Supplementary Material

Exploring Shared Biomarkers of Myocardial Infarction and Alzheimer's Disease via Single-Cell/Nucleus Sequencing and Bioinformatics Analysis

Supplementary Table 1. The characteristics of the four datasets (GSE66360, GSE5281, GSE159677, GSE157827).

GEO ID	Platform	Participants	Species	Tissues
GSE66360	GPL570	21 MI and 22 controls		Circulating endothelial cells
GSE5281	GPL570	87 AD and 74 controls	Homo	Entorhinal cortex
GSE159677	GPL18573	3 AC and 3 controls	sapiens	Carotid artery atherosclerotic core
GSE3298152	GPL24676	2 AD and 2 controls		Prefrontal cortex

Supplementary Table 2. Common DEGs of MI and AD.

The 26 intersecting genes of MI and AD:
MAFF
EGR1
ARHGEF40
MPP1
ZNF204P
NFKBIA
VCAN
BCL6
GABARAPL1
CSRNP1
RNF175
GLUL
RPH3A
RP11-373D23.2
KLF4
NRGN
SRGN
EPB41L3
FGR
GJA1
DMXL2
CXCL1
GIMAP7
DUSP4
RGS1
RPS4Y1

Supplementary Table 3. Results of GO enrichment analysis. See Excel file.

Supplementary Table 4. Results of KEGG enrichment analysis. See Excel file.

Supplementary Table 5. Results of LASSO regression based on the DEGs in the MI bulk RNA-seq dataset and AD bulk RNA-seq dataset.

23 candidate genes of MI	31 candidate genes of AD
GABARAPL1	PCYOX1L
PDE4B	ZNF415
IL1R2	ASAH2B
ZFP36	SST
BCL3	CXCR4
GADD45A	SDR16C5
ITLN1	CTD-3092A11.2
JDP2	SLC7A2
FCGR2A	HDAC7
EFEMP1	NUDT2
CH25H	HVCN1
MGP	GPER1
RGS1	BRD9
DOCK4	WDR70
SYTL3	LOC100289283
VNN3	C14orf119
TSIX	ELMO1
CRTAM	RIIAD1
EOMES	MAEL
LOC645984	RP3-327A19.5
POP5	C11orf97
LOC101927069	BHLHE22
MEST	RP11-5C23.1
	AP000265.1
	PCDHAC2
	OR7E47P
	PDE6H
	CRYBA2
	PLA2G4A
	HLA-DRB4
	RGS1

Supplementary Table 6. Degree of nodes in PPI network for MI and AD. See Excel file.

Supplementary Table 7. The "singleR" package was used to annotate the 22 cell clusters in the CA single-cell RNA sequencing dataset.

Cell cluster	Cell type in singleR
0	T cells
1	T cells
2	Endothelial cells
3	Tissue stem cells
4	Chondrocytes
5	Monocyte
6	Monocyte
7	T cells
8	Monocyte
9	B cells
10	Tissue stem cells
11	Macrophage
12	Endothelial cells
13	B cells
14	Monocyte
15	Common Myeloid Progenitor (CMP)
16	Macrophage
17	Erythroblast
18	Pre-B cell CD34
19	Macrophage
20	Macrophage
21	Endothelial cells

Supplementary Table 8. DEGs in CA dataset.

725 DEGs in CA dataset

RBP7	LMCD1	NCOA7	SERPING1	FBN1
NBL1	FBLN2	PERP	CTTN	FGF7
ID3	SH3BP5	AKAP12	PRCP	C2CD4B
FAM110D	ZNF385D	MYCT1	FZD4	RPS17
SH3BGRL3	TGFBR2	MEOX2	NNMT	NR2F2
LAPTM5	CLEC3B	IL6	ESAM	SLC9A3R2
PODN	LAMB2	AQP1	AKR1C1	EMP2
PLPP3	ADAMTS9	FKBP9	AKR1C3	MKL2
JUN	MTRNR2L12	RAMP3	SRGN	C16orf45
NFIA	NFKBIZ	GNG11	PLAC9	PLCG2
ADGRL4	PDIA5	PDK4	FAM213A	CYBA
TGFBR3	SLCO2A1	RASA4	MMRN2	YWHAE
ARHGAP29	PLSCR4	CAV1	SNCG	TMEM88
CNN3	APOD	IL3RA	ADIRF	CCL14
PALMD	LDB2	TMSB4X	PDLIM1	IGFBP4
S100A13	SPARCL1	SRPX	ABLIM1	CAVIN1
ADAM15	SPP1	TSPAN7	VWF	RAMP2
KRTCAP2	MMRN1	CXorf36	MFAP5	ABCA6
ACKR1	EMCN	RPL36A	APOLD1	RPL38
SELE	RPL34	CHRDL1	EMP1	ITGB4
RGS16	CFI	MTUS1	ABCC9	CYGB
PTPRC	SPRY1	STC1	TNS2	MXRA7
CD34	LIFR	CLU	PCBP2	ANKRD29
EPHX1	RPL37	SFRP1	RASSF9	RPL17
CRIM1	IL6ST	PLAT	BTG1	TCF4
SPTBN1	SEMA6A	PREX2	HSPB8	ID1
VAMP8	PPIC	IL33	RGCC	SLPI
IGKC	EGR1	NFIB	ITM2B	TSHZ2
IL1R1	ECSCR	CNTNAP3B	GPR183	RPS21
MALL	EBF1	GAS1	F10	PPDPF
LIMS2	SLIT3	GSN	CLEC14A	SOX18
NOSTRIN	HNRNPH1	OLFM1	FOS	OAZ1
CALCRL	NRN1	NPDC1	CALM1	RPL36
TFPI	TNXB	IFITM1	IFI27	RPS28
CAVIN2	RPS10	IFITM3	CRIP2	KANK3
RPL37A	PI16	POLR2L	CRIP1	JUNB
ARPC2	SH3BGRL2	MTRNR2L8	TJP1	KLF2
ACKR3	TPD52L1	CD59	LPCAT4	PLVAP

JUND	EZR	ZBTB20	10-Sep	SEC62
COX7A1	MDK	C3	CTHRC1	SELENOM
ZFP36	LHFPL6	EFNA1	NET1	PLIN2
PCAT19	CPXM2	NR4A1	RPS16	RPL13A
BCAM	ARPC3	C7	ATP5ME	IL1RN
APOE	ITGA6	NDRG1	FBP1	ABI3BP
APOC1	AIF1	HCST	DUSP2	CLDN5
FOSB	RPL35A	ARHGDIB	MS4A7	SFRP4
FTL	FOXC1	MYC	CCL3	HIPK3
ADM5	SFRP2	INMT	OLFML3	C1QB
IGLC2	DPYSL2	EGFL7	GAPDH	NRP1
MIF	KLF4	DNAJB4	ARHGAP18	PLAUR
TIMP3	ITM2A	IER2	CD44	ARF5
A4GALT	LIMA1	SELENOW	DNASE1L3	CYB5R3
FBLN1	ARL4C	DBN1	DSTN	NDUFA3
JAM2	CXCR4	SON	PRSS23	GK
APP	RGS1	CCDC80	CYTIP	LEPROT
CYYR1	CAV2	LILRB4	SLC38A2	FLT1
ADAMTS1	METTL7A	RCN1	ZNF331	CD48
MT-ND3	FCER1G	RPL22	FSTL1	SNHG7
MT-ND4L	CD151	TESC	CFL1	DUSP1
HES1	TYROBP	FERMT2	FYB1	PDGFRL
NUPR1	HDGFL3	PPP3CA	MS4A4A	C5AR1
MYADM	ELN	AKR1C2	IGFBP6	MSX1
RPL15	CLIC2	RGS10	SARAF	TRA2A
C15orf48	NTRK2	CAPG	TSPAN4	FOXP1
RPL39	RPL41	RNASET2	YBX3	FILIP1L
SLIT2	LEPR	OLR1	NDUFA13	VCAM1
ISLR	DCN	TINAGL1	SOCS3	CD68
CD52	MSR1	ELK3	HSPB1	VAMP5
CD320	TM4SF1	FCGR3A	CD40	SMAP2
EPAS1	S100A16	RPS27	PTMS	TACC1
LYZ	CORO1A	FAM241A	ICAM1	PLEK
LCP1	FTH1	ARL2	HMGN3	EMP3
IFITM2	PECAM1	HSP90AA1	PIK3C2A	ATP6V0B
KLF9	PROS1	LGALS1	HSPB6	GBP4
DAAM1	PSMB10	MGST1	LTBP4	CYBRD1
DLC1	HYAL2	PMP22	RPL27A	IFI30
FNBP1L	MGLL	HIST1H4C	C1QA	CD53
ABCA8	IGFBP7	LRRC75A	PTGIS	HMOX1
RPS26	ZFYVE21	C11orf96	RARRES2	MT1M

LITAF	TNFRSF1A	RAC2	PCOLCE	PRRX1
CALCOCO2	GPSM3	LY86	C1orf162	OASL
TAGLN2	SERPINA1	GPRIN3	GRB2	MEF2C
NUCB1	CD86	C1S	LEPROTL1	CTSZ
STOM	ABRACL	CD55	DOK2	CEBPD
IGFBP5	A2M	MXRA8	TSTD1	TRBC2
C1R	CLIC1	ATP5MC3	NINJ1	FUOM
H2AFZ	FCGR1A	SAMSN1	REL	RPSA
SPI1	USP53	H2AFV	CD93	GMFG
TNFSF10	JPT1	ISYNA1	SSPN	CD14
CXCL12	BTG2	CD2	CTSB	TRAC
CTSD	ACP5	MGST2	WISP2	LTB
CYB5A	CPE	PHACTR1	ARID5B	TYMP
DYNC1I2	TPI1	IL1B	GLRX	CD3G
ROMO1	CXCL16	IQGAP2	UAP1	GIMAP7
CIB1	ARPC5	ASPH	CHCHD10	PRELID1
NDUFB1	ALOX5AP	RAB20	TNFAIP8	ISG15
AC245014.3	FKBP1A	RAB11A	ADD3	EIF5
NPL	MFAP4	IGHA1	C4orf48	SGK1
RNASE6	FN1	RRBP1	DST	SLA
CTSF	MARCKSL1	RPS11	NCL	CKLF
CYTL1	CD83	PYCARD	CST3	GLIPR2
SAT1	FAM49B	ADH1B	ITGA4	ARL4A
MARCO	GZMA	ENG	S100A9	ISG20
PLK2	GZMK	FAM107B	HERPUD1	CCL3L1
C1QC	COTL1	CTNNB1	STK4	IDH2
BICC1	MCTP1	HMGA1	ATF3	APOBEC3G
ITGB2	ETS2	SRSF3	PPP1R10	LACTB
SUB1	ENO1	CYBB	PHLDA1	CKS2
ADAP2	C3AR1	RHOB	SOD3	H2AFY
VSIG4	IL7R	SQSTM1	RPS29	SSR4
NFIC	FCGR2A	LAPTM4A	PRELP	COPE
AHNAK	CCL5	MAFF	HCLS1	DUSP23
SNHG8	CCND1	PDXK	BATF	RALA
FCGR2B	MS4A6A	ABCA1	GPX4	EFHD2
PPIF	LPAR6	PLEKHO1	PSMA7	PGK1
PDGFRA	CD3D	SERPINF1	EMB	AREG
IGSF6	FERMT3	CTGF	TUBA1C	UCP2
CD163	RHOC	CYR61	CRTAC1	ATP6V1F
CDKN1C	CD84	CXCL8	GPR65	COX5A
GPX3	APBB1IP	CSTB	TMOD3	ACTR3

FBLN5	AC020656.1	RBM38	PGAM1	GCHFR
RPS20	EIF4EBP1	RNF7	CALM3	ASAH1
CALR	CREM	DBI	CDV3	CDKN2D
PCOLCE2	GSTO1	KLRB1	G3BP2	CHMP1B
FABP5	CDKN1A	ICOS	DHRS3	LRP1
MT1E	HIF1A	ATP1B3	CLEC2B	TSC22D3
ARPC5L	TPM3	BNIP3L	GSPT1	VCAN
CTSK	COL6A2	PSMD8	CACYBP	BLVRB
PTPN7	HMGN1	ITGBL1	BIRC3	S100A8
COL1A2	CRYAB	PPP1R2	HES4	CD63
CST7	INSIG1	MMP2	EML4	CNOT6L
PTTG1	ID4	6-Sep	SPOCK2	GADD45B
CD36	FABP4	TRBC1	PPP1R14B	HLA-DMA
TUBA4A	RUNX3	M6PR	MAFB	LGMN
KPNA2	CCDC88A	TERF2IP	METRNL	EIF4A3
EPB41L2	OMD	ACAP1	CLEC2D	HLA-DPA1
CXCL3	SKAP1	AP2S1	UBE2S	IFI6
APRT	LCK	DNAJB6	MRPS6	TMEM176B
LSP1	S100A11	HSPA5	CTSL	GLUL
ATP6V1G1	PTP4A2	LAT	STMN1	BRI3
CFD	SH3KBP1	ANXA1	NPC2	CPVL
NAGK	EVL	GTF2B	OGN	IGLC3
RHOG	SLC25A5	NAP1L1	HLA-DMB	IER3
TSPO	PPP1CA	STK17A	GYPC	HLA-DQA1
SDF2L1	CEBPB	EFEMP1	PKM	CCL2

Supplementary Table 9. Results of LASSO regression based on the DEGs in the CA dataset.

NR4A2
PDE4B
THBD
IL1R2
MAP3K8
ZFP36
JDP2
PMAIP1
ETS2
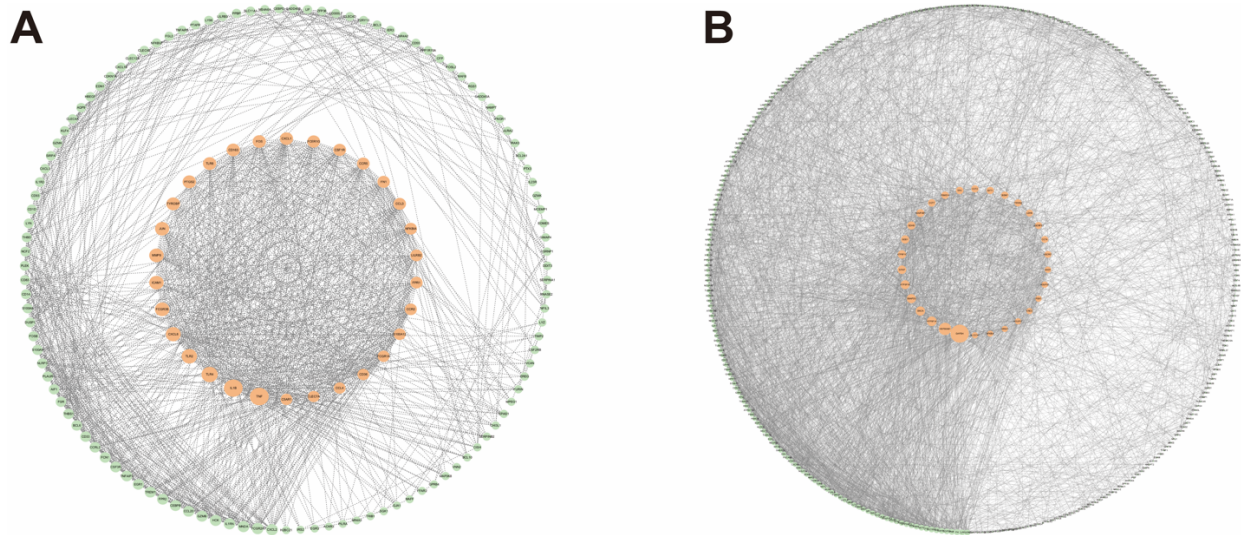CH25H
MGP
LRG1
RGS1
EREG
ARHGEF40
RPS4Y1

Supplementary Table 10. The "singleR" package was used to annotate the 22 cell clusters in the AD single-cell RNA-seq dataset.

Cell cluster	Cell type in singleR
0	Astrocyte
1	Astrocyte
2	Astrocyte
3	Astrocyte
4	Astrocyte
5	Macrophage
6	Astrocyte
7	Astrocyte
8	Astrocyte
9	Astrocyte
10	Astrocyte
11	Astrocyte
12	Astrocyte
13	Astrocyte
14	Astrocyte
15	Astrocyte
16	Astrocyte
17	Endothelial cells
18	Astrocyte
19	Astrocyte
20	Astrocyte
21	Astrocyte

Supplementary Table 11. Results of motif enrichment analysis of 26 common DEGs of MI and AD. See Excel file.

Supplementary Figure 1. PPI network. The nodes represent proteins, the edges represent interaction. The top 30 core nodes are shown in the center with orange dots. A) Core nodes in the PPI network for MI. The top 30 core nodes are shown in the center with orange dots. B) Core nodes in the PPI network for AD. PPI, protein-protein interaction; MI, myocardial infarction; AD, Alzheimer's disease.

Supplementary Figure 2. Box diagram of the expression of RGS1 in MI and AD datasets. Red dots are samples from the disease group and blue dots are samples from the control group. A) In the MI dataset, the expression level of RGS1 was higher in the disease group than in the control group, and the difference was statistically significant (p<0.001). B) In the AD dataset, the expression level of RGS1 was higher in the disease group than in the control group, and the difference was statistically significant (p<0.001).