

## Analysis of infection-associated gene expression and their interaction with differentially expressed miRNA from the prospective of polymicrobial infections in corneal keratitis

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### Supplementary Data

Suppl. Table S1 — 343 curated infection-associated genes with corneal expression and present in tear secretome

i) Metabolism	
Gene	Function
ACTB	filament polymerization
AIP	xenobiotic metabolism
ASL	hydrolytic cleavage of argininosuccinate
BLVRA	conversion of biliverdin to bilirubin
COMT	catalyses O-methylation
COX6B1	electron transfer from reduced Cytochrome <i>c</i>
CST3	inhibitor of cysteine proteases
CUL5	ubiquitin protein ligase binding activity
DCXR	NADPH-dependent reduction
DDX6	microRNA-induced gene silencing
EEF1A1	protein biosynthesis
FHIT	purine metabolism
FUCA1	hydrolyses alpha-1,6-linked fucose
GAA	degradation of glycogen
GANAB	catalytic subunit of glucosidase II
GAPDH	glycolysis
GSN	prevents actin monomer exchange
HADHA	mitochondrial beta-oxidation pathway
HNRNPA1	packaging of pre-mRNA into hnRNP
HNRNPD	pre-mRNA processing
HTRA1	serine protease
IDH1	regeneration of NADPH
MAN2A1	hydrolyses N-glycan maturation pathway
MAN2A2	enable alpha-mannosidase activity
MAN2B2	enable alpha-mannosidase activity
MANBA	processing of glycoprotein oligosaccharides

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MOGS	cleaves the distal alpha-1,2-linked glucose residue
MX1	Interferon-induced dynamin-like GTPase
NEDD8	ubiquitin protein ligase binding activity
NQO1	quinone reductase
OTUB1	edits polyubiquitin chain growth
PDCD6IP	endocytosis
PEPD	hydrolyzes dipeptides or tripeptides
PRDX1	detoxification of peroxides
PSMA6	functions in the immunoproteasome
PSMB1	TBP (TATA-binding protein) gene
PSMB8	functions in the immunoproteasome
PSMB9	functions in the immunoproteasome
PTBP1	promote the binding of U2 snRNP to pre-mRNAs
SOD1	free radical scavenging
SUMO2	post-translational modification
TPMT	metabolizes thiopurine drugs
TSG11	tumor suppressor
UBC	polyubiquitin precursor
UBE2D3	ubiquitination
UBE2N	DNA post-replication repair
USP14	cleaves the ubiquitin from ubiquitin-fused precursors
XDH	oxidative metabolism of purines

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ii) Biosynthesis

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ACO1	TCA cycle
ACTG1	cell motility
AR	ligand-activated transcription factor
ARF6	stimulate the ADP-ribosyltransferase activity
ASS1	L-citrulline metabolism
CSTB	thiol proteinase inhibitor
DHX9	ATP-dependent nucleic acid helicase
EEF1D	subunit of the elongation factor-1 complex
EEF2	essential factor for protein synthesis
EIF2S1	protein synthesis initiation
EIF4A2	enables ATP hydrolysis activity
EIF4E	translation initiation
EIF4G1	recruitment of mRNA to the ribosome
FASN	synthesis of palmitate
FTL	stores iron
FURIN	protein and peptide processing
G6PD	oxidative pentose-phosphate pathway
GALNT3	biosynthesis of O-linked oligosaccharide
GART	required for de novo purine biosynthesis
GLB1	cleaves beta-linked terminal galactosyl residues
HDGF	mitogenic and DNA-binding activity
HEXB	degradation of GM2 gangliosides
ILF3	gene expression and stabilize mRNAs
KRT1	regulate the activity of kinases
LTA4H	hydrolase and aminopeptidase activities
MGAT2	formation of N-glycans
NAMPT	biosynthesis of nicotinamide adenine dinucleotide
NCL	synthesis and maturation of ribosomes

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P4HB	formation, breakage and rearrangement of disulphide bonds
PABPC1	a poly(A) binding protein
PDIA3	modulate folding of glycoproteins
PFAS	IMP biosynthesis
PPIL1	protein folding
PRPS1	phosphoribosylation of ribose 5-phosphate
PTGES	glutathione-dependent prostaglandin E synthase
RAP1A	antagonizes mitogenic function of Ras
RPL15	rRNA processing
RPL18	60S subunit component
RPL26	60S subunit component
RPL35	60S subunit component
RPL4	60S subunit component
RPS15A	40S subunit component
RPS19	40S subunit component
RPS3	40S subunit component
SMPD1	converts sphingomyelin to ceramide
TUFM	protein translation in mitochondria

iii) Cell proliferation/ survival

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ANXA2	calcium-regulated membrane-binding protein
APOL1	lipid exchange and transport
BAX	mitochondrial apoptotic process
CABLES1	cell cycle regulation
CAT	hydrogen peroxide scavenging
CD59	complement binding activity
CD82	cell proliferation
CDC42	membrane-associated small GTPase
CTSL	lysosomal cysteine proteinase
CX3CL1	ligand for both CX3CR1 and integrins
EGF	role in the growth, proliferation and differentiation
ENO1	glycolysis
ERCC2	general and transcription-coupled nucleotide excision repair
GAS6	cell proliferation
GLI2	transcription regulator
GOLM1	protein and peptide processing
HMGB1	DNA chaperone
IGFBP6	enables protein binding activity
LCN2	iron-trafficking protein
LGALS1	inhibits CD45 protein phosphatase activity
LGALS3	antimicrobial activity
MAPK13	proliferation and differentiation
MUC4	cell-cell and cell-extracellular matrix interactions
NAP1L1	DNA replication
NDRG2	neurite outgrowth
NPM1	centrosome duplication and protein chaperoning
PTPRS	cell proliferation and differentiation
RAD21	chromosome segregation
SERPINE1	inhibitor of tissue plasminogen activator
SET	inhibits apoptosis
TACC2	cell cycle regulation
TFRC	iron uptake

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TIMP1	natural inhibitor of MMP
iv) Cell death	
CASP1	cleaves IL-1 beta
CASP3	apoptosis
GSTP1	conjugation of reduced glutathione
HSPA5	ER chaperone
PDCD4	binds to eukaryotic translation initiation factor 4A1
PEA15	negative regulator of apoptosis
PYCARD	inflammasome pathway
SERPINB2	inhibits urokinase-type plasminogen activator
XRCC6	DNA-dependent ATP-dependent helicase
v) Cell adhesion /motility /structure	
ACTA2	cell motility
ACTR2	cell shape and motility
ACTR3	cell shape and motility
ADAM1A	binding activity of sperm to zona pellucida
APOM	lipid transport
BANF1	host pathogen interactions
CADM1	enables signaling receptor binding activity
CD81	complexes with integrins
CDH1	calcium-dependent cell adhesion proteins
CDH3	cell adhesion proteins
CEACAM	granulocyte receptor mediating recognition
CFL1	actin cytoskeleton dynamics
CNNA1	cell cycle regulation
CTNNB1	constituent of adherens junctions
CTTN	cytoskeleton and cell adhesion structure organization
DCTN4	centrosome dynamics
DEFB1	bactericidal activity
DIAPH1	regulation of actin polymerization
DNAJC3	DNAJ chaperone family members
DNM1L	mitochondrial and peroxisomal division
DNM2	actin and cytoskeletal protein function
ERAP1	peptide trimming
EZR	cell surface adhesion and migration
F11R	epithelial tight junction formation
FLNA	anchors transmembrane proteins to the actin cytoskeleton
GBP1	bind guanine nucleotides
ITGA3	receptor for fibronectin
ITGB1	receptors for collagen and fibronectin
IVL	structural component
KIAA0319L	axon guidance
KIF4A	chromosomal integrity
KIF5B	enables protein binding activity
KRT14	keratin intermediate filament function
KRT16	innate immunity
KRT4	cell integrity and migration
KRT6A	epithelial cell migration
KRT8	muscle contraction
LGALS3BP	promotes integrin-mediated cell adhesion
LMAN1	cargo receptor for glycoprotein transport

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MAPRE1	centrosomes and spindle microtubules
MMP4	double-stranded RNA binding
MSN	cell-cell recognition and cell movement
MYH9	cytokinesis and cell shape
NEO1	cell growth and differentiation
PLEC	anchors intermediate filaments to desmosomes
PLG	proteolytic factor
PRNP	neuronal development and synaptic plasticity
RDX	actin filament binding
RHOA	GTPase
SDC1	cell surface proteoglycan
STMN1	microtubule filament system regulation
SWAP70	regulation of actin polymerization
TGM2	cross-linking of proteins
THBS1	cell-to-cell and cell-to-matrix interactions
TUBA1A	constituent of microtubules
TUBA1B	constituent of microtubules
TUBA4A	constituent of microtubules
TUBB4B	constituent of microtubules
VCL	cell-matrix adhesion and cell-cell adhesion
VIM	class-III intermediate filaments

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vi) Immunity

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ANXA1	innate immune response
B2M	forms amyloid fibrils
C1QTNF3	enables protein binding
C3	activation of the complement system
C5	inflammation, pathogen host interactions
CCL28	chemokine signaling
CD47	membrane transport
CD58	mediate thymocyte interactions
CSF	macrophage production and differentiation
CXCL14	chemoattractant
FUT3	catalyzes the addition of fucose to precursor
HLA-A	presentation of antigen
HLA-B	presentation of antigen
HLA-C	presentation of antigen
HLA-E	immune self-nonsel self discrimination
IFI16	inhibits cell growth
IFI35	enables protein binding
IGSF8	role in cell migration
IL16	stimulates migration of immune cells
IL6ST	signal transmission of IL6
KHSRP	alternative mRNA splicing and localization
LGALS9	modulate cell-cell and cell-matrix interactions
NLRC5	antiviral immunity
PDIA4	antibody assembly
PPIB	secretion
PSMD7	processing of class I MHC peptides
SAA1	acute phase protein
SAMHD1	host pathogen interactions
SLP1	enables DNA-binding transcription factor activity

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TGFB2	cell proliferation
TNFSF1	anchor lymphotoxin-alpha to the cell surface
TNFSF13	stimulation of B- and T-cell function
TOLLIP	inflammatory signaling
TRIM23	intracellular transport
TRIM25	ubiquitin E3 ligase
vii) Phosphatase/kinase/ other type of enzyme	
KRAS	regulation of cell proliferation
APEX1	DNA repair and redox regulation
APOBEC3A	deamination of DNA cytidines
CDK6	cell cycle and differentiation
CSK	non-receptor tyrosine-protein kinase
DDX17	ATPase
DNAJB1	stimulates the ATPase activity of Hsp70 heat-shock protein
DUSP3	dephosphorylation
FLH1	DNA-binding transcription factor activity
FUBP1	single stranded DNA-binding protein
G3BP2	enables RNA binding activity
GSK3B	glucose homeostasis and Wnt signaling
GSTO1	glutathione-dependent thiol transferase
HEXA	degradation of GM2 gangliosides
HSP9AA1	heat shock protein
HSP9B1	heat shock protein
HSPA1A	molecular chaperone
HSPA4	heat shock protein
HSPA8	molecular chaperone
HSPB1	molecular chaperone
IQGAP1	regulate cell morphology and motility
ITPA	hydrolyzes the non-canonical purine nucleotides
MAN1A1	hydrolysis of mannose residues
MAN2B1	catabolism of N-linked carbohydrates
MAPK3	serine/threonine kinase
MT1X	cellular response to cadmium ion
NME1	metastasis
PCBP1	poly(rC)-binding protein
PCBP2	poly(rC)-binding protein
PPA1	hydrolysis of pyrophosphate to inorganic phosphate
PPIA	cis-trans isomerization of proline imidic peptide bonds
PPM1A	inhibit the activation of p38 and JNK kinase
PPP1R13L	regulation of apoptosis
PRKAA1	ATP homeostasis
PROS1	cofactor for the anticoagulant protease
PTPN6	regulate cell growth
RAB1A	controls vesicle traffic
RAB5A	enables GDP binding activity
RAC1	GTPase
RPL11	Protein associated with ribosomal RNA
RPS6KB1	mTOR signaling
SOD2	quenching superoxide anion radicals
SSB	RNA processing
SUB1	enables protein binding activity

TXN	redox reactions
UBE2L3	proteins degradation
YTHDF1	enables N6-methyladenosine-containing RNA binding activity
	viii) Receptor/channel/transporter/trafficking
ABCC2	membrane transporter
ABCE1	membrane transport
APP	amyloid plaque formation
ARF4	guanine nucleotide-binding protein
ATP1B1	gradient maintenance of Na and K ions
BSG	spermatogenesis
CD14	innate immune response
CD44	cell-cell interactions
CD55	C4 and c3 activation
CD9	integral membrane protein associated with integrins
CLTC	autophagosome formation
COPA	vesicular transport
CRABP2	retinoid signaling
GNAI1	signal-transducing molecules
GNAI2	signal-transducing molecules
GNAI3	signal-transducing molecules
HNRNPH1	heterogeneous nuclear ribonucleoproteins
HNRNPM	pre-mRNA processing
IPO5	nuclear-cytoplasmic transport
KPNB1	nuclear transport
LAMP1	selectin formation
MCAM	glomerular filtration
MET	proto-oncogene
NPC2	intracellular cholesterol transporter
NUP153	nuclear pore glycoproteins
OSBP	transport sterols
PLA2R1	phospholipase A2 clearance
PLIN3	endosome-to-Golgi transport
PTPRF	intrinsic protein tyrosine phosphatase
RAB35	transport
RAB7A	regulates vesicle traffic
RAB8A	protein transport
RELN	cell positioning and neuronal migration
SCARB2	membrane transportation
SELENOP	antioxidant mechanisms
SLC9A3R1	scaffold protein
ST3GAL4	glycoprotein formation
STAU1	RNA-binding protein
STXBP1	neurotransmitter release
SYK	innate and adaptive immunity
TACSTD2	growth factor receptor
TLR-2	innate immunity
VDAC1	membrane channel
VPS4B	intracellular protein trafficking
YWHAQ	mediate signal transduction
	ix) Intracellular signalling
BAG3	protein folding

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CCT7	molecular chaperone
ENPP2	cell proliferation and chemotaxis
FTH1	iron homeostasis
HNRNPK	RNA binding protein
IDE	zinc metalloproteinase
LANCL2	phosphatidylinositol phosphate binding activity
MAPK1	proliferation and differentiation
PDGFA	growth factor
PDIA6	inhibits the protein aggregation
PHB	inhibits DNA synthesis
PRDX6	reduction of hydrogen peroxide
RHOG	reorganization of the actin cytoskeleton
SCGB2A1	androgen binding protein
SIRPA	receptor-type transmembrane glycoproteins
SLC3A2	regulation of intracellular calcium
STAT1	interferons and cytokine responses
STAT2	mediates innate antiviral activity
YTHDF2	RNA processing
YWHAB	cell proliferation

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