LYZ, MUC1, VIM, ITGB2, C3, FN1, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, TIMP1, CTSS, LGMN, FLNA, B2M, CD68, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, HSPG2, LSP1, PSMB8, TG2</i>
Cell Activation	1.66×10^{-10}	<i>APOE, CD74, FTL, C1QA, LGALS1, CYBA, COL1A1, MDK, GPNMB, LYZ, CTSD, ITGB2, C3, COL1A2, CTSB, TYROBP, PSAP, PYCARD, COL3A1, CORO1A, TIMP1, CTSS, EMILIN1, FLNA, B2M, COMP, CD68, CD14, FCER1G, LRP1, ACTB, SPI1</i>
Regulation Of Immune System Process	1.93×10^{-10}	<i>APOE, CD74, C1QB, C1QA, LGALS1, C1QC, CYBA, COL1A1, MDK, A2M, GPNMB, MUC1, ITGB2, C3, COL1A2, CTSB, TYROBP, PYCARD, COL3A1, SERPING1, CORO1A, CTSS, LGMN, EMILIN1, B2M, CD68, CD14, FCER1G, C1S, RARRES2, ACTB, SPI1, PSMB8, FBN1</i>
Immune Response	3.76×10^{-10}	<i>APOE, CD74, C1QB, FTL, C1QA, LGALS1, C1QC, CRIP1, CYBA, COL1A1, MDK, A2M, LYZ, MUC1, CTSD, VIM, ITGB2, C3, COL1A2, CTSB, TYROBP, PSAP, PYCARD, FAU, COL3A1, SERPING1, CORO1A, CTSS, LGMN, B2M, CD68, CD14, FCER1G, C1S, LRP1, RARRES2, ACTB, TAPBP, PSMB8</i>
Regulated Exocytosis	6.07×10^{-10}	<i>FTL, SPARC, CYBA, A2M, LYZ, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, CD68, CD14, FCER1G, RARRES2</i>
Response To External Stimulus	5.88×10^{-9}	<i>APOE, CD74, C1QB, C1QA, SPARC, C1QC, CYBA, SFRP2, COL1A1, MDK, A2M, GPNMB, LYZ, POSTN, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SEMA3f, COL3A1, TYMP, SERPING1, CORO1A, CTSS, LGMN, FLNA, GFRA1, DCN, B2M, CD68, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, PSMB8, TG2</i>
Collagen Fibril Organization	9.42×10^{-9}	<i>SFRP2, AEBP1, COL1A1, LUM, COL1A2, COL3A1, MMP11, EMILIN1, COMP</i>
Immune Effector Process	9.99×10^{-9}	<i>CD74, C1QB, FTL, C1QA, LGALS1, C1QC, CYBA, MDK, A2M, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, SERPING1, CORO1A, CTSS, FLNA, B2M, CD68, CD14, FCER1G, C1S, LRP1, ACTB</i>
Exocytosis	1.07×10^{-8}	<i>FTL, SPARC, CYBA, A2M, LYZ, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, CD68, CD14, FCER1G, RARRES2</i>
Response To Stress	3.34×10^{-8}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, CYBA, SFRP2, COL1A1, MDK, A2M, LYZ, POSTN, MUC1, VIM, ITGB2, C3, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, COL3A1, SERPING1, CORO1A, TIMP1, CTSS, LGMN, FLNA, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, ACTB, ELOB, HSPG2, LSP1, PSMB8, TG2</i>
Secretion By Cell	3.35×10^{-8}	<i>APOE, FTL, SPARC, CYBA, MDK, A2M, LYZ, POSTN, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SELENOM, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, COMP, CD68, CD14, FCER1G, LRP1, RARRES2</i>
Secretion	5.14×10^{-8}	<i>APOE, CD74, FTL, SPARC, CYBA, MDK, A2M, LYZ, POSTN, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SELENOM, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, COMP, CD68, CD14, FCER1G, LRP1, RARRES2</i>
Export From Cell	6.96×10^{-8}	<i>APOE, FTL, SPARC, CYBA, MDK, A2M, LYZ, POSTN, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SELENOM, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, COMP, CD68, CD14, FCER1G, LRP1, RARRES2</i>
Innate Immune Response	8.42×10^{-8}	<i>APOE, C1QB, C1QA, C1QC, CYBA, A2M, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, CTSS, LGMN, B2M, CD14, FCER1G, C1S, RARRES2, PSMB8</i>

Biological process	Adjusted p-value	Intersecting genes
Defense Response To Other Organism	9.40×10^{-8}	<i>APOE, C1QB, C1QA, C1QC, CYBA, A2M, LYZ, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, CTSS, LGMN, FLNA, B2M, CD14, FCER1G, C1S, RARRES2, PSMB8</i>
Regulation Of Immune Response	1.23×10^{-7}	<i>APOE, CD74, C1QB, C1QA, C1QC, CYBA, COL1A1, A2M, MUC1, ITGB2, C3, COL1A2, CTSB, TYROBP, PYCARD, COL3A1, SERPING1, CTSS, LGMN, B2M, CD14, FCER1G, C1S, ACTB, PSMB8</i>
Response To Other Organism	1.53×10^{-7}	<i>APOE, C1QB, C1QA, SPARC, C1QC, CYBA, A2M, LYZ, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, CTSS, LGMN, FLNA, DCN, B2M, CD68, CD14, FCER1G, C1S, RARRES2, PSMB8</i>
Response To External Biotic Stimulus	1.58×10^{-7}	<i>APOE, C1QB, C1QA, SPARC, C1QC, CYBA, A2M, LYZ, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, CTSS, LGMN, FLNA, DCN, B2M, CD68, CD14, FCER1G, C1S, RARRES2, PSMB8</i>
Negative Regulation Of Multicellular Organismal Process	1.81×10^{-7}	<i>APOE, CD74, APOC1, LGALS1, SPARC, C1QC, CYBA, SFRP2, MDK, GPNMB, VIM, FN1, TYROBP, PYCARD, SEMA3F, COL3A1, SERPING1, TIMP1, LGMN, EMILIN1, DCN, B2M, SERPINF1, INPP5J, LRP1, HSPG2, FBN1</i>
Cellular Response To Chemical Stimulus	2.19×10^{-7}	<i>APOE, CD74, LGALS1, SPARC, CRIP1, COL6A1, LAPTm5, CYBA, CPNE7, SFRP2, COL1A1, MDK, POSTN, MUC1, VIM, ITGB2, COL1A2, FN1, CTSB, PSAP, PYCARD, COL3A1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, ELOB, VSTM2A, SPI1, PSMB8, FBN1</i>
Response To Biotic Stimulus	2.25×10^{-7}	<i>APOE, C1QB, C1QA, SPARC, C1QC, CYBA, A2M, LYZ, MUC1, VIM, ITGB2, C3, CTSB, TYROBP, PYCARD, FAU, SERPING1, CORO1A, CTSS, LGMN, FLNA, DCN, B2M, CD68, CD14, FCER1G, C1S, RARRES2, PSMB8</i>
Leukocyte Mediated Immunity	2.66×10^{-7}	<i>CD74, C1QB, FTL, C1QA, C1QC, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, SERPING1, CORO1A, CTSS, B2M, CD68, CD14, FCER1G, C1S</i>
Response To Organic Substance	2.78×10^{-7}	<i>APOE, CD74, LGALS1, SPARC, CRIP1, COL6A1, LAPTm5, CYBA, SFRP2, COL1A1, LUM, MDK, POSTN, MUC1, VIM, ITGB2, COL1A2, FN1, CTSB, PSAP, PYCARD, COL3A1, COL6A2, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, VSTM2A, SPI1, PSMB8, FBN1</i>
Positive Regulation Of Immune System Process	4.99×10^{-7}	<i>CD74, C1QB, C1QA, LGALS1, C1QC, CYBA, MDK, A2M, MUC1, ITGB2, C3, CTSB, TYROBP, PYCARD, SERPING1, CORO1A, CTSS, LGMN, B2M, CD14, FCER1G, C1S, RARRES2, ACTB, PSMB8</i>
Animal Organ Development	7.01×10^{-7}	<i>CD74, C1QB, LGALS1, SPARC, C1QC, CRIP1, COL6A1, SFRP2, CRIP2, COL1A1, LUM, MDK, GPNMB, VIM, SLC02B1, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TIMP1, EMILIN1, FLNA, DCN, B2M, COMP, SERPINF1, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Cellular Response To Organic Substance	8.83×10^{-7}	<i>CD74, LGALS1, SPARC, COL6A1, LAPTm5, CYBA, SFRP2, COL1A1, POSTN, MUC1, VIM, ITGB2, COL1A2, FN1, CTSB, PSAP, PYCARD, COL3A1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, VSTM2A, SPI1, PSMB8, FBN1</i>
System Development	9.09×10^{-7}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, SFRP2, CRIP2, COL1A1, LUM, MDK, GPNMB, POSTN, VIM, SLC02B1, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, TIMP1, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Cellular Component Organization	9.97×10^{-7}	<i>APOE, CD74, APOC1, C1QB, C1QA, CAPG, LGALS1, SPARC, C1QC, COL6A1, CYBA, SFRP2, AEBP1, COL1A1, LUM, MDK, A2M, REPS2, POSTN, MUC1, VIM, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, TYROBP, PSAP, PYCARD, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, TIMP1, MMP11, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD14, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, ACTB, TAPBP, ELOB, COL6A3, HSPG2, SPI1, SPARCL1, TGM2, FBN1</i>
Platelet Degranulation	1.13×10^{-6}	<i>SPARC, A2M, ISLR, FN1, PSAP, SERPING1, TIMP1, FLNA, FCER1G, RARRES2</i>
Response To Chemical	1.31×10^{-6}	<i>APOE, CD74, C1QA, LGALS1, SPARC, CRIP1, COL6A1, LAPTm5, CYBA, CPNE7, SFRP2, COL1A1, LUM, MDK, GPNMB, POSTN, MUC1, VIM, ITGB2, COL1A2, FN1, CTSB, PSAP, PYCARD, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, ELOB, VSTM2A, SPI1, PSMB8, FBN1</i>
Response To Wounding	1.46×10^{-6}	<i>APOE, LGALS1, SPARC, COL1A1, MDK, A2M, POSTN, COL1A2, FN1, TYROBP, COL3A1, SERPING1, TIMP1, FLNA, DCN, COMP, FCER1G, LRP1, ACTB</i>

Biological process	Adjusted p-value	Intersecting genes
Regulation Of Developmental Process	2.02×10^{-6}	<i>APOE, CD74, LGALS1, SPARC, C1QC, SFRP2, COL1A1, MDK, GPNMB, POSTN, VIM, ITGB2, C3, CTHRC1, FN1, TYROBP, SEMA3F, COL3A1, TYMP, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, SERPINF1, INPP5J, LRP1, RARRES2, VSTM2A, HSPG2, SPI1, PSMB8, FBN1</i>
Cell Activation Involved In Immune Response	2.04×10^{-6}	<i>FTL, LGALS1, CYBA, MDK, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CORO1A, CTSS, B2M, CD68, FCER1G, LRP1</i>
Cellular Component Organization Or Biogenesis	3.50×10^{-6}	<i>APOE, CD74, APOC1, C1QB, C1QA, CAPG, LGALS1, SPARC, C1QC, COL6A1, CYBA, SFRP2, AEBP1, COL1A1, LUM, MDK, A2M, REPS2, POSTN, MUC1, VIM, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, TYROBP, PSAP, PYCARD, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, TIMP1, MMP11, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD14, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, TAPBP, ELOB, COL6A3, HSPG2, SPI1, SPARCL1, TGM2, FBN1</i>
Developmental Process	3.73×10^{-6}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, SFRP2, CRIP2, COL1A1, LUM, MDK, A2M, GPNMB, POSTN, VIM, SLC2B1, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, SERPING1, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD68, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, VSTM2A, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Myeloid Leukocyte Activation	4.14×10^{-6}	<i>CD74, FTL, C1QA, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G, SPI1</i>
Inflammatory Response	7.65×10^{-6}	<i>APOE, C1QA, CYBA, MDK, LYZ, ITGB2, C3, FN1, TYROBP, PYCARD, TIMP1, CD68, CD14, SERPINF1, FCER1G, LRP1, RARRES2, HSPG2, TGM2</i>
Regulation Of Multicellular Organismal Process	8.05×10^{-6}	<i>APOE, CD74, APOC1, LGALS1, SPARC, C1QC, CYBA, SFRP2, COL1A1, LUM, MDK, GPNMB, POSTN, VIM, ITGB2, C3, CTHRC1, FN1, TYROBP, PYCARD, SEMA3F, COL3A1, TYMP, SERPING1, TIMP1, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD14, SERPINF1, INPP5J, FCER1G, LRP1, HSPG2, SPI1, PSMB8, FBN1</i>
Blood Vessel Development	8.51×10^{-6}	<i>APOE, SPARC, SFRP2, COL1A1, MDK, GPNMB, ITGB2, C3, COL1A2, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1</i>
Regulation Of Cell Migration	8.98×10^{-6}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, LRP1, RARRES2</i>
Negative Regulation Of Developmental Process	9.20×10^{-6}	<i>APOE, CD74, LGALS1, SPARC, C1QC, SFRP2, MDK, POSTN, VIM, SEMA3F, COL3A1, TIMP1, MMP11, LGMN, EMILIN1, DCN, B2M, SERPINF1, INPP5J, LRP1, HSPG2, FBN1</i>
Leukocyte Degranulation	1.06×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CORO1A, CTSS, B2M, CD68, CD14, FCER1G</i>
Leukocyte Activation Involved In Immune Response	1.29×10^{-5}	<i>FTL, LGALS1, CYBA, MDK, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CORO1A, CTSS, B2M, CD68, CD14, FCER1G</i>
Response To Endogenous Stimulus	1.29×10^{-5}	<i>APOE, SPARC, COL6A1, CYBA, SFRP2, COL1A1, MDK, POSTN, VIM, ITGB2, COL1A2, CTSB, COL3A1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, COMP, CD68, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, VSTM2A, FBN1</i>
Multicellular Organism Development	1.61×10^{-5}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, SFRP2, CRIP2, COL1A1, LUM, MDK, GPNMB, POSTN, VIM, SLC2B1, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, TIMP1, MMP11, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Positive Regulation Of Immune Response	1.63×10^{-5}	<i>CD74, C1QB, C1QA, C1QC, CYBA, A2M, MUC1, ITGB2, C3, CTSB, PYCARD, SERPING1, CTSS, LGMN, B2M, CD14, FCER1G, C1S, ACTB, PSMB8</i>
Vasculature Development	1.75×10^{-5}	<i>APOE, SPARC, SFRP2, COL1A1, MDK, GPNMB, ITGB2, C3, COL1A2, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1</i>
Cell Adhesion	1.96×10^{-5}	<i>CD74, LGALS1, COL6A1, SFRP2, COL1A1, MDK, GPNMB, POSTN, MUC1, ITGB2, ISLR, FN1, PYCARD, COL3A1, COL6A2, CORO1A, EMILIN1, FLNA, COMP, LRP1, ACTB, COL6A3, SPARCL1, TGM2, FBN1</i>
Vesicle-Mediated Transport	2.05×10^{-5}	<i>APOE, APOC1, FTL, SPARC, CYBA, A2M, LYZ, CTSD, ITGB2, ISLR, C3, FN1, CTSB, TYROBP, PSAP, PYCARD, SERPING1, CORO1A, TIMP1, CTSS, FLNA, B2M, CD68, CD14, FCER1G, LRP1, RARRES2, ACTB, TAPBP, HSPG2, TGM2</i>
Activation Of Immune Response	2.08×10^{-5}	<i>C1QB, C1QA, C1QC, CYBA, A2M, MUC1, ITGB2, C3, CTSB, PYCARD, SERPING1, CTSS, LGMN, CD14, FCER1G, C1S, ACTB, PSMB8</i>
Cardiovascular System Development	2.10×10^{-5}	<i>APOE, SPARC, SFRP2, COL1A1, MDK, GPNMB, ITGB2, C3, COL1A2, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1</i>

Biological process	Adjusted p-value	Intersecting genes
Connective Tissue Development	2.11×10^{-5}	<i>CRIP1, COL6A1, SFRP2, COL1A1, LUM, MDK, BGN, SELENOM, COL6A2, TIMP1, COMP, COL6A3</i>
Biological Adhesion	2.16×10^{-5}	<i>CD74, LGALS1, COL6A1, SFRP2, COL1A1, MDK, GPNMB, POSTN, MUC1, ITGB2, ISLR, FN1, PYCARD, COL3A1, COL6A2, CORO1A, EMILIN1, FLNA, COMP, LRP1, ACTB, COL6A3, SPARCL1, TGM2, FBN1</i>
Neutrophil Degranulation	2.33×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Neutrophil Activation Involved In Immune Response	2.53×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Regulation Of Cell Motility	2.70×10^{-5}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, LRP1, RARRES2</i>
Regulation Of Multicellular Organismal Development	2.98×10^{-5}	<i>APOE, CD74, LGALS1, SPARC, C1QC, SFRP2, COL1A1, MDK, GPNMB, VIM, ITGB2, C3, CTHRC1, FN1, TYROBP, SEMA3F, COL3A1, TYMP, TIMP1, EMILIN1, FLNA, DCN, B2M, COMP, SERPINF1, INPP5J, LRP1, HSPG2, SPI1, PSMB8, FBN1</i>
Antigen Processing And Presentation	3.03×10^{-5}	<i>CD74, CYBA, CTSD, PYCARD, CTSS, LGMN, B2M, CD68, FCER1G, TAPBP, PSMB8</i>
Wound Healing	3.33×10^{-5}	<i>APOE, SPARC, COL1A1, MDK, A2M, POSTN, COL1A2, FN1, COL3A1, SERPING1, TIMP1, FLNA, DCN, COMP, FCER1G, ACTB</i>
Neutrophil Activation	3.40×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Neutrophil Mediated Immunity	3.40×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Granulocyte Activation	3.99×10^{-5}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Multi-Organism Process	4.21×10^{-5}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CYBA, MDK, A2M, LYZ, MUC1, VIM, ITGB2, C3, FN1, CTSB, TYROBP, PYCARD, FAU, RPLP1, SERPING1, CORO1A, TIMP1, CTSS, LGMN, FLNA, DCN, B2M, CD68, CD14, FCER1G, C1S, RPL10, RARRES2, RPL13, PSMB8</i>
Supramolecular Fiber Organization	4.42×10^{-5}	<i>APOE, CAPG, SFRP2, AEBP1, COL1A1, LUM, VIM, COL1A2, PYCARD, COL3A1, CORO1A, MMP11, EMILIN1, FLNA, B2M, COMP, INPP5J</i>
Positive Regulation Of Response To Stimulus	5.98×10^{-5}	<i>APOE, CD74, C1QB, C1QA, LGALS1, C1QC, CYBA, SFRP2, COL1A1, MDK, A2M, GPNMB, MUC1, ITGB2, C3, CTSB, PSAP, PYCARD, COL3A1, SERPING1, CTSS, LGMN, FLNA, DCN, B2M, CD14, FCER1G, C1S, LRP1, RARRES2, ACTB, PSMB8, TGM2</i>
Antigen Processing And Presentation Of Peptide Antigen	6.05×10^{-5}	<i>CD74, CYBA, CTSD, PYCARD, CTSS, LGMN, B2M, FCER1G, TAPBP, PSMB8</i>
Blood Vessel Morphogenesis	6.37×10^{-5}	<i>APOE, SPARC, SFRP2, MDK, GPNMB, ITGB2, C3, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1</i>
Skeletal System Development	6.67×10^{-5}	<i>SPARC, COL6A1, SFRP2, COL1A1, LUM, MDK, BGN, COL1A2, TYROBP, COL3A1, COL6A2, TIMP1, COMP, COL6A3, FBN1</i>
Regulation Of Locomotion	8.66×10^{-5}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, LRP1, RARRES2</i>
Cell Surface Receptor Signaling Pathway	8.99×10^{-5}	<i>APOE, CD74, CYBA, SFRP2, COL1A1, MDK, REPS2, POSTN, MUC1, VIM, ITGB2, LY6E, C3, CTHRC1, COL1A2, FN1, TYROBP, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD14, FCER1G, LRP1, RARRES2, ACTB, SPI1, PSMB8, FBN1</i>
Myeloid Cell Activation Involved In Immune Response	1.01×10^{-4}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Response To Stimulus	1.13×10^{-4}	<i>APOE, CD74, C1QB, FTL, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, LAPTM5, CYBA, CPNE7, SFRP2, COL1A1, LUM, MDK, A2M, REPS2, GPNMB, LYZ, POSTN, MUC1, CTSD, VIM, ITGB2, LY6E, C3, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, SERPING1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD68, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, ACTB, TAPBP, ELOB, VSTM2A, HSPG2, SPI1, SPARCL1, LSP1, PSMB8, TGM2, FBN1</i>
Regulation Of Cellular Component Movement	1.13×10^{-4}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, LRP1, RARRES2</i>

Biological process	Adjusted p-value	Intersecting genes
Myeloid Leukocyte Mediated Immunity	1.20×10^{-4}	<i>FTL, CYBA, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CTSS, B2M, CD68, CD14, FCER1G</i>
Anatomical Structure Development	1.26×10^{-4}	<i>APOE, CD74, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, SFRP2, CRIP2, COL1A1, LUM, MDK, GPNMB, POSTN, VIM, SLCO2B1, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, TIMP1, MMP11, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Regulation Of Response To External Stimulus	1.42×10^{-4}	<i>APOE, CD74, CYBA, MDK, A2M, MUC1, ITGB2, C3, CTSB, PYCARD, SEMA3F, SERPING1, CTSS, LGMN, CD14, SERPINF1, FCER1G, LRP1, RARRES2, PSMB8, TGM2</i>
Positive Regulation Of Response To External Stimulus	1.44×10^{-4}	<i>CD74, CYBA, MDK, MUC1, ITGB2, C3, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, LRP1, RARRES2, PSMB8, TGM2</i>
Anatomical Structure Morphogenesis	1.69×10^{-4}	<i>APOE, SPARC, CRIP1, COL6A1, SFRP2, COL1A1, MDK, GPNMB, POSTN, ITGB2, C3, CTHRC1, COL1A2, FN1, TYROBP, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, EMILIN1, FLNA, GFRA1, DCN, COMP, SERPINF1, LRP1, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Cartilage Development	1.78×10^{-4}	<i>COL6A1, SFRP2, COL1A1, LUM, MDK, BGN, COL6A2, TIMP1, COMP, COL6A3</i>
Collagen Metabolic Process	1.85×10^{-4}	<i>COL1A1, CTSD, VIM, COL1A2, CTSB, MMP11, CTSS, EMILIN1</i>
Tube Morphogenesis	1.87×10^{-4}	<i>APOE, SPARC, SFRP2, MDK, GPNMB, ITGB2, C3, CTHRC1, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1, TGM2</i>
Cell Migration	1.97×10^{-4}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, ITGB2, CTHRC1, COL1A2, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, FCER1G, LRP1, RARRES2</i>
Locomotion	2.31×10^{-4}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, ITGB2, CTHRC1, COL1A2, FN1, PYCARD, SEMA3F, COL3A1, TYMP, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, GFRA1, DCN, SERPINF1, FCER1G, LRP1, RARRES2, ACTB</i>
Bone Development	2.41×10^{-4}	<i>SPARC, COL6A1, SFRP2, COL1A1, BGN, TYROBP, COL6A2, COMP, COL6A3, FBN1</i>
Regulation Of Response To Stimulus	2.68×10^{-4}	<i>APOE, CD74, C1QB, C1QA, LGALS1, C1QC, CYBA, SFRP2, COL1A1, MDK, A2M, GPNMB, POSTN, MUC1, ITGB2, LY6E, C3, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, RPLP1, SEMA3F, COL3A1, SERPING1, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, DCN, B2M, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, ACTB, PSMB8, TGM2, FBN1</i>
Negative Regulation Of Biological Process	2.76×10^{-4}	<i>APOE, CD74, APOC1, CAPG, LGALS1, SPARC, C1QC, CYBA, SFRP2, AEBP1, COL1A1, MDK, A2M, GPNMB, POSTN, MUC1, VIM, ITGB2, C3, CTHRC1, FN1, TYROBP, PSAP, PYCARD, FAU, RPLP1, SEMA3F, COL3A1, SERPING1, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD68, CD14, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RPL13, COL6A3, HSPG2, SPI1, PSMB8, FBN1</i>
Cell Motility	2.92×10^{-4}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, ITGB2, CTHRC1, COL1A2, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, FCER1G, LRP1, RARRES2, ACTB</i>
Localization Of Cell	2.92×10^{-4}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, ITGB2, CTHRC1, COL1A2, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, DCN, SERPINF1, FCER1G, LRP1, RARRES2, ACTB</i>
Multicellular Organismal Process	3.13×10^{-4}	<i>APOE, CD74, APOC1, C1QB, C1QA, LGALS1, SPARC, C1QC, CRIP1, COL6A1, CYBA, SFRP2, CRIP2, COL1A1, LUM, MDK, A2M, GPNMB, LYZ, POSTN, VIM, SLCO2B1, ITGB2, C3, BGN, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, SELENOM, SEMA3F, COL3A1, COL6A2, TYMP, SERPING1, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, GFRA1, DCN, B2M, COMP, CD14, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, RARRES2, ACTB, COL6A3, HSPG2, SPI1, PSMB8, TGM2, FBN1</i>
Antigen Processing And Presentation Of Exogenous Peptide Antigen	3.26×10^{-4}	<i>CD74, CYBA, CTSD, CTSS, LGMN, B2M, FCER1G, TAPBP, PSMB8</i>
Circulatory System Development	3.38×10^{-4}	<i>APOE, SPARC, CRIP1, SFRP2, COL1A1, MDK, GPNMB, ITGB2, C3, COL1A2, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, HSPG2, SPI1, FBN1</i>
Synapse Pruning	3.53×10^{-4}	<i>C1QB, C1QA, C1QC, C3</i>

Biological process	Adjusted p-value	Intersecting genes
Leukocyte Activation	3.58×10^{-4}	<i>CD74, FTL, C1QA, LGALS1, CYBA, MDK, GPNMB, LYZ, CTSD, ITGB2, C3, CTSB, TYROBP, PSAP, PYCARD, CORO1A, CTSS, B2M, CD68, CD14, FCER1G, SPI1</i>
Regulation Of Cell Adhesion	4.50×10^{-4}	<i>CD74, LGALS1, SFRP2, COL1A1, MDK, GPNMB, POSTN, MUC1, ITGB2, FN1, PYCARD, CORO1A, EMILIN1, FLNA, LRP1, TGM2</i>
Antigen Processing And Presentation Of Exogenous Antigen	4.58×10^{-4}	<i>CD74, CYBA, CTSD, CTSS, LGMN, B2M, FCER1G, TAPBP, PSMB8</i>
Regulation Of Innate Immune Response	5.34×10^{-4}	<i>APOE, CYBA, A2M, MUC1, ITGB2, CTSB, PYCARD, SERPING1, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Regulation Of Defense Response	5.72×10^{-4}	<i>APOE, CYBA, MDK, A2M, MUC1, ITGB2, C3, CTSB, PYCARD, SERPING1, CTSS, LGMN, CD14, SERPINF1, FCER1G, PSMB8, TGM2</i>
Protein Metabolic Process	5.95×10^{-4}	<i>APOE, CD74, APOC1, LGALS1, SFRP2, AEBP1, A2M, GPNMB, LYZ, MUC1, CTSD, VIM, ITGB2, C3, BGN, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, RPLP1, COL3A1, SERPING1, TIMP1, MMP11, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, CPB1, B2M, COMP, GALNT6, SERPINF1, INPP5J, C1S, RPL10, LRP1, RARRES2, ACTB, RPL13, ELOB, COL6A3, HSPG2, SPI1, SPARCL1, PSMB8, TGM2, FBN1</i>
Tissue Development	6.30×10^{-4}	<i>CRIP1, COL6A1, SFRP2, COL1A1, LUM, MDK, GPNMB, POSTN, VIM, ITGB2, BGN, CTHRC1, COL1A2, FN1, CTSB, PSAP, SELENOM, SEMA3F, COL3A1, COL6A2, TIMP1, FLNA, DCN, COMP, COL6A3, HSPG2, PSMB8, TGM2</i>
Regulation Of Peptidase Activity	6.37×10^{-4}	<i>SFRP2, A2M, CTSD, C3, FN1, PYCARD, SERPING1, TIMP1, LGMN, SERPINF1, LRP1, COL6A3, PSMB8</i>
Tube Development	7.33×10^{-4}	<i>APOE, SPARC, SFRP2, MDK, GPNMB, ITGB2, C3, CTHRC1, FN1, COL3A1, TYMP, EMILIN1, DCN, COMP, SERPINF1, LRP1, RARRES2, HSPG2, SPI1, TGM2</i>
Positive Regulation Of Cell Migration	7.72×10^{-4}	<i>CD74, SPARC, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, CORO1A, LGMN, FLNA, LRP1, RARRES2</i>
Response To Oxygen-Containing Compound	8.07×10^{-4}	<i>APOE, LGALS1, SPARC, COL6A1, CYBA, COL1A1, POSTN, VIM, COL1A2, PSAP, PYCARD, COL3A1, COL6A2, TIMP1, LGMN, FLNA, DCN, CD68, CD14, SERPINF1, LRP1, RARRES2, ACTB, SPI1, FBN1</i>
Negative Regulation Of Cellular Process	1.04×10^{-3}	<i>APOE, CD74, APOC1, CAPG, LGALS1, SPARC, C1QC, CYBA, SFRP2, AEBP1, COL1A1, MDK, A2M, GPNMB, POSTN, MUC1, VIM, ITGB2, C3, CTHRC1, FN1, TYROBP, PSAP, PYCARD, SEMA3F, COL3A1, SERPING1, CORO1A, TIMP1, MMP11, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD14, SERPINF1, INPP5J, FCER1G, RPL10, LRP1, COL6A3, SPI1, PSMB8, FBN1</i>
Positive Regulation Of Cell Motility	1.24×10^{-3}	<i>CD74, SPARC, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, CORO1A, LGMN, FLNA, LRP1, RARRES2</i>
Negative Regulation Of Immune System Process	1.28×10^{-3}	<i>CD74, C1QC, MDK, A2M, GPNMB, TYROBP, COL3A1, SERPING1, EMILIN1, CD68, CD14, FCER1G, FBN1</i>
Regulation Of Anatomical Structure Morphogenesis	1.33×10^{-3}	<i>APOE, SPARC, SFRP2, MDK, GPNMB, POSTN, ITGB2, C3, CTHRC1, FN1, TYROBP, SEMA3F, CORO1A, EMILIN1, FLNA, DCN, SERPINF1, LRP1, HSPG2, PSMB8</i>
Localization	1.42×10^{-3}	<i>APOE, CD74, APOC1, FTL, SPARC, CYBA, SFRP2, COL1A1, MDK, A2M, GPNMB, LYZ, POSTN, CTSD, SLCO2B1, ITGB2, ISLR, C3, CTHRC1, COL1A2, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, RPLP1, SELENOM, SEMA3F, COL3A1, SERPING1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, SLC39A6, COMP, CD68, CD14, SERPINF1, FCER1G, RPL10, LRP1, RARRES2, ACTB, TAPBP, RPL13, VSTM2A, HSPG2, PSMB8, TGM2, FBN1</i>
Peptide Cross-Linking	1.48×10^{-3}	<i>BGN, FN1, COL3A1, DCN, TGM2</i>
Cellular Developmental Process	1.65×10^{-3}	<i>APOE, CD74, C1QA, LGALS1, SPARC, C1QC, COL6A1, SFRP2, COL1A1, MDK, A2M, GPNMB, POSTN, VIM, ITGB2, C3, CTHRC1, FN1, CTSB, TYROBP, PSAP, SEMA3F, COL3A1, COL6A2, TYMP, CORO1A, MMP11, FLNA, GFRA1, B2M, COMP, SERPINF1, INPP5J, FCER1G, LRP1, RARRES2, ACTB, COL6A3, VSTM2A, HSPG2, SPI1, PSMB8, FBN1</i>
Regulation Of Localization	1.74×10^{-3}	<i>APOE, CD74, APOC1, SPARC, CYBA, SFRP2, COL1A1, MDK, GPNMB, POSTN, CTSD, ITGB2, C3, FN1, TYROBP, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, CD14, SERPINF1, FCER1G, LRP1, RARRES2, ACTB, VSTM2A</i>
Positive Regulation Of Cellular Component Movement	1.80×10^{-3}	<i>CD74, SPARC, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, CORO1A, LGMN, FLNA, LRP1, RARRES2</i>
Regulation Of Multi-Organism Process	1.82×10^{-3}	<i>APOE, CD74, LGALS1, CYBA, A2M, MUC1, ITGB2, CTSB, PYCARD, SERPING1, TIMP1, CTSS, LGMN, CD14, FCER1G, PSMB8</i>

Biological process	Adjusted p-value	Intersecting genes
Platelet Activation	1.84×10^{-3}	<i>APOE, COL1A1, COL1A2, COL3A1, FLNA, COMP, FCER1G, ACTB</i>
Positive Regulation Of Locomotion	2.20×10^{-3}	<i>CD74, SPARC, COL1A1, MDK, GPNMB, POSTN, FN1, PYCARD, SEMA3F, CORO1A, LGMN, FLNA, LRP1, RARRES2</i>
Cell-Substrate Adhesion	2.24×10^{-3}	<i>LGALS1, COL1A1, MDK, POSTN, ITGB2, FN1, COL3A1, CORO1A, EMILIN1, FLNA, LRP1</i>
Regulation Of Complement Activation	2.26×10^{-3}	<i>C1QB, C1QA, C1QC, A2M, C3, SERPING1, C1S</i>
Positive Regulation Of Defense Response	2.30×10^{-3}	<i>CYBA, MDK, MUC1, ITGB2, C3, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, PSMB8, TGM2</i>
Movement Of Cell Or Subcellular Component	2.42×10^{-3}	<i>APOE, CD74, SPARC, SFRP2, COL1A1, MDK, GPNMB, POSTN, VIM, ITGB2, CTHRC1, COL1A2, FN1, PYCARD, SEMA3F, COL3A1, CORO1A, TIMP1, LGMN, EMILIN1, FLNA, GFRA1, DCN, SERPINF1, FCER1G, LRP1, RARRES2, ACTB</i>
Response To Cytokine	2.46×10^{-3}	<i>CD74, SPARC, LAPTM5, CYBA, COL1A1, POSTN, MUC1, VIM, ITGB2, COL1A2, FN1, PYCARD, COL3A1, CORO1A, TIMP1, B2M, CD14, FCER1G, SPI1, PSMB8</i>
Regulation Of Response To Biotic Stimulus	2.79×10^{-3}	<i>APOE, CYBA, A2M, MUC1, ITGB2, CTSB, PYCARD, SERPING1, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Regulation Of Immune Effector Process	3.63×10^{-3}	<i>CD74, C1QB, C1QA, C1QC, A2M, ITGB2, C3, PYCARD, SERPING1, B2M, FCER1G, C1S</i>
Positive Regulation Of Multi-Organism Process	3.83×10^{-3}	<i>APOE, CD74, LGALS1, CYBA, MUC1, ITGB2, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Cell Differentiation	4.21×10^{-3}	<i>APOE, CD74, C1QA, LGALS1, C1QC, COL6A1, SFRP2, COL1A1, MDK, A2M, GPNMB, POSTN, VIM, ITGB2, C3, CTHRC1, FN1, CTSB, TYROBP, PSAP, SEMA3F, COL3A1, COL6A2, TYMP, MMP11, FLNA, GFRA1, B2M, COMP, SERPINF1, INPP5J, FCER1G, LRP1, RARRES2, ACTB, COL6A3, VSTM2A, HSPG2, SPI1, PSMB8, FBN1</i>
Phagocytosis	4.26×10^{-3}	<i>CYBA, ITGB2, C3, TYROBP, PYCARD, CORO1A, CD14, FCER1G, LRP1, ACTB, TGM2</i>
Regulation Of Cell Death	4.70×10^{-3}	<i>APOE, CD74, C1QA, LGALS1, SFRP2, MDK, GPNMB, MUC1, CTSD, ITGB2, CTSB, TYROBP, PSAP, PYCARD, CORO1A, TIMP1, LGMN, FLNA, COMP, SERPINF1, FCER1G, RPL10, LRP1, TGM2</i>
Organonitrogen Compound Metabolic Process	4.86×10^{-3}	<i>APOE, CD74, APOC1, LGALS1, SFRP2, AEFP1, LUM, A2M, GPNMB, LYZ, MUC1, CTSD, VIM, ITGB2, C3, BGN, FN1, CTSB, TYROBP, PSAP, PYCARD, FAU, RPLP1, COL3A1, TYMP, SERPING1, TIMP1, MMP11, CTSS, LGMN, EMILIN1, FLNA, GFRA1, DCN, CPB1, B2M, COMP, GALNT6, SERPINF1, INPP5J, C1S, RPL10, LRP1, RARRES2, ACTB, TAPBP, RPL13, ELOB, COL6A3, HSPG2, SPI1, SPARCL1, PSMB8, TGM2, FBN1</i>
Regulation Of Cell Differentiation	5.32×10^{-3}	<i>APOE, CD74, LGALS1, C1QC, SFRP2, COL1A1, MDK, POSTN, VIM, CTHRC1, FN1, TYROBP, SEMA3F, COL3A1, MMP11, FLNA, B2M, SERPINF1, INPP5J, LRP1, RARRES2, VSTM2A, SPI1, PSMB8, FBN1</i>
Positive Regulation Of Biological Process	5.35×10^{-3}	<i>APOE, CD74, APOC1, C1QB, C1QA, LGALS1, SPARC, C1QC, CYBA, SFRP2, CRIP2, COL1A1, LUM, MDK, A2M, GPNMB, POSTN, MUC1, CTSD, VIM, ITGB2, C3, CTHRC1, FN1, CTSB, TYROBP, PSAP, PYCARD, RPLP1, SEMA3F, COL3A1, SERPING1, CORO1A, TIMP1, CTSS, LGMN, EMILIN1, FLNA, DCN, B2M, COMP, CD14, SERPINF1, FCER1G, C1S, LRP1, RARRES2, ACTB, VSTM2A, SPI1, PSMB8, TGM2</i>
Chondrocyte Development	5.98×10^{-3}	<i>COL6A1, SFRP2, COL6A2, COMP, COL6A3</i>
Positive Regulation Of Cytokine Production	6.10×10^{-3}	<i>CD74, CYBA, LUM, MDK, POSTN, C3, TYROBP, PYCARD, B2M, CD14, FCER1G, LRP1</i>
Response To Organonitrogen Compound	6.49×10^{-3}	<i>APOE, SPARC, COL6A1, CYBA, COL1A1, VIM, ITGB2, COL1A2, COL3A1, TIMP1, LGMN, FLNA, CD68, FCER1G, LRP1, RARRES2, ACTB, FBN1</i>
Regulation Of Humoral Immune Response	6.59×10^{-3}	<i>C1QB, C1QA, C1QC, A2M, C3, SERPING1, C1S</i>
Cartilage Development Involved In Endochondral Bone Morphogenesis	6.67×10^{-3}	<i>COL6A1, COL1A1, COL6A2, COMP, COL6A3</i>
Receptor-Mediated Endocytosis	7.13×10^{-3}	<i>APOE, APOC1, SPARC, ITGB2, C3, B2M, CD14, FCER1G, LRP1, HSPG2</i>
Negative Regulation Of Cell Differentiation	7.40×10^{-3}	<i>APOE, CD74, LGALS1, C1QC, SFRP2, MDK, POSTN, VIM, SEMA3F, COL3A1, MMP11, B2M, INPP5J, LRP1, FBN1</i>
Regulation Of Response To Stress	7.65×10^{-3}	<i>APOE, CD74, CYBA, SFRP2, MDK, A2M, MUC1, ITGB2, C3, CTSB, PSAP, PYCARD, SERPING1, CTSS, LGMN, B2M, CD14, SERPINF1, FCER1G, LRP1, PSMB8, TGM2</i>

Biological process	Adjusted p-value	Intersecting genes
Activation Of Innate Immune Response	7.75×10^{-3}	CYBA, MUC1, ITGB2, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, PSMB8
Regulation Of Neuron Death	8.19×10^{-3}	APOE, C1QA, MDK, GPNMB, ITGB2, TYROBP, CORO1A, LGMN, SERPINF1, LRP1
Aging	8.42×10^{-3}	C1QA, ITGB2, SERPING1, TIMP1, DCN, B2M, COMP, CD68, SERPINF1, LRP1
Positive Regulation Of Cell Adhesion	8.50×10^{-3}	CD74, LGALS1, SFRP2, MDK, ITGB2, FN1, PYCARD, CORO1A, EMILIN1, FLNA, TGM2
Cellular Response To Oxygen-Containing Compound	1.03×10^{-2}	LGALS1, COL6A1, CYBA, COL1A1, VIM, COL1A2, PSAP, PYCARD, COL3A1, LGMN, FLNA, CD68, CD14, SERPINF1, LRP1, RARRES2, ACTB, SPI1, FBN1
Leukocyte Migration	1.08×10^{-2}	CD74, COL1A1, MDK, ITGB2, COL1A2, FN1, PYCARD, CORO1A, LGMN, EMILIN1, FCER1G, RARRES2
Cellular Response To Endogenous Stimulus	1.11×10^{-2}	COL6A1, CYBA, SFRP2, COL1A1, POSTN, VIM, COL1A2, CTSB, COL3A1, CORO1A, CTSS, LGMN, EMILIN1, FLNA, COMP, SERPINF1, LRP1, RARRES2, ACTB, VSTM2A, FBN1
Regulation Of Biological Quality	1.14×10^{-2}	APOE, CD74, FTL, CAPG, LGALS1, SPARC, CYBA, COL1A1, A2M, LYZ, POSTN, VIM, ITGB2, C3, COL1A2, FN1, TYROBP, PYCARD, SELENOM, SEMA3F, COL3A1, SERPING1, CORO1A, LGMN, FLNA, DCN, B2M, SLC39A6, COMP, SERPINF1, FCER1G, LRP1, ACTB, TAPBP, VSTM2A, SPI1, PSMB8, TGM2, FBN1
Developmental Growth	1.17×10^{-2}	APOE, COL6A1, SFRP2, MDK, POSTN, FN1, PSAP, SELENOM, SEMA3F, COL6A2, LGMN, COMP, LRP1, COL6A3
Blood Coagulation	1.22×10^{-2}	APOE, COL1A1, A2M, COL1A2, COL3A1, SERPING1, FLNA, COMP, FCER1G, ACTB
Hemostasis	1.39×10^{-2}	APOE, COL1A1, A2M, COL1A2, COL3A1, SERPING1, FLNA, COMP, FCER1G, ACTB
Cell Death	1.46×10^{-2}	APOE, CD74, C1QA, LGALS1, CRIP1, SFRP2, MDK, GPNMB, MUC1, CTSD, ITGB2, CTSB, TYROBP, PSAP, PYCARD, CORO1A, TIMP1, LGMN, FLNA, COMP, CD14, SERPINF1, FCER1G, RPL10, LRP1, SPI1, TGM2
Negative Regulation Of Cell Development	1.46×10^{-2}	APOE, LGALS1, POSTN, VIM, SEMA3F, COL3A1, B2M, INPP5J, LRP1, FBN1
Coagulation	1.50×10^{-2}	APOE, COL1A1, A2M, COL1A2, COL3A1, SERPING1, FLNA, COMP, FCER1G, ACTB
Regulation Of Endopeptidase Activity	1.54×10^{-2}	SFRP2, A2M, CTSD, C3, PYCARD, SERPING1, TIMP1, LGMN, SERPINF1, COL6A3, PSMB8
Antigen Processing And Presentation Of Peptide Antigen Via Mhc Class Ii	1.73×10^{-2}	CD74, CTSD, PYCARD, CTSS, LGMN, FCER1G
Regulation Of Cell-Substrate Adhesion	1.77×10^{-2}	LGALS1, COL1A1, MDK, POSTN, FN1, EMILIN1, FLNA, LRP1
Lymphocyte Mediated Immunity	1.78×10^{-2}	CD74, C1QB, C1QA, C1QC, C3, SERPING1, CORO1A, B2M, FCER1G, C1S
Response To Nitrogen Compound	1.84×10^{-2}	APOE, SPARC, COL6A1, CYBA, COL1A1, VIM, ITGB2, COL1A2, COL3A1, TIMP1, LGMN, FLNA, CD68, FCER1G, LRP1, RARRES2, ACTB, FBN1
Antigen Processing And Presentation Of Peptide Or Polysaccharide Antigen Via Mhc Class Ii	2.05×10^{-2}	CD74, CTSD, PYCARD, CTSS, LGMN, FCER1G
Neuron Death	2.07×10^{-2}	APOE, C1QA, MDK, GPNMB, ITGB2, TYROBP, CORO1A, LGMN, SERPINF1, LRP1
Cell Development	2.14×10^{-2}	APOE, C1QA, LGALS1, COL6A1, SFRP2, MDK, POSTN, VIM, C3, CTHRC1, FN1, TYROBP, PSAP, SEMA3F, COL3A1, COL6A2, FLNA, GFRA1, B2M, COMP, SERPINF1, INPP5J, LRP1, ACTB, COL6A3, FBN1
Humoral Immune Response	2.17×10^{-2}	C1QB, C1QA, C1QC, A2M, LYZ, C3, FAU, SERPING1, C1S, RARRES2
Regulation Of Cellular Component Organization	2.26×10^{-2}	APOE, APOC1, CAPG, LGALS1, SPARC, CYBA, SFRP2, AEBP1, MDK, POSTN, MUC1, VIM, ITGB2, C3, FN1, TYROBP, PYCARD, SEMA3F, CORO1A, EMILIN1, FLNA, DCN, B2M, CD14, SERPINF1, INPP5J, LRP1, SPI1
Response To Growth Factor	2.51×10^{-2}	SPARC, SFRP2, COL1A1, LUM, POSTN, COL1A2, COL3A1, CORO1A, LGMN, EMILIN1, DCN, COMP, VSTM2A, FBN1
Regulation Of Proteolysis	2.55×10^{-2}	APOE, SFRP2, A2M, CTSD, C3, FN1, PYCARD, SERPING1, TIMP1, LGMN, SERPINF1, LRP1, COL6A3, PSMB8
Regulation Of Cytokine Production	2.55×10^{-2}	CD74, CYBA, LUM, MDK, GPNMB, POSTN, C3, FN1, TYROBP, PYCARD, B2M, CD14, FCER1G, LRP1

Biological process	Adjusted <i>p</i> -value	Intersecting genes
Immunoglobulin Mediated Immune Response	2.65×10^{-2}	<i>CD74, C1QB, C1QA, C1QC, C3, SERPING1, FCER1G, C1S</i>
Positive Regulation Of Chemokine (C-X-C Motif) Ligand 2 Production	2.73×10^{-2}	<i>CD74, POSTN, LRP1</i>
B Cell Mediated Immunity	2.92×10^{-2}	<i>CD74, C1QB, C1QA, C1QC, C3, SERPING1, FCER1G, C1S</i>
Integrin-Mediated Signaling Pathway	3.02×10^{-2}	<i>ITGB2, TYROBP, COL3A1, TIMP1, FLNA, FCER1G</i>
Positive Regulation Of Innate Immune Response	3.08×10^{-2}	<i>CYBA, MUC1, ITGB2, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Innate Immune Response-Activating Signal Transduction	3.40×10^{-2}	<i>CYBA, MUC1, ITGB2, CTSB, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Regulation Of Cell Development	3.40×10^{-2}	<i>APOE, LGALS1, SFRP2, MDK, POSTN, VIM, FN1, TYROBP, SEMA3F, COL3A1, FLNA, B2M, SERPINF1, INPP5J, LRP1, FBN1</i>
Negative Regulation Of Cellular Component Movement	3.78×10^{-2}	<i>APOE, CD74, SFRP2, SEMA3F, COL3A1, TIMP1, EMILIN1, DCN, SERPINF1, LRP1</i>
Response To Lipoprotein Particle	4.03×10^{-2}	<i>APOE, ITGB2, CD68, FCER1G</i>
Regulation Of Angiogenesis	4.04×10^{-2}	<i>SPARC, SFRP2, MDK, GPNMB, ITGB2, C3, EMILIN1, DCN, SERPINF1, HSPG2</i>
Positive Regulation Of Phagocytosis	4.18×10^{-2}	<i>CYBA, C3, PYCARD, FCER1G, LRP1</i>
Bone Morphogenesis	4.54×10^{-2}	<i>COL6A1, SFRP2, COL1A1, COL6A2, COMP, COL6A3</i>
Positive Regulation Of Response To Biotic Stimulus	4.70×10^{-2}	<i>CYBA, MUC1, ITGB2, CTSB, PYCARD, CTSS, LGMN, CD14, FCER1G, PSMB8</i>
Cellular Response To Amino Acid Stimulus	4.82×10^{-2}	<i>COL6A1, CYBA, COL1A1, COL1A2, COL3A1</i>
Negative Regulation Of Complement Activation, Lectin Pathway	4.89×10^{-2}	<i>A2M, SERPING1</i>
Regulation Of Complement Activation, Lectin Pathway	4.89×10^{-2}	<i>A2M, SERPING1</i>
Negative Regulation Of Locomotion	4.91×10^{-2}	<i>APOE, CD74, SFRP2, SEMA3F, COL3A1, TIMP1, EMILIN1, DCN, SERPINF1, LRP1</i>