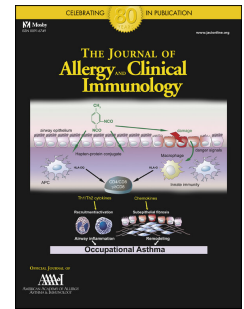


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Diesel exhaust and allergen modulate miRNA and RNA in intact human epithelium

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Running title: Diesel exhaust and allergen modulate miRNA and RNA in intact human lung epithelium

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Key Messages:

- Gene and miRNA profiles in human bronchial epithelial cells are modulated by allergen, even 48h after a transient exposure.
- Diesel exhaust did not significantly augment allergen-induced effects on miRNA or mRNA expression, suggesting that exposure may only induce transient changes.
- Regulation of mRNAs by specific miRNAs may influence immune responses with relevance to asthma, including lung inflammatory cell recruitment and epithelial cell shedding.

Capsule Summary:

In vivo exposure to allergen, diesel exhaust or co-exposures modulated miRNA and mRNA expression in human bronchial epithelial cells (BECs). Allergen induced gene expression correlated with lung inflammatory cell recruitment and BEC shedding.

Key words: Air pollution, Allergy, Controlled Human Exposure, Inflammatory Markers, Multi-omics

Abbreviations used:

BAL (bronchoalveolar lavage), BEC (bronchial epithelial cell), BW (bronchial wash), DE (diesel exhaust), DEA (diesel exhaust plus allergen), DES (diesel exhaust plus saline), brush (epithelial cell brushings), FA (filtered air), FAA (filtered air plus allergen), FAS (filtered air plus saline), FEV₁ (forced expiratory volume in 1 second), GATHER (gene annotation tool to help explain relationships), GO (gene ontology), HDM (house dust mite), IL (interleukin), LLL (left lower lobe), PBMC (peripheral blood mononuclear cell), PC₂₀ (provocative concentration causing a 20% FEV₁ drop), PLS (partial least squares), PM (particulate matter), RLL (right lower lobe), RML (right middle lobe), SD (standard deviation), Tc (T cytotoxic), Th (T helper), Treg (T regulatory), TRAP (traffic related air pollution).

Contributions:

CC designed and executed the exposure study. MY processed all samples. CFR, OPG, MY and AS conducted data analysis, with guidance from JAH, SJT and CC. CFR and OPG constructed the figures. CFR, OPG and CC wrote the manuscript, with guidance and critical revisions from MY, JAH, AS and SJT. All authors read and approved the manuscript.

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Pulmonary and Cardiovascular Training Program (IMPACT), the Sumitomo Life Social Welfare Services Foundation and the Mochida Memorial Foundation for Medical and Pharmaceutical Research.

Abstract

Background

Air pollution's association with asthma may be due its augmentation of allergenic effects, but the role of miRNA and gene expression in this synergy is unknown.

Objective

To determine whether exposure to allergen, diesel exhaust (DE) or co-exposures modulates miRNA, gene expression or inflammatory pathways and whether these measurements are correlated.

Methods

Fifteen atopic participants completed this controlled study of 2h of filtered air (FA) or DE (300 $\mu\text{g PM}_{2.5}/\text{m}^3$) exposure, followed by saline-controlled segmental bronchial allergen challenge. Gene and microRNA expression in bronchial brushings and lung inflammatory markers were measured 48h later, in study arms separated by approximately 4 weeks. Expression of miRNAs, mRNAs and inflammatory markers and their interrelationships were determined using regression.

Results

Robust linear models indicated that diesel exhaust plus saline and diesel exhaust plus allergen significantly modulated the highest number of miRNAs and mRNAs, respectively, relative to control (filtered air plus saline). In mixed models, allergen exposure significantly modulated

($q \leq 0.2$) miRNAs including miR-183-5p, miR-324-5p and miR-132-3p and genes including *NFKBIZ* and *CDKN1A*, but diesel exhaust did not significantly modify this allergenic effect. Repression of *CDKN1A* by allergen-induced miR-132-3p may contribute to shedding of BECs.

Conclusions

Expression of specific miRNAs and genes associated with bronchial immune responses were significantly modulated by DE or allergen. However, DE did not augment the effect of allergen at 48h, suggesting adjuvancy may be transient or require higher or prolonged exposure. *In silico* analysis suggested a possible mechanism contributing to epithelial wall damage following allergen exposure. ClinicalTrials.gov Identifier: NCT01792232

Introduction

Allergic diseases develop through complex interactions between genetics and environmental factors, including exposure to allergens¹. For example, asthma is often triggered by inhaled aeroallergens, resulting in chronic lung inflammation, reversible bronchoconstriction, airways hyper-responsiveness and increased mucus production². Incidence of allergic diseases including asthma have been increasing globally, at a pace that cannot be explained by genetic changes, with estimates indicating that asthma now affects over 2.8 million Canadians and 300 million individuals worldwide³⁻⁶. Additionally, projections suggest that global asthma prevalence will rise to 400 million by 2025⁴. One possible explanation for the increasing prevalence of asthma may be environmental exposures such as air pollution, which typically increases as countries develop⁵. Furthermore, there is considerable evidence linking combustion-derived particulate matter (PM) to asthma exacerbations and even development⁷⁻⁹. Of particular concern is diesel engine exhaust from transport, industry and power generation, which contains a complex mix of gases (including CO, O₃ and NO_x) and particulate matter. Diesel exhaust (DE) is a major source of particulate matter smaller than 2.5 microns (PM_{2.5}), which can penetrate deep into the lung^{10,11}.

Experimental models, along with epidemiological findings, have greatly enhanced our understanding of DE-related asthma, with numerous studies demonstrating that exposure contributes to asthma symptoms, exacerbation frequency and the use of medications¹²⁻¹⁴. While mechanisms underlying the effects of air pollution on asthma remain unclear, DE has been reported to possess adjuvant effects influencing adaptive immune responses following allergen inhalation in human nasal models¹⁵⁻¹⁷. Furthermore, growing evidence suggests a role

for epigenetic mechanisms^{5,18–20}. These include microRNA (miRNA) expression, DNA methylation and histone modifications, which may act as key regulators of inflammation^{5,21}. MicroRNAs are small, non-coding RNAs that regulate gene expression by binding to the complementary messenger RNA of target genes and inhibiting protein translation. Under conditions of environmental stress, miRNA expression may be altered and influence downstream pathways that may regulate disease²². For example, asthmatics display differences in miRNA expression compared to healthy controls, including increased miR-21 and decreased expression of miR-34/449 family members, which may contribute to asthma pathogenesis, for example through regulating epithelial cell growth^{23–25}. However, our current knowledge of epithelial responses to environmental factors is primarily based on short-duration, single-exposure models, while combined exposure models remain underexplored. We therefore sought to examine responses in an *in vivo* human experiment that combines DE, diluted and aged to reflect real-world conditions, with an allergen challenge^{26,27}.

Epithelial cells are amongst the first cell types exposed to inhaled substances, including air pollutants and aeroallergens, express many pathogen-associated molecular pattern receptors, and are therefore crucial in initiating key downstream inflammatory processes^{28,29}. Recently we demonstrated that miRNA profiles in blood were altered by inhaled DE and allergen in human asthmatics and that these changes were associated with oxidative stress and immune responses^{30,31}. We hypothesized that combined exposure to allergen and DE alters miRNA expression in the airway epithelium leading to changes in associated gene expression. We further posit that such co-exposures would mediate an expression pattern distinct from that induced by isolated allergen or DE exposures and that this would contribute to pathophysiologic features of asthma, such as airway inflammation and recruitment of

immune cells to the lung, which we have previously documented as resultant from these combined exposures³².

Abbreviated Methods

Detailed full methods appear in the Online Supplement.

Study Design

Eighteen non-smoking healthy volunteers aged 19-49 with atopy (skin-prick positive) to either house dust mite (HDM; *D. pteronyssinus*), birch or Timothy/Pacific grass, and devoid of exclusion criteria (see Supplemental Methods), were recruited to this double-blinded crossover exposure study. Participants were order-randomized to receive two inhalation exposure conditions, each lasting two hours (Fig. 1A), on separate occasions. Crossover was between exposure to diesel exhaust (DE; standardized to 300 $\mu\text{g PM}_{2.5}/\text{m}^3$) and filtered air (FA; negative control for DE). Participants underwent a first bronchoscopy 1 h after exposure during which 5ml of allergen (chosen based on skin prick testing, with concentration determined per protocol in Supplemental Methods) was instilled into 2 left lung segments (one within lingula and one within lower lobe) and saline (diluent control) into 2 complementary right lower lung segments (one within middle and one within lower lobe), or vice versa in a randomized and blinded fashion.

Sample Collection, Processing and Analysis

Participants underwent a second bronchoscopy 48h after exposure, during which bronchial washes (BW) and bronchoalveolar lavages (BAL) were collected from the lingular/middle lung segments where saline or allergen had previously been instilled. Bronchial brushes were also collected from the right and left lower lung lobe segments previously instilled. Following a

washout period of approximately 4 weeks, participants received a second two-hour exposure followed by their third bronchoscopy during which allergen and saline were administered to opposite lungs, and previously untouched segments, relative to those chosen during the first exposure. Samples were again collected during a fourth bronchoscopy performed 48 h after the second exposure. All samples were stored at -80°C until processing and analysis. miRNA and mRNA was extracted, assessed for quality and expression determined by NanoString[®] Technologies (Seattle, US) using nCounter[™] Human miRNA v2 (includes 800 miRNAs) and Human Immunology v1 (includes 511 mRNAs) panels, respectively.

BAL cells were Wright-Giemsa-stained and percentages of eosinophils, neutrophils, macrophages/monocytes, lymphocytes and bronchial epithelial cells (BEC) recorded by two independent observers. Flow cytometry assessed T cell subsets (helper (Th), cytotoxic (Tc) and regulatory (Treg)), while interferon gamma-induced protein 10 (CXCL10), interleukin 8 (CXCL8), granulocyte-colony stimulating factor (CSF3) and monocyte chemotactic protein 1 (CCL2) were measured using Luminex assays.

Data Analysis

Inflammatory markers, miRNA and mRNA expression data were analyzed in R (see Fig. 1B and Supplemental Methods). Data were normalized, background-filtered and all values below the global background were floored. Initial analysis was performed using a robust linear model, with Storey's q-value estimation for false discovery rate correction, to evaluate the effects of individual conditions: 1) diesel exhaust plus allergen (DEA), 2) diesel exhaust plus saline (DES; 0.9% saline was the diluent control for allergen), and 3) filtered air plus allergen (FAA); each relative to 4) filtered air plus saline (FAS). Subsequently, univariate analysis using a

mixed effects model was performed, to determine miRNAs and genes significantly modulated by DE exposure and/or allergen instillation. Integrative analysis of miRNA, miRNA and inflammatory markers was performed by partial least squares (PLS) correlation, as implemented in the mixOmics R package. PLS components were derived from mathematical procedures that use an orthogonal transformation to map the correlated data variables into 10 linearly uncorrelated dimensions. These were ranked according to which projections contained the most variation and plotted. *In silico* analysis of correlations was performed by examining gene targets of miRNAs with significantly modulated expression, using the miRTarBase and Targetscan databases^{33,34}. Finally, gene ontology of the genes with q-values of ≤ 0.2 following allergen instillation was examined using gene annotation tool to help explain relationships (GATHER)³⁵.

Results

Robust linear model of effects of DE and allergen on miRNA and gene expression

Comparisons of DEA, FAA, and DES to FAS were performed using a robust linear model (Table E2). Venn diagrams were constructed for miRNAs modulated, with a Storey's q -value of ≤ 0.05 , with increasing and decreasing expression relative to FAS (Fig. 2A). A total of 156 differentially expressed miRNAs were identified, with 5 miRNAs modulated by all three conditions containing DE or allergen, relative to FAS. The greatest number of modulated genes was following DES exposure (11 increased, 15 decreased) and the lowest number FAA (7 increased, 10 decreased). Nevertheless, DEA, which modulated an intermediate 19 miRNAs, enhanced expression of 12 miRNAs (the highest number), while it decreased the expression of 7 (the lowest).

An identical analysis was performed for gene (mRNA) expression (Table E3) and a second Venn diagram constructed (Fig. 2B). The pattern of modulation of gene expression differed from that seen with miRNAs, in that the FAA condition affected the largest group of genes (103), while DEA only modulated 39. DEA increased expression of the greatest number of genes (60), followed by FAA (58) and finally DES, which only enhanced the expression of 19 genes. Likewise, DES reduced expression of the smallest number of genes (20), while DEA and FAA decreased expression of 37 and 45 miRNAs respectively. These data indicate that allergen exposure had larger effects on gene expression than DE.

Mixed effects model of allergen or diesel exhaust on miRNA and gene expression

Comparisons of DEA, DES and FAA to FAS using a robust linear model did not take into account all available data, as only the relevant two-condition portions of the data set were utilised in each paired analysis. To assess the *individual* effects of allergen and DE on miRNA and gene expression, data were analysed using a mixed effects model with DE, allergen and DE plus allergen as fixed effects and participant's ID as a random effect. There were significant effects of diesel and allergen separately, but no evidence for an interaction between them was detected for either miRNA or mRNA expression (Tables E4 and E5). Further analysis therefore used data from a mixed model analysis that did not include an interaction factor (DE plus allergen). Within this second model, a total of 13 miRNA's had main effect p-values of ≤ 0.05 for allergen (Table E6), but following false discovery correction only 5 miRNAs (miR-183-5p, miR-324-5p, miR-132-3p, miR-331-3p and miR-28-3p) were below the $q \leq 0.2$ threshold (Fig. 3A). Plots for the main effect of diesel exhaust on each of the top 20 miRNAs for allergen were also produced (Fig. 3A), but none had q-values of ≤ 0.2 .

Allergen instillation also modulated mRNA expression, with 37 mRNAs having p-values of ≤ 0.05 (Table E7). However, after false discovery correction, 20 mRNAs were significantly modulated with q-values of ≤ 0.2 , including NFKBIZ, CDKN1A and STAT5A (Fig. 3B). Values were also plotted for the effects of diesel exhaust on these genes, but none showed q-values of ≤ 0.2 (Fig. 3B). Plots were prepared to evaluate the effects of individual conditions on the expression of miRNAs and genes most affected following allergen instillation (Fig. 4). This indicated that allergen significantly modulated 5 miRNAs, with expression of miR-324-5p, miR-

132-3p and miR-331-3p increased, miR-183-5p decreased and miR-28-3p increased by the combination of DE and allergen. Likewise, gene expression was modulated by allergen, with expression of STAT5A and TSFSF12 increased, but NFKBIZ and CDKN1A reduced. IFNGR1 expression was modestly decreased by either allergen or DE alone and additively decreased by the combination (Fig. 5). Gene ontology (GO) analysis identified 73 GO terms with p-values of ≤ 0.05 for these 20 genes (Table E8). Top terms included 9607 'response to biotic stimulus', 6955 'immune response' and 6952 'defense response', with each term including ≥ 12 of the 20 genes at p-values of < 0.0001 .

Main effects of diesel exhaust in the mixed effects model analysis (Tables E6 and E7) were subsequently evaluated on miRNA and gene expression (Fig. 5). Six miRNAs had p-values of ≤ 0.05 (miR-22-3p, 197-3p, 135b-5p, 15b-5p, 141-3p and 92a-3p), but all had q-values > 0.2 . Conversely, two of the top 20 miRNAs identified for the main effect of DE exposure, miR-28-3p and mir-183-5p, showed q-values ≤ 0.2 for allergen (Fig. 5A bottom panel). The effects of DE were also evaluated on mRNA expression, with 10 genes having p-values of ≤ 0.05 , including HLA-A, CD58 and CITTA, but none with q-values ≤ 0.2 (Fig. 6B).

Interplay between miRNA and mRNA expression in bronchial brushings

MicroRNAs play a critical role in decreasing protein expression, through targeting specific mRNAs inducing degradation or reducing translation³⁶. Annotation of candidate miRNAs with q-values of ≤ 0.2 , whose expression was enhanced by allergen (miR-324-5p, miR-132-3p, miR-331-3p and miR-28-3p) was therefore evaluated using miRTarBase³³. We focused on miRNAs that targeted genes with decreased expression and q-values of ≤ 0.2 (NFKBIZ, CDKN1A, IFNGR1, AHR, CXCL1, CXCL2 and NFIL3). Analysis revealed that miR-

132-3p targets CDKN1A, with strong evidence³⁷ (Fig. 6). Additionally, CDKN1A is targeted by miR-125a-5p, let-7a-5p and miR-20a/b-5p, all miRNAs within the top 20 showing a main effect for allergen, but reduced expression (Fig. 3A). Conversely, miR-183-5p, whose expression was reduced by allergen, targets HLA-A, a gene enhanced following allergen exposure^{33,38}.

To further examine interactions between the miRNAs and mRNAs highlighted, an *in silico* unsupervised partial least squares (PLS) analysis was performed. This revealed two primary miRNA groups (1 and 2), with apparently opposite effects on the expression of main clusters of mRNAs, each composed of two smaller subsets of the 'top 20' genes (Fig. 7A). The smaller cluster 1 of miRNAs included let-7a-5p, miR-125a-5p, 20a/b-5p and miR-183-5p, which in general positively correlated with γ and δ , but negatively correlated with gene groups α and β that included STAT5A and TNFSF12. Conversely, miRNAs in cluster 2, which included miR-28-3p, miR-132-3p and miR-324-5p, were positively correlated with groups α and β , but negatively correlated with genes, such as IFNGR1, NFKBIZ and CDKN1A, included in groups γ and δ . These groups showed concordance with earlier observations from miRTarBase, including the negative correlations of miR-132-3p with CDKN1A and miR-183-5p with HLA-A.

Interactions between miRNA and gene expression were depicted using network plots constructed based on correlations of ≥ 0.7 (Fig. 7B). These revealed the existence of five separate networks, three of which consisted of a single paired miRNA with an mRNA, but two larger networks. Of the links in these networks, six showed negative correlations between miRNA and gene pairs including NFKBIZ with miR-574-5p, while four were positive e.g. NFIL3 with miR-20a/b-5p.

Correlations between gene expression and inflammatory markers

As allergic diseases, including asthma, are characterised by chronic inflammation², we investigated the relationship between gene expression and inflammatory markers using PLS correlation. This analysis generated a range of correlations between -0.9 and 0.93 and suggested the presence of two principle groups of inflammatory markers, showing contrasting patterns of gene interactions, consisting of BAL BECs and twelve other markers that were subdivided into two groups (6 and 7) showing similar correlations (Fig. 8A). Gene group ϵ , which included CIITA, IRF5 and STAT5A, appeared to positively correlate with all inflammatory markers (except BECs), while cluster ζ was mostly negatively correlated and included NFKBIZ, CDKN1A and IFNGR1. When correlations of ≥ 0.7 were examined (Fig. 8B), four networks were produced, including one containing mostly genes from group ϵ , another containing genes from ζ , and finally two inflammatory marker pairs (STAT5 with Treg cells; NFIL3 with CXCL10).

Discussion

Few papers have explored interactions between allergen and air pollution exposure in humans, which is increasingly critical in understanding the contributions of air pollution to asthma development and exacerbation^{8,9}. Understanding these interactions may explain why current asthma medications, based on a simplistic understanding of environmental exposures, are often of limited efficacy and thus may inform behaviours to prevent exacerbation of this debilitating condition^{39,40}. Of particular interest is unravelling how exposures mediate sustained modulation of lung immune responses. This human crossover study therefore evaluated the effects of DE and allergen on the expression of miRNA and mRNA in brushings containing a high percentage of bronchial epithelial cells, the first cells exposed in the lung and accordingly instrumental in initiating immune responses^{29,41}.

DE exposure may modulate allergen responsiveness through inducing oxidative stress in the epithelium, mediating cytokine release and recruitment of inflammatory cells to the lung^{42,43}. Indeed, our previous major study focused on determining whether antioxidant supplementation would abrogate effects of DE exposure⁴⁴. This study demonstrated that 5-day pre-exposure supplementation with the antioxidant N-acetylcysteine (NAC) blunted DE-induced airway responsiveness relative to placebo, as measured using methacholine challenges in adult airway-hyperresponsive study participants⁴⁵. NAC supplementation also reduced DE-enhanced expression of miRNAs, including miR-144, miR-30e and miR-21, in peripheral blood mononuclear cells (PBMCs) 6h after exposure³¹ highlighting the inflammatory effects of DE and that oxidative stress may modulate gene expression. While the present study focused on determining effects of DE and allergen exposure on epithelial immunology, we

were also interested in effects on oxidative stress genes. In examining predicted gene targets of modulated miRNAs, we discovered that miR-183-5p, which was significantly repressed following allergen exposure, targets FOXO1, a transcription factor crucial in responding to oxidative stress⁴⁶. Additionally, GZMA, a potent inducer of ROS generation⁴⁷, and MAPK14, which encodes the oxidative stress activated p38 α MAPK⁴⁶, were significantly enhanced by DE and DE plus allergen exposure respectively, in our robust linear regression model (but not in our mixed model). Unfortunately, the NanoString® Immunology panel contains few other genes normally associated with oxidative stress, with only one other NFKB1, which codes for the p105 NF- κ B subunit, mapping onto the [wikipathways.org](http://www.wikipathways.org) 'oxidative stress' pathway. Nonetheless, our data provides some additional support for the role of oxidative stress in the response to DE and allergen exposures.

The choice to sample at 48h after exposure was based on data regarding latency in changes in adaptive immunity after co-exposure to diesel exhaust particulate and allergen^{17,48}. However, peaks of miRNA and mRNA expression are likely to occur within hours^{49,50}. The robust linear model analysis of these 48h data subsets indicated interactions between DE and allergen, but DE exposure did not significantly modulate miRNA or mRNA expression when evaluated after applying a FDR-corrected mixed model (which we consider a better model for assessing such potential synergy). The limited DE-induced changes in genes and miRNAs may be due to insufficient power for detecting changes of modest magnitude in this model, where DE was applied diffusely (by inhalation, presumed to reach target segments) relative to allergen (directly applied to target segments). Alternatively, peaks for diesel exhaust could plausibly occur earlier, or signalling cascades be downregulated more rapidly, relative to those for allergen; this hypothesis is partially supported by results from our earlier studies, wherein

DE exposure significantly modulates miRNA expression at 6h in PBMCs³¹. Regardless, the changes documented in this study are both remarkable and unique, given the gap between acute exposure and sampling, as the few prior controlled allergen studies have typically sampled at 24 hours or earlier^{51–53}.

Analysis did not demonstrate modulation of miR-146a or miR-155 as previously demonstrated in asthma^{24,54,55}. Instead, in our model allergen effected a unique set of miRNAs, including miR-183-5p, miR-324-5p and miR-132-3p, potentially reflecting important differences between miRNAs modulated by acute exposures, versus those observed with chronic stable asthma. Interestingly, miR-132-3p expression was enhanced ~2-fold at 6h following 2h of exposure to 0.4 ppm of ozone, an air pollutant that also potently induces oxidative stress⁵⁶. Increased expression of miR-132-3p was of particular relevance as a repressor of cyclin-dependent kinase inhibitor CDKN1A. CDKN1A encodes p21WAF, which regulates cell proliferation by binding to cyclin-CDK complexes⁵⁷. Additionally, p21WAF reduces apoptosis, potentially by inhibiting the activity of inflammatory pathways such as JNK MAPK and NF- κ B^{57,58}. Conversely, reduced CDKN1A expression could promote dysregulation of cell cycle control, increased epithelial cell apoptosis and activity of pro-inflammatory pathways. Indeed, the number of epithelial cells was modestly increased in BAL (though the percentage significantly decreased) following allergen exposure³², suggesting increased epithelial shedding prior to our sampling, and a positive correlation with CKDN1A expression was identified (Fig. 8). Furthermore, reduced inhibition by NFKBIZ and CDKN1A may contribute to the association between CDKN1A and CXCL10, which is regulated by NF- κ B and JNK MAPK, important pathways in immune responses⁵⁹. However, we were unable to directly confirm this link or validate the data using a second technique, due to inadequate sample supply.

Nevertheless, NanoString® assays correlate strongly (~70-95%) with other RNA analysis platforms, including RT-PCR⁶⁰⁻⁶².

Many of the genes modulated by allergen in this study have roles in immune responses that may contribute to the development of allergies or allergic diseases. These include HLA-A, HLA-DRB1, HLA-DRB3 and CIITA, with roles in the major histocompatibility complex. HLA-DRB3, a component of the HLA class II histocompatibility antigen, which was modestly above the 0.2 q-value threshold in our mixed model, has previously been shown to be significantly upregulated in individuals who respond to ozone air pollution⁶³. Nevertheless, the gene ontology (GO) term showing the greatest enrichment for the top 20 genes modulated by allergen was GO:9607, response to biotic stimulus (Table E8). This contributes to literature indicating that exposure to allergen results in the activation of pathogen detection and response systems⁶⁴. As traffic-related air pollution appears to activate many of the same detection systems, exposure may contribute to the development of allergy and asthma in vulnerable populations^{39,65,66}.

In summary, we have shown that exposure to diesel exhaust and allergen results in clear allergen-predominant effects on both miRNA and gene expression in the epithelium 48h later. Allergen modulated the expression of numerous miRNAs, which correlated with target gene expression. These results demonstrate that allergen exposure regulates gene expression, potentially through modulating expression of specific miRNAs. We also detected negative correlations of miR-132-3p with CDKN1A and miR-183-5p with HLA-A, through both miRTarBase *in silico* and mixOmics analysis. Finally, CDKN1A gene expression, which may regulate apoptosis, appeared to correlate with BAL BEC percentages. These results improve our understanding of the effects of exposures on individuals with allergic disease and may also

pave the way for improving targeted interventions. Nevertheless, further research is urgently needed to enhance prevention and improve treatment of allergic diseases, as current therapies are of limited efficacy due to issues such as poor compliance, corticosteroid resistance and ineffective control of exacerbating factors, including air pollution⁶⁷.

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Figures

Fig 1

A) Outline of study design. B) Details of the testing and data analysis performed.

Bronchoalveolar lavage (BAL), diesel exhaust (DE), epithelial cell brushings (brush), filtered air (FA), left lower lobe (LLL), partial least squares (PLS), right lower lobe (RLL), right middle lobe (RML), standard deviation (SD).

Fig 2

MicroRNA and gene expression were measured with NanoString® nCounter™ Human miRNA v2 and Human Immunology v1 assays respectively, in total RNA extracted from bronchial brushings. Effects of the indicated conditions were evaluated using robust linear models and Venn diagrams constructed showing miRNAs and mRNAs with q-values of ≤ 0.05 .

Fig 3

Mixed models were used to evaluate the effects of allergen or diesel exhaust exposure on brushing miRNA and mRNA expression. The twenty miRNAs and mRNAs with the smallest uncorrected p-values and q-values for allergen exposure were plotted (top panels). Values for the same miRNAs and mRNAs following diesel exhaust exposure are plotted in the bottom panels.

Fig 4

Bar (mean) and whisker (standard deviation) plots showing the effects of conditions on the expression of the five miRNAs and mRNAs with the smallest uncorrected p-values for allergen were generated. Grey circles indicate individual participant values. FAS (filtered air plus saline), FAA (filtered air plus allergen), DES (diesel exhaust plus saline), DEA (diesel exhaust plus allergen).

Fig 5

Mixed effects models demonstrated the effects of allergen or diesel exhaust exposure on brushing miRNA and mRNA expression. The twenty miRNAs and mRNAs with the smallest uncorrected p-values and q-values for diesel exhaust exposure were plotted (top panels). Values for the same miRNAs and mRNAs following allergen exposure were also plotted (bottom panels).

Fig 6

The miRTarBase database was consulted for miRNAs targeting CDKN1C and those modulated by allergen treatment grouped, with shades of blue indicating the strength of experimental evidence.

Fig 7

A) Correlations between the twenty miRNAs and mRNAs with the lowest p-values following allergen exposure were analysed by partial least squares regression and the first two components plotted as a heatmap. Blue depicts negative correlation, while red indicates

positive correlation. B) Network diagrams were constructed showing elements with a correlation of ≥ 0.7 between variables.

Fig 8

A) Correlations between the twenty mRNAs and thirteen inflammatory mediators with the lowest p-values following allergen exposure were analysed by partial least squares regression and the first two components plotted as a heatmap. Blue depicts negative correlation, while red indicates positive correlation. B) Network diagrams were constructed showing elements with a correlation of ≥ 0.7 between variables.

Tables

Table E1. Study participant characteristics.

Characteristics of the 15 participants whose data was analysed. Provocative methacholine concentration resulting in a 20% drop in FEV₁ (PC₂₀), PC₂₀ dose response slope (DRS).

Table E2. Effects of conditions on miRNA expression.

The effects of A) diesel exhaust (DE) plus allergen (DEA), B) DE plus saline (DES), and C) filtered air plus allergen (FAA) in comparison to filtered air plus saline (FAS) on miRNA expression were measured using NanoString® nCounter™ Human miRNA v2 assays and log fold change, mean expression levels, p- and q-values recorded.

Table E3. Effects of conditions on mRNA expression.

The effects of A) diesel exhaust (DE) plus allergen (DEA), B) DE plus saline (DES), and C) filtered air plus allergen (FAA) in comparison to filtered air plus saline (FAS) on mRNA expression were measured using NanoString® nCounter™ Human Immunology v1 assays and log fold change, mean expression levels, p- and q-values recorded.

Table E4. Output of mixed model with interaction analysis of treatment effects on miRNA expression.

The effects of diesel exhaust (DE) and allergen on miRNA expression was measured using NanoString® nCounter™ Human miRNA v2 assays and analysed using mixed effects models including a DE plus allergen interaction term.

742

743 Table E5. Output of mixed model with interaction analysis of treatment effects on mRNA
744 expression.

745 The effects of diesel exhaust (DE) and allergen on mRNA expression was measured using
746 NanoString® nCounter™ Human Immunology v1 assays and analysed using mixed effects
747 models including a DE plus allergen interaction term.

748

749 Table E6. Output of mixed model analysis of treatment effects on miRNA expression.

750 The effects of diesel exhaust (DE) and allergen on miRNA expression was measured using
751 NanoString® nCounter™ Human miRNA v2 assays and analysed using mixed effects models.

752

753 Table E7. Output of mixed model analysis of treatment effects on mRNA expression.

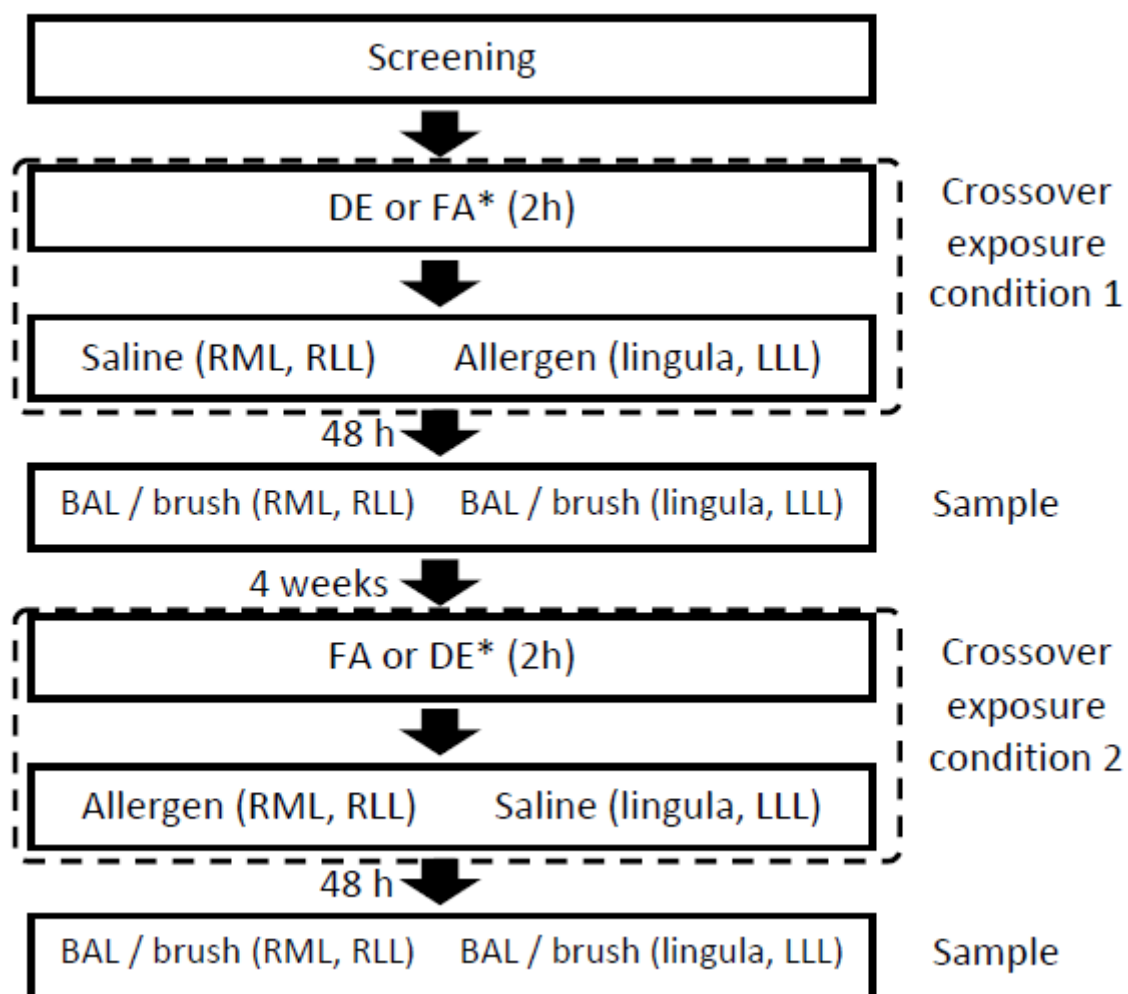
754 The effects of diesel exhaust (DE) and allergen on mRNA expression was measured using
755 NanoString® nCounter™ Human Immunology v1 assays and analysed using mixed effects
756 models.

757

758 Table E8. Gene ontology analysis of mRNAs modulated by allergen.

759 Gene ontology analysis of genes significantly modulated ≥ 0.2 following allergen treatment was
760 performed using gene annotation tool to help explain relationships (GATHER) and all terms
761 recorded. False discovery rate (FDR), Fisher's exact test (FET), negative (Neg).

A

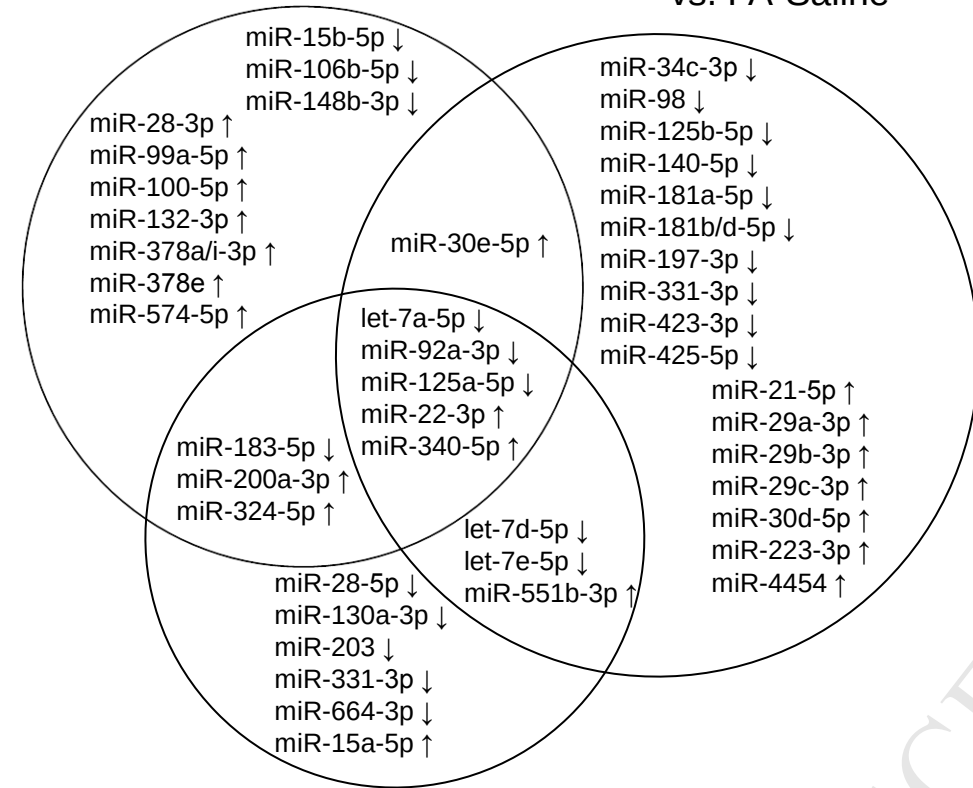


B

miRNAs (800)	mRNAs (511)	Inflammatory Markers (15)
Removal of Outlier Samples		
Normalization		
Correction factors from positive control probes applied		
Samples normalized to top: 90 mRNAs or 94 miRNAs		
Background Filtering		
Sample Filtering (Mean + 2 SD of Negative probes)		
Global Filtering (Max of Sample Background)		
Flooring of All Values Below Global Background		
Univariate Analysis		
Robust linear model (limma) comparing: DEA, DES, FAA vs. FAS		
Mixed-effects model (fixed effect: condition, random effect: volunteer id) w/wo interaction		
Multivariate Analysis		
PLS and sparse PLS analysis of interactions between: miRNA & mRNA, miRNA & inflammatory markers, mRNA and inflammatory markers		

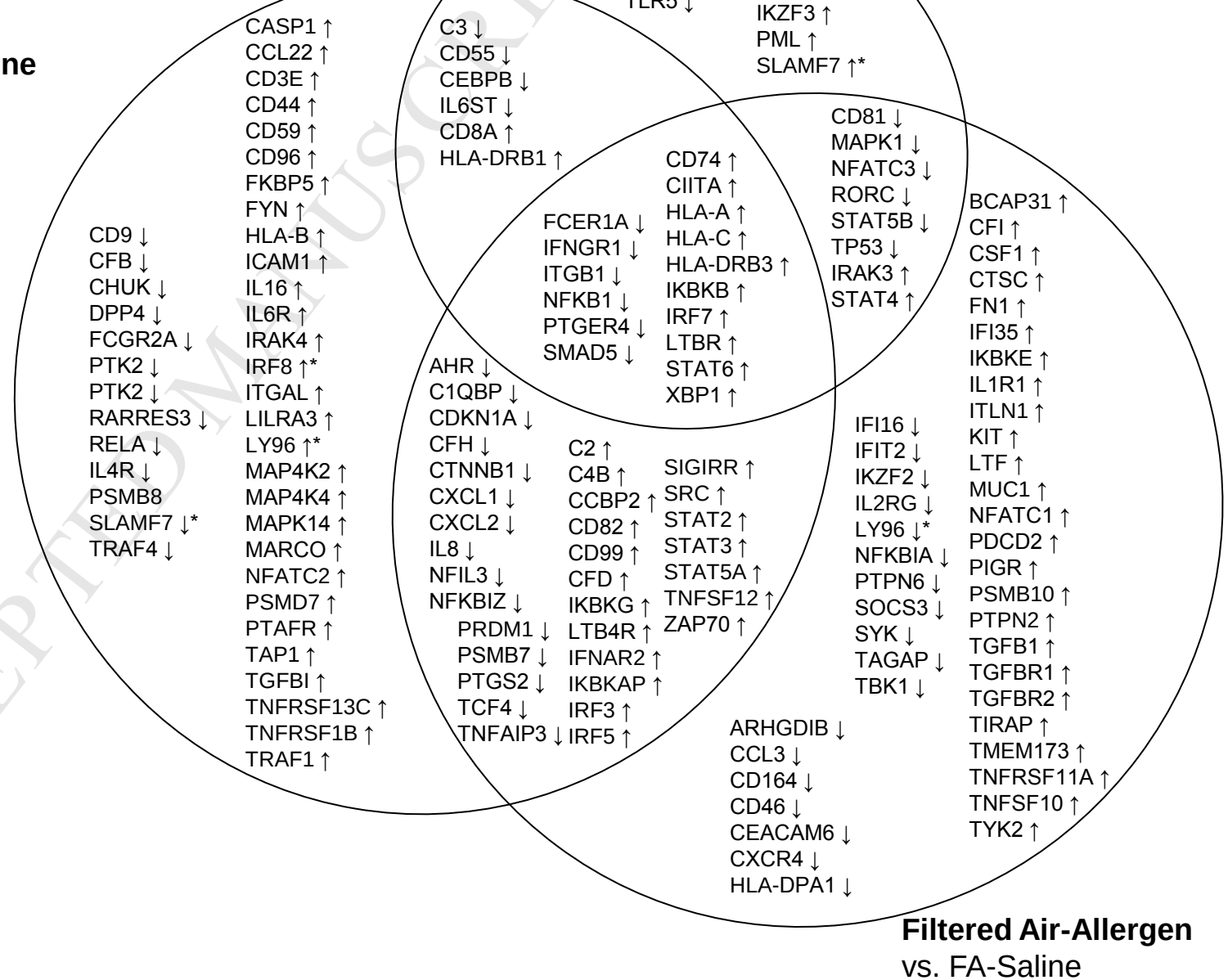
A

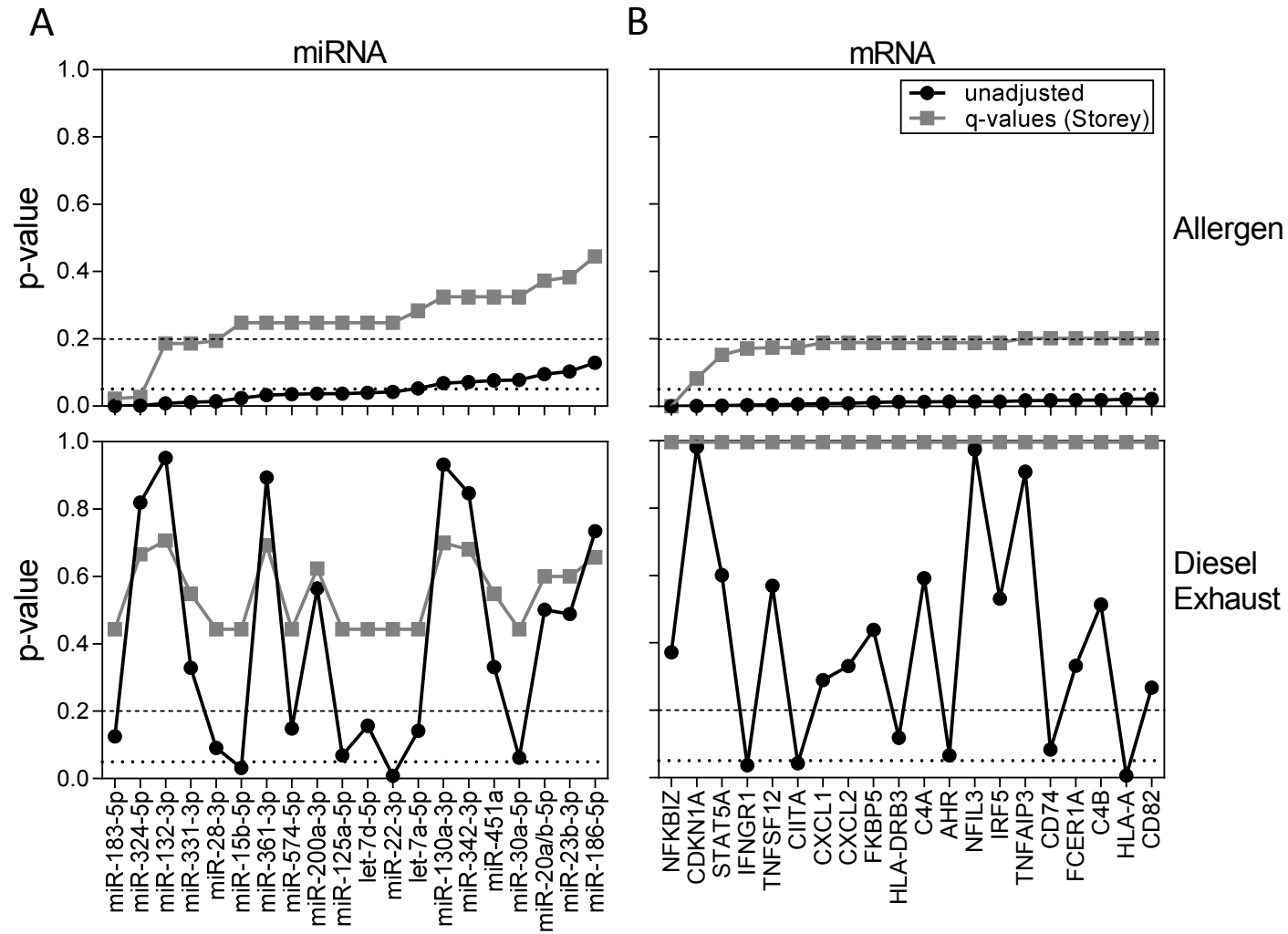
**Diesel Exhaust-Allergen
vs. FA-Saline**

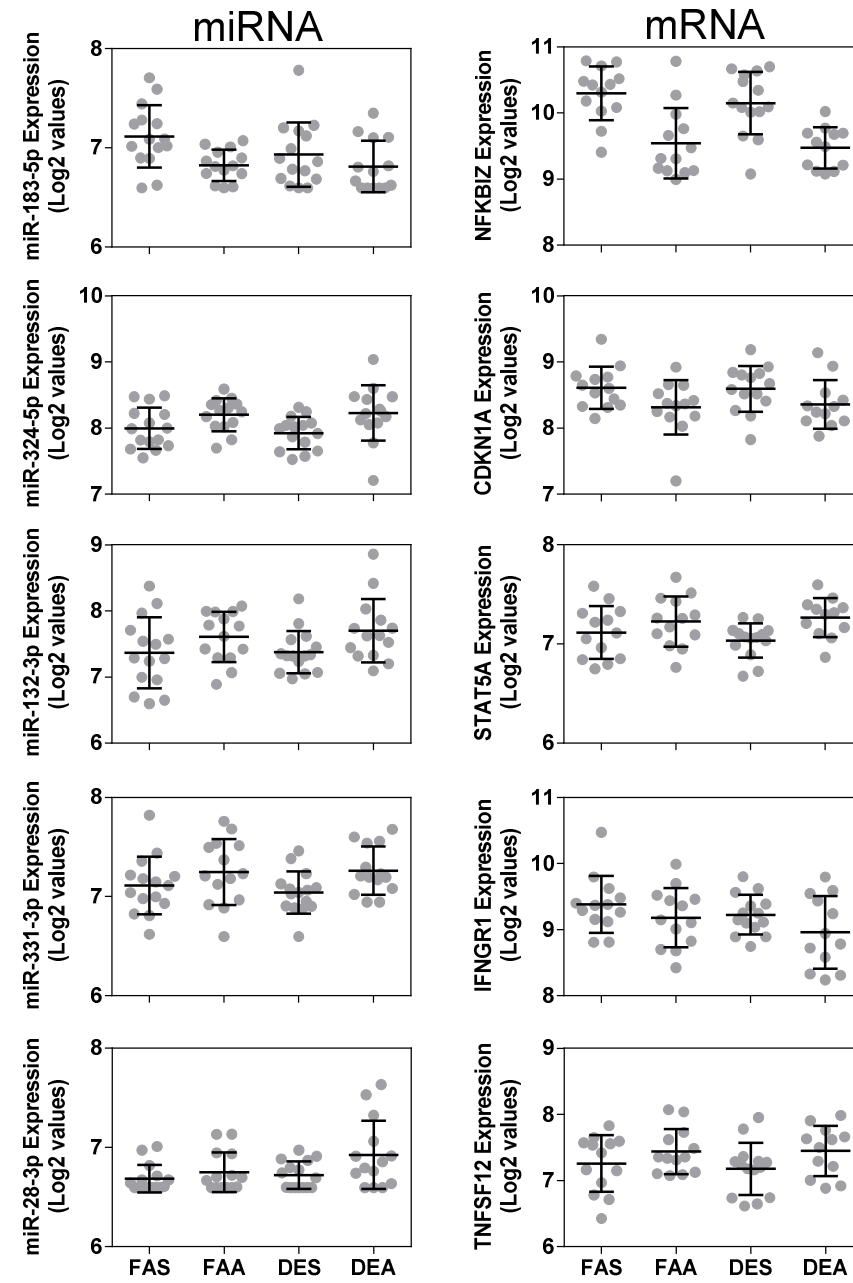


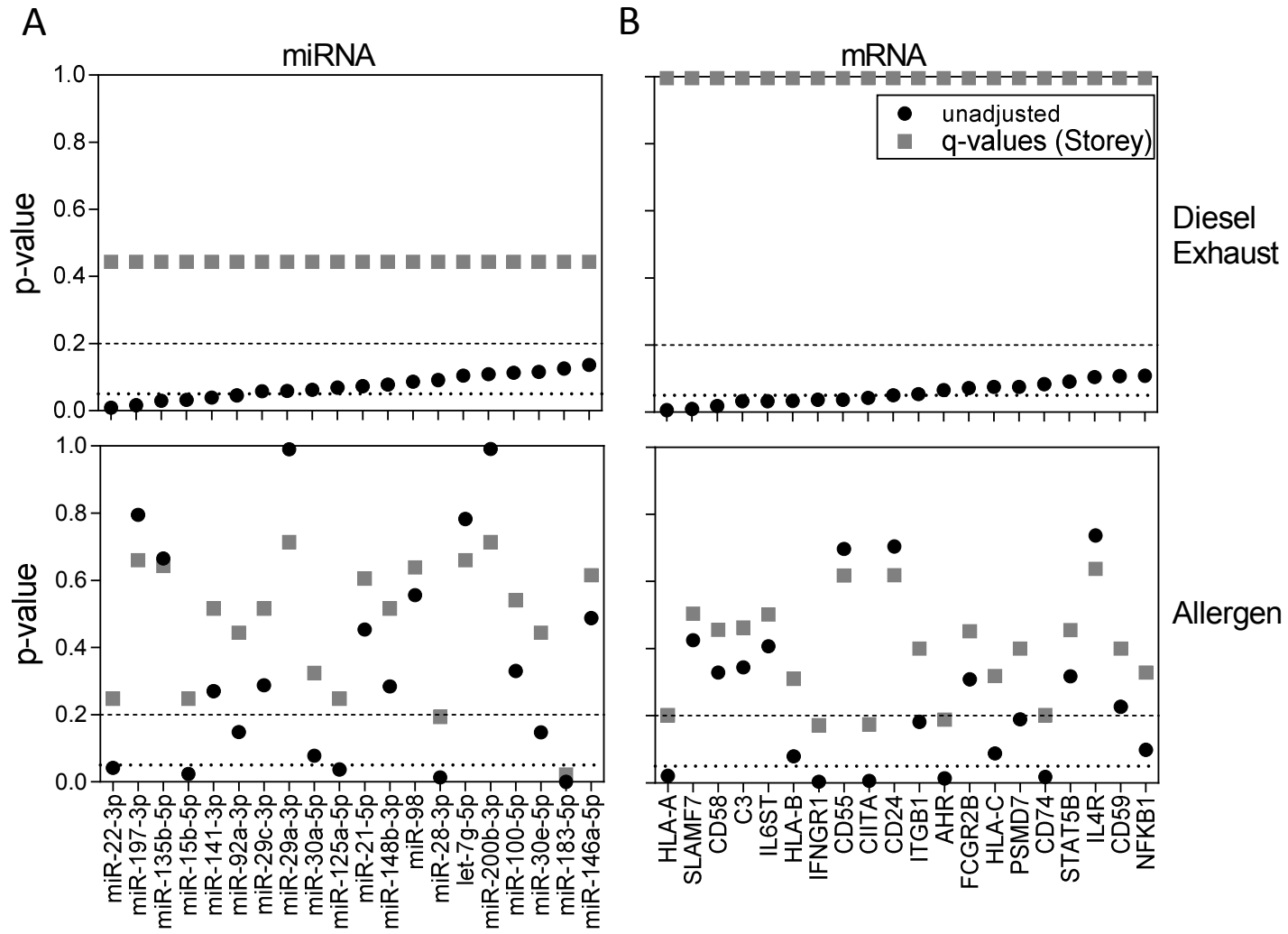
B

**Diesel Exhaust-Allergen
vs. FA-Saline**

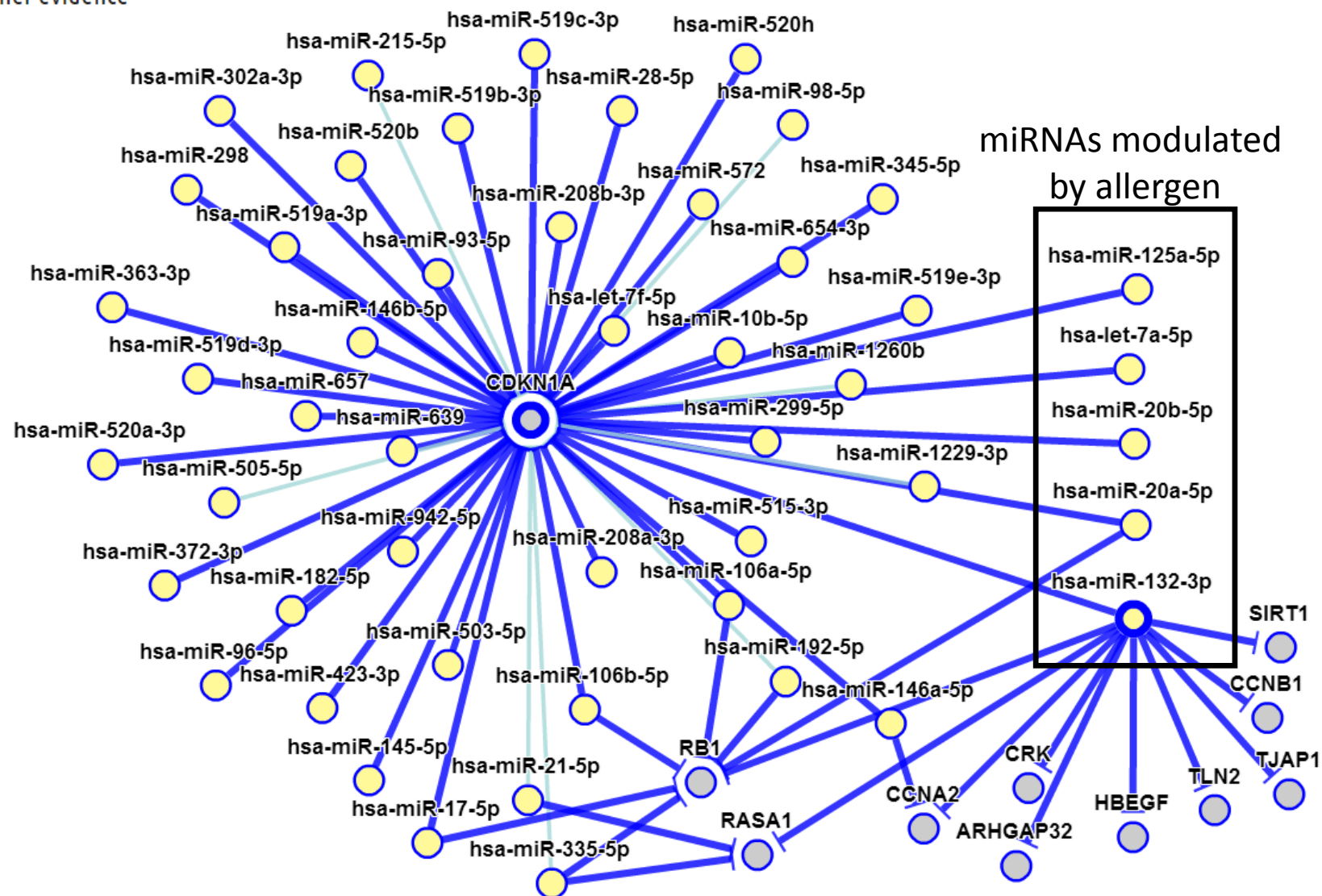


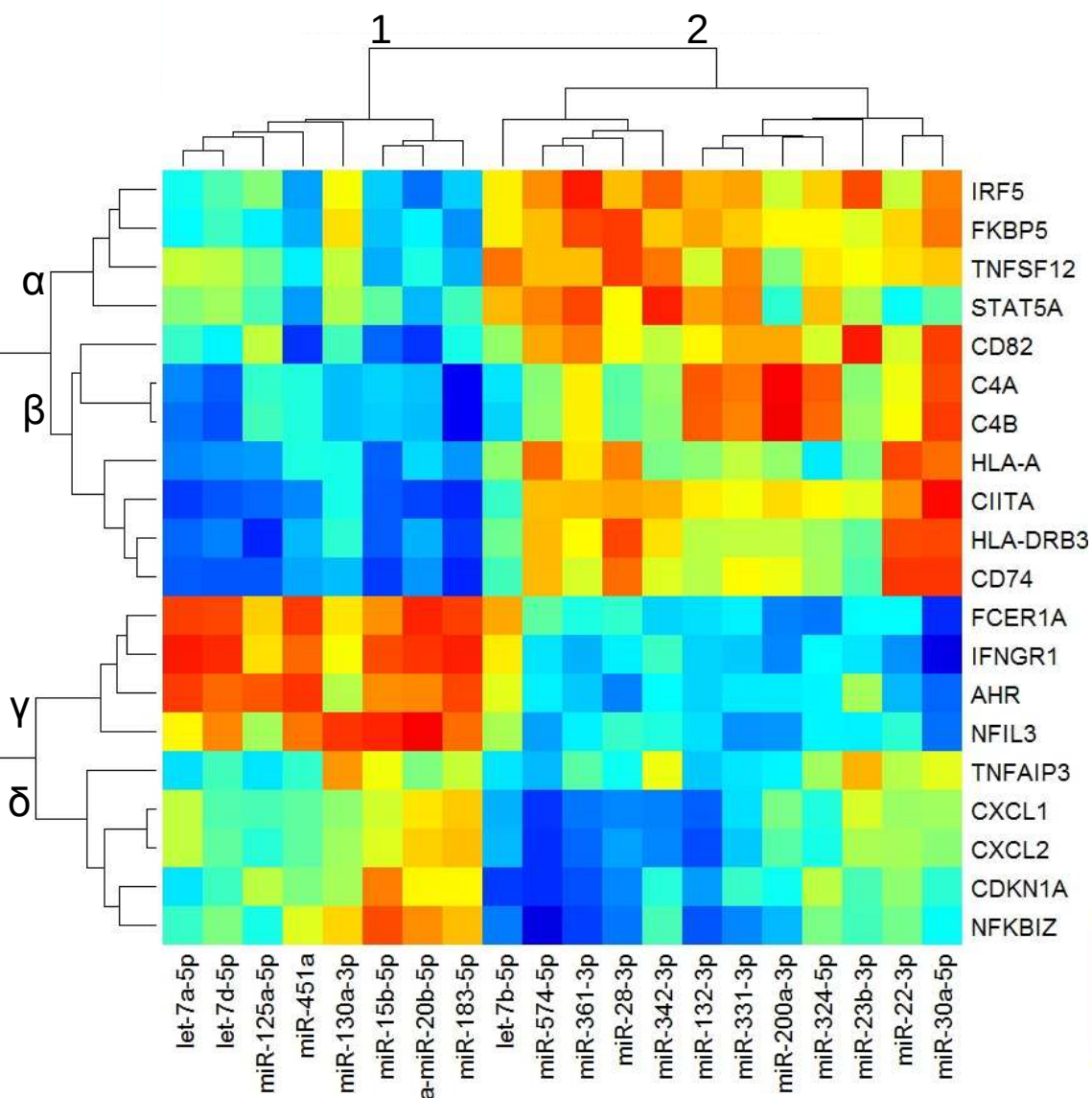




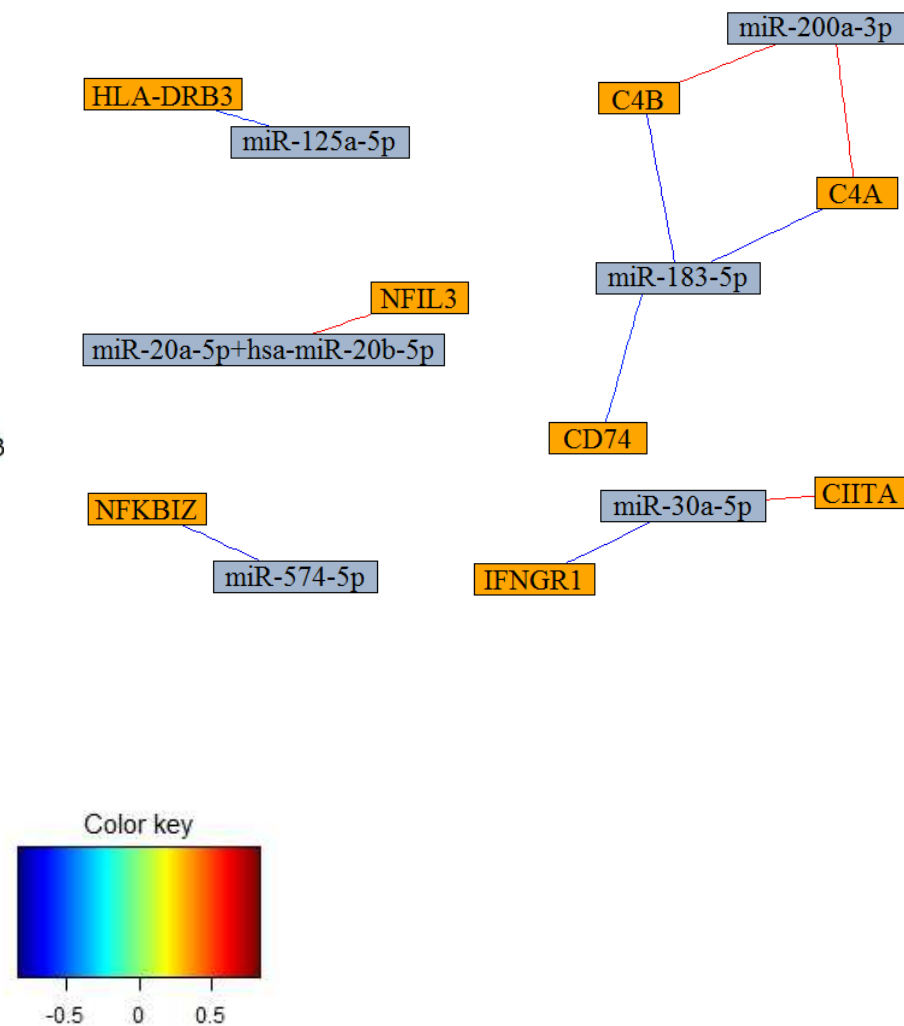


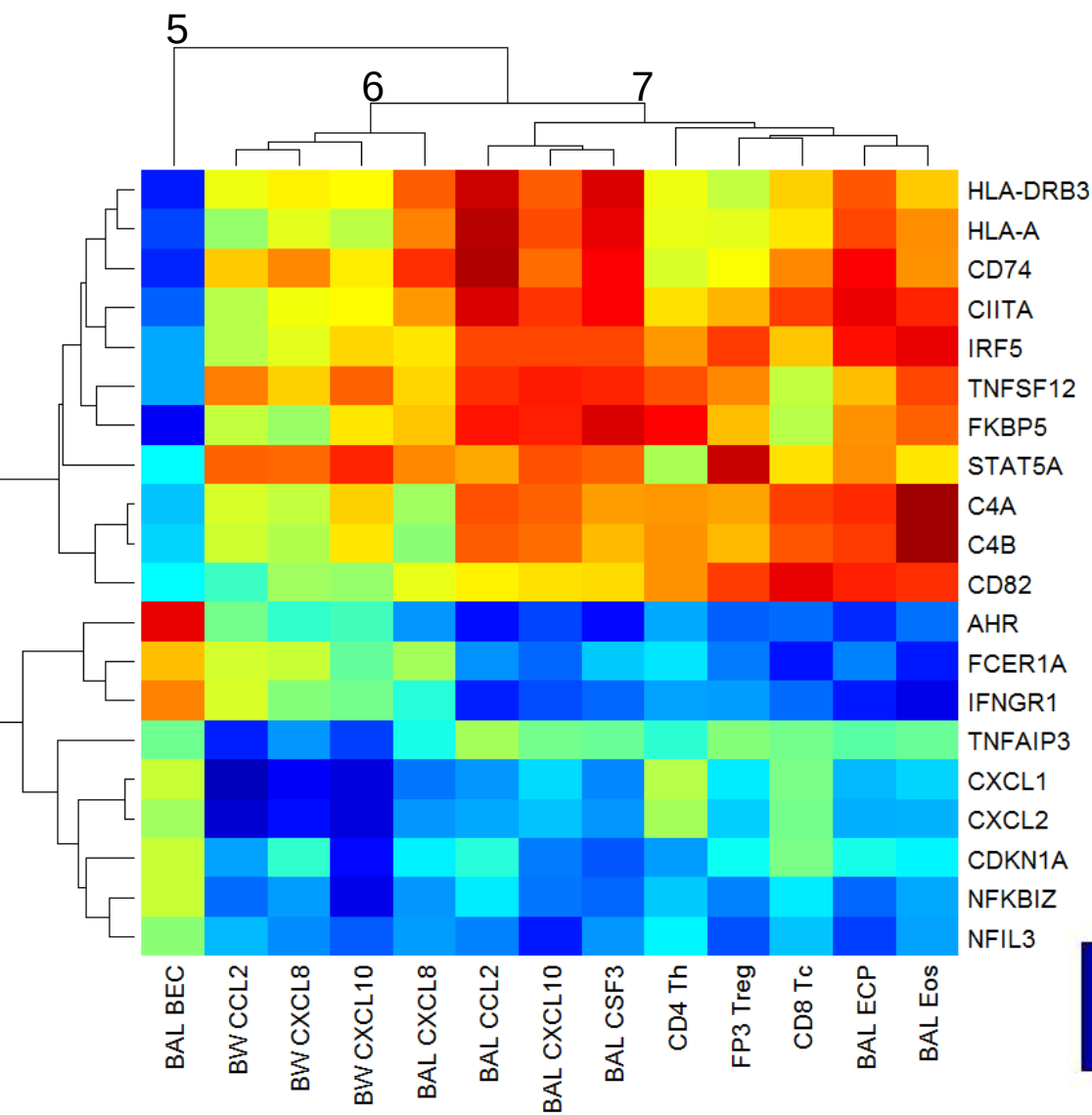
- Strong evidence (reporter assay, western blot, qRT-PCR or qPCR)
- Other evidence



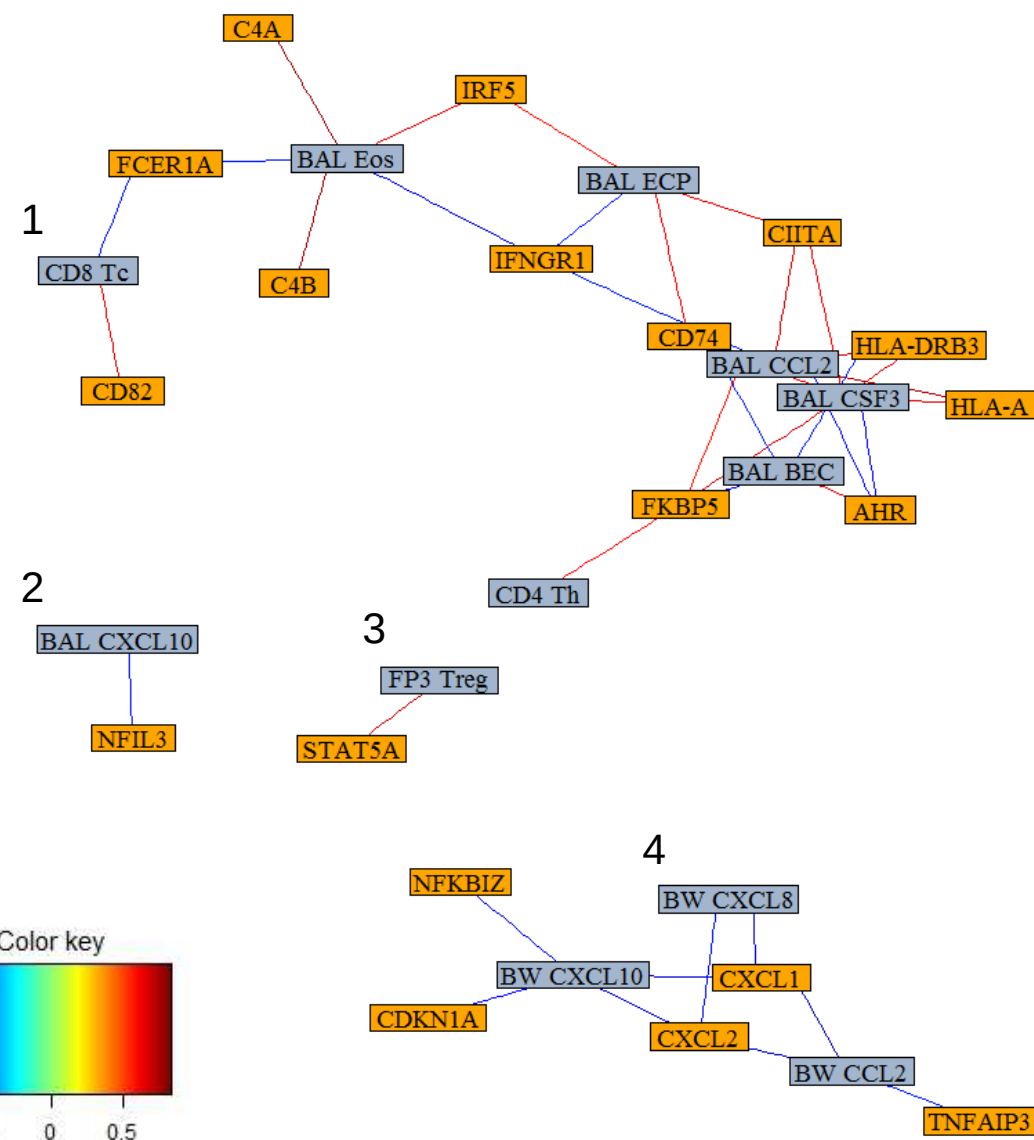


B





B



	Gender	Age	PC ₂₀	DRS	Instilled Allergen
1	F	20	13.85	0.56	HDM
2	F	31	>16	0.13	HDM
3	F	24	>16	0.45	HDM
4	M	32	>16	0.35	Grasses
5	F	34	0.185	2.53	Grasses
6	M	27	>16	0.10	HDM
7	F	25	>16	0.10	HDM
8	M	46	0.38	2.31	Birch
9	M	27	>16	0.13	Grasses
10	F	46	>16	0.06	HDM
11	F	31	0.26	2.47	Birch
12	M	28	>16	0.54	Grasses
13	M	23	2.41	1.15	Grasses
14	F	23	>16	0.18	HDM
15	M	23	>16	0.05	HDM

miRNAs	log Fold Change	Mean Expression	p-Value	q-Value
hsa-miR-183-5p	-0.32	6.93	0.00	0.00
hsa-miR-22-3p	0.34	9.45	0.00	0.01
hsa-miR-28-3p	0.16	6.77	0.00	0.01
hsa-miR-30e-5p	0.19	8.05	0.00	0.01
hsa-miR-15b-5p	-0.47	10.29	0.00	0.02
hsa-let-7a-5p	-0.28	13.82	0.00	0.02
hsa-miR-30a-5p	0.25	9.53	0.00	0.03
hsa-miR-574-5p	0.33	7.46	0.01	0.03
hsa-let-7d-5p	-0.21	9.70	0.01	0.03
hsa-miR-451a	-1.68	10.86	0.01	0.03
hsa-miR-92a-3p	-0.51	7.42	0.01	0.03
hsa-miR-125a-5p	-0.44	9.54	0.01	0.03
hsa-miR-100-5p	0.26	8.68	0.01	0.03
hsa-miR-340-5p	0.21	7.23	0.01	0.05
hsa-miR-324-5p	0.24	8.08	0.01	0.05
hsa-miR-200a-3p	0.36	11.49	0.01	0.05
hsa-miR-132-3p	0.28	7.51	0.02	0.07
hsa-miR-30d-5p	0.19	8.92	0.02	0.07
hsa-miR-361-3p	0.20	7.18	0.03	0.08
hsa-miR-146a-5p	0.29	8.69	0.03	0.08
hsa-miR-99a-5p	0.18	10.45	0.03	0.08
hsa-miR-197-3p	-0.24	6.94	0.04	0.10
hsa-miR-342-3p	0.14	10.53	0.04	0.11
hsa-miR-30c-5p	0.14	7.39	0.04	0.11
hsa-miR-222-3p	0.21	9.62	0.04	0.11
hsa-let-7e-5p	-0.20	8.49	0.04	0.11
hsa-miR-135b-5p	0.15	8.34	0.05	0.12
hsa-miR-141-3p	0.16	10.76	0.06	0.12
hsa-miR-151a-3p	0.16	7.19	0.06	0.13
hsa-miR-148b-3p	-0.19	9.10	0.07	0.15
hsa-miR-331-3p	0.14	7.16	0.08	0.15
hsa-miR-20a/b-5p	-0.13	8.30	0.08	0.16
hsa-miR-429	0.26	9.82	0.09	0.16
hsa-miR-186-5p	0.20	7.44	0.09	0.16
hsa-miR-205-5p	-0.20	13.04	0.10	0.17
hsa-miR-130a-3p	-0.13	7.04	0.11	0.19
hsa-miR-551b-3p	0.24	7.74	0.11	0.19
hsa-miR-29a-3p	0.17	10.60	0.12	0.20
hsa-miR-223-3p	0.32	10.59	0.13	0.22
hsa-miR-21-5p	0.21	13.01	0.14	0.22

hsa-miR-151a-5p	0.07	7.36	0.15	0.22
hsa-miR-378a/i-3p	0.17	7.56	0.15	0.22
hsa-miR-106b-5p	-0.17	7.57	0.16	0.22
hsa-miR-378e	0.27	8.07	0.16	0.22
hsa-miR-28-5p	-0.08	6.92	0.18	0.25
hsa-miR-181b/d-5p	-0.10	6.89	0.18	0.25
hsa-miR-23a-3p	0.10	11.03	0.19	0.25
hsa-miR-23b-3p	-0.07	10.54	0.21	0.27
hsa-miR-425-5p	0.07	7.48	0.25	0.31
hsa-miR-181a-5p	-0.09	9.29	0.24	0.30
hsa-miR-191-5p	-0.08	10.93	0.25	0.31
hsa-miR-26b-5p	-0.09	10.16	0.30	0.36
hsa-miR-107	-0.14	8.65	0.30	0.36
hsa-miR-99b-5p	0.08	9.19	0.32	0.37
hsa-miR-30b-5p	-0.20	9.79	0.33	0.37
hsa-miR-98	-0.09	8.09	0.33	0.37
hsa-miR-15a-5p	0.10	10.84	0.35	0.38
hsa-let-7f-5p	-0.19	10.43	0.35	0.38
hsa-let-7c	0.06	10.65	0.38	0.39
hsa-miR-221-3p	0.06	7.15	0.40	0.39
hsa-miR-29b-3p	0.13	11.94	0.39	0.39
hsa-miR-423-3p	-0.05	6.76	0.40	0.39
hsa-miR-26a-5p	-0.14	10.85	0.39	0.39
hsa-miR-34a-5p	0.08	9.14	0.40	0.39
hsa-miR-1260a	-0.17	8.91	0.43	0.41
hsa-let-7g-5p	-0.09	13.29	0.43	0.41
hsa-miR-664-3p	-0.03	6.88	0.53	0.49
hsa-miR-200b-3p	0.07	12.05	0.48	0.45
hsa-miR-148a-3p	0.06	9.12	0.54	0.49
hsa-miR-375	-0.09	10.05	0.57	0.50
hsa-miR-140-5p	-0.04	7.04	0.61	0.52
hsa-miR-125b-5p	0.06	12.84	0.57	0.50
hsa-miR-24-3p	0.05	9.62	0.61	0.52
hsa-miR-31-5p	-0.03	7.01	0.65	0.54
hsa-miR-449a	-0.06	9.14	0.64	0.54
hsa-let-7i-5p	0.04	9.93	0.66	0.54
hsa-miR-720	-0.12	9.90	0.68	0.55
hsa-miR-27b-3p	-0.03	9.19	0.73	0.56
hsa-miR-16-5p	-0.05	11.73	0.72	0.56
hsa-miR-598	-0.02	6.90	0.79	0.57
hsa-miR-374b-5p	-0.01	6.78	0.77	0.57

hsa-miR-4454	0.06	12.23	0.77	0.57
hsa-miR-29c-3p	0.04	9.20	0.69	0.55
hsa-miR-34c-5p	0.04	12.31	0.72	0.56
hsa-miR-493-3p	-0.03	7.44	0.82	0.57
hsa-let-7b-5p	-0.02	12.24	0.75	0.57
hsa-miR-142-3p	0.04	9.04	0.82	0.57
hsa-miR-150-5p	0.04	10.14	0.81	0.57
hsa-miR-106a-5p+hsa-miR-17-5p	0.00	8.45	0.98	0.63
hsa-miR-93-5p	0.00	9.67	0.98	0.63
hsa-miR-374a-5p	-0.03	7.77	0.78	0.57
hsa-miR-34b-3p	0.05	8.41	0.78	0.57
hsa-miR-200c-3p	-0.01	13.43	0.88	0.61
hsa-miR-19b-3p	-0.01	7.73	0.90	0.61
hsa-miR-25-3p	0.01	10.11	0.96	0.63
hsa-miR-34c-3p	0.01	11.65	0.91	0.61
hsa-miR-203	0.00	7.47	0.97	0.63
hsa-miR-1180	0.02	8.86	0.92	0.61

miRNAs	log Fold Change	Mean Expression	p-Value	q-Value
hsa-miR-183-5p	-0.26	6.93	0.00	0.00
hsa-miR-340-5p	0.29	7.23	0.00	0.02
hsa-let-7a-5p	-0.24	13.82	0.00	0.13
hsa-let-7d-5p	-0.20	9.70	0.01	0.16
hsa-miR-130a-3p	-0.20	7.04	0.02	0.24
hsa-let-7e-5p	-0.24	8.49	0.02	0.24
hsa-miR-342-3p	0.15	10.53	0.02	0.24
hsa-miR-324-5p	0.22	8.08	0.02	0.24
hsa-miR-22-3p	0.20	9.45	0.03	0.25
hsa-miR-664-3p	-0.12	6.88	0.03	0.25
hsa-miR-4454	0.49	12.23	0.03	0.25
hsa-miR-200a-3p	0.31	11.49	0.03	0.25
hsa-miR-125a-5p	-0.35	9.54	0.03	0.25
hsa-miR-28-5p	-0.12	6.92	0.04	0.26
hsa-miR-423-3p	-0.12	6.76	0.05	0.32
hsa-miR-23b-3p	-0.12	10.54	0.06	0.35
hsa-miR-20a/b-5p	-0.14	8.30	0.07	0.38
hsa-miR-30e-5p	0.10	8.05	0.07	0.38
hsa-miR-331-3p	0.15	7.16	0.07	0.38
hsa-miR-15a-5p	0.18	10.84	0.09	0.43
hsa-miR-132-3p	0.20	7.51	0.09	0.44
hsa-miR-100-5p	0.16	8.68	0.10	0.44
hsa-miR-451a	-0.91	10.86	0.13	0.52
hsa-miR-29b-3p	0.23	11.94	0.14	0.52
hsa-miR-449a	-0.18	9.14	0.13	0.52
hsa-miR-99a-5p	0.12	10.45	0.14	0.52
hsa-miR-361-3p	0.13	7.18	0.14	0.52
hsa-miR-203	-0.13	7.47	0.15	0.52
hsa-miR-551b-3p	0.22	7.74	0.16	0.53
hsa-miR-140-5p	-0.10	7.04	0.17	0.56
hsa-miR-34c-3p	-0.13	11.65	0.19	0.56
hsa-miR-574-5p	0.15	7.46	0.20	0.56
hsa-miR-148a-3p	0.13	9.12	0.20	0.56
hsa-miR-186-5p	0.15	7.44	0.20	0.56
hsa-miR-1260a	0.28	8.91	0.20	0.56
hsa-miR-30c-5p	0.08	7.39	0.22	0.58
hsa-miR-107	-0.17	8.65	0.21	0.58
hsa-miR-493-3p	-0.15	7.44	0.23	0.60
hsa-miR-92a-3p	-0.21	7.42	0.25	0.63
hsa-miR-1180	-0.25	8.86	0.26	0.64

hsa-miR-181b/d-5p	-0.08	6.89	0.27	0.65
hsa-miR-720	0.31	9.90	0.29	0.69
hsa-miR-16-5p	0.14	11.73	0.31	0.70
hsa-miR-221-3p	0.07	7.15	0.31	0.70
hsa-miR-28-3p	0.04	6.77	0.34	0.73
hsa-miR-374b-5p	-0.04	6.78	0.40	0.83
hsa-miR-106b-5p	0.10	7.57	0.39	0.82
hsa-miR-429	0.12	9.82	0.41	0.83
hsa-miR-191-5p	-0.06	10.93	0.43	0.84
hsa-miR-26b-5p	-0.07	10.16	0.43	0.84
hsa-miR-21-5p	0.11	13.01	0.44	0.85
hsa-miR-150-5p	0.11	10.14	0.50	0.87
hsa-miR-374a-5p	-0.08	7.77	0.46	0.87
hsa-miR-200c-3p	-0.04	13.43	0.50	0.87
hsa-miR-93-5p	-0.04	9.67	0.51	0.87
hsa-miR-30d-5p	0.05	8.92	0.52	0.87
hsa-miR-30a-5p	0.05	9.53	0.55	0.87
hsa-let-7i-5p	-0.05	9.93	0.54	0.87
hsa-miR-197-3p	0.06	6.94	0.58	0.87
hsa-miR-181a-5p	-0.05	9.29	0.54	0.87
hsa-miR-15b-5p	-0.08	10.29	0.58	0.87
hsa-miR-34c-5p	0.07	12.31	0.57	0.87
hsa-miR-151a-5p	0.03	7.36	0.57	0.87
hsa-miR-31-5p	0.04	7.01	0.57	0.87
hsa-miR-135b-5p	-0.04	8.34	0.63	0.88
hsa-miR-26a-5p	-0.09	10.85	0.59	0.87
hsa-let-7f-5p	-0.12	10.43	0.57	0.87
hsa-miR-378a/i-3p	0.06	7.56	0.59	0.87
hsa-miR-99b-5p	0.04	9.19	0.62	0.87
hsa-let-7g-5p	-0.06	13.29	0.61	0.87
hsa-miR-23a-3p	0.03	11.03	0.66	0.91
hsa-miR-200b-3p	-0.04	12.05	0.67	0.91
hsa-miR-151a-3p	0.03	7.19	0.70	0.94
hsa-miR-146a-5p	-0.04	8.69	0.74	0.97
hsa-miR-141-3p	0.02	10.76	0.81	1.00
hsa-miR-425-5p	0.01	7.48	0.92	1.00
hsa-miR-375	-0.05	10.05	0.73	0.97
hsa-miR-106a-5p+hsa-miR-17-5p	0.01	8.45	0.87	1.00
hsa-miR-223-3p	-0.01	10.59	0.98	1.00
hsa-miR-27b-3p	0.00	9.19	1.00	1.00
hsa-miR-598	-0.02	6.90	0.79	1.00

hsa-let-7c	-0.01	10.65	0.84	1.00
hsa-miR-142-3p	0.02	9.04	0.94	1.00
hsa-miR-34a-5p	0.02	9.14	0.81	1.00
hsa-miR-25-3p	0.00	10.11	1.00	1.00
hsa-miR-222-3p	0.01	9.62	0.95	1.00
hsa-miR-30b-5p	0.06	9.79	0.79	1.00
hsa-miR-29a-3p	0.02	10.60	0.86	1.00
hsa-let-7b-5p	0.01	12.24	0.89	1.00
hsa-miR-19b-3p	0.00	7.73	0.99	1.00
hsa-miR-378e	0.04	8.07	0.83	1.00
hsa-miR-24-3p	-0.01	9.62	0.93	1.00
hsa-miR-34b-3p	0.01	8.41	0.98	1.00
hsa-miR-205-5p	-0.02	13.04	0.89	1.00
hsa-miR-98	-0.01	8.09	0.89	1.00
hsa-miR-29c-3p	0.01	9.20	0.93	1.00
hsa-miR-125b-5p	0.00	12.84	0.97	1.00
hsa-miR-148b-3p	0.00	9.10	1.00	1.00

miRNAs	log Fold Change	Mean Expression	p-Value	q-Value
hsa-miR-340-5p	0.25	7.23	0.00	0.14
hsa-miR-4454	0.62	12.23	0.01	0.14
hsa-miR-183-5p	-0.16	6.93	0.01	0.14
hsa-let-7a-5p	-0.22	13.82	0.01	0.14
hsa-miR-30e-5p	0.14	8.05	0.01	0.14
hsa-miR-22-3p	0.23	9.45	0.01	0.14
hsa-miR-135b-5p	0.20	8.34	0.01	0.14
hsa-miR-181a-5p	-0.19	9.29	0.01	0.14
hsa-miR-34c-3p	-0.23	11.65	0.02	0.15
hsa-miR-29b-3p	0.36	11.94	0.02	0.15
hsa-let-7b-5p	-0.15	12.24	0.02	0.15
hsa-miR-197-3p	-0.25	6.94	0.02	0.16
hsa-let-7d-5p	-0.15	9.70	0.03	0.19
hsa-miR-29c-3p	0.23	9.20	0.03	0.19
hsa-miR-423-3p	-0.12	6.76	0.04	0.20
hsa-miR-125a-5p	-0.32	9.54	0.04	0.20
hsa-let-7e-5p	-0.19	8.49	0.05	0.20
hsa-miR-181b/d-5p	-0.14	6.89	0.05	0.20
hsa-miR-21-5p	0.27	13.01	0.05	0.20
hsa-miR-100-5p	0.19	8.68	0.05	0.20
hsa-miR-146a-5p	0.24	8.69	0.06	0.20
hsa-miR-140-5p	-0.15	7.04	0.06	0.20
hsa-miR-98	-0.17	8.09	0.06	0.20
hsa-miR-493-3p	-0.22	7.44	0.07	0.21
hsa-miR-92a-3p	-0.33	7.42	0.07	0.21
hsa-let-7g-5p	-0.20	13.29	0.09	0.28
hsa-miR-1260a	0.35	8.91	0.10	0.28
hsa-miR-25-3p	-0.17	10.11	0.12	0.34
hsa-miR-29a-3p	0.17	10.60	0.12	0.34
hsa-miR-125b-5p	-0.15	12.84	0.15	0.41
hsa-miR-374a-5p	0.16	7.77	0.16	0.41
hsa-miR-664-3p	-0.07	6.88	0.17	0.43
hsa-miR-720	0.38	9.90	0.19	0.47
hsa-miR-425-5p	-0.08	7.48	0.21	0.49
hsa-miR-107	-0.17	8.65	0.21	0.48
hsa-miR-200c-3p	-0.07	13.43	0.26	0.53
hsa-miR-141-3p	0.10	10.76	0.26	0.53
hsa-miR-331-3p	-0.09	7.16	0.26	0.53
hsa-miR-15b-5p	-0.15	10.29	0.27	0.53
hsa-miR-148a-3p	0.11	9.12	0.26	0.53

hsa-let-7f-5p	-0.22	10.43	0.27	0.53
hsa-let-7i-5p	-0.09	9.93	0.29	0.55
hsa-miR-200a-3p	0.14	11.49	0.31	0.57
hsa-miR-551b-3p	0.15	7.74	0.31	0.57
hsa-miR-223-3p	0.20	10.59	0.33	0.58
hsa-miR-203	-0.08	7.47	0.34	0.58
hsa-miR-324-5p	-0.09	8.08	0.34	0.58
hsa-miR-30c-5p	0.06	7.39	0.38	0.61
hsa-miR-30d-5p	0.07	8.92	0.36	0.60
hsa-miR-19b-3p	0.09	7.73	0.38	0.61
hsa-miR-30b-5p	0.17	9.79	0.39	0.61
hsa-miR-23a-3p	0.06	11.03	0.41	0.63
hsa-miR-142-3p	0.15	9.04	0.44	0.65
hsa-miR-598	0.05	6.90	0.44	0.65
hsa-miR-99a-5p	0.06	10.45	0.46	0.66
hsa-miR-30a-5p	0.06	9.53	0.48	0.67
hsa-miR-148b-3p	-0.07	9.10	0.48	0.67
hsa-miR-20a/b-5p	-0.04	8.30	0.56	0.70
hsa-let-7c	-0.04	10.65	0.52	0.70
hsa-miR-99b-5p	-0.05	9.19	0.53	0.70
hsa-miR-27b-3p	0.05	9.19	0.56	0.70
hsa-miR-222-3p	0.06	9.62	0.57	0.70
hsa-miR-15a-5p	0.06	10.84	0.57	0.70
hsa-miR-26a-5p	-0.10	10.85	0.54	0.70
hsa-miR-26b-5p	-0.05	10.16	0.58	0.70
hsa-miR-374b-5p	-0.02	6.78	0.58	0.70
hsa-miR-31-5p	0.04	7.01	0.60	0.70
hsa-miR-191-5p	-0.03	10.93	0.63	0.70
hsa-miR-361-3p	-0.04	7.18	0.62	0.70
hsa-miR-451a	-0.29	10.86	0.62	0.70
hsa-miR-205-5p	-0.06	13.04	0.62	0.70
hsa-miR-200b-3p	0.05	12.05	0.63	0.70
hsa-miR-28-3p	0.02	6.77	0.69	0.74
hsa-miR-132-3p	-0.05	7.51	0.69	0.74
hsa-miR-130a-3p	-0.02	7.04	0.77	0.78
hsa-miR-375	-0.06	10.05	0.70	0.74
hsa-miR-429	-0.05	9.82	0.73	0.75
hsa-miR-106b-5p	0.04	7.57	0.76	0.77
hsa-miR-93-5p	-0.02	9.67	0.80	0.78
hsa-miR-23b-3p	-0.01	10.54	0.93	0.79
hsa-miR-106a-5p+hsa-miR-17-5p	0.01	8.45	0.89	0.79

hsa-miR-34c-5p	-0.03	12.31	0.80	0.78
hsa-miR-16-5p	0.03	11.73	0.82	0.78
hsa-miR-28-5p	0.00	6.92	0.96	0.79
hsa-miR-378a/i-3p	0.04	7.56	0.72	0.75
hsa-miR-151a-5p	0.01	7.36	0.88	0.78
hsa-miR-150-5p	0.03	10.14	0.84	0.78
hsa-miR-342-3p	-0.01	10.53	0.85	0.78
hsa-miR-221-3p	0.00	7.15	0.97	0.79
hsa-miR-1180	-0.06	8.86	0.78	0.78
hsa-miR-34a-5p	-0.02	9.14	0.86	0.78
hsa-miR-449a	-0.02	9.14	0.87	0.78
hsa-miR-186-5p	-0.01	7.44	0.95	0.79
hsa-miR-24-3p	0.00	9.62	0.98	0.79
hsa-miR-378e	0.04	8.07	0.82	0.78
hsa-miR-574-5p	-0.01	7.46	0.94	0.79
hsa-miR-34b-3p	-0.01	8.41	0.96	0.79
hsa-miR-151a-3p	-0.01	7.19	0.91	0.79

miRNAs	log Fold Change	Mean Expression	p-Value	q-Value
NFKBIZ	-0.74	9.88	0.00	0.00
CD82	0.31	8.85	0.00	0.00
IKBKG	0.35	7.46	0.00	0.00
CD46	-0.32	11.15	0.00	0.00
HLA-A	0.36	12.09	0.00	0.00
AHR	-0.27	10.57	0.00	0.00
IL8	-0.52	10.63	0.00	0.01
FCER1A	-0.57	6.47	0.00	0.01
ITGB1	-0.24	10.55	0.00	0.01
HLA-B	0.29	13.24	0.00	0.01
IFNGR1	-0.45	9.19	0.00	0.01
CD74	0.32	13.04	0.00	0.01
LTB4R	0.39	7.24	0.00	0.01
CCL22	0.29	6.19	0.00	0.01
CIITA	0.53	8.85	0.00	0.01
FKBP5	0.28	7.80	0.00	0.03
IKBKB	0.34	8.49	0.00	0.03
CD96	0.27	6.19	0.00	0.03
FYN	0.27	7.19	0.00	0.03
C3	-0.55	9.94	0.00	0.03
SMAD5	-0.27	8.34	0.00	0.03
XBP1	0.41	12.96	0.00	0.03
LTBR	0.29	9.55	0.00	0.03
HLA-DRB1	0.40	11.31	0.00	0.03
PTGER4	-0.22	7.28	0.00	0.03
IRF3	0.19	9.49	0.00	0.03
CDKN1A	-0.26	8.47	0.01	0.03
IRF7	0.39	7.49	0.01	0.03
STAT3	0.25	11.58	0.01	0.03
ITGAL	0.40	6.67	0.01	0.03
ZAP70	0.25	6.07	0.01	0.03
CCBP2	0.41	6.31	0.01	0.03
IFI35	0.32	7.82	0.01	0.03
TAP1	0.25	7.27	0.01	0.04
PSMD7	0.17	10.55	0.01	0.04
CD59	0.24	13.87	0.01	0.04
BCAP31	0.20	10.31	0.01	0.04
STAT2	0.24	9.69	0.01	0.04
PTGS2	-0.18	6.03	0.01	0.04
HLA-C	0.32	12.70	0.01	0.04

PSMB7	-0.19	10.21	0.01	0.04
IRF5	0.35	7.20	0.01	0.04
CXCL1	-0.30	11.70	0.01	0.04
C4B	0.39	8.60	0.01	0.04
TNFRSF1B	0.30	6.46	0.01	0.04
HLA-DRB3	0.53	12.09	0.01	0.04
TNFSF12	0.18	7.33	0.01	0.04
PSMC2	-0.25	9.61	0.01	0.04
C4A	0.39	8.91	0.01	0.04
C1QBP	-0.15	9.64	0.02	0.04
TBK1	-0.17	8.18	0.01	0.04
CD99	0.26	11.04	0.01	0.04
STAT6	0.34	11.21	0.01	0.04
PRDM1	-0.23	6.93	0.02	0.04
NFKB1	-0.31	7.49	0.02	0.05
CXCL2	-0.31	10.55	0.02	0.05
CFH	-0.30	10.08	0.02	0.05
CD8A	0.35	6.43	0.02	0.05
IL6ST	-0.29	9.65	0.02	0.05
PTAFR	0.29	7.30	0.02	0.05
STAT4	0.17	6.18	0.02	0.05
C2	0.37	7.06	0.02	0.05
IKBKAP	0.20	9.01	0.02	0.05
SRC	0.15	7.68	0.02	0.05
CSF2RB	0.51	7.78	0.02	0.05
IRAK4	0.17	7.34	0.02	0.05
NFATC3	-0.29	8.34	0.02	0.05
SIGIRR	0.25	9.59	0.02	0.05
TP53	-0.28	7.26	0.03	0.05
MAPK14	0.20	9.15	0.03	0.05
TNFAIP3	-0.15	10.18	0.03	0.05
CFD	0.21	6.33	0.03	0.06
TGFB1	0.42	8.89	0.03	0.06
CD9	-0.20	12.48	0.03	0.06
CEBPB	-0.26	9.38	0.03	0.06
RELA	-0.18	7.33	0.03	0.06
PTPN2	0.16	8.53	0.04	0.07
CTNNB1	-0.24	11.19	0.04	0.07
CD58	-0.15	8.65	0.04	0.08
IKBKE	0.26	7.65	0.04	0.08
CD4	0.18	7.57	0.05	0.08

NFATC2	0.26	8.39	0.05	0.08
TNFRSF13C	0.22	6.20	0.05	0.08
ETS1	0.21	7.66	0.05	0.08
MAPK1	-0.20	9.86	0.05	0.08
TCF4	-0.16	8.57	0.05	0.08
PDCD2	0.18	7.69	0.05	0.09
SLAMF7	-0.25	7.10	0.05	0.09
CD81	-0.38	10.74	0.06	0.09
CD164	-0.27	12.78	0.06	0.09
TRAF1	0.13	5.97	0.06	0.10
CD24	0.26	12.76	0.06	0.09
MAP4K2	0.19	6.77	0.06	0.10
ARHGDIB	-0.18	8.36	0.07	0.10
TRAF4	-0.13	9.08	0.07	0.10
MAP4K4	0.22	9.47	0.07	0.11
TIRAP	0.18	6.46	0.08	0.11
LITAF	0.18	10.44	0.08	0.11
RUNX1	0.19	10.18	0.08	0.11
NFIL3	-0.14	6.00	0.08	0.11
CFB	-0.22	10.47	0.08	0.11
IKZF2	-0.17	9.34	0.08	0.11
IL32	0.23	18.23	0.08	0.11
TGFB1	0.29	8.36	0.08	0.11
TOLLIP	0.12	8.50	0.08	0.12
STAT5A	0.14	7.16	0.09	0.12
CHUK	-0.07	8.74	0.10	0.13
CD55	-0.18	6.28	0.09	0.12
PSMB8	-0.10	10.19	0.10	0.13
CCL3	-0.23	6.39	0.11	0.13
CASP3	0.19	7.70	0.10	0.13
IGF2R	0.10	8.21	0.10	0.13
BST2	0.27	9.57	0.10	0.13
HFE	0.13	6.26	0.10	0.13
HLA-DMB	-0.29	8.85	0.10	0.13
FCGR2C	-0.46	8.03	0.10	0.13
ITGA6	-0.23	7.19	0.11	0.13
NFATC1	0.16	6.92	0.10	0.13
B2M	0.11	14.03	0.12	0.13
NOS2	0.30	9.03	0.11	0.13
APP	-0.15	11.83	0.11	0.13
IFITM1	-0.39	9.01	0.11	0.13

BCL2	0.14	7.40	0.12	0.14
TGFBR1	0.19	7.14	0.11	0.13
RARRES3	-0.14	10.14	0.12	0.14
IL6R	0.11	6.94	0.12	0.14
IL4R	-0.13	8.72	0.13	0.14
IFNAR2	0.12	9.78	0.12	0.14
STAT5B	-0.21	7.12	0.13	0.14
IFIH1	0.14	7.63	0.14	0.15
TFRC	-0.25	9.12	0.14	0.15
FCGR3A	-0.44	7.66	0.15	0.16
IL16	0.23	8.44	0.14	0.15
MYD88	-0.13	9.01	0.14	0.15
PML	0.11	11.66	0.15	0.16
PTK2	-0.09	10.59	0.15	0.16
PSMB9	0.19	9.72	0.15	0.16
NOTCH2	-0.10	8.98	0.16	0.17
MARCO	0.73	8.64	0.16	0.16
CRADD	0.20	8.21	0.16	0.16
CASP8	-0.09	8.52	0.18	0.17
TNFRSF11A	0.13	6.33	0.17	0.17
CD48	-0.23	6.78	0.17	0.17
FCGR2A	-0.32	6.86	0.18	0.17
ICAM3	0.07	7.57	0.20	0.19
CX3CL1	-0.27	9.10	0.17	0.17
CFI	0.15	7.83	0.19	0.19
TMEM173	0.09	11.22	0.20	0.19
CD3E	0.21	6.44	0.21	0.21
CD209	0.08	6.03	0.22	0.21
CD44	0.18	9.56	0.22	0.21
PRKCD	0.13	9.03	0.22	0.21
LAIR1	0.35	7.26	0.23	0.22
CASP1	0.10	8.20	0.25	0.23
CCL5	0.21	7.82	0.25	0.23
ILF3	-0.10	9.94	0.25	0.23
HLA-DRA	-0.18	12.81	0.26	0.24
TAPBP	0.07	9.60	0.27	0.25
PLAUR	-0.24	7.45	0.27	0.25
LILRA3	0.21	6.72	0.27	0.25
IRAK3	0.10	8.19	0.29	0.26
STAT1	0.09	9.67	0.32	0.27
PIGR	-0.10	15.41	0.31	0.27

TRAF3	0.13	8.30	0.29	0.26
NOTCH1	0.11	7.81	0.31	0.27
BCL6	0.16	10.50	0.30	0.26
TAGAP	-0.20	6.70	0.31	0.27
TGFBR2	0.10	8.85	0.32	0.27
RORC	-0.12	7.38	0.33	0.28
JAK3	0.10	6.16	0.35	0.30
IRAK1	-0.04	7.52	0.40	0.33
CEACAM6	-0.13	11.68	0.36	0.30
TNFRSF14	0.06	9.32	0.36	0.30
JAK1	-0.04	9.49	0.40	0.33
LCP2	-0.12	7.31	0.42	0.33
SKI	0.07	8.63	0.38	0.31
CUL9	-0.10	7.83	0.38	0.32
CTSC	-0.10	13.08	0.41	0.33
PSMB10	-0.05	9.11	0.41	0.33
CSF1	0.06	6.10	0.45	0.35
CLEC4A	0.13	6.78	0.41	0.33
ITLN1	-0.11	7.66	0.46	0.36
IRF8	0.09	6.09	0.43	0.34
CASP2	0.05	8.08	0.45	0.35
MAPKAPK2	0.05	8.68	0.42	0.34
IL2RG	-0.12	7.16	0.46	0.35
TNFSF10	0.13	10.89	0.43	0.34
MUC1	0.07	11.51	0.47	0.36
CD97	-0.05	9.35	0.50	0.37
HLA-DPA1	-0.12	10.79	0.47	0.36
ITGB2	0.16	8.26	0.47	0.36
ICAM1	0.10	6.37	0.49	0.37
TRAF5	0.05	6.52	0.51	0.37
CYBB	0.24	8.59	0.49	0.37
FCGR2B	-0.08	6.18	0.51	0.37
NFKBIA	-0.05	9.69	0.50	0.37
IRF1	-0.06	8.82	0.52	0.38
KIT	0.06	6.32	0.58	0.40
ATG16L1	0.06	7.99	0.51	0.37
TYK2	0.05	7.58	0.54	0.39
NCF4	0.09	7.12	0.55	0.39
PTPN6	-0.06	8.50	0.56	0.39
CXCR4	-0.13	8.14	0.54	0.39
IL1R1	0.07	7.56	0.54	0.39

NFKB2	-0.06	8.00	0.55	0.39
TLR5	-0.08	7.26	0.52	0.38
TLR2	0.03	7.34	0.64	0.42
MSR1	0.31	8.57	0.53	0.38
MX1	0.04	10.22	0.68	0.44
BLNK	0.02	5.98	0.64	0.42
IFI16	-0.04	9.27	0.59	0.40
TCF7	0.05	6.57	0.61	0.41
BCL3	0.09	8.41	0.60	0.41
KLRB1	0.02	6.07	0.71	0.45
IKZF3	0.04	6.32	0.64	0.42
BTK	0.09	6.33	0.59	0.40
UBE2L3	0.03	8.34	0.63	0.42
CD36	-0.08	6.48	0.62	0.42
TLR4	0.04	7.31	0.72	0.45
IFIT2	0.07	6.51	0.67	0.43
GPI	0.01	8.94	0.79	0.48
CD83	0.06	7.42	0.71	0.45
SMAD3	0.03	9.27	0.69	0.44
IL13RA1	-0.03	10.06	0.67	0.43
CD3D	-0.07	6.28	0.64	0.42
CD14	0.10	7.76	0.64	0.42
HLA-DPB1	-0.04	10.82	0.70	0.45
C6	-0.09	8.20	0.68	0.44
CCL4	0.12	6.91	0.67	0.43
IL10RA	-0.02	6.62	0.88	0.50
CCL15	-0.02	6.48	0.81	0.49
ITGAX	-0.04	7.11	0.83	0.50
PRF1	0.05	6.36	0.81	0.49
LY96	0.05	6.30	0.76	0.47
IFNAR1	-0.03	7.98	0.76	0.47
SERPING1	0.03	8.97	0.88	0.50
CD40	-0.01	7.42	0.91	0.52
IL1RN	0.09	7.38	0.78	0.48
CSF3R	0.04	6.88	0.88	0.50
IL12A	-0.04	6.13	0.71	0.45
LTF	0.07	7.72	0.78	0.48
SYK	0.00	7.51	1.00	0.54
BST1	0.02	7.13	0.83	0.50
NOD2	-0.02	6.86	0.79	0.48
IL18	0.02	8.23	0.81	0.49

IL1RAP	0.01	8.06	0.88	0.50
FCGRT	0.00	8.95	0.97	0.54
DPP4	-0.03	8.00	0.87	0.50
IL18R1	0.02	6.52	0.86	0.50
GZMA	0.03	6.55	0.87	0.50
SOCS3	0.00	7.99	0.99	0.54
JAK2	-0.01	8.66	0.84	0.50
TLR1	0.02	8.48	0.86	0.50
TRAF6	0.00	7.98	0.97	0.54
TRAF2	0.00	6.82	0.96	0.53
C1QB	0.04	9.28	0.87	0.50
CCL18	-0.08	8.40	0.83	0.50
PTPN22	-0.01	6.11	0.92	0.52
PTPRC	-0.01	9.06	0.94	0.52
FCER1G	0.03	8.37	0.93	0.52
FN1	0.00	7.38	0.99	0.54
C1R	0.00	6.29	0.98	0.54
IL7R	-0.01	6.79	0.95	0.53
CD86	0.00	6.91	0.99	0.54
ABL1	-0.01	7.49	0.93	0.52

mRNAs	log Fold Change	Mean Expression	p-Value	q-Value
NFKBIZ	-0.76	9.88	0.00	0.00
PRDM1	-0.42	6.93	0.00	0.00
PTGER4	-0.28	7.28	0.00	0.01
PTGS2	-0.24	6.03	0.00	0.02
C4B	0.50	8.60	0.00	0.02
FCER1A	-0.45	6.47	0.00	0.02
XBP1	0.44	12.96	0.00	0.03
IKBK G	0.24	7.46	0.00	0.03
C4A	0.44	8.91	0.00	0.03
ZAP70	0.25	6.07	0.00	0.03
TBK1	-0.19	8.18	0.01	0.03
IL8	-0.37	10.63	0.01	0.03
STAT4	0.21	6.18	0.01	0.03
CDKN1A	-0.25	8.47	0.01	0.03
IRAK3	0.25	8.19	0.01	0.03
CCL3	-0.38	6.39	0.01	0.03
IKBKAP	0.23	9.01	0.01	0.03
IRF3	0.18	9.49	0.01	0.04
CXCL2	-0.34	10.55	0.01	0.04
TNFAIP3	-0.19	10.18	0.01	0.04
NFKBIA	-0.18	9.69	0.01	0.04
NFIL3	-0.21	6.00	0.01	0.04
CXCL1	-0.29	11.70	0.01	0.04
IKBKB	0.27	8.49	0.01	0.04
SOCS3	-0.52	7.99	0.01	0.04
PIGR	0.25	15.41	0.01	0.05
CXCR4	-0.52	8.14	0.01	0.05
SMAD5	-0.21	8.34	0.01	0.05
STAT3	0.21	11.58	0.01	0.05
HLA-A	0.21	12.09	0.02	0.05
LTBR	0.22	9.55	0.02	0.06
CTSC	0.28	13.08	0.02	0.06
CIITA	0.35	8.85	0.02	0.06
SIGIRR	0.25	9.59	0.02	0.06
CD82	0.13	8.85	0.02	0.07
IFI35	0.26	7.82	0.02	0.07
HLA-DPA1	-0.39	10.79	0.02	0.07
IL18R1	0.26	6.52	0.03	0.07
TNFSF12	0.16	7.33	0.03	0.07
STAT2	0.19	9.69	0.03	0.07

NFATC3	-0.27	8.34	0.03	0.07
TMEM173	0.14	11.22	0.03	0.07
ITGB1	-0.13	10.55	0.03	0.07
SRC	0.13	7.68	0.03	0.07
CD46	-0.15	11.15	0.03	0.07
CD74	0.18	13.04	0.03	0.07
IFNGR1	-0.25	9.19	0.03	0.07
MUC1	0.20	11.51	0.03	0.07
CD59	0.19	13.87	0.04	0.07
NFKB1	-0.26	7.49	0.04	0.07
IL2RG	-0.34	7.16	0.04	0.07
CEBPB	-0.24	9.38	0.04	0.07
PTPN2	0.16	8.53	0.04	0.08
C2	0.31	7.06	0.04	0.08
HLA-DPB1	-0.23	10.82	0.04	0.08
HLA-C	0.24	12.70	0.04	0.08
TGFB1	0.24	7.14	0.04	0.08
PDCD2	0.18	7.69	0.04	0.08
AHR	-0.13	10.57	0.04	0.08
BCAP31	0.15	10.31	0.05	0.08
FYN	0.18	7.19	0.05	0.08
CFH	-0.24	10.08	0.05	0.08
LCP2	-0.27	7.31	0.05	0.08
LTB4R	0.21	7.24	0.05	0.08
JAK1	0.08	9.49	0.06	0.08
IKBKE	0.24	7.65	0.05	0.08
SLAMF7	0.25	7.10	0.05	0.08
HLA-B	0.14	13.24	0.05	0.08
CHUK	0.08	8.74	0.06	0.08
TNFRSF11A	0.18	6.33	0.05	0.08
CD209	0.13	6.03	0.06	0.08
CD81	-0.35	10.74	0.06	0.08
HLA-DRB3	0.38	12.09	0.06	0.08
IFNAR2	0.15	9.78	0.06	0.08
TIRAP	0.18	6.46	0.06	0.08
CCBP2	0.28	6.31	0.07	0.09
TLR2	0.12	7.34	0.07	0.09
CFI	0.20	7.83	0.07	0.09
FCGR2C	-0.50	8.03	0.07	0.09
IL6ST	-0.21	9.65	0.07	0.09
CRADD	0.25	8.21	0.07	0.09

NOS2	0.33	9.03	0.08	0.10
TNFSF10	0.28	10.89	0.08	0.09
ITLN1	0.26	7.66	0.08	0.10
B2M	0.11	14.03	0.09	0.10
ICAM3	0.09	7.57	0.10	0.10
STAT6	0.23	11.21	0.08	0.10
TAGAP	-0.34	6.70	0.09	0.10
CD99	0.17	11.04	0.08	0.10
TRAF4	-0.12	9.08	0.09	0.10
STAT5B	-0.23	7.12	0.09	0.10
STAT5A	0.13	7.16	0.09	0.10
TRAF1	0.11	5.97	0.10	0.11
PSMD7	0.10	10.55	0.10	0.11
TGFB1	0.27	8.36	0.10	0.11
CD164	-0.22	12.78	0.10	0.11
CD8A	0.23	6.43	0.10	0.11
NFATC1	0.16	6.92	0.11	0.11
PSMB7	-0.11	10.21	0.11	0.11
PTPN22	-0.17	6.11	0.11	0.11
TP53	-0.19	7.26	0.11	0.11
ETS1	0.16	7.66	0.12	0.12
IKZF2	-0.14	9.34	0.12	0.11
CASP8	-0.10	8.52	0.12	0.12
IRAK1	-0.07	7.52	0.12	0.12
CFD	0.14	6.33	0.13	0.12
PML	0.11	11.66	0.13	0.12
LTF	0.38	7.72	0.13	0.12
MAPK1	-0.14	9.86	0.13	0.12
MARCO	0.75	8.64	0.13	0.12
PSMB10	0.10	9.11	0.14	0.13
IRF7	0.19	7.49	0.15	0.13
NFATC2	0.18	8.39	0.14	0.13
C1QBP	-0.08	9.64	0.15	0.13
NOD2	-0.11	6.86	0.15	0.13
IL12A	-0.14	6.13	0.15	0.13
IKZF3	0.13	6.32	0.16	0.13
CD83	-0.24	7.42	0.16	0.14
GPI	0.06	8.94	0.17	0.14
IFIT2	-0.21	6.51	0.17	0.14
FKBP5	0.12	7.80	0.16	0.14
HLA-DRB1	0.18	11.31	0.16	0.14

IL16	0.21	8.44	0.16	0.14
ITGAL	0.19	6.67	0.16	0.14
IRF5	0.18	7.20	0.18	0.14
FN1	0.44	7.38	0.19	0.14
CD24	0.18	12.76	0.19	0.14
ARHGDIB	-0.12	8.36	0.20	0.15
BCL3	0.21	8.41	0.18	0.14
LITAF	0.13	10.44	0.18	0.14
BCL6	0.20	10.50	0.19	0.14
CASP3	0.15	7.70	0.19	0.14
TGFB2	0.13	8.85	0.19	0.14
HFE	0.10	6.26	0.19	0.14
RORC	-0.16	7.38	0.19	0.14
TGFB1	0.23	8.89	0.21	0.15
PSMC2	-0.11	9.61	0.21	0.15
CX3CL1	-0.24	9.10	0.21	0.15
MAPK14	0.11	9.15	0.23	0.17
CEACAM6	-0.17	11.68	0.23	0.17
HLA-DRA	-0.19	12.81	0.23	0.17
IFI16	-0.09	9.27	0.25	0.17
ICAM1	-0.16	6.37	0.24	0.17
MYD88	-0.10	9.01	0.25	0.17
IL10RA	-0.12	6.62	0.27	0.18
PTPN6	-0.11	8.50	0.25	0.17
CTNNB1	-0.13	11.19	0.24	0.17
DPP4	0.19	8.00	0.25	0.17
ABL1	-0.10	7.49	0.25	0.17
IL6R	0.08	6.94	0.26	0.17
ILF3	-0.10	9.94	0.26	0.17
PLAUR	-0.23	7.45	0.27	0.18
TRAF3	0.13	8.30	0.26	0.17
TCF4	-0.09	8.57	0.26	0.17
IRAK4	0.08	7.34	0.27	0.18
IL1RN	-0.35	7.38	0.27	0.18
CSF2RB	0.23	7.78	0.28	0.18
FCGR2A	-0.25	6.86	0.28	0.18
NOTCH2	0.08	8.98	0.28	0.18
TYK2	0.08	7.58	0.29	0.18
TNFRSF13C	0.11	6.20	0.29	0.18
HLA-DMB	-0.18	8.85	0.29	0.18
CD36	0.17	6.48	0.30	0.18

PTPRC	-0.18	9.06	0.31	0.19
CD4	0.09	7.57	0.30	0.18
SYK	-0.09	7.51	0.32	0.19
FCGR3A	-0.29	7.66	0.33	0.20
CSF1	0.07	6.10	0.33	0.20
KIT	0.10	6.32	0.34	0.20
CD97	-0.06	9.35	0.37	0.21
CCL4	-0.26	6.91	0.35	0.21
RUNX1	0.09	10.18	0.37	0.22
CD9	-0.08	12.48	0.37	0.21
CFB	0.11	10.47	0.38	0.22
MSR1	0.42	8.57	0.39	0.22
IGF2R	0.05	8.21	0.40	0.23
PSMB9	0.11	9.72	0.39	0.22
C1QB	0.22	9.28	0.43	0.24
STAT1	0.07	9.67	0.44	0.24
BCL2	0.07	7.40	0.41	0.23
SMAD3	-0.05	9.27	0.45	0.24
KLRB1	0.03	6.07	0.58	0.27
TFRC	-0.13	9.12	0.42	0.24
TCF7	0.07	6.57	0.44	0.24
CD96	0.06	6.19	0.45	0.24
SERPING1	-0.12	8.97	0.46	0.25
LY96	-0.13	6.30	0.44	0.24
TAP1	0.06	7.27	0.49	0.25
CD48	-0.12	6.78	0.46	0.24
CD44	0.11	9.56	0.44	0.24
RELA	-0.06	7.33	0.44	0.24
IFIH1	0.06	7.63	0.51	0.26
PSMB8	-0.04	10.19	0.50	0.26
SKI	-0.06	8.63	0.46	0.25
ATG16L1	0.06	7.99	0.48	0.25
TLR4	0.07	7.31	0.53	0.26
BST2	0.10	9.57	0.52	0.26
LAIR1	0.20	7.26	0.48	0.25
UBE2L3	0.05	8.34	0.49	0.25
CD3D	-0.10	6.28	0.53	0.26
CYBB	0.22	8.59	0.51	0.26
PTAFR	0.07	7.30	0.52	0.26
NOTCH1	-0.07	7.81	0.52	0.26
CD3E	0.10	6.44	0.53	0.26

BLNK	-0.02	5.98	0.60	0.27
FCGRT	-0.04	8.95	0.58	0.27
NCF4	0.08	7.12	0.58	0.27
CCL22	0.04	6.19	0.60	0.27
IRF1	-0.05	8.82	0.57	0.27
CCL18	0.21	8.40	0.57	0.27
NFKB2	-0.05	8.00	0.56	0.27
JAK2	0.04	8.66	0.59	0.27
TLR5	-0.07	7.26	0.56	0.27
MX1	-0.04	10.22	0.67	0.29
MAP4K4	0.07	9.47	0.56	0.27
PTK2	0.03	10.59	0.59	0.27
CUL9	-0.06	7.83	0.57	0.27
MAP4K2	0.05	6.77	0.59	0.27
C6	-0.13	8.20	0.57	0.27
CASP2	0.03	8.08	0.63	0.28
IL1RAP	-0.04	8.06	0.59	0.27
CD86	-0.07	6.91	0.64	0.28
GZMA	0.09	6.55	0.62	0.28
RARRES3	-0.05	10.14	0.60	0.27
CSF3R	-0.11	6.88	0.62	0.28
TAPBP	-0.03	9.60	0.60	0.27
ITGA6	-0.06	7.19	0.66	0.29
PRKCD	0.05	9.03	0.62	0.28
IL32	0.05	18.23	0.68	0.30
CD40	-0.01	7.42	0.76	0.32
BTK	0.07	6.33	0.67	0.30
PRF1	-0.06	6.36	0.73	0.31
CASP1	0.03	8.20	0.77	0.32
IL7R	-0.09	6.79	0.70	0.30
TRAF6	0.02	7.98	0.73	0.31
CLEC4A	0.06	6.78	0.72	0.31
FCGR2B	-0.03	6.18	0.81	0.33
TNFRSF14	0.02	9.32	0.75	0.32
TRAF2	0.02	6.82	0.77	0.32
FCER1G	0.07	8.37	0.81	0.33
TRAF5	0.02	6.52	0.80	0.33
MAPKAPK2	0.02	8.68	0.75	0.32
TOLLIP	0.01	8.50	0.83	0.34
CD55	-0.03	6.28	0.73	0.31
APP	-0.02	11.83	0.84	0.34

IL1R1	0.03	7.56	0.79	0.33
LILRA3	0.05	6.72	0.80	0.33
BST1	-0.02	7.13	0.85	0.34
TNFRSF1B	0.00	6.46	0.99	0.38
CCL5	0.00	7.82	0.99	0.38
JAK3	0.01	6.16	0.93	0.36
IRF8	-0.01	6.09	0.91	0.35
ITGAX	0.02	7.11	0.90	0.35
IL4R	-0.01	8.72	0.90	0.35
CD14	0.05	7.76	0.81	0.33
IFITM1	0.01	9.01	0.98	0.37
ITGB2	-0.03	8.26	0.90	0.35
CCL15	0.01	6.48	0.89	0.35
IL18	0.01	8.23	0.91	0.35
IFNAR1	0.01	7.98	0.94	0.36
TLR1	0.02	8.48	0.84	0.34
C3	-0.02	9.94	0.89	0.35
C1R	0.02	6.29	0.89	0.35
CD58	-0.01	8.65	0.91	0.35
IL13RA1	0.00	10.06	1.00	0.38

mRNAs	log Fold Change	Mean Expression	p-Value	q-Value
IRAK3	0.30	8.19	0.00	0.18
PTGER4	-0.22	7.28	0.00	0.19
STAT4	0.22	6.18	0.00	0.19
B2M	0.19	14.03	0.00	0.19
PML	0.20	11.66	0.01	0.19
ITGB1	-0.16	10.55	0.01	0.19
CEBPB	-0.30	9.38	0.01	0.23
CASP2	-0.15	8.08	0.01	0.24
IL6ST	-0.29	9.65	0.01	0.24
PSMD7	0.15	10.55	0.01	0.24
IL18R1	0.28	6.52	0.02	0.24
HLA-A	0.20	12.09	0.02	0.24
SMAD5	-0.20	8.34	0.02	0.24
PTGS2	-0.15	6.03	0.02	0.27
KIT	0.22	6.32	0.02	0.29
XBP1	0.28	12.96	0.03	0.29
IKBKG	0.17	7.46	0.03	0.29
IKBKB	0.22	8.49	0.03	0.29
CD24	0.28	12.76	0.03	0.29
TNFSF12	-0.15	7.33	0.04	0.29
IRF8	-0.24	6.09	0.04	0.29
STAT5B	-0.27	7.12	0.04	0.29
NOS2	0.37	9.03	0.04	0.29
IL8	-0.25	10.63	0.05	0.29
CD99	0.20	11.04	0.05	0.29
FCGRT	-0.13	8.95	0.05	0.29
SRC	0.12	7.68	0.05	0.29
IKZF3	0.18	6.32	0.05	0.29
TMEM173	0.12	11.22	0.05	0.29
IL4R	-0.16	8.72	0.05	0.29
HLA-C	0.22	12.70	0.05	0.29
CD55	-0.19	6.28	0.06	0.29
HFE	0.15	6.26	0.06	0.29
NFKB1	-0.22	7.49	0.06	0.29
HLA-B	0.13	13.24	0.06	0.29
BCL3	0.29	8.41	0.06	0.29
FCER1A	-0.25	6.47	0.06	0.29
NFATC3	-0.22	8.34	0.06	0.29
IFI35	0.20	7.82	0.06	0.29
CCBP2	0.26	6.31	0.06	0.29

SKI	-0.15	8.63	0.07	0.29
CD74	0.15	13.04	0.07	0.29
TBK1	-0.11	8.18	0.07	0.29
CIITA	0.26	8.85	0.07	0.29
KLRB1	0.08	6.07	0.07	0.29
CD83	-0.29	7.42	0.07	0.29
CD96	0.15	6.19	0.07	0.29
TRAF5	-0.14	6.52	0.07	0.29
FCGR2B	-0.21	6.18	0.08	0.29
NFKBIA	-0.12	9.69	0.08	0.29
ICAM3	0.10	7.57	0.08	0.29
MAPK1	-0.16	9.86	0.08	0.29
CD81	-0.31	10.74	0.08	0.29
CCL3	-0.22	6.39	0.09	0.30
CD59	0.14	13.87	0.09	0.30
STAT3	0.14	11.58	0.09	0.30
TRAF4	-0.11	9.08	0.09	0.30
CX3CL1	-0.33	9.10	0.09	0.30
C4B	0.24	8.60	0.09	0.30
TAP1	0.15	7.27	0.09	0.30
PTAFR	0.19	7.30	0.10	0.30
PRDM1	-0.15	6.93	0.10	0.31
CD36	0.26	6.48	0.10	0.31
C3	-0.28	9.94	0.10	0.31
CD8A	0.22	6.43	0.11	0.32
ZAP70	0.13	6.07	0.11	0.32
CFH	-0.19	10.08	0.11	0.33
LTB4R	0.16	7.24	0.12	0.33
IRF7	0.19	7.49	0.12	0.34
SLAMF7	-0.19	7.10	0.13	0.35
CFI	0.16	7.83	0.14	0.36
SYK	-0.13	7.51	0.14	0.37
IKBKE	0.18	7.65	0.14	0.37
IFNGR1	-0.17	9.19	0.14	0.37
STAT6	0.19	11.21	0.15	0.37
MUC1	0.13	11.51	0.14	0.37
CASP3	0.16	7.70	0.15	0.37
LTBR	0.13	9.55	0.16	0.38
CFD	0.13	6.33	0.16	0.39
CD164	-0.18	12.78	0.16	0.39
CXCL2	-0.16	10.55	0.17	0.40

TLR5	-0.16	7.26	0.17	0.40
TRAF6	-0.09	7.98	0.19	0.42
CXCL1	-0.14	11.70	0.19	0.42
IFNAR1	-0.11	7.98	0.18	0.42
RORC	-0.16	7.38	0.18	0.42
LTF	-0.32	7.72	0.20	0.44
AHR	-0.08	10.57	0.20	0.44
BST2	0.20	9.57	0.21	0.44
TNFRSF14	-0.07	9.32	0.21	0.44
PTK2	-0.07	10.59	0.22	0.44
IGF2R	-0.07	8.21	0.22	0.44
ITGAL	0.16	6.67	0.22	0.44
C2	0.18	7.06	0.21	0.44
IRAK1	-0.06	7.52	0.22	0.44
FYN	0.10	7.19	0.23	0.44
STAT2	0.10	9.69	0.23	0.44
DPP4	-0.19	8.00	0.22	0.44
TNFRSF11A	0.11	6.33	0.23	0.44
IL2RG	-0.18	7.16	0.24	0.44
APP	-0.10	11.83	0.23	0.44
CD58	-0.08	8.65	0.23	0.44
SERPING1	-0.19	8.97	0.24	0.44
C4A	0.17	8.91	0.24	0.44
HLA-DRB3	0.23	12.09	0.24	0.44
TFRC	-0.18	9.12	0.25	0.44
CCL5	0.19	7.82	0.26	0.44
CD86	-0.16	6.91	0.26	0.44
SOCS3	0.22	7.99	0.27	0.44
CSF1	0.08	6.10	0.28	0.45
TP53	-0.13	7.26	0.26	0.44
BST1	-0.11	7.13	0.27	0.45
STAT5A	-0.08	7.16	0.26	0.44
FCGR2C	-0.29	8.03	0.27	0.44
PSMB9	0.14	9.72	0.26	0.44
PTPN2	0.08	8.53	0.26	0.44
CHUK	0.04	8.74	0.31	0.47
HLA-DRB1	0.14	11.31	0.27	0.45
JAK2	-0.07	8.66	0.28	0.45
IKZF2	-0.09	9.34	0.28	0.45
CRADD	0.14	8.21	0.28	0.45
MAPK14	0.09	9.15	0.29	0.46

IRAK4	0.07	7.34	0.30	0.47
IL7R	-0.22	6.79	0.30	0.47
TGFB1	0.16	8.36	0.30	0.47
SIGIRR	0.11	9.59	0.31	0.47
GZMA	0.18	6.55	0.31	0.47
CD97	-0.06	9.35	0.34	0.47
PSMB10	0.06	9.11	0.32	0.47
IKBKAP	0.08	9.01	0.32	0.47
CUL9	-0.10	7.83	0.32	0.47
ARHGDIB	-0.08	8.36	0.33	0.47
BCAP31	0.07	10.31	0.33	0.47
C6	-0.21	8.20	0.33	0.47
TOLLIP	-0.06	8.50	0.34	0.47
MYD88	-0.08	9.01	0.34	0.47
IL13RA1	-0.06	10.06	0.34	0.47
IFNAR2	0.07	9.78	0.34	0.47
PTPN22	-0.10	6.11	0.34	0.47
PTPN6	-0.08	8.50	0.35	0.48
CCL22	0.07	6.19	0.36	0.48
ITLN1	-0.13	7.66	0.37	0.49
NOTCH2	0.06	8.98	0.37	0.49
ABL1	-0.08	7.49	0.36	0.48
TAPBP	-0.06	9.60	0.35	0.48
CD44	0.13	9.56	0.37	0.48
IL1RAP	-0.06	8.06	0.42	0.50
LCP2	-0.11	7.31	0.39	0.50
JAK3	0.08	6.16	0.40	0.50
CASP1	0.07	8.20	0.39	0.50
IL1R1	-0.09	7.56	0.39	0.50
TNFSF10	0.13	10.89	0.39	0.50
IFIT2	-0.12	6.51	0.42	0.50
IL18	0.07	8.23	0.41	0.50
ETS1	0.08	7.66	0.41	0.50
NFIL3	-0.06	6.00	0.41	0.50
PTPRC	-0.14	9.06	0.41	0.50
CTNNB1	-0.09	11.19	0.39	0.50
NFATC2	0.10	8.39	0.42	0.50
IFI16	0.06	9.27	0.44	0.52
SMAD3	-0.04	9.27	0.49	0.55
ILF3	-0.06	9.94	0.44	0.52
ITGA6	0.09	7.19	0.48	0.55

PSMB7	-0.05	10.21	0.44	0.52
STAT1	0.06	9.67	0.49	0.55
TLR4	-0.07	7.31	0.48	0.55
CTSC	0.08	13.08	0.47	0.55
NFKBIZ	-0.04	9.88	0.57	0.57
TCF4	-0.06	8.57	0.46	0.55
C1QBP	-0.04	9.64	0.51	0.56
FCGR3A	-0.19	7.66	0.50	0.55
BCL2	0.06	7.40	0.52	0.56
CFB	0.08	10.47	0.49	0.55
NCF4	0.09	7.12	0.52	0.56
CSF2RB	0.13	7.78	0.51	0.56
FCGR2A	-0.15	6.86	0.50	0.55
IFITM1	0.14	9.01	0.52	0.56
GPI	0.02	8.94	0.60	0.57
HLA-DPA1	-0.11	10.79	0.51	0.56
CD46	-0.04	11.15	0.52	0.56
MAPKAPK2	-0.04	8.68	0.53	0.57
IRF3	0.04	9.49	0.56	0.57
CD82	-0.03	8.85	0.58	0.57
IRF1	0.05	8.82	0.53	0.57
IL6R	-0.04	6.94	0.59	0.57
IL16	0.09	8.44	0.55	0.57
TAGAP	-0.11	6.70	0.57	0.57
RELA	-0.05	7.33	0.55	0.57
ITGB2	-0.12	8.26	0.56	0.57
UBE2L3	0.04	8.34	0.56	0.57
HLA-DMB	-0.10	8.85	0.56	0.57
BLNK	-0.01	5.98	0.74	0.65
CD3D	-0.08	6.28	0.59	0.57
LITAF	0.05	10.44	0.58	0.57
TGFB1	0.10	8.89	0.56	0.57
C1QB	-0.14	9.28	0.58	0.57
TGFBR1	0.06	7.14	0.58	0.57
LILRA3	-0.09	6.72	0.60	0.57
IL12A	-0.05	6.13	0.59	0.57
NFKB2	0.04	8.00	0.64	0.60
CCL18	-0.19	8.40	0.59	0.57
LY96	-0.08	6.30	0.62	0.59
MAP4K2	0.04	6.77	0.65	0.61
HLA-DPB1	-0.05	10.82	0.62	0.59

CLEC4A	0.07	6.78	0.63	0.59
JAK1	-0.01	9.49	0.78	0.67
BTK	-0.08	6.33	0.62	0.59
NOTCH1	-0.04	7.81	0.68	0.62
CXCR4	-0.08	8.14	0.67	0.62
FN1	-0.14	7.38	0.65	0.61
TLR2	0.02	7.34	0.74	0.65
TNFAIP3	-0.02	10.18	0.71	0.64
TNFRSF1B	0.03	6.46	0.80	0.67
CD3E	0.06	6.44	0.70	0.63
ITGAX	0.06	7.11	0.75	0.65
FKBP5	-0.03	7.80	0.72	0.65
MAP4K4	0.04	9.47	0.73	0.65
MX1	0.01	10.22	0.95	0.72
TCF7	0.02	6.57	0.84	0.69
BCL6	0.06	10.50	0.69	0.63
CD4	0.03	7.57	0.76	0.66
PSMB8	-0.01	10.19	0.86	0.69
CD48	-0.05	6.78	0.74	0.65
ATG16L1	-0.03	7.99	0.74	0.65
IFIH1	-0.01	7.63	0.88	0.70
TIRAP	0.03	6.46	0.75	0.65
CD40	0.00	7.42	0.98	0.72
NOD2	-0.02	6.86	0.76	0.66
CD209	-0.02	6.03	0.79	0.67
TRAF1	-0.02	5.97	0.77	0.66
IL10RA	0.02	6.62	0.86	0.69
TYK2	0.00	7.58	0.96	0.72
NFATC1	0.02	6.92	0.81	0.67
CCL15	-0.02	6.48	0.83	0.69
PIGR	0.02	15.41	0.86	0.69
TRAF2	-0.01	6.82	0.85	0.69
C1R	0.04	6.29	0.78	0.67
RARRES3	-0.01	10.14	0.88	0.69
IRF5	0.03	7.20	0.80	0.67
RUNX1	0.02	10.18	0.84	0.69
PLAUR	-0.03	7.45	0.86	0.69
CSF3R	0.03	6.88	0.89	0.70
TGFBR2	0.01	8.85	0.91	0.70
CYBB	-0.07	8.59	0.82	0.69
CASP8	0.00	8.52	0.99	0.72

PRF1	0.00	6.36	0.98	0.72
IL32	-0.01	18.23	0.91	0.70
ICAM1	0.00	6.37	0.99	0.72
CD14	-0.04	7.76	0.83	0.69
MARCO	0.09	8.64	0.85	0.69
TRAF3	-0.01	8.30	0.96	0.72
IL1RN	-0.01	7.38	0.97	0.72
CDKN1A	0.00	8.47	0.97	0.72
LAIR1	-0.05	7.26	0.85	0.69
TLR1	0.00	8.48	1.00	0.72
PDCD2	0.00	7.69	0.98	0.72
TNFRSF13C	-0.01	6.20	0.89	0.70
PRKCD	0.01	9.03	0.95	0.72
HLA-DRA	0.00	12.81	0.99	0.72
FCER1G	-0.01	8.37	0.96	0.72
CCL4	0.02	6.91	0.95	0.72
CD9	-0.01	12.48	0.89	0.70
MSR1	-0.05	8.57	0.91	0.70
PSMC2	-0.01	9.61	0.91	0.70
CEACAM6	0.00	11.68	0.99	0.72

miRNA	p-value (Diesel)	p-value (Allergen)	p-value (Diesel & Allergen)	q-value (Diesel)	q-value (Allergen)	q-value (Diesel & Allergen)	Fixed Effect (Diesel)	Standard Error (Diesel)	Confidence Bound (lower 2.5%; Diesel)	Confidence Bound (upper 97.5%; Diesel)	Zero covered by CI (Diesel)	Fixed Effect (Allergen)	Standard Error (Allergen)	Confidence Bound (lower 2.5%; Allergen)	Confidence Bound (upper 97.5%; Allergen)	Zero covered by CI (Allergen)	Fixed Effect (Diesel & Allergen)	Standard Error (Diesel & Allergen)	Confidence Bound (lower 2.5%; Diesel & Allergen)	Confidence Bound (upper 97.5%; Diesel & Allergen)	Zero covered by CI (Diesel & Allergen)
hsa-let-7a-5p	0.13	0.07	0.5	0.34	0.82	0.99	-0.19	0.12	-0.41	0.05	Yes	-0.23	0.13	-0.23	-0.23	-0.23	0.12	0.17	-0.22	0.46	Yes
hsa-let-7b-5p	0.12	0.94	0.17	0.34	0.99	0.87	-0.15	0.09	-0.33	0.03	Yes	-0.01	0.09	-0.23	-0.23	-0.23	0.18	0.13	-0.07	0.43	Yes
hsa-let-7c	0.32	0.85	0.21	0.43	0.99	0.87	-0.11	0.11	-0.31	0.1	Yes	-0.02	0.11	-0.23	-0.23	-0.23	0.19	0.15	-0.1	0.48	Yes
hsa-let-7d-5p	0.1	0.04	0.36	0.34	0.82	0.95	-0.19	0.12	-0.42	0.03	Yes	-0.25	0.12	-0.23	-0.23	-0.23	0.15	0.16	-0.16	0.47	Yes
hsa-let-7e-5p	0.16	0.11	0.3	0.35	0.82	0.87	-0.18	0.13	-0.43	0.07	Yes	-0.22	0.13	-0.23	-0.23	-0.23	0.19	0.18	-0.16	0.54	Yes
hsa-let-7f-5p	0.39	0.67	0.96	0.47	0.95	0.99	-0.22	0.26	-0.72	0.28	Yes	-0.11	0.26	-0.23	-0.23	-0.23	0.02	0.36	-0.68	0.72	Yes
hsa-let-7g-5p	0.05	0.51	0.24	0.28	0.86	0.87	-0.23	0.12	-0.46	-0.01	No	-0.08	0.12	-0.23	-0.23	-0.23	0.2	0.16	-0.12	0.51	Yes
hsa-let-7i-5p	0.23	0.44	0.15	0.4	0.82	0.87	-0.15	0.13	-0.4	0.09	Yes	-0.10	0.13	-0.23	-0.23	-0.23	0.26	0.18	-0.08	0.6	Yes
hsa-miR-100-5p	0.13	0.28	0.57	0.34	0.82	0.99	0.21	0.14	-0.05	0.48	Yes	0.15	0.14	-0.23	-0.23	-0.23	-0.11	0.19	-0.48	0.27	Yes
hsa-miR-106a-5p+hsa-miR-17-5p	0.4	0.37	0.71	0.47	0.82	0.99	-0.14	0.16	-0.45	0.18	Yes	-0.15	0.17	-0.23	-0.23	-0.23	0.09	0.23	-0.36	0.53	Yes
hsa-miR-106b-5p	0.82	0.97	0.32	0.52	0.99	0.88	-0.04	0.16	-0.34	0.27	Yes	-0.01	0.16	-0.23	-0.23	-0.23	-0.22	0.22	-0.65	0.21	Yes
hsa-miR-107	0.58	0.45	0.8	0.51	0.82	0.99	-0.11	0.2	-0.5	0.27	Yes	-0.16	0.20	-0.23	-0.23	-0.23	-0.07	0.28	-0.62	0.47	Yes
hsa-miR-1180	0.79	0.26	0.26	0.52	0.82	0.87	-0.06	0.22	-0.5	0.37	Yes	-0.26	0.23	-0.23	-0.23	-0.23	0.36	0.32	-0.25	0.98	Yes
hsa-miR-125a-5p	0.06	0.04	0.39	0.28	0.82	0.96	-0.31	0.16	-0.62	0	Yes	-0.35	0.16	-0.23	-0.23	-0.23	0.2	0.23	-0.24	0.64	Yes
hsa-miR-125b-5p	0.31	0.97	0.24	0.43	0.99	0.87	-0.13	0.12	-0.37	0.11	Yes	0.00	0.13	-0.23	-0.23	-0.23	0.21	0.17	-0.13	0.55	Yes
hsa-miR-1260a	0.15	0.2	0.01	0.34	0.82	0.87	0.39	0.27	-0.12	0.91	Yes	0.35	0.27	-0.23	-0.23	-0.23	-1	0.38	-1.72	-0.27	No
hsa-miR-130a-3p	0.49	0.04	0.29	0.51	0.82	0.87	-0.08	0.11	-0.29	0.14	Yes	-0.23	0.11	-0.23	-0.23	-0.23	0.17	0.16	-0.14	0.47	Yes
hsa-miR-132-3p	0.63	0.18	0.46	0.52	0.82	0.99	-0.07	0.14	-0.34	0.2	Yes	0.20	0.14	-0.23	-0.23	-0.23	0.15	0.2	-0.23	0.53	Yes

hsa-miR-135b-5p	0.12	0.78	0.99	0.34	0.99	0.99	0.2	0.13	-0.04	0.44	Yes	-0.04	0.13	-0.23	-0.23	-0.23	0	0.18	-0.35	0.34	Yes
hsa-miR-140-5p	0.1	0.31	0.1	0.34	0.82	0.87	-0.18	0.1	-0.38	0.02	Yes	-0.11	0.11	-0.23	-0.23	-0.23	0.25	0.15	-0.04	0.54	Yes
hsa-miR-141-3p	0.14	0.44	0.98	0.34	0.82	0.99	0.21	0.14	-0.05	0.49	Yes	0.11	0.14	-0.23	-0.23	-0.23	-0.01	0.2	-0.36	0.36	Yes
hsa-miR-142-3p	0.76	0.64	0.65	0.52	0.95	0.99	0.09	0.3	-0.49	0.67	Yes	0.14	0.31	-0.23	-0.23	-0.23	-0.19	0.43	-1.01	0.62	Yes
hsa-miR-146a-5p	0.27	0.59	0.93	0.43	0.94	0.99	0.21	0.19	-0.15	0.57	Yes	0.10	0.19	-0.23	-0.23	-0.23	-0.02	0.26	-0.53	0.49	Yes
hsa-miR-148a-3p	0.41	0.47	0.21	0.47	0.82	0.87	0.12	0.14	-0.16	0.4	Yes	0.11	0.15	-0.23	-0.23	-0.23	-0.26	0.2	-0.65	0.14	Yes
hsa-miR-148b-3p	0.64	0.94	0.26	0.52	0.99	0.87	-0.06	0.13	-0.3	0.18	Yes	0.01	0.13	-0.23	-0.23	-0.23	-0.2	0.18	-0.55	0.14	Yes
hsa-miR-150-5p	0.76	0.85	0.91	0.52	0.99	0.99	-0.07	0.25	-0.55	0.4	Yes	0.05	0.25	-0.23	-0.23	-0.23	-0.04	0.35	-0.71	0.63	Yes
hsa-miR-151a-3p	0.93	0.89	0.28	0.53	0.99	0.87	0.01	0.1	-0.19	0.21	Yes	0.01	0.10	-0.23	-0.23	-0.23	0.16	0.15	-0.12	0.44	Yes
hsa-miR-151a-5p	0.7	0.92	0.66	0.52	0.99	0.99	-0.03	0.07	-0.17	0.11	Yes	-0.01	0.07	-0.23	-0.23	-0.23	0.05	0.1	-0.15	0.24	Yes
hsa-miR-15a-5p	0.52	0.78	0.98	0.51	0.99	0.99	-0.09	0.14	-0.36	0.18	Yes	0.04	0.14	-0.23	-0.23	-0.23	-0.01	0.2	-0.39	0.38	Yes
hsa-miR-15b-5p	0.17	0.16	0.81	0.35	0.82	0.99	-0.36	0.26	-0.87	0.14	Yes	-0.38	0.27	-0.23	-0.23	-0.23	-0.09	0.37	-0.81	0.63	Yes
hsa-miR-16-5p	0.67	0.75	0.85	0.52	0.99	0.99	-0.11	0.25	-0.6	0.38	Yes	-0.08	0.26	-0.23	-0.23	-0.23	-0.07	0.36	-0.76	0.62	Yes
hsa-miR-181a-5p	0.05	0.46	0.21	0.28	0.82	0.87	-0.2	0.1	-0.39	0	No	-0.08	0.10	-0.23	-0.23	-0.23	0.18	0.14	-0.09	0.45	Yes
hsa-miR-181b/d-5p	0.16	0.17	0.26	0.35	0.82	0.87	-0.13	0.09	-0.32	0.05	Yes	-0.13	0.10	-0.23	-0.23	-0.23	0.15	0.13	-0.1	0.41	Yes
hsa-miR-183-5p	0.11	0	0.44	0.34	0.21	0.99	-0.13	0.08	-0.29	0.02	Yes	-0.27	0.08	-0.23	-0.23	-0.23	0.09	0.11	-0.13	0.31	Yes
hsa-miR-186-5p	0.8	0.29	0.99	0.52	0.82	0.99	0.03	0.14	-0.23	0.3	Yes	0.15	0.14	-0.23	-0.23	-0.23	0	0.2	-0.38	0.38	Yes
hsa-miR-191-5p	0.51	0.23	0.68	0.51	0.82	0.99	-0.09	0.13	-0.34	0.16	Yes	-0.16	0.13	-0.23	-0.23	-0.23	0.08	0.18	-0.28	0.41	Yes
hsa-miR-197-3p	0.04	0.81	0.56	0.28	0.99	0.99	-0.32	0.15	-0.61	-0.04	No	-0.04	0.15	-0.23	-0.23	-0.23	0.12	0.21	-0.28	0.53	Yes
hsa-miR-19b-3p	0.8	0.68	0.7	0.52	0.95	0.99	0.04	0.16	-0.27	0.35	Yes	-0.07	0.16	-0.23	-0.23	-0.23	-0.09	0.23	-0.53	0.35	Yes
hsa-miR-200a-3p	0.58	0.11	0.82	0.51	0.82	0.99	0.09	0.16	-0.21	0.39	Yes	0.26	0.16	-0.23	-0.23	-0.23	-0.05	0.22	-0.47	0.37	Yes
hsa-miR-200b-3p	0.32	0.89	0.85	0.43	0.99	0.99	0.12	0.12	-0.11	0.34	Yes	-0.02	0.12	-0.23	-0.23	-0.23	0.03	0.16	-0.29	0.35	Yes
hsa-miR-200c-3p	0.86	0.64	0.38	0.52	0.95	0.96	-0.02	0.1	-0.2	0.17	Yes	-0.05	0.10	-0.23	-0.23	-0.23	0.12	0.14	-0.14	0.38	Yes
hsa-miR-203	0.46	0.29	0.18	0.5	0.82	0.87	-0.07	0.1	-0.26	0.12	Yes	-0.11	0.10	-0.23	-0.23	-0.23	0.19	0.14	-0.08	0.46	Yes
hsa-miR-205-5p	0.7	0.98	0.62	0.52	0.99	0.99	-0.06	0.16	-0.38	0.25	Yes	0.00	0.17	-0.23	-0.23	-0.23	-0.12	0.23	-0.56	0.33	Yes
hsa-miR-20a/b-5p	0.33	0.1	0.47	0.43	0.82	0.99	-0.16	0.16	-0.47	0.15	Yes	-0.28	0.16	-0.23	-0.23	-0.23	0.16	0.23	-0.28	0.6	Yes
hsa-miR-21-5p	0.04	0.19	0.28	0.28	0.82	0.87	0.38	0.18	0.03	0.74	No	0.25	0.19	-0.23	-0.23	-0.23	-0.29	0.26	-0.79	0.22	Yes
hsa-miR-22-3p	0.02	0.06	0.53	0.28	0.82	0.99	0.24	0.1	0.04	0.44	No	0.20	0.10	-0.23	-0.23	-0.23	-0.09	0.14	-0.37	0.19	Yes
hsa-miR-221-3p	0.81	0.6	0.95	0.52	0.94	0.99	-0.03	0.11	-0.24	0.18	Yes	0.06	0.11	-0.23	-0.23	-0.23	-0.01	0.15	-0.31	0.28	Yes
hsa-miR-222-3p	0.5	0.98	0.67	0.51	0.99	0.99	0.1	0.14	-0.18	0.38	Yes	0.00	0.15	-0.23	-0.23	-0.23	0.09	0.2	-0.31	0.48	Yes
hsa-miR-223-3p	0.8	0.69	0.91	0.52	0.95	0.99	0.09	0.35	-0.58	0.76	Yes	0.14	0.35	-0.23	-0.23	-0.23	0.06	0.49	0	INoof	Yes
hsa-miR-23a-3p	0.65	0.93	0.76	0.52	0.99	0.99	0.04	0.09	-0.13	0.21	Yes	-0.01	0.09	-0.23	-0.23	-0.23	0.04	0.13	-0.2	0.28	Yes
hsa-miR-23b-3p	0.5	0.35	0.79	0.51	0.82	0.99	0.06	0.09	-0.12	0.24	Yes	-0.09	0.09	-0.23	-0.23	-0.23	-0.04	0.13	-0.29	0.22	Yes
hsa-miR-24-3p	0.98	0.86	0.77	0.55	0.99	0.99	0	0.16	-0.31	0.31	Yes	-0.03	0.16	-0.23	-0.23	-0.23	-0.07	0.23	-0.49	0.36	Yes

hsa-miR-25-3p	0.08	0.31	0.17	0.33	0.82	0.87	-0.33	0.18	-0.69	0.02	Yes	-0.19	0.19	-0.23	-0.23	-0.23	0.36	0.26	-0.14	0.86	Yes
hsa-miR-26a-5p	0.85	0.93	0.73	0.52	0.99	0.99	-0.04	0.23	-0.48	0.41	Yes	-0.02	0.24	-0.23	-0.23	-0.23	-0.11	0.33	-0.75	0.5	Yes
hsa-miR-26b-5p	0.86	0.61	0.99	0.52	0.95	0.99	-0.03	0.14	-0.29	0.24	Yes	-0.07	0.14	-0.23	-0.23	-0.23	0	0.19	-0.37	0.36	Yes
hsa-miR-27b-3p	0.34	0.82	0.5	0.43	0.99	0.99	0.13	0.13	-0.13	0.39	Yes	0.03	0.14	-0.23	-0.23	-0.23	-0.13	0.19	-0.49	0.23	Yes
hsa-miR-28-3p	0.76	0.4	0.2	0.52	0.82	0.87	0.02	0.07	-0.12	0.17	Yes	0.06	0.08	-0.23	-0.23	-0.23	0.14	0.1	-0.07	0.34	Yes
hsa-miR-28-5p	0.85	0.12	0.24	0.52	0.82	0.87	-0.02	0.1	-0.21	0.17	Yes	-0.16	0.10	-0.23	-0.23	-0.23	0.17	0.14	-0.1	0.44	Yes
hsa-miR-29a-3p	0.19	0.99	0.97	0.36	0.99	0.99	0.18	0.14	-0.08	0.45	Yes	0.00	0.14	-0.23	-0.23	-0.23	0.01	0.19	-0.37	0.38	Yes
hsa-miR-29b-3p	0.03	0.13	0.07	0.28	0.82	0.87	0.45	0.19	0.1	0.83	No	0.30	0.20	-0.23	-0.23	-0.23	-0.5	0.28	-1.01	-0.01	No
hsa-miR-29c-3p	0.03	0.89	0.22	0.28	0.99	0.87	0.26	0.11	0.04	0.48	No	0.02	0.12	-0.23	-0.23	-0.23	-0.2	0.16	-0.51	0.11	Yes
hsa-miR-30a-5p	0.3	0.36	0.67	0.43	0.82	0.99	0.12	0.12	-0.1	0.35	Yes	0.11	0.12	-0.23	-0.23	-0.23	0.07	0.16	-0.25	0.39	Yes
hsa-miR-30b-5p	0.46	0.66	0.07	0.5	0.95	0.87	0.19	0.25	-0.3	0.68	Yes	0.12	0.26	-0.23	-0.23	-0.23	-0.66	0.36	-1.35	0.03	Yes
hsa-miR-30c-5p	0.83	0.82	0.87	0.52	0.99	0.99	0.02	0.11	-0.19	0.23	Yes	0.03	0.11	-0.23	-0.23	-0.23	0.03	0.15	-0.27	0.32	Yes
hsa-miR-30d-5p	0.34	0.55	0.95	0.43	0.91	0.99	0.11	0.11	-0.1	0.32	Yes	0.07	0.11	-0.23	-0.23	-0.23	0.01	0.16	-0.29	0.31	Yes
hsa-miR-30e-5p	0.21	0.25	0.83	0.39	0.82	0.99	0.12	0.09	-0.06	0.29	Yes	0.11	0.09	-0.23	-0.23	-0.23	-0.03	0.13	-0.27	0.22	Yes
hsa-miR-31-5p	0.54	0.47	0.27	0.51	0.82	0.87	0.06	0.09	-0.12	0.24	Yes	0.07	0.10	-0.23	-0.23	-0.23	-0.15	0.13	-0.4	0.11	Yes
hsa-miR-324-5p	0.56	0.05	0.55	0.51	0.82	0.99	-0.06	0.11	-0.27	0.14	Yes	0.22	0.11	-0.23	-0.23	-0.23	0.09	0.15	-0.2	0.38	Yes
hsa-miR-331-3p	0.24	0.2	0.48	0.41	0.82	0.99	-0.11	0.09	-0.29	0.07	Yes	0.12	0.09	-0.23	-0.23	-0.23	0.09	0.13	-0.03	0.28	Yes
hsa-miR-340-5p	0.09	0.14	0.19	0.34	0.82	0.87	0.23	0.13	-0.03	0.49	Yes	0.21	0.14	-0.23	-0.23	-0.23	-0.25	0.19	-0.62	0.11	Yes
hsa-miR-342-3p	0.95	0.15	0.78	0.54	0.82	0.99	0.01	0.11	-0.21	0.22	Yes	0.16	0.11	-0.23	-0.23	-0.23	-0.04	0.15	-0.34	0.26	Yes
hsa-miR-34a-5p	0.72	0.42	0.81	0.52	0.82	0.99	0.04	0.11	-0.17	0.25	Yes	0.09	0.11	-0.23	-0.23	-0.23	0.04	0.15	-0.26	0.34	Yes
hsa-miR-34b-3p	0.91	0.87	0.99	0.53	0.99	0.99	-0.02	0.18	-0.38	0.34	Yes	0.03	0.19	-0.23	-0.23	-0.23	0	0.26	-0.5	0.51	Yes
hsa-miR-34c-3p	0.17	0.36	0.12	0.35	0.82	0.87	-0.18	0.13	-0.43	0.07	Yes	-0.12	0.13	-0.23	-0.23	-0.23	0.29	0.18	-0.06	0.64	Yes
hsa-miR-34c-5p	0.9	0.75	0.94	0.53	0.99	0.99	0.02	0.18	-0.32	0.36	Yes	0.06	0.18	-0.23	-0.23	-0.23	0.02	0.25	-0.47	0.5	Yes
hsa-miR-361-3p	0.56	0.31	0.48	0.51	0.82	0.99	-0.06	0.1	-0.26	0.14	Yes	0.11	0.11	-0.23	-0.23	-0.23	0.1	0.15	-0.18	0.39	Yes
hsa-miR-374a-5p	0.43	0.43	0.8	0.48	0.82	0.99	0.11	0.14	-0.16	0.38	Yes	-0.11	0.14	-0.23	-0.23	-0.23	-0.05	0.2	-0.43	0.33	Yes
hsa-miR-374b-5p	0.64	0.44	0.3	0.52	0.82	0.87	-0.04	0.08	-0.2	0.12	Yes	-0.07	0.08	-0.23	-0.23	-0.23	0.12	0.12	-0.06	0.33	Yes
hsa-miR-375	0.53	0.45	0.68	0.51	0.82	0.99	-0.12	0.19	-0.48	0.24	Yes	-0.15	0.19	-0.23	-0.23	-0.23	0.11	0.26	-0.4	0.62	Yes
hsa-miR-378a/i-3p	0.74	0.68	0.53	0.52	0.95	0.99	0.04	0.11	-0.18	0.25	Yes	0.05	0.11	-0.23	-0.23	-0.23	0.1	0.16	-0.21	0.41	Yes
hsa-miR-378e	0.77	0.97	0.39	0.52	0.99	0.96	0.05	0.18	-0.29	0.4	Yes	0.01	0.18	-0.23	-0.23	-0.23	0.22	0.25	-0.27	0.7	Yes
hsa-miR-423-3p	0.06	0.24	0.08	0.28	0.82	0.87	-0.14	0.07	-0.28	0	No	-0.09	0.07	-0.23	-0.23	-0.23	0.18	0.1	-0.01	0.38	Yes
hsa-miR-425-5p	0.39	0.97	0.42	0.47	0.99	0.99	-0.1	0.12	-0.33	0.12	Yes	0.00	0.12	-0.23	-0.23	-0.23	0.13	0.16	-0.18	0.45	Yes
hsa-miR-429	0.58	0.26	0.84	0.51	0.82	0.99	0.13	0.23	-0.31	0.56	Yes	0.26	0.23	-0.23	-0.23	-0.23	-0.07	0.32	-0.68	0.55	Yes
hsa-miR-4454	0.05	0.16	0.02	0.28	0.82	0.87	0.61	0.31	0.02	1.21	No	0.45	0.32	-0.23	-0.23	-0.23	-1.06	0.44	-1.91	-0.22	No
hsa-miR-449a	0.66	0.5	0.66	0.52	0.85	0.99	0.08	0.17	-0.26	0.41	Yes	-0.12	0.18	-0.23	-0.23	-0.23	0.11	0.24	-0.36	0.57	Yes

hsa-miR-451a	0.68	0.33	0.71	0.52	0.82	0.99	-0.33	0.78	-1.83	1.17	Yes	-0.77	0.79	-0.23	-0.23	-0.23	-0.42	1.1	-2.54	1.71	Yes
hsa-miR-493-3p	0.25	0.44	0.32	0.42	0.82	0.88	-0.21	0.18	-0.55	0.14	Yes	-0.14	0.18	-0.23	-0.23	-0.23	0.25	0.25	-0.23	0.73	Yes
hsa-miR-551b-3p	0.56	0.21	0.67	0.51	0.82	0.99	0.1	0.18	-0.24	0.45	Yes	0.23	0.18	-0.23	-0.23	-0.23	-0.11	0.25	-0.59	0.38	Yes
hsa-miR-574-5p	0.9	0.57	0.2	0.53	0.93	0.87	0.02	0.15	-0.28	0.31	Yes	0.09	0.15	-0.23	-0.23	-0.23	0.28	0.21	-0.13	0.7	Yes
hsa-miR-598	0.75	0.45	0.54	0.52	0.82	0.99	0.04	0.13	-0.21	0.29	Yes	-0.10	0.13	-0.23	-0.23	-0.23	0.11	0.18	-0.24	0.47	Yes
hsa-miR-664-3p	0.34	0.1	0.09	0.43	0.82	0.87	-0.09	0.09	-0.25	0.09	Yes	-0.15	0.09	-0.23	-0.23	-0.23	0.22	0.13	0	0.47	No
hsa-miR-720	0.29	0.4	0.14	0.43	0.82	0.87	0.38	0.36	-0.31	1.08	Yes	0.31	0.37	-0.23	-0.23	-0.23	-0.77	0.51	-1.75	0.22	Yes
hsa-miR-92a-3p	0.06	0.14	0.5	0.28	0.82	0.99	-0.5	0.26	-1	0	Yes	-0.40	0.27	-0.23	-0.23	-0.23	0.25	0.37	-0.45	0.95	Yes
hsa-miR-93-5p	0.13	0.12	0.18	0.34	0.82	0.87	-0.2	0.13	-0.44	0.05	Yes	-0.21	0.13	-0.23	-0.23	-0.23	0.24	0.18	-0.1	0.59	Yes
hsa-miR-98	0.04	0.68	0.25	0.28	0.95	0.87	-0.18	0.09	-0.35	-0.01	No	-0.04	0.09	-0.23	-0.23	-0.23	0.14	0.12	-0.09	0.38	Yes
hsa-miR-99a-5p	0.33	0.28	0.8	0.43	0.82	0.99	0.12	0.12	-0.11	0.35	Yes	0.13	0.12	-0.23	-0.23	-0.23	-0.04	0.17	-0.37	0.28	Yes
hsa-miR-99b-5p	0.7	0.83	0.75	0.52	0.99	0.99	-0.04	0.09	-0.21	0.14	Yes	0.02	0.09	-0.23	-0.23	-0.23	0.04	0.13	-0.21	0.29	Yes

ACCEPTED MANUSCRIPT																	
miRNA	p-value (Diesel)	p-value (Allergen)	q-value (Diesel)	q-value (Allergen)	Interaction p-value from log-likelihood ratio test	Interaction q-value from log-likelihood ratio test	Evidence of Interaction (criteria: q<0.05)	Fixed Effect (Diesel)	Standard Error (Diesel)	Confidence Bound (lower 2.5%; Diesel)	Confidence Bound (upper 97.5%; Diesel)	Zero covered by CI (Diesel)	Fixed Effect (Allergen)	Standard Error (Allergen)	Confidence Bound (lower 2.5%; Allergen)	Confidence Bound (upper 97.5%; Allergen)	Zero covered by CI (Allergen)
hsa-miR-183-5p	0.12	0.00	0.44	0.02	0.42	0.97	No	-0.09	0.06	-0.20	0.02	Yes	-0.22	0.06	-0.33	-0.11	No
hsa-miR-324-5p	0.82	0.00	0.67	0.03	0.53	0.98	No	-0.02	0.07	-0.16	0.13	Yes	0.27	0.07	0.13	0.42	No
hsa-miR-132-3p	0.95	0.01	0.71	0.19	0.44	0.97	No	0.01	0.10	-0.19	0.20	Yes	0.27	0.10	0.08	0.46	No
hsa-miR-331-3p	0.33	0.01	0.55	0.19	0.46	0.97	No	-0.06	0.06	-0.19	0.06	Yes	0.17	0.06	0.04	0.30	No
hsa-miR-28-3p	0.09	0.01	0.44	0.19	0.18	0.81	No	0.09	0.05	-0.01	0.19	Yes	0.14	0.05	0.03	0.24	No
hsa-miR-15b-5p	0.03	0.02	0.44	0.25	0.80	0.99	No	-0.41	0.18	-0.77	-0.05	No	-0.43	0.18	-0.79	-0.07	No
hsa-miR-361-3p	0.89	0.03	0.69	0.25	0.47	0.97	No	-0.01	0.07	-0.15	0.13	Yes	0.16	0.07	0.02	0.31	No
hsa-miR-574-5p	0.15	0.03	0.44	0.25	0.18	0.81	No	0.16	0.11	-0.05	0.37	Yes	0.24	0.11	0.02	0.45	No
hsa-miR-200a-3p	0.57	0.04	0.62	0.25	0.82	0.99	No	0.06	0.11	-0.15	0.27	Yes	0.23	0.11	0.02	0.44	No
hsa-miR-125a-5p	0.07	0.04	0.44	0.25	0.37	0.91	No	-0.21	0.11	-0.43	0.01	Yes	-0.24	0.11	-0.46	-0.02	No
hsa-let-7d-5p	0.16	0.04	0.44	0.25	0.34	0.90	No	-0.12	0.08	-0.28	0.04	Yes	-0.17	0.08	-0.33	-0.01	No
hsa-miR-22-3p	0.01	0.04	0.44	0.25	0.51	0.98	No	0.20	0.07	0.06	0.34	No	0.15	0.07	0.01	0.29	No
hsa-let-7a-5p	0.14	0.05	0.44	0.28	0.49	0.97	No	-0.13	0.09	-0.30	0.04	Yes	-0.17	0.09	-0.34	0.00	No
hsa-miR-130a-3p	0.93	0.07	0.70	0.33	0.27	0.81	No	0.01	0.08	-0.15	0.16	Yes	-0.15	0.08	-0.30	0.01	Yes
hsa-miR-342-3p	0.85	0.07	0.68	0.33	0.77	0.99	No	-0.01	0.08	-0.16	0.13	Yes	0.14	0.08	-0.01	0.29	Yes
hsa-miR-451a	0.33	0.08	0.55	0.33	0.69	0.99	No	-0.53	0.54	-1.60	0.53	Yes	-0.99	0.54	-2.06	0.07	Yes

hsa-miR-30a-5p	0.06	0.08	0.44	0.33	0.66	0.99	No	0.16	0.08	0.00	0.32	Yes	0.15	0.08	-0.01	0.31	Yes
hsa-miR-20a-5p+hsa-miR-20b-5p	0.50	0.10	0.60	0.37	0.46	0.97	No	-0.08	0.11	-0.30	0.14	Yes	-0.19	0.11	-0.41	0.03	Yes
hsa-miR-23b-3p	0.49	0.10	0.60	0.38	0.78	0.99	No	0.05	0.06	-0.08	0.17	Yes	-0.11	0.06	-0.24	0.02	Yes
hsa-miR-186-5p	0.73	0.13	0.66	0.45	0.99	0.99	No	0.03	0.10	-0.16	0.22	Yes	0.15	0.10	-0.04	0.34	Yes
hsa-miR-30e-5p	0.12	0.15	0.44	0.45	0.83	0.99	No	0.10	0.06	-0.02	0.23	Yes	0.09	0.06	-0.03	0.22	Yes
hsa-miR-92a-3p	0.05	0.15	0.44	0.45	0.48	0.97	No	-0.38	0.18	-0.74	-0.02	No	-0.27	0.18	-0.63	0.09	Yes
hsa-miR-429	0.56	0.15	0.62	0.45	0.83	0.99	No	0.09	0.16	-0.22	0.40	Yes	0.23	0.16	-0.08	0.54	Yes
hsa-miR-34a-5p	0.46	0.16	0.59	0.45	0.81	0.99	No	0.06	0.08	-0.09	0.21	Yes	0.11	0.08	-0.04	0.26	Yes
hsa-miR-374a-5p	0.38	0.16	0.56	0.45	0.79	0.99	No	0.09	0.10	-0.10	0.28	Yes	-0.14	0.10	-0.33	0.05	Yes
hsa-miR-551b-3p	0.68	0.17	0.66	0.45	0.66	0.99	No	0.05	0.12	-0.19	0.30	Yes	0.17	0.12	-0.07	0.42	Yes
hsa-miR-107	0.30	0.18	0.54	0.45	0.79	0.99	No	-0.15	0.14	-0.42	0.13	Yes	-0.19	0.14	-0.47	0.08	Yes
hsa-miR-151a-3p	0.23	0.19	0.53	0.45	0.26	0.81	No	0.09	0.07	-0.05	0.23	Yes	0.10	0.07	-0.04	0.24	Yes
hsa-miR-191-5p	0.60	0.19	0.63	0.45	0.67	0.99	No	-0.05	0.09	-0.23	0.13	Yes	-0.12	0.09	-0.30	0.06	Yes
hsa-let-7b-5p	0.40	0.19	0.56	0.45	0.16	0.81	No	-0.06	0.07	-0.19	0.07	Yes	0.09	0.07	-0.04	0.22	Yes
hsa-miR-99a-5p	0.26	0.20	0.54	0.45	0.79	0.99	No	0.10	0.08	-0.07	0.26	Yes	0.11	0.08	-0.05	0.27	Yes
hsa-let-7e-5p	0.34	0.21	0.55	0.46	0.28	0.81	No	-0.09	0.09	-0.27	0.09	Yes	-0.12	0.09	-0.29	0.06	Yes
hsa-miR-378a-3p+hsa-miR-378i	0.27	0.21	0.54	0.46	0.51	0.98	No	0.09	0.08	-0.07	0.24	Yes	0.10	0.08	-0.06	0.25	Yes
hsa-miR-30b-5p	0.45	0.22	0.59	0.46	0.06	0.81	No	-0.14	0.18	-0.50	0.22	Yes	-0.23	0.18	-0.58	0.13	Yes
hsa-miR-125b-5p	0.79	0.24	0.67	0.49	0.22	0.81	No	-0.02	0.09	-0.20	0.15	Yes	0.10	0.09	-0.07	0.28	Yes
hsa-miR-141-3p	0.04	0.27	0.44	0.52	0.98	0.99	No	0.21	0.10	0.02	0.40	No	0.11	0.10	-0.08	0.30	Yes
hsa-miR-106b-5p	0.19	0.28	0.48	0.52	0.30	0.83	No	-0.15	0.11	-0.37	0.07	Yes	-0.12	0.11	-0.34	0.09	Yes
hsa-miR-148b-3p	0.08	0.28	0.44	0.52	0.24	0.81	No	-0.16	0.09	-0.33	0.01	Yes	-0.10	0.09	-0.27	0.08	Yes
hsa-miR-29c-3p	0.06	0.29	0.44	0.52	0.20	0.81	No	0.16	0.08	0.00	0.32	No	-0.09	0.08	-0.24	0.07	Yes
hsa-miR-28-5p	0.36	0.30	0.56	0.52	0.22	0.81	No	0.06	0.07	-0.07	0.20	Yes	-0.07	0.07	-0.21	0.06	Yes
hsa-let-7c	0.87	0.30	0.69	0.52	0.19	0.81	No	-0.01	0.08	-0.16	0.14	Yes	0.08	0.08	-0.07	0.23	Yes
hsa-miR-19b-3p	0.98	0.32	0.72	0.53	0.68	0.99	No	0.00	0.11	-0.22	0.22	Yes	-0.11	0.11	-0.33	0.11	Yes
hsa-miR-100-5p	0.11	0.33	0.44	0.54	0.56	0.99	No	0.16	0.10	-0.03	0.34	Yes	0.09	0.10	-0.09	0.28	Yes
hsa-miR-378e	0.21	0.35	0.50	0.55	0.37	0.91	No	0.16	0.13	-0.08	0.41	Yes	0.12	0.13	-0.13	0.37	Yes
hsa-miR-30d-5p	0.15	0.35	0.44	0.55	0.95	0.99	No	0.11	0.08	-0.04	0.26	Yes	0.07	0.08	-0.08	0.22	Yes
hsa-miR-106a-5p+hsa-miR-17-5p	0.40	0.36	0.56	0.55	0.70	0.99	No	-0.10	0.11	-0.32	0.13	Yes	-0.11	0.11	-0.33	0.12	Yes

hsa-miR-93-5p	0.40	0.37	0.56	0.56	0.16	0.81	No	-0.08	0.09	-0.25	0.10	Yes	-0.08	0.09	-0.26	0.09	Yes
hsa-miR-181b-5p+hsa-miR-181d	0.37	0.40	0.56	0.60	0.24	0.81	No	-0.06	0.07	-0.19	0.07	Yes	-0.06	0.07	-0.19	0.07	Yes
hsa-miR-1260a	0.60	0.42	0.63	0.60	0.01	0.74	No	-0.11	0.20	-0.50	0.29	Yes	-0.16	0.20	-0.56	0.23	Yes
hsa-miR-425-5p	0.68	0.43	0.66	0.61	0.40	0.95	No	-0.03	0.08	-0.20	0.13	Yes	0.07	0.08	-0.10	0.23	Yes
hsa-miR-340-5p	0.28	0.45	0.54	0.61	0.17	0.81	No	0.10	0.10	-0.08	0.29	Yes	0.07	0.10	-0.11	0.26	Yes
hsa-miR-21-5p	0.07	0.45	0.44	0.61	0.26	0.81	No	0.24	0.13	-0.01	0.49	Yes	0.10	0.13	-0.16	0.35	Yes
hsa-miR-26b-5p	0.79	0.45	0.67	0.61	0.99	0.99	No	-0.03	0.10	-0.21	0.16	Yes	-0.07	0.10	-0.26	0.11	Yes
hsa-miR-223-3p	0.63	0.48	0.65	0.61	0.90	0.99	No	0.12	0.24	-0.36	0.59	Yes	0.17	0.24	-0.30	0.65	Yes
hsa-miR-221-3p	0.68	0.48	0.66	0.61	0.94	0.99	No	-0.03	0.08	-0.18	0.12	Yes	0.05	0.08	-0.09	0.20	Yes
hsa-miR-146a-5p	0.14	0.49	0.44	0.61	0.93	0.99	No	0.20	0.13	-0.06	0.45	Yes	0.09	0.13	-0.16	0.35	Yes
hsa-miR-375	0.62	0.50	0.65	0.61	0.67	0.99	No	-0.06	0.13	-0.32	0.19	Yes	-0.09	0.13	-0.35	0.16	Yes
hsa-miR-99b-5p	0.82	0.51	0.67	0.62	0.74	0.99	No	-0.02	0.06	-0.14	0.11	Yes	0.04	0.06	-0.08	0.17	Yes
hsa-miR-16-5p	0.43	0.51	0.58	0.62	0.85	0.99	No	-0.14	0.18	-0.49	0.20	Yes	-0.12	0.18	-0.46	0.23	Yes
hsa-miR-98	0.09	0.56	0.44	0.64	0.23	0.81	No	-0.11	0.06	-0.23	0.01	Yes	0.04	0.06	-0.08	0.16	Yes
hsa-miR-24-3p	0.74	0.57	0.66	0.64	0.76	0.99	No	-0.04	0.11	-0.26	0.18	Yes	-0.06	0.11	-0.29	0.15	Yes
hsa-let-7f-5p	0.24	0.57	0.54	0.64	0.96	0.99	No	-0.21	0.18	-0.56	0.14	Yes	-0.10	0.18	-0.45	0.25	Yes
hsa-miR-34c-5p	0.80	0.58	0.67	0.64	0.94	0.99	No	0.03	0.12	-0.21	0.27	Yes	0.07	0.12	-0.17	0.31	Yes
hsa-miR-664-3p	0.70	0.59	0.66	0.64	0.07	0.81	No	0.02	0.06	-0.10	0.15	Yes	-0.04	0.06	-0.16	0.09	Yes
hsa-miR-449a	0.29	0.59	0.54	0.64	0.65	0.99	No	0.13	0.12	-0.11	0.36	Yes	-0.06	0.12	-0.30	0.17	Yes
hsa-miR-30c-5p	0.64	0.61	0.65	0.64	0.86	0.99	No	0.04	0.08	-0.11	0.19	Yes	0.04	0.08	-0.11	0.19	Yes
hsa-miR-26a-5p	0.53	0.62	0.61	0.64	0.72	0.99	No	-0.10	0.16	-0.42	0.22	Yes	-0.08	0.16	-0.39	0.24	Yes
hsa-miR-205-5p	0.29	0.62	0.54	0.64	0.60	0.99	No	-0.12	0.11	-0.34	0.10	Yes	-0.06	0.11	-0.28	0.17	Yes
hsa-miR-222-3p	0.17	0.63	0.45	0.64	0.66	0.99	No	0.14	0.10	-0.06	0.34	Yes	0.05	0.10	-0.15	0.25	Yes
hsa-miR-598	0.29	0.64	0.54	0.64	0.53	0.98	No	0.10	0.09	-0.08	0.28	Yes	-0.04	0.09	-0.22	0.13	Yes
hsa-miR-1180	0.45	0.64	0.59	0.64	0.24	0.81	No	0.12	0.16	-0.19	0.43	Yes	-0.07	0.16	-0.39	0.24	Yes
hsa-miR-4454	0.72	0.66	0.66	0.64	0.02	0.74	No	0.08	0.23	-0.37	0.54	Yes	-0.10	0.23	-0.55	0.35	Yes
hsa-miR-135b-5p	0.03	0.66	0.44	0.64	0.99	0.99	No	0.20	0.09	0.03	0.37	No	-0.04	0.09	-0.21	0.13	Yes
hsa-let-7i-5p	0.79	0.68	0.67	0.65	0.13	0.81	No	-0.02	0.09	-0.20	0.15	Yes	0.04	0.09	-0.14	0.21	Yes
hsa-miR-27b-3p	0.50	0.70	0.60	0.66	0.48	0.97	No	0.06	0.09	-0.12	0.25	Yes	-0.04	0.09	-0.22	0.15	Yes
hsa-miR-15a-5p	0.35	0.71	0.55	0.66	0.98	0.99	No	-0.09	0.10	-0.28	0.10	Yes	0.04	0.10	-0.15	0.23	Yes

hsa-miR-720	1.00	0.74	0.72	0.66	0.12	0.81	No	0.00	0.26	-0.51	0.51	Yes	-0.09	0.26	-0.59	0.42	Yes
hsa-miR-151a-5p	0.92	0.74	0.70	0.66	0.65	0.99	No	-0.01	0.05	-0.10	0.09	Yes	0.02	0.05	-0.08	0.12	Yes
hsa-miR-29b-3p	0.17	0.76	0.46	0.66	0.06	0.81	No	0.20	0.14	-0.08	0.47	Yes	0.04	0.14	-0.23	0.32	Yes
hsa-miR-34c-3p	0.71	0.76	0.66	0.66	0.10	0.81	No	-0.03	0.09	-0.22	0.15	Yes	0.03	0.09	-0.15	0.21	Yes
hsa-let-7g-5p	0.11	0.78	0.44	0.66	0.22	0.81	No	-0.14	0.08	-0.30	0.02	Yes	0.02	0.08	-0.14	0.18	Yes
hsa-miR-140-5p	0.49	0.79	0.60	0.66	0.08	0.81	No	-0.05	0.08	-0.20	0.09	Yes	0.02	0.08	-0.13	0.17	Yes
hsa-miR-148a-3p	0.93	0.79	0.70	0.66	0.19	0.81	No	-0.01	0.10	-0.21	0.19	Yes	-0.03	0.10	-0.23	0.17	Yes
hsa-miR-181a-5p	0.14	0.79	0.44	0.66	0.19	0.81	No	-0.11	0.07	-0.24	0.03	Yes	0.02	0.07	-0.12	0.16	Yes
hsa-miR-197-3p	0.02	0.80	0.44	0.66	0.54	0.99	No	-0.26	0.10	-0.46	-0.06	No	0.03	0.10	-0.18	0.23	Yes
hsa-miR-34b-3p	0.89	0.81	0.69	0.66	0.99	0.99	No	-0.02	0.13	-0.27	0.23	Yes	0.03	0.13	-0.22	0.28	Yes
hsa-miR-200c-3p	0.53	0.82	0.61	0.66	0.36	0.91	No	0.04	0.07	-0.09	0.18	Yes	0.02	0.07	-0.12	0.15	Yes
hsa-miR-142-3p	0.98	0.84	0.72	0.67	0.64	0.99	No	0.00	0.21	-0.42	0.41	Yes	0.04	0.21	-0.37	0.46	Yes
hsa-miR-23a-3p	0.35	0.85	0.55	0.67	0.75	0.99	No	0.06	0.06	-0.06	0.18	Yes	0.01	0.06	-0.11	0.13	Yes
hsa-miR-150-5p	0.59	0.87	0.63	0.68	0.91	0.99	No	-0.09	0.17	-0.43	0.24	Yes	0.03	0.17	-0.31	0.37	Yes
hsa-miR-423-3p	0.34	0.90	0.55	0.69	0.07	0.81	No	-0.05	0.05	-0.15	0.05	Yes	0.01	0.05	-0.09	0.11	Yes
hsa-miR-203	0.76	0.91	0.67	0.69	0.16	0.81	No	0.02	0.07	-0.12	0.16	Yes	-0.01	0.07	-0.15	0.13	Yes
hsa-miR-31-5p	0.81	0.92	0.67	0.69	0.25	0.81	No	-0.02	0.07	-0.15	0.11	Yes	-0.01	0.07	-0.14	0.12	Yes
hsa-miR-493-3p	0.52	0.92	0.61	0.69	0.30	0.83	No	-0.08	0.13	-0.33	0.16	Yes	-0.01	0.13	-0.26	0.23	Yes
hsa-miR-374b-5p	0.70	0.97	0.66	0.71	0.28	0.81	No	0.02	0.06	-0.09	0.14	Yes	0.00	0.06	-0.12	0.11	Yes
hsa-miR-25-3p	0.25	0.98	0.54	0.71	0.15	0.81	No	-0.15	0.13	-0.41	0.10	Yes	0.00	0.13	-0.26	0.25	Yes
hsa-miR-29a-3p	0.06	0.99	0.44	0.71	0.97	0.99	No	0.19	0.10	0.00	0.37	Yes	0.00	0.10	-0.19	0.19	Yes
hsa-miR-200b-3p	0.11	0.99	0.44	0.71	0.85	0.99	No	0.13	0.08	-0.03	0.29	Yes	0.00	0.08	-0.16	0.16	Yes

#	Annotation	Total Genes (With Annotation)	Total Genes (No Annotation)	Genome (With Annotation)	Genome (No Annotation)	Natural Log (Bayes factor)	Neg Natural Log (p value)	FET: Neg Natural Log (p-value)	FET: Neg Natural Log (FDR)	Genes
1	GO:0009607 [4]: response to biotic stimulus	13	5	945	11316	21.64	11.17	24.55	19.85	C4A C4B CD74 CXCL1 CXCL2 FCER1A HLA-A HLA-DRB3 IFNGR1 MHC2TA NFIL3 STAT5A TNFSF12
2	GO:0006955 [4]: immune response	12	6	735	11526	21.27	11.17	24.19	19.85	C4A C4B CD74 CXCL1 CXCL2 FCER1A HLA-A HLA-DRB3 MHC2TA NFIL3 STAT5A TNFSF12
3	GO:0006952 [5]: defense response	12	6	826	11435	19.93	11.17	22.85	18.91	C4A C4B CD74 CXCL1 CXCL2 FCER1A HLA-A HLA-DRB3 MHC2TA NFIL3 STAT5A TNFSF12
4	GO:0050896 [3]: response to stimulus	14	4	1930	10331	15.55	11.17	18.45	14.81	AHR C4A C4B CD74 CXCL1 CXCL2 FCER1A HLA-A HLA-DRB3 IFNGR1 MHC2TA NFIL3 STAT5A TNFSF12
5	GO:0050874 [3]: organismal physiological process	12	6	1832	10429	10.98	11.17	13.84	10.42	C4A C4B CD74 CXCL1 CXCL2 FCER1A HLA-A HLA-DRB3 MHC2TA NFIL3 STAT5A TNFSF12
6	GO:0009613 [5]: response to pest, pathogen or parasite	7	11	464	11797	9.98	11.17	12.87	9.63	C4A C4B CD74 CXCL1 CXCL2 IFNGR1 MHC2TA
7	GO:0043207 [5]: response to external biotic	7	11	495	11766	9.56	11.17	12.45	9.36	C4A C4B CD74 CXCL1 CXCL2 IFNGR1 MHC2TA

	stimulus									
8	GO:0006954 [5]: inflammatory response	5	13	191	12070	8.94	11.17	11.85	8.9	C4A C4B CD74 CXCL1 CXCL2
9	GO:0006950 [4]: response to stress	8	10	842	11419	8.47	11.17	11.33	8.5	AHR C4A C4B CD74 CXCL1 CXCL2 IFNGR1 MHC2TA
10	GO:0019882 [5]: antigen presentation	3	15	42	12219	7.3	10.47	10.23	7.5	CD74 HLA-A HLA-DRB3
11	GO:0009611 [5]: response to wounding	5	13	281	11980	7.13	10.07	10.03	7.39	C4A C4B CD74 CXCL1 CXCL2
12	GO:0019883 [6]: antigen presentation, endogenous antigen	2	16	10	12251	5.99	9.09	8.93	6.38	CD74 HLA-A
13	GO:0009605 [4]: response to external stimulus	8	10	1255	11006	5.66	8.97	8.48	6.01	AHR C4A C4B CD74 CXCL1 CXCL2 IFNGR1 MHC2TA
14	GO:0050791 [3]: regulation of physiological process	11	7	2542	9719	5.61	8.97	8.39	6	AHR C4A CD74 CDKN1A CXCL1 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3 TNFSF12
15	GO:0006915 [6]: apoptosis	5	13	435	11826	5.13	8.53	8	5.72	AHR CD74 CDKN1A TNFAIP3 TNFSF12
16	GO:0012501 [5]: programmed cell death	5	13	437	11824	5.12	8.53	7.98	5.72	AHR CD74 CDKN1A TNFAIP3 TNFSF12
17	GO:0042981	4	14	246	12015	4.91	8.53	7.8	5.63	CD74 CDKN1A TNFAIP3 TNFSF12

	[6]: regulation of apoptosis									
18	GO:0043067 [5]: regulation of programmed cell death	4	14	248	12013	4.88	8.53	7.77	5.63	CD74 CDKN1A TNFAIP3 TNFSF12
19	GO:0008219 [4]: cell death	5	13	465	11796	4.84	8.53	7.69	5.62	AHR CD74 CDKN1A TNFAIP3 TNFSF12
20	GO:0016265 [3]: death	5	13	469	11792	4.8	8.53	7.66	5.62	AHR CD74 CDKN1A TNFAIP3 TNFSF12
21	GO:0051243 [5]: negative regulation of cellular physiological process	4	14	261	12000	4.69	8.4	7.58	5.59	CD74 CDKN1A CXCL1 TNFAIP3
22	GO:0042828 [6]: response to pathogen	2	16	22	12239	4.57	8.28	7.51	5.57	IFNGR1 MHC2TA
23	GO:0050789 [2]: regulation of biological process	11	7	2856	9405	4.56	8.28	7.32	5.42	AHR C4A CD74 CDKN1A CXCL1 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3 TNFSF12
24	GO:0051244 [4]: regulation of cellular physiological process	5	13	562	11699	4	7.77	6.84	5.03	CD74 CDKN1A CXCL1 TNFAIP3 TNFSF12
25	GO:0030333 [5]: antigen processing	2	16	30	12231	4	7.77	6.93	5.07	HLA-A HLA-DRB3
26	GO:0006956 [6]: complement	2	16	37	12224	3.61	7.14	6.53	4.76	C4A C4B

	activation									
27	GO:0006959 [5]: humoral immune response	3	15	160	12101	3.53	6.98	6.43	4.69	C4A C4B CD74
28	GO:0043118 [4]: negative regulation of physiological process	4	14	415	11846	3.04	6.49	5.88	4.18	CD74 CDKN1A CXCL1 TNFAIP3
29	GO:0042221 [6]: response to chemical substance	3	15	227	12034	2.58	5.96	5.45	3.8	AHR CXCL1 CXCL2
30	GO:0050794 [3]: regulation of cellular process	5	13	787	11474	2.58	5.96	5.37	3.77	CD74 CDKN1A CXCL1 TNFAIP3 TNFSF12
31	GO:0043030 [6]: regulation of macrophage activation	1	17	2	12259	2.49	5.86	5.43	3.8	CD74
32	GO:0045058 [5]: T-cell selection	1	17	4	12257	1.98	5.27	4.92	3.35	CD74
33	GO:0043066 [7]: negative regulation of apoptosis	2	16	101	12160	1.73	5	4.63	3.14	CD74 TNFAIP3
34	GO:0043069 [6]: negative regulation of programmed cell death	2	16	102	12159	1.71	5	4.61	3.14	CD74 TNFAIP3

35	GO:0042116 [6]: macrophage activation	1	17	6	12255	1.65	4.91	4.58	3.14	CD74
36	GO:0042829 [6]: defense response to pathogen	1	17	6	12255	1.65	4.91	4.58	3.14	MHC2TA
37	GO:0042330 [5]: taxis	2	16	115	12146	1.49	4.74	4.38	3.04	CXCL1 CXCL2
38	GO:0006935 [6]: chemotaxis	2	16	115	12146	1.49	4.74	4.38	3.04	CXCL1 CXCL2
39	GO:0016064 [6]: humoral defense mechanism (sensu Vertebrata)	2	16	117	12144	1.46	4.74	4.35	3.04	C4A CD74
40	GO:0012502 [7]: induction of programmed cell death	2	16	121	12140	1.4	4.69	4.29	3.04	CDKN1A TNFSF12
41	GO:0006917 [8]: induction of apoptosis	2	16	121	12140	1.4	4.69	4.29	3.04	CDKN1A TNFSF12
42	GO:0009596 [6]: detection of pest, pathogen or parasite	1	17	8	12253	1.4	4.69	4.33	3.04	MHC2TA
43	GO:0046457 [9]: prostanoid biosynthesis	1	17	8	12253	1.4	4.69	4.33	3.04	CD74
44	GO:0001516	1	17	8	12253	1.4	4.69	4.33	3.04	CD74

	[10]: prostaglandin biosynthesis									
45	GO:0043065 [7]: positive regulation of apoptosis	2	16	128	12133	1.3	4.6	4.18	2.99	CDKN1A TNFSF12
46	GO:0043068 [6]: positive regulation of programmed cell death	2	16	129	12132	1.28	4.57	4.17	2.99	CDKN1A TNFSF12
47	GO:0008285 [6]: negative regulation of cell proliferation	2	16	129	12132	1.28	4.57	4.17	2.99	CDKN1A CXCL1
48	GO:0009628 [5]: response to abiotic stimulus	3	15	378	11883	1.25	4.57	4.07	2.91	AHR CXCL1 CXCL2
49	GO:0019885 [6]: antigen processing, endogenous antigen via MHC class I	1	17	11	12250	1.11	4.41	4.05	2.91	HLA-A
50	GO:0006366 [8]: transcription from Pol II promoter	3	15	427	11834	0.95	4.25	3.75	2.7	AHR NFIL3 STAT5A
51	GO:0009618 [7]: response to pathogenic	1	17	14	12247	0.89	4.21	3.83	2.71	IFNGR1

	bacteria									
52	GO:0009595 [5]: detection of biotic stimulus	1	17	15	12246	0.82	4.16	3.76	2.7	MHC2TA
53	GO:0008629 [9]: induction of apoptosis by intracellular signals	1	17	15	12246	0.82	4.16	3.76	2.7	CDKN1A
54	GO:0019884 [6]: antigen presentation, exogenous antigen	1	17	16	12245	0.77	4.06	3.7	2.7	HLA-DRB3
55	GO:0006692 [8]: prostanoid metabolism	1	17	16	12245	0.77	4.06	3.7	2.7	CD74
56	GO:0006693 [9]: prostaglandin metabolism	1	17	16	12245	0.77	4.06	3.7	2.7	CD74
57	GO:0007165 [4]: signal transduction	8	10	2818	9443	0.74	4.06	3.32	2.36	AHR CD74 CXCL1 CXCL2 HLA-DRB3 IFNGR1 STAT5A TNFSF12
58	GO:0019886 [6]: antigen processing, exogenous antigen via MHC class II	1	17	17	12244	0.71	4.01	3.65	2.66	HLA-DRB3
59	GO:0046456 [8]: icosanoid biosynthesis	1	17	21	12240	0.51	3.87	3.45	2.48	CD74

60	GO:0045449 [6]: regulation of transcription	6	12	1871	10390	0.49	3.82	3.09	2.22	AHR IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
61	GO:0019219 [5]: regulation of nucleobase, nucleoside, nucleotide and nucleic acid metabolism	6	12	1897	10364	0.43	3.77	3.04	2.21	AHR IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
62	GO:0006457 [7]: protein folding	2	16	215	12046	0.39	3.7	3.23	2.31	CD74 FKBP5
63	GO:0007259 [7]: JAK-STAT cascade	1	17	26	12235	0.32	3.65	3.25	2.31	STAT5A
64	GO:0006350 [6]: transcription	6	12	1963	10298	0.31	3.65	2.89	2.16	AHR IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
65	GO:0006937 [4]: regulation of muscle contraction	1	17	27	12234	0.29	3.6	3.21	2.31	C4A
66	GO:0006958 [7]: complement activation, classical pathway	1	17	29	12232	0.22	3.55	3.14	2.26	C4A
67	GO:0019222 [4]: regulation of metabolism	6	12	2032	10229	0.18	3.5	2.75	2.05	AHR IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
68	GO:0050865 [5]: regulation	1	17	31	12230	0.16	3.5	3.08	2.22	CD74

	of cell activation									
69	GO:0030098 [4]: lymphocyte differentiation	1	17	32	12229	0.13	3.45	3.05	2.21	CD74
70	GO:0008283 [4]: cell proliferation	4	14	1054	11207	0.1	3.4	2.76	2.05	AHR CD74 CDKN1A CXCL1
71	GO:0042127 [5]: regulation of cell proliferation	2	16	258	12003	0.08	3.4	2.91	2.16	CDKN1A CXCL1
72	GO:0051242 [5]: positive regulation of cellular physiological process	2	16	259	12002	0.07	3.4	2.9	2.16	CDKN1A TNFSF12
73	GO:0006690 [7]: icosanoid metabolism	1	17	34	12227	0.07	3.4	2.99	2.18	CD74
74	GO:0009615 [6]: response to virus	1	17	38	12223	-0.03	0	2.89	2.16	IFNGR1
75	GO:0000079 [5]: regulation of cyclin dependent protein kinase activity	1	17	38	12223	-0.03	0	2.89	2.16	CDKN1A
76	GO:0007582 [2]: physiological process	18	0	10444	1817	-0.06	0	2.88	2.16	AHR C4A C4B CD74 CDKN1A CXCL1 CXCL2 FCER1A FKBP5 HLA-A HLA-DRB3 IFNGR1 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3 TNFSF12

77	GO:0000086 [7]: G2/M transition of mitotic cell cycle	1	17	45	12216	-0.19	0	2.73	2.04	CDKN1A
78	GO:0007154 [3]: cell communication	8	10	3467	8794	-0.2	0	2.24	1.73	AHR CD74 CXCL1 CXCL2 HLA-DRB3 IFNGR1 STAT5A TNFSF12
79	GO:0009410 [7]: response to xenobiotic stimulus	1	17	47	12214	-0.23	0	2.69	2.01	AHR
80	GO:0001525 [6]: angiogenesis	1	17	48	12213	-0.24	0	2.67	2.01	TNFSF12
81	GO:0048514 [5]: blood vessel morphogenesis	1	17	50	12211	-0.28	0	2.63	1.99	TNFSF12
82	GO:0001568 [4]: blood vessel development	1	17	50	12211	-0.28	0	2.63	1.99	TNFSF12
83	GO:0006633 [7]: fatty acid biosynthesis	1	17	52	12209	-0.31	0	2.59	1.97	CD74
84	GO:0043119 [4]: positive regulation of physiological process	2	16	335	11926	-0.34	0	2.45	1.89	CDKN1A TNFSF12
85	GO:0006355 [7]: regulation of	5	13	1808	10453	-0.36	0	2.17	1.67	AHR IRF5 MHC2TA NFIL3 STAT5A

	transcription, DNA- dependent									
86	GO:0050776 [5]: regulation of immune response	1	17	56	12205	-0.39	0	2.52	1.92	CD74
87	GO:0000082 [7]: G1/S transition of mitotic cell cycle	1	17	56	12205	-0.39	0	2.52	1.92	CDKN1A
88	GO:0007050 [7]: cell cycle arrest	1	17	59	12202	-0.43	0	2.47	1.89	CDKN1A
89	GO:0006351 [7]: transcription, DNA- dependent	5	13	1864	10397	-0.43	0	2.07	1.61	AHR IRF5 MHC2TA NFIL3 STAT5A
90	GO:0016053 [6]: organic acid biosynthesis	1	17	61	12200	-0.46	0	2.44	1.89	CD74
91	GO:0046394 [7]: carboxylic acid biosynthesis	1	17	61	12200	-0.46	0	2.44	1.89	CD74
92	GO:0009987 [2]: cellular process	14	4	10933	1328	-0.48	0	0.04	0.04	AHR CD74 CDKN1A CXCL1 CXCL2 FKBP5 HLA- DRB3 IFNGR1 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3 TNFSF12
93	GO:0050875 [3]: cellular physiological	11	7	9084	3177	-0.56	0	0.07	0.04	AHR CD74 CDKN1A CXCL1 FKBP5 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3 TNFSF12

	process									
94	GO:0046649 [6]: lymphocyte activation	1	17	70	12191	-0.58	0	2.31	1.78	CD74
95	GO:0009617 [6]: response to bacteria	1	17	71	12190	-0.6	0	2.3	1.78	IFNGR1
96	GO:0030097 [5]: hemopoiesis	1	17	71	12190	-0.6	0	2.3	1.78	CD74
97	GO:0009887 [4]: organogenesis	3	15	921	11340	-0.71	0	1.9	1.5	CD74 CXCL1 TNFSF12
98	GO:0048513 [3]: organ development	3	15	921	11340	-0.71	0	1.9	1.5	CD74 CXCL1 TNFSF12
99	GO:0008152 [3]: metabolism	8	10	6957	5304	-0.72	0	0.1	0.07	AHR CD74 FKBP5 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
100	GO:0045321 [5]: immune cell activation	1	17	86	12175	-0.76	0	2.12	1.63	CD74
101	GO:0001775 [4]: cell activation	1	17	87	12174	-0.78	0	2.11	1.63	CD74
102	GO:0006916 [8]: anti-apoptosis	1	17	91	12170	-0.82	0	2.07	1.61	TNFAIP3
103	GO:0051239 [4]: regulation of organismal physiological process	1	17	94	12167	-0.84	0	2.04	1.59	CD74
104	GO:0045859 [4]: regulation	1	17	95	12166	-0.85	0	2.03	1.59	CDKN1A

	of protein kinase activity									
105	GO:0030036 [8]: actin cytoskeleton organization and biogenesis	1	17	100	12161	-0.9	0	1.98	1.55	CXCL1
106	GO:0006139 [5]: nucleobase, nucleoside, nucleotide and nucleic acid metabolism	6	12	2961	9300	-0.94	0	1.37	1.07	AHR IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
107	GO:0030029 [7]: actin filament-based process	1	17	110	12151	-0.97	0	1.89	1.5	CXCL1
108	GO:0044237 [4]: cellular metabolism	8	10	6557	5704	-0.97	0	0.17	0.11	AHR CD74 FKBP5 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
109	GO:0051179 [3]: localization	1	17	1984	10277	-1.01	0	0.04	0.04	CD74
110	GO:0006810 [4]: transport	1	17	1974	10287	-1.02	0	0.04	0.04	CD74
111	GO:0051234 [4]: establishment of localization	1	17	1976	10285	-1.03	0	0.04	0.04	CD74
112	GO:0016481 [7]: negative regulation of transcription	1	17	123	12138	-1.07	0	1.79	1.4	TNFAIP3
113	GO:0009653 [3]:	3	15	1147	11114	-1.07	0	1.45	1.11	CD74 CXCL1 TNFSF12

	morphogenesis									
114	GO:0044238 [4]: primary metabolism	8	10	6278	5983	-1.1	0	0.24	0.15	AHR CD74 FKBP5 IRF5 MHC2TA NFIL3 STAT5A TNFAIP3
115	GO:0045934 [6]: negative regulation of nucleobase, nucleoside, nucleotide and nucleic acid metabolism	1	17	131	12130	-1.12	0	1.73	1.36	TNFAIP3
116	GO:0043170 [4]: macromolecule metabolism	3	15	3143	9118	-1.12	0	0.13	0.08	CD74 FKBP5 TNFAIP3
117	GO:0006936 [3]: muscle contraction	1	17	136	12125	-1.15	0	1.7	1.33	C4A
118	GO:0006631 [6]: fatty acid metabolism	1	17	142	12119	-1.19	0	1.66	1.3	CD74
119	GO:0044260 [5]: cellular macromolecule metabolism	3	15	2983	9278	-1.22	0	0.16	0.11	CD74 FKBP5 TNFAIP3
120	GO:0009892 [5]: negative regulation of metabolism	1	17	155	12106	-1.26	0	1.58	1.23	TNFAIP3
121	GO:0019538 [5]: protein metabolism	3	15	2805	9456	-1.33	0	0.2	0.14	CD74 FKBP5 TNFAIP3
122	GO:0007049	2	16	711	11550	-1.33	0	1.27	0.99	AHR CDKN1A

	[5]: cell cycle									
123	GO:0044267 [6]: cellular protein metabolism	3	15	2784	9477	-1.34	0	0.21	0.14	CD74 FKBP5 TNFAIP3
124	GO:0050790 [3]: regulation of enzyme activity	1	17	181	12080	-1.37	0	1.44	1.11	CDKN1A
125	GO:0000278 [6]: mitotic cell cycle	1	17	195	12066	-1.43	0	1.38	1.07	CDKN1A
126	GO:0006461 [7]: protein complex assembly	1	17	195	12066	-1.43	0	1.38	1.07	CD74
127	GO:0008610 [6]: lipid biosynthesis	1	17	200	12061	-1.44	0	1.36	1.06	CD74
128	GO:0030154 [3]: cell differentiation	1	17	213	12048	-1.48	0	1.3	1.02	CD74
129	GO:0006464 [7]: protein modification	1	17	1508	10753	-1.51	0	0.1	0.07	TNFAIP3
130	GO:0007275 [2]: development	3	15	1784	10477	-1.51	0	0.7	0.52	CD74 CXCL1 TNFSF12
131	GO:0006357 [8]: regulation of transcription from Pol II promoter	1	17	230	12031	-1.54	0	1.24	0.97	STAT5A
132	GO:0007186	2	16	992	11269	-1.6	0	0.83	0.61	CXCL1 CXCL2

	[6]: G-protein coupled receptor protein signaling pathway									
133	GO:0007243 [6]: protein kinase cascade	1	17	251	12010	-1.6	0	1.17	0.91	STAT5A
134	GO:0007242 [5]: intracellular signaling cascade	2	16	989	11272	-1.6	0	0.84	0.61	CXCL1 STAT5A
135	GO:0007166 [5]: cell surface receptor linked signal transduction	2	16	1419	10842	-1.7	0	0.46	0.34	CXCL1 CXCL2
136	GO:0006886 [6]: intracellular protein transport	1	17	313	11948	-1.73	0	0.99	0.74	CD74
137	GO:0007010 [6]: cytoskeleton organization and biogenesis	1	17	325	11936	-1.75	0	0.96	0.71	CXCL1
138	GO:0000074 [6]: regulation of cell cycle	1	17	397	11864	-1.85	0	0.8	0.59	CDKN1A
139	GO:0007399 [5]:	1	17	402	11859	-1.86	0	0.79	0.58	CXCL1

	neurogenesis									
140	GO:0006082 [5]: organic acid metabolism	1	17	413	11848	-1.86	0	0.77	0.58	CD74
141	GO:0019752 [6]: carboxylic acid metabolism	1	17	411	11850	-1.86	0	0.78	0.58	CD74
142	GO:0044255 [5]: cellular lipid metabolism	1	17	428	11833	-1.88	0	0.75	0.56	CD74
143	GO:0009058 [4]: biosynthesis	1	17	988	11273	-1.9	0	0.25	0.16	CD74
144	GO:0044249 [5]: cellular biosynthesis	1	17	943	11318	-1.91	0	0.27	0.17	CD74
145	GO:0015031 [5]: protein transport	1	17	476	11785	-1.92	0	0.67	0.51	CD74
146	GO:0045184 [5]: establishment of protein localization	1	17	478	11783	-1.92	0	0.67	0.51	CD74
147	GO:0008104 [4]: protein localization	1	17	491	11770	-1.92	0	0.65	0.5	CD74
148	GO:0046907 [5]: intracellular transport	1	17	504	11757	-1.93	0	0.63	0.49	CD74

149	GO:0006512 [8]: ubiquitin cycle	1	17	546	11715	-1.95	0	0.58	0.44	TNFAIP3
150	GO:0006629 [5]: lipid metabolism	1	17	552	11709	-1.95	0	0.57	0.44	CD74
151	GO:0016043 [4]: cell organization and biogenesis	1	17	824	11437	-1.96	0	0.34	0.23	CXCL1
152	GO:0009581 [5]: detection of external stimulus	1	17	594	11667	-1.97	0	0.53	0.4	MHC2TA
153	GO:0006996 [5]: organelle organization and biogenesis	1	17	673	11588	-1.97	0	0.45	0.34	CXCL1

Online Data Supplement

Diesel exhaust and allergen modulate miRNA and RNA in intact human epithelium

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Supplementary Methods

Participant Characteristics

Healthy human volunteers aged between 19 and 49 were screened using spirometry and tested for sensitivity to house dust mite (HDM; *D. pteronyssinus*), birch and Timothy/Pacific grass. Eighteen non-smoking volunteers participated, who were not subject to any of the following exclusion criteria:

- (1) Pregnancy/breastfeeding
- (2) Use of inhaled corticosteroids
- (3) Use of bronchodilator medication more than 3 times per week
- (4) Unstable asthma symptoms
- (5) Presence of co-existing medical conditions (as assessed by the primary investigator)
- (6) Participation in another study that involves taking medications

- (7) Regular use of antihistamines, non-steroidal anti-inflammatories
anticoagulants, acetylsalicylic acid (ASA) or decongestants
- (8) Unstable asthma, i.e. an exacerbation in previous 2 weeks
- (9) Allergy to Lidocaine, Fentanyl or Versed

Supplemental table E1 includes details of the 15 participants who successfully completed this study, including age, provocative methacholine concentration resulting in a 20% drop in FEV₁ (PC₂₀) and the PC₂₀ dose response slope (DRS).

Bronchial brushing collection and processing and NanoString® Assays

Forty-eight hours after each exposure, participants underwent a second bronchoscopy during which bronchial washes (BW; collected from the first 40 ml of saline instilled) and bronchoalveolar lavages (BAL; from 100 ml subsequently instilled) were collected from the middle lung lobes where saline or allergen had previously been delivered. Bronchial brushes were collected from the right and left lower lung lobes and stored at -80°C. Bronchial brushes consistently contained mostly epithelial cells during *in-vitro* testing (FAS=97.3%, FAA=98.7%, DES=95.4%, DEA=98.7%). Qiagen miRNeasy Mini Kits were used to extract miRNA and mRNA, according to the manufacturer's protocol. We assessed RNA quality using an Agilent 2100 bioanalyzer with Eukaryote total-RNA Nano chips. MicroRNA and mRNA expression was determined by NanoString® Technologies (Seattle, US) using nCounter™ Human miRNA v2 (includes 800 miRNAs) and Human Immunology v1 (includes 511 mRNAs) panels respectively.

Inflammatory Marker Analysis

BAL cells were Wright-Giemsa stained and counted under a microscope using a haemocytometer. We spun volumes of BAL containing ~30,000 cells onto slides using a cytopsin (Cytospin 3; Shandon, Pittsburgh, PA) and stained using a Harleco Hemacolor (Wright-Giemsa) kit (Millipore; Etobicoke, Canada). At least 400 cells were counted on each slide and percentages of eosinophils and bronchial epithelial cells (BEC) recorded by two independent observers, after which mean values were calculated.

Data Analysis

Sixty samples (15 participants x 4 conditions) were collected, but degraded samples were excluded based on examination of the Agilent[®] chromatograms by multiple authors. Full analysis was therefore performed on 58 samples of miRNA (from 15 participants, 13 with all 4 conditions) and 52 samples of mRNA (from 13 participants, 10 with all 4 conditions). Inflammatory markers, miRNA and mRNA expression data were analyzed in R (version 3.2.0), as detailed in Fig. 1B. Normalization of mRNA and miRNA datasets combined a correction factor calculated from positive control probe counts to represent platform-associated sources of variation, with a normalization factor derived from control probe-adjusted data to account for sample input variations. NanoString[®]'s default top 100 probes procedure³⁴ was modified in two ways to determine the second factor: 1) all identified outlier samples were first excluded and, 2) probes with a coefficient of variation that was 1.5 times the inter-quartile range above the 75% quantile across samples were removed, to avoid disproportionately large effects of individual probes on normalization factors. We filtered variables to remove noise by

first defining a global background threshold for absence/presence as the maximum of all sample-specific background thresholds. Next, a 'flooring' procedure was applied that set all expression values below the global background threshold to that value. Finally, only variables where at least one exposure group had a minimum of 75% of samples above the background threshold passed filtering.

Initial analysis was performed using a robust linear model implemented using the limma³⁵ R package to evaluate the effects of individual conditions: 1) diesel exhaust plus allergen (DEA), 2) diesel exhaust plus saline (DES; saline was the diluent control for allergen), and 3) filtered air plus allergen (FAA); each relative to 4) filtered air plus saline (FAS). Corrections for false discovery rate were performed using Storey's q-value correction, using the qvalue R package³⁶. Subsequently, univariate analysis using a mixed effects model implemented in 'lme4'³⁷ was performed, to determine which miRNAs and genes were significantly modulated by DE exposure and/or allergen instillation. Data was plotted using GraphPad Prism version 6 and various plotting functions in R. Gene targets of miRNAs showing significantly increased expression were examined within the miRTarBase database³⁸. Integrative analysis of miRNA, miRNA and inflammatory markers was performed using mixOmics³⁹ and sparse partial least squares (PLS) used to simultaneously reduce dimensions and select important variables, yielding the principle components. PLS components are derived from mathematical procedures that use an orthogonal transformation to model the covariance structures of two sets of variables into multiple dimensions. These were ranked according to which projections contained the greatest correlations and the first ten used in plotting heatmaps. As a second approach to showing this data, network

diagrams were constructed for elements having a correlation of ≥ 0.7 . Finally, gene ontology of the genes with q-values of ≤ 0.2 following allergen instillation was examined using gene annotation tool to help explain relationships (GATHER)⁴⁰.

ACCEPTED MANUSCRIPT																					
mRNA	p-value (Diesel)	p-value (Allergen)	p-value (Diesel & Allergen)	q-value (Diesel)	q-value (Allergen)	q-value (Diesel & Allergen)	Fixed Effect (Diesel)	Standard Error (Diesel)	Confidence Bound (lower 2.5%; Diesel)	Confidence Bound (upper 97.5%; Diesel)	Zero covered by CI (Diesel)	Fixed Effect (Allergen)	Standard Error (Allergen)	Confidence Bound (lower 2.5%; Allergen)	Confidence Bound (upper 97.5%; Allergen)	Zero covered by CI (Allergen)	Fixed Effect (Diesel & Allergen)	Standard Error (Diesel & Allergen)	Confidence Bound (lower 2.5%; Diesel & Allergen)	Confidence Bound (upper 97.5%; Diesel & Allergen)	Zero covered by CI (Diesel & Allergen)
ABL1	0.39	0.28	0.17	0.89	0.39	0.99	-0.08	0.09	-0.25	0.09	Yes	-0.10	0.09	-0.28	0.08	Yes	0.18	0.13	-0.07	0.43	Yes
AHR	0.33	0.16	0.6	0.89	0.36	0.99	-0.07	0.07	-0.21	0.07	Yes	-0.11	0.07	-0.25	0.04	Yes	-0.06	0.11	-0.26	0.15	Yes
APP	0.24	0.51	0.61	0.89	0.47	0.99	-0.15	0.13	-0.39	0.09	Yes	-0.09	0.13	-0.33	0.16	Yes	0.09	0.18	-0.26	0.44	Yes
ARHGDIB	0.2	0.4	0.62	0.89	0.42	0.99	-0.21	0.16	-0.51	0.1	Yes	-0.14	0.16	-0.43	0.17	Yes	0.12	0.23	-0.32	0.55	Yes
ATG16L1	0.89	0.87	0.57	0.99	0.52	0.99	-0.01	0.1	-0.21	0.18	Yes	0.02	0.11	-0.19	0.22	Yes	0.09	0.15	-0.2	0.37	Yes
B2M	0.07	0.21	0.16	0.89	0.38	0.99	0.19	0.1	0	0.39	Yes	0.13	0.10	-0.07	0.33	Yes	-0.21	0.15	-0.49	0.07	Yes
BCAP31	0.41	0.09	0.66	0.89	0.36	0.99	0.07	0.09	-0.1	0.25	Yes	0.16	0.09	-0.02	0.33	Yes	-0.06	0.13	-0.3	0.19	Yes
BCL2	0.59	0.49	0.94	0.94	0.47	0.99	0.07	0.14	-0.19	0.34	Yes	0.10	0.14	-0.17	0.37	Yes	0.01	0.2	-0.37	0.4	Yes
BCL3	0.2	0.44	0.13	0.89	0.44	0.99	0.23	0.18	-0.11	0.58	Yes	0.14	0.18	-0.21	0.50	Yes	-0.4	0.26	-0.9	0.1	Yes
BCL6	0.78	0.33	0.79	0.99	0.39	0.99	0.04	0.16	-0.26	0.35	Yes	0.16	0.16	-0.15	0.47	Yes	-0.06	0.23	-0.5	0.38	Yes
BLNK	0.8	0.98	0.78	0.99	0.54	0.99	0.02	0.07	-0.12	0.16	Yes	0.00	0.08	-0.14	0.15	Yes	0.03	0.11	-0.18	0.24	Yes
BST1	0.43	0.9	0.34	0.89	0.52	0.99	-0.11	0.14	-0.39	0.16	Yes	-0.02	0.15	-0.29	0.25	Yes	0.2	0.21	-0.17	0.6	Yes
BST2	0.26	0.51	0.52	0.89	0.47	0.99	0.3	0.26	-0.21	0.8	Yes	0.18	0.27	-0.33	0.69	Yes	-0.25	0.38	-0.97	0.48	Yes
BTK	0.59	0.8	0.63	0.94	0.51	0.99	-0.09	0.17	-0.85	0.24	Yes	0.05	0.18	-0.29	0.38	Yes	0.12	0.25	-0.36	0.6	Yes

C1QB	0.55	0.92	0.69	0.93	0.52	0.99	-0.24	0.4	-1.03	0.53	Yes	0.04	0.41	-0.76	0.83	Yes	0.24	0.58	-0.88	1.37	Yes
C1QBP	0.94	0.58	0.86	0.99	0.47	0.99	0.01	0.1	-0.18	0.2	Yes	-0.06	0.10	-0.25	0.14	Yes	-0.02	0.14	-0.3	0.25	Yes
C1R	0.83	0.73	0.58	0.99	0.49	0.99	0.04	0.18	-0.32	0.39	Yes	0.07	0.19	-0.27	0.40	Yes	-0.15	0.27	-0.6	0.34	Yes
C2	0.37	0.08	0.77	0.89	0.36	0.99	0.16	0.17	-0.18	0.49	Yes	0.32	0.18	-0.03	0.66	Yes	-0.07	0.25	-0.56	0.42	Yes
C3	0.26	0.84	0.51	0.89	0.52	0.99	-0.25	0.22	-0.67	0.17	Yes	-0.05	0.22	-0.48	0.38	Yes	-0.21	0.32	-0.82	0.4	Yes
C4A	0.43	0.03	0.55	0.89	0.36	0.99	0.14	0.18	-0.2	0.48	Yes	0.41	0.18	0.06	0.76	No	-0.16	0.26	-0.65	0.34	Yes
C4B	0.26	0.02	0.34	0.89	0.33	0.99	0.22	0.19	-0.15	0.59	Yes	0.48	0.20	0.09	0.86	No	-0.27	0.28	-0.81	0.27	Yes
C6	0.47	0.43	0.21	0.9	0.44	0.99	-0.21	0.28	-0.76	0.34	Yes	-0.23	0.29	-0.80	0.33	Yes	0.52	0.41	-0.27	1.32	Yes
CASP1	0.77	0.69	0.79	0.98	0.48	0.99	0.04	0.13	-0.21	0.28	Yes	0.05	0.13	-0.20	0.30	Yes	-0.05	0.19	-0.41	0.31	Yes
CASP2	0.17	0.79	0.24	0.89	0.51	0.99	-0.12	0.09	-0.29	0.04	Yes	0.02	0.09	-0.15	0.19	Yes	0.15	0.12	-0.09	0.39	Yes
CASP3	0.19	0.33	0.55	0.89	0.39	0.99	0.18	0.14	-0.08	0.45	Yes	0.14	0.14	-0.13	0.41	Yes	-0.12	0.2	-0.5	0.26	Yes
CASP8	0.52	0.09	0.72	0.9	0.36	0.99	-0.05	0.08	-0.21	0.1	Yes	-0.14	0.08	-0.30	0.02	Yes	0.04	0.12	-0.18	0.27	Yes
CCBP2	0.16	0.07	0.42	0.89	0.36	0.99	0.25	0.18	-0.09	0.59	Yes	0.33	0.18	-0.02	0.68	Yes	-0.21	0.25	-0.7	0.28	Yes
CCL15	0.97	0.85	0.91	0.99	0.52	0.99	0	0.11	-0.21	0.22	Yes	0.02	0.11	-0.20	0.24	Yes	-0.02	0.16	-0.33	0.29	Yes
CCL18	0.57	0.63	0.96	0.94	0.48	0.99	-0.24	0.43	-1.08	0.59	Yes	0.21	0.44	-0.64	1.06	Yes	-0.03	0.62	-1.23	1.18	Yes
CCL22	0.45	0.3	0.89	0.89	0.39	0.99	0.1	0.12	-0.14	0.34	Yes	0.13	0.13	-0.11	0.38	Yes	0.02	0.18	-0.33	0.37	Yes
CCL3	0.59	0.29	0.27	0.94	0.39	0.99	-0.16	0.29	-0.72	0.4	Yes	-0.31	0.29	-0.82	0.18	Yes	0.46	0.42	-0.21	1.21	Yes
CCL4	0.81	0.4	0.49	0.99	0.42	0.99	0.07	0.31	-0.52	0.67	Yes	-0.27	0.31	-0.87	0.34	Yes	0.31	0.44	-0.54	1.17	Yes
CCL5	0.72	0.78	0.66	0.98	0.51	0.99	0.08	0.24	-0.38	0.54	Yes	-0.07	0.24	-0.54	0.40	Yes	0.16	0.35	-0.51	0.83	Yes
CD14	0.75	0.62	0.84	0.98	0.47	0.99	-0.08	0.24	-0.53	0.38	Yes	0.12	0.24	-0.35	0.58	Yes	0.07	0.34	-0.58	0.73	Yes
CD164	0.25	0.19	0.52	0.89	0.37	0.99	-0.16	0.14	-0.44	0.11	Yes	-0.19	0.14	-0.47	0.09	Yes	0.13	0.2	-0.26	0.53	Yes
CD209	0.74	0.11	0.78	0.98	0.36	0.99	-0.03	0.09	-0.2	0.14	Yes	0.15	0.09	-0.03	0.33	Yes	-0.04	0.13	-0.29	0.21	Yes
CD24	0.07	0.48	0.53	0.89	0.47	0.99	0.31	0.16	-0.01	0.63	Yes	0.12	0.17	-0.21	0.44	Yes	-0.15	0.24	-0.61	0.31	Yes
CD36	0.35	0.41	0.09	0.89	0.42	0.99	0.19	0.2	-0.2	0.59	Yes	0.17	0.21	-0.23	0.58	Yes	-0.51	0.29	-1.08	0.05	Yes
CD3D	0.5	0.75	0.64	0.9	0.5	0.99	-0.14	0.2	-0.53	0.25	Yes	-0.07	0.21	-0.46	0.33	Yes	0.14	0.29	-0.43	0.7	Yes
CD3E	0.8	0.93	0.69	0.99	0.53	0.99	-0.05	0.18	-0.39	0.3	Yes	0.02	0.18	0.00	Inf	Yes	0.1	0.26	-0.4	0.6	Yes
CD4	0.95	0.5	0.49	0.99	0.47	0.99	-0.01	0.1	-0.21	0.2	Yes	0.07	0.11	-0.14	0.28	Yes	0.11	0.15	-0.19	0.4	Yes
CD40	0.73	0.73	0.65	0.98	0.49	0.99	-0.03	0.07	-0.17	0.12	Yes	-0.03	0.08	-0.17	0.12	Yes	0.05	0.11	-0.16	0.26	Yes
CD44	0.42	0.41	0.76	0.89	0.42	0.99	0.13	0.16	-0.18	0.44	Yes	0.14	0.16	-0.18	0.45	Yes	-0.07	0.23	-0.52	0.37	Yes
CD46	0.69	0.26	0.73	0.98	0.39	0.99	-0.04	0.1	-0.24	0.16	Yes	-0.12	0.11	-0.32	0.09	Yes	-0.05	0.15	-0.34	0.24	Yes

CD48	0.53	0.81	0.78	0.9	0.51	0.99	-0.14	0.22	-0.57	0.29	Yes	-0.05	0.23	-0.49	0.38	Yes	-0.09	0.32	-0.71	0.53	Yes
CD55	0.06	0.52	0.61	0.89	0.47	0.99	-0.18	0.1	-0.37	0	Yes	-0.06	0.10	-0.25	0.13	Yes	0.07	0.14	-0.2	0.34	Yes
CD58	0.21	0.85	0.48	0.89	0.52	0.99	-0.1	0.08	-0.25	0.05	Yes	-0.01	0.08	-0.17	0.14	Yes	-0.08	0.11	-0.3	0.14	Yes
CD59	0.23	0.38	0.96	0.89	0.42	0.99	0.16	0.13	-0.09	0.41	Yes	0.12	0.13	-0.14	0.38	Yes	-0.01	0.19	-0.38	0.35	Yes
CD74	0.29	0.14	0.77	0.89	0.36	0.99	0.11	0.1	-0.09	0.31	Yes	0.16	0.11	-0.05	0.37	Yes	0.04	0.15	-0.25	0.34	Yes
CD81	0.29	0.26	0.69	0.89	0.39	0.99	-0.26	0.24	-0.73	0.21	Yes	-0.28	0.25	-0.76	0.20	Yes	0.14	0.35	-0.54	0.82	Yes
CD82	0.72	0.23	0.52	0.98	0.38	0.99	0.04	0.11	-0.18	0.26	Yes	0.14	0.12	-0.08	0.37	Yes	0.11	0.17	-0.21	0.43	Yes
CD83	0.35	0.5	0.28	0.89	0.47	0.99	-0.25	0.26	-0.75	0.25	Yes	-0.18	0.27	-0.69	0.33	Yes	0.41	0.38	-0.31	1.13	Yes
CD86	0.33	0.91	0.68	0.89	0.52	0.99	-0.22	0.23	-0.66	0.21	Yes	0.03	0.23	-0.42	0.47	Yes	0.13	0.33	-0.49	0.76	Yes
CD8A	0.2	0.21	0.5	0.89	0.38	0.99	0.22	0.17	-0.1	0.53	Yes	0.22	0.17	-0.12	0.54	Yes	-0.16	0.24	-0.62	0.3	Yes
CD9	0.97	0.54	0.7	0.99	0.47	0.99	0	0.12	-0.22	0.23	Yes	-0.08	0.12	-0.31	0.16	Yes	-0.07	0.17	-0.4	0.26	Yes
CD96	0.72	0.86	0.59	0.98	0.52	0.99	0.05	0.14	-0.22	0.32	Yes	0.03	0.14	-0.25	0.30	Yes	0.11	0.2	-0.28	0.5	Yes
CD97	0.34	0.37	0.59	0.89	0.42	0.99	-0.09	0.09	-0.26	0.09	Yes	-0.08	0.09	-0.26	0.10	Yes	0.07	0.13	-0.18	0.33	Yes
CD99	0.13	0.16	0.52	0.89	0.36	0.99	0.19	0.12	-0.04	0.41	Yes	0.17	0.12	-0.06	0.41	Yes	-0.11	0.17	-0.44	0.22	Yes
CDKN1A	0.75	0.01	0.63	0.98	0.33	0.99	-0.03	0.1	-0.22	0.16	Yes	-0.29	0.10	-0.49	-0.10	No	0.07	0.14	-0.21	0.35	Yes
CEACAM6	1	0.24	0.8	1	0.39	0.99	0	0.15	-0.3	0.3	Yes	-0.19	0.16	-0.49	0.12	Yes	0.06	0.22	-0.38	0.49	Yes
CEBPB	0.03	0.06	0.12	0.89	0.36	0.99	-0.3	0.14	-0.57	-0.04	No	-0.27	0.14	-0.54	0.00	No	0.31	0.2	-0.07	0.69	Yes
CFB	0.5	0.52	0.12	0.9	0.47	0.99	0.11	0.16	-0.2	0.41	Yes	0.11	0.16	-0.21	0.42	Yes	-0.37	0.23	-0.81	0.07	Yes
CFD	0.22	0.22	0.53	0.89	0.38	0.99	0.18	0.14	-0.09	0.45	Yes	0.18	0.14	-0.10	0.46	Yes	-0.13	0.2	-0.52	0.26	Yes
CFH	0.34	0.31	0.71	0.89	0.39	0.99	-0.15	0.15	-0.43	0.14	Yes	-0.16	0.15	-0.45	0.14	Yes	0.08	0.22	-0.34	0.5	Yes
CFI	0.1	0.08	0.14	0.89	0.36	0.99	0.2	0.12	-0.03	0.43	Yes	0.22	0.12	-0.02	0.46	Yes	-0.26	0.17	-0.6	0.08	Yes
CHUK	0.51	0.21	0.1	0.9	0.38	0.99	0.05	0.07	-1.25	0.19	Yes	0.10	0.07	0.00	Inf	Yes	-0.18	0.11	-0.33	-0.05	No
CIITA	0.08	0.02	0.69	0.89	0.33	0.99	0.25	0.14	-0.02	0.51	Yes	0.33	0.14	0.06	0.60	No	-0.08	0.2	-0.47	0.31	Yes
CLEC4A	0.88	0.66	0.96	0.99	0.48	0.99	0.03	0.18	-0.32	0.38	Yes	0.08	0.19	-0.28	0.44	Yes	-0.01	0.26	-0.52	0.49	Yes
CRADD	0.32	0.16	0.5	0.89	0.36	0.99	0.15	0.15	-0.14	0.44	Yes	0.22	0.15	-0.08	0.51	Yes	-0.15	0.21	-0.56	0.27	Yes
CSF1	0.43	0.41	0.44	0.89	0.42	0.99	0.11	0.14	-0.16	0.38	Yes	0.12	0.14	-0.16	0.39	Yes	-0.16	0.2	-0.53	0.23	Yes
CSF2RB	0.88	0.51	0.69	0.99	0.47	0.99	0.04	0.28	-0.5	0.59	Yes	0.19	0.29	-0.37	0.74	Yes	0.16	0.41	-0.62	0.95	Yes
CSF3R	0.71	0.58	0.75	0.98	0.47	0.99	-0.15	0.38	-0.89	0.59	Yes	-0.22	0.39	-0.98	0.54	Yes	0.18	0.56	-0.9	1.25	Yes
CTNNB1	0.47	0.37	0.81	0.9	0.42	0.99	-0.08	0.11	-0.3	0.14	Yes	-0.10	0.12	-0.33	0.12	Yes	-0.04	0.16	-0.36	0.28	Yes
CTSC	0.7	0.12	0.17	0.98	0.36	0.99	0.06	0.16	-0.24	0.37	Yes	0.26	0.16	-0.05	0.58	Yes	-0.32	0.23	-0.77	0.12	Yes

CUL9	0.38	0.47	0.66	0.89	0.47	0.99	-0.11	0.12	-0.33	0.12	Yes	-0.09	0.12	-0.32	0.15	Yes	0.08	0.17	-0.25	0.41	Yes
CX3CL1	0.09	0.3	0.32	0.89	0.39	0.99	-0.35	0.2	-0.74	0.04	Yes	-0.22	0.21	-0.62	0.18	Yes	0.29	0.29	-0.27	0.86	Yes
CXCL1	0.26	0.02	0.6	0.89	0.33	0.99	-0.18	0.16	-0.49	0.12	Yes	-0.38	0.16	-0.69	-0.07	No	0.12	0.23	-0.32	0.56	Yes
CXCL2	0.24	0.02	0.49	0.89	0.33	0.99	-0.18	0.16	-0.48	0.11	Yes	-0.39	0.16	-0.69	-0.08	No	0.16	0.22	-0.28	0.59	Yes
CXCR4	0.63	0.21	0.49	0.95	0.38	0.99	-0.14	0.28	-0.68	0.4	Yes	-0.36	0.29	-0.91	0.19	Yes	0.29	0.41	-0.5	1.07	Yes
CYBB	0.81	0.5	0.95	0.99	0.47	0.99	-0.09	0.38	-0.83	0.64	Yes	0.27	0.39	-0.48	1.01	Yes	0.03	0.55	-1.03	1.09	Yes
DPP4	0.56	0.28	0.74	0.94	0.39	0.99	-0.12	0.21	-0.53	0.28	Yes	0.23	0.22	-0.18	0.65	Yes	0.1	0.3	-0.49	0.69	Yes
ETS1	0.71	0.9	0.76	0.98	0.52	0.99	-0.06	0.16	-0.36	0.24	Yes	0.02	0.16	-0.29	0.32	Yes	0.07	0.23	-0.36	0.5	Yes
FCER1A	0.16	0.02	0.3	0.89	0.33	0.99	-0.24	0.16	-0.56	0.08	Yes	-0.42	0.17	-0.75	-0.09	No	0.25	0.24	-0.21	0.71	Yes
FCER1G	0.97	0.68	0.91	0.99	0.48	0.99	-0.01	0.35	-0.69	0.67	Yes	0.15	0.36	-0.54	0.84	Yes	-0.06	0.51	-1.04	0.92	Yes
FCGR2A	0.41	0.75	1	0.89	0.5	1	-0.26	0.31	-0.86	0.34	Yes	-0.10	0.32	-0.71	0.51	Yes	0	0.45	-0.86	0.86	Yes
FCGR2B	0.15	0.56	0.85	0.89	0.47	0.99	-0.27	0.19	-0.63	0.09	Yes	0.11	0.19	-0.25	0.48	Yes	0.05	0.27	-0.47	0.57	Yes
FCGR2C	0.33	0.38	0.68	0.89	0.42	0.99	-0.36	0.37	-1.08	0.35	Yes	-0.34	0.38	-1.01	0.35	Yes	0.22	0.53	-0.81	1.18	Yes
FCGR3A	0.42	0.55	0.73	0.89	0.47	0.99	-0.37	0.46	-1.25	0.51	Yes	-0.28	0.46	-1.18	0.61	Yes	0.23	0.66	-1.03	1.5	Yes
FCGRT	0.2	0.66	0.15	0.89	0.48	0.99	-0.12	0.09	-0.3	0.06	Yes	-0.04	0.09	-0.22	0.14	Yes	0.19	0.13	-0.06	0.45	Yes
FKBP5	0.87	0.15	0.56	0.99	0.36	0.99	0.02	0.12	-0.21	0.25	Yes	0.18	0.12	-0.06	0.41	Yes	0.1	0.17	-0.23	0.43	Yes
FN1	0.5	0.32	0.8	0.9	0.39	0.99	-0.29	0.42	-1.1	0.52	Yes	0.44	0.43	-0.40	1.27	Yes	-0.15	0.61	-1.33	1.02	Yes
FYN	0.87	0.57	0.63	0.99	0.47	0.99	-0.02	0.14	-0.28	0.24	Yes	0.08	0.14	-0.19	0.35	Yes	0.1	0.2	-0.28	0.48	Yes
GPI	0.57	0.54	0.63	0.94	0.47	0.99	0.04	0.08	-0.11	0.2	Yes	0.05	0.08	-0.10	0.20	Yes	-0.05	0.11	-0.27	0.16	Yes
GZMA	0.75	0.66	0.67	0.98	0.48	0.99	0.08	0.26	-0.42	0.58	Yes	0.12	0.27	-0.39	0.63	Yes	-0.16	0.38	-0.89	0.57	Yes
HFE	0.12	0.16	0.31	0.89	0.36	0.99	0.14	0.09	-0.03	0.31	Yes	0.13	0.09	-0.04	0.31	Yes	-0.13	0.13	-0.38	0.12	Yes
HLA-A	0.03	0.06	0.76	0.89	0.36	0.99	0.23	0.1	0.04	0.42	No	0.19	0.10	0.00	0.39	Yes	-0.04	0.14	-0.32	0.23	Yes
HLA-B	0.17	0.29	0.79	0.89	0.39	0.99	0.14	0.1	-0.06	0.34	Yes	0.11	0.10	-0.09	0.31	Yes	0.04	0.15	-0.24	0.33	Yes
HLA-C	0.08	0.09	0.47	0.89	0.36	0.99	0.23	0.12	-0.01	0.47	Yes	0.22	0.13	-0.02	0.47	Yes	-0.13	0.18	-0.48	0.22	Yes
HLA-DMB	0.61	0.6	0.89	0.94	0.47	0.99	-0.12	0.22	-0.54	0.31	Yes	-0.12	0.23	-0.56	0.32	Yes	-0.05	0.32	-0.66	0.58	Yes
HLA-DPA1	0.67	0.28	0.43	0.97	0.39	0.99	-0.1	0.23	-0.54	0.34	Yes	-0.26	0.23	-0.70	0.20	Yes	0.26	0.33	-0.38	0.9	Yes
HLA-DPB1	0.64	0.61	0.52	0.96	0.47	0.99	-0.08	0.17	-0.41	0.25	Yes	-0.09	0.17	-0.43	0.25	Yes	0.16	0.25	-0.31	0.64	Yes
HLA-DRA	0.77	0.61	0.99	0.98	0.47	1	-0.06	0.21	-0.46	0.34	Yes	-0.11	0.21	-0.52	0.30	Yes	0	0.3	-0.58	0.57	Yes
HLA-DRB1	0.39	0.19	0.7	0.89	0.37	0.99	0.13	0.15	-0.16	0.43	Yes	0.21	0.16	-0.09	0.51	Yes	0.09	0.22	-0.34	0.52	Yes
HLA-DRB3	0.2	0.05	0.82	0.89	0.36	0.99	0.23	0.18	-0.11	0.58	Yes	0.36	0.18	0.01	0.71	No	-0.06	0.26	-0.56	0.44	Yes

ICAM1	1	0.7	0.73	1	0.48	0.99	0	0.18	-0.35	0.35	Yes	-0.07	0.19	-0.43	0.29	Yes	0.09	0.26	-0.42	0.6	Yes
ICAM3	0.61	0.67	0.66	0.94	0.48	0.99	-0.1	0.19	-0.46	0.27	Yes	-0.08	0.19	-0.46	0.29	Yes	0.12	0.28	-0.41	0.65	Yes
IFI16	0.84	0.38	0.93	0.99	0.42	0.99	0.02	0.11	-0.19	0.23	Yes	-0.10	0.11	-0.31	0.12	Yes	-0.01	0.16	-0.32	0.29	Yes
IFI35	0.38	0.28	0.63	0.89	0.39	0.99	0.18	0.2	-0.21	0.57	Yes	0.23	0.21	-0.17	0.62	Yes	-0.14	0.29	-0.71	0.43	Yes
IFIH1	0.95	0.43	0.92	0.99	0.44	0.99	0.01	0.18	-0.34	0.36	Yes	0.15	0.19	-0.21	0.51	Yes	-0.03	0.26	-0.53	0.49	Yes
IFIT2	0.38	0.5	0.45	0.89	0.47	0.99	-0.31	0.35	-0.98	0.36	Yes	-0.24	0.36	-0.93	0.45	Yes	0.38	0.5	-0.59	1.36	Yes
IFITM1	0.83	0.83	0.52	0.99	0.52	0.99	0.08	0.4	-0.69	0.85	Yes	-0.09	0.41	-0.88	0.70	Yes	-0.37	0.58	-1.49	0.75	Yes
IFNAR1	0.38	0.81	0.59	0.89	0.51	0.99	-0.1	0.11	-0.31	0.12	Yes	-0.03	0.11	-0.25	0.19	Yes	0.09	0.16	-0.22	0.4	Yes
IFNAR2	0.59	0.12	0.45	0.94	0.36	0.99	0.04	0.07	-0.1	0.18	Yes	0.12	0.08	-0.02	0.27	Yes	-0.08	0.11	-0.29	0.13	Yes
IFNGR1	0.2	0.06	0.73	0.89	0.36	0.99	-0.15	0.12	-0.38	0.07	Yes	-0.23	0.12	-0.46	0.00	Yes	-0.06	0.17	-0.38	0.27	Yes
IGF2R	0.3	0.77	0.31	0.89	0.5	0.99	-0.1	0.09	-0.27	0.08	Yes	0.03	0.09	-0.15	0.21	Yes	0.14	0.13	-0.12	0.39	Yes
IKBKAP	0.41	0.14	0.75	0.89	0.36	0.99	0.1	0.12	-0.13	0.33	Yes	0.18	0.12	-0.05	0.42	Yes	-0.06	0.17	-0.39	0.28	Yes
IKBKB	0.21	0.09	0.51	0.89	0.36	0.99	0.18	0.14	-0.09	0.44	Yes	0.25	0.14	-0.03	0.51	Yes	-0.13	0.2	-0.51	0.25	Yes
IKBKE	0.34	0.13	0.52	0.89	0.36	0.99	0.14	0.14	-0.14	0.41	Yes	0.23	0.15	-0.06	0.51	Yes	-0.14	0.21	-0.54	0.26	Yes
IKBKG	0.39	0.15	0.98	0.89	0.36	0.99	0.12	0.14	-0.15	0.39	Yes	0.21	0.14	-0.06	0.48	Yes	0.01	0.2	-0.38	0.39	Yes
IKZF2	0.32	0.2	0.67	0.89	0.38	0.99	-0.09	0.09	-0.27	0.09	Yes	-0.12	0.10	-0.31	0.06	Yes	0.06	0.13	-0.2	0.32	Yes
IKZF3	0.2	0.33	0.19	0.89	0.39	0.99	0.15	0.12	-0.07	0.37	Yes	0.12	0.12	-0.11	0.33	Yes	-0.22	0.17	-0.54	0.1	Yes
IL10RA	0.77	0.5	0.38	0.98	0.47	0.99	-0.05	0.18	-0.4	0.29	Yes	-0.12	0.18	-0.48	0.23	Yes	0.23	0.26	-0.26	0.74	Yes
IL12A	0.54	0.16	0.34	0.91	0.36	0.99	-0.06	0.09	-0.24	0.12	Yes	-0.14	0.10	-0.33	0.05	Yes	0.13	0.14	-0.14	0.39	Yes
IL13RA1	0.37	0.77	0.6	0.89	0.5	0.99	-0.07	0.08	-0.21	0.08	Yes	-0.02	0.08	-0.17	0.13	Yes	0.06	0.11	-0.15	0.27	Yes
IL16	0.97	0.41	0.97	0.99	0.42	0.99	-0.01	0.19	-0.37	0.36	Yes	0.16	0.19	-0.22	0.54	Yes	0.01	0.28	-0.52	0.54	Yes
IL18	0.51	0.93	0.58	0.9	0.53	0.99	0.07	0.11	-0.14	0.28	Yes	-0.01	0.11	-0.22	0.20	Yes	-0.09	0.16	-0.39	0.21	Yes
IL18R1	0.1	0.09	0.03	0.89	0.36	0.99	0.25	0.14	-0.03	0.53	Yes	0.26	0.15	-0.03	0.54	Yes	-0.47	0.21	-0.88	-0.07	No
IL1R1	0.61	0.55	0.72	0.94	0.47	0.99	-0.07	0.14	-0.34	0.19	Yes	0.09	0.14	-0.19	0.36	Yes	0.07	0.2	-0.31	0.46	Yes
IL1RAP	0.96	0.92	0.88	0.99	0.52	0.99	-0.01	0.11	-0.2	0.2	Yes	-0.01	0.11	-0.21	0.19	Yes	0.02	0.16	-0.26	0.3	Yes
IL1RN	0.85	0.59	0.76	0.99	0.47	0.99	0.08	0.41	-0.71	0.87	Yes	-0.23	0.42	-1.03	0.58	Yes	0.18	0.59	-0.96	1.32	Yes
IL2RG	0.25	0.33	0.34	0.89	0.39	0.99	-0.27	0.23	-0.7	0.17	Yes	-0.23	0.23	-0.67	0.22	Yes	0.32	0.33	-0.26	0.94	Yes
IL32	0.8	0.77	0.42	0.99	0.5	0.99	-0.04	0.15	-0.32	0.24	Yes	0.04	0.15	-0.25	0.33	Yes	0.17	0.21	-0.24	0.58	Yes
IL4R	0.09	0.76	0.44	0.89	0.5	0.99	-0.2	0.12	-0.43	0.02	Yes	-0.04	0.12	-0.27	0.19	Yes	0.13	0.17	-0.2	0.46	Yes
IL6R	0.46	0.92	0.38	0.89	0.52	0.99	-0.08	0.11	-0.3	0.13	Yes	0.01	0.11	-0.21	0.23	Yes	0.15	0.16	-0.17	0.46	Yes

IL6ST	0.02	0.18	0.28	0.89	0.36	0.99	-0.28	0.12	-0.5	-0.05	No	-0.16	0.12	-0.39	0.07	Yes	0.19	0.17	-0.14	0.51	Yes
IL7R	0.26	0.84	0.77	0.89	0.52	0.99	-0.32	0.28	-0.86	0.22	Yes	0.06	0.28	-0.48	0.60	Yes	0.12	0.4	-0.66	0.88	Yes
IL8	0.27	0.08	0.63	0.89	0.36	0.99	-0.23	0.2	-0.63	0.17	Yes	-0.37	0.21	-0.78	0.03	Yes	0.14	0.3	-0.43	0.72	Yes
ILF3	0.43	0.24	0.67	0.89	0.39	0.99	-0.07	0.09	-0.24	0.1	Yes	-0.11	0.09	-0.29	0.07	Yes	0.06	0.13	-0.19	0.3	Yes
IRAK1	0.22	0.12	0.14	0.89	0.36	0.99	-0.08	0.06	-0.2	0.04	Yes	-0.10	0.07	-0.23	0.02	Yes	0.14	0.09	-0.04	0.32	Yes
IRAK3	0.05	0.06	0.02	0.89	0.36	0.99	0.25	0.12	0.01	0.48	No	0.24	0.12	0.00	0.48	No	-0.45	0.18	-0.79	-0.11	No
IRAK4	0.45	0.33	0.82	0.89	0.39	0.99	0.06	0.08	-0.09	0.21	Yes	0.08	0.08	-0.07	0.23	Yes	0.03	0.11	-0.19	0.24	Yes
IRF1	0.68	0.52	0.72	0.98	0.47	0.99	0.06	0.14	-0.21	0.32	Yes	-0.09	0.14	-0.37	0.18	Yes	-0.07	0.2	-0.46	0.32	Yes
IRF3	0.7	0.14	0.89	0.98	0.36	0.99	0.04	0.1	-0.16	0.24	Yes	0.16	0.11	-0.04	0.36	Yes	-0.02	0.15	-0.31	0.27	Yes
IRF5	0.98	0.18	0.54	0.99	0.36	0.99	0	0.14	-0.27	0.28	Yes	0.20	0.15	-0.08	0.49	Yes	0.13	0.21	-0.27	0.54	Yes
IRF7	0.5	0.32	0.9	0.9	0.39	0.99	0.13	0.19	-0.24	0.49	Yes	0.19	0.19	-0.18	0.56	Yes	-0.03	0.27	-0.56	0.49	Yes
IRF8	0.13	0.67	0.34	0.89	0.48	0.99	-0.25	0.16	-0.55	0.06	Yes	0.07	0.16	-0.24	0.38	Yes	0.22	0.23	-0.21	0.66	Yes
ITGA6	0.96	0.57	0.69	0.99	0.47	0.99	0.01	0.18	-0.34	0.36	Yes	-0.10	0.18	-0.45	0.26	Yes	-0.11	0.26	-0.61	0.39	Yes
ITGAL	0.76	0.64	0.45	0.98	0.48	0.99	0.05	0.17	-0.28	0.38	Yes	0.08	0.17	-0.26	0.41	Yes	0.19	0.25	-0.29	0.66	Yes
ITGAX	0.97	0.95	0.86	0.99	0.53	0.99	-0.01	0.29	-0.58	0.56	Yes	0.02	0.30	-0.56	0.60	Yes	-0.07	0.43	-0.9	0.74	Yes
ITGB1	0.1	0.22	0.68	0.89	0.38	0.99	-0.14	0.08	-0.29	0.02	Yes	-0.10	0.08	-0.26	0.06	Yes	0.05	0.12	-0.18	0.27	Yes
ITGB2	0.48	0.99	0.5	0.9	0.54	0.99	-0.2	0.28	-0.74	0.34	Yes	0.00	0.29	-0.56	0.54	Yes	0.27	0.4	-0.5	1.06	Yes
ITLN1	0.88	0.25	0.5	0.99	0.39	0.99	0.05	0.34	-0.6	0.7	Yes	0.41	0.34	-0.26	1.07	Yes	-0.34	0.49	-1.28	0.6	Yes
JAK1	0.42	0.98	0.85	0.89	0.54	0.99	-0.06	0.07	-0.2	0.08	Yes	0.00	0.07	-0.14	0.14	Yes	-0.02	0.1	-0.22	0.18	Yes
JAK2	0.23	0.75	0.62	0.89	0.5	0.99	-0.1	0.09	-0.27	0.06	Yes	0.03	0.09	-0.14	0.20	Yes	0.06	0.12	-0.18	0.3	Yes
JAK3	0.85	0.76	0.82	0.99	0.5	0.99	-0.03	0.16	-0.34	0.28	Yes	-0.05	0.16	-0.37	0.26	Yes	0.05	0.23	-0.39	0.5	Yes
KIT	0.09	0.26	0.07	0.89	0.39	0.99	0.28	0.16	-0.03	0.58	Yes	0.19	0.16	-0.13	0.50	Yes	-0.43	0.23	-0.88	0.02	Yes
KLRB1	0.66	0.6	0.79	0.97	0.47	0.99	-0.07	0.15	0	Inf	Yes	-0.08	0.15	-0.37	0.21	Yes	-0.06	0.22	-0.48	0.36	Yes
LAIR1	0.75	0.61	0.62	0.98	0.47	0.99	-0.09	0.28	-0.64	0.45	Yes	0.15	0.29	-0.42	0.69	Yes	0.2	0.41	-0.58	0.99	Yes
LCP2	0.7	0.7	0.72	0.98	0.48	0.99	-0.1	0.25	-0.59	0.39	Yes	-0.10	0.26	-0.60	0.40	Yes	0.13	0.37	-0.57	0.84	Yes
LILRA3	0.66	0.55	0.79	0.97	0.47	0.99	-0.11	0.25	-0.57	0.38	Yes	0.16	0.26	-0.31	0.60	Yes	0.1	0.37	-0.53	0.77	Yes
LITAF	0.85	0.4	0.77	0.99	0.42	0.99	0.02	0.1	-0.18	0.22	Yes	0.09	0.11	-0.11	0.29	Yes	0.04	0.15	-0.24	0.33	Yes
LTB4R	0.5	0.27	0.97	0.9	0.39	0.99	0.13	0.19	-0.24	0.5	Yes	0.22	0.19	-0.16	0.59	Yes	-0.01	0.28	-0.54	0.52	Yes
LTBR	0.34	0.09	0.49	0.89	0.36	0.99	0.13	0.13	-0.12	0.38	Yes	0.23	0.13	-0.03	0.48	Yes	-0.13	0.19	-0.49	0.23	Yes
LTF	0.42	0.31	0.86	0.89	0.39	0.99	-0.28	0.35	-0.95	0.38	Yes	0.37	0.35	-0.32	1.05	Yes	-0.09	0.5	-1.06	0.88	Yes

LY96	0.51	0.92	0.61	0.9	0.52	0.99	-0.15	0.23	-0.57	0.29	Yes	-0.02	0.23	-0.46	0.40	Yes	0.17	0.33	0	Inf	Yes
MAP4K2	0.95	0.85	0.47	0.99	0.52	0.99	0.01	0.13	-0.25	0.26	Yes	0.03	0.14	-0.24	0.29	Yes	0.14	0.19	-0.23	0.51	Yes
MAP4K4	0.89	0.9	0.48	0.99	0.52	0.99	0.02	0.14	-0.25	0.29	Yes	0.02	0.14	-0.26	0.29	Yes	0.14	0.2	-0.16	0.49	Yes
MAPK1	0.12	0.2	0.32	0.89	0.38	0.99	-0.17	0.11	-0.38	0.04	Yes	-0.14	0.11	-0.36	0.07	Yes	0.16	0.16	-0.15	0.46	Yes
MAPK14	0.64	0.66	0.59	0.96	0.48	0.99	0.05	0.11	-0.16	0.26	Yes	0.05	0.11	-0.16	0.26	Yes	0.09	0.16	-0.21	0.38	Yes
MAPKAPK2	0.61	0.93	0.44	0.94	0.53	0.99	-0.04	0.08	-0.18	0.11	Yes	-0.01	0.08	-0.16	0.14	Yes	0.09	0.11	-0.12	0.3	Yes
MARCO	0.89	0.39	0.98	0.99	0.42	0.99	0.08	0.57	-0.99	1.17	Yes	0.50	0.58	-0.63	1.53	Yes	0.02	0.82	-1.48	1.57	Yes
MSR1	0.84	0.58	0.92	0.99	0.47	0.99	-0.1	0.51	-1.09	0.87	Yes	0.29	0.52	-0.73	1.26	Yes	0.08	0.73	-1.31	1.49	Yes
MUC1	0.28	0.17	0.2	0.89	0.36	0.99	0.13	0.12	-0.1	0.36	Yes	0.17	0.12	-0.07	0.40	Yes	-0.23	0.17	-0.56	0.11	Yes
MX1	0.95	0.86	0.97	0.99	0.52	0.99	0.02	0.3	-0.57	0.6	Yes	0.06	0.31	-0.54	0.65	Yes	-0.02	0.44	-0.86	0.83	Yes
MYD88	0.5	0.88	0.93	0.9	0.52	0.99	-0.08	0.11	-0.29	0.14	Yes	-0.02	0.11	-0.24	0.20	Yes	-0.01	0.16	-0.32	0.3	Yes
NCF4	0.9	0.71	0.95	0.99	0.48	0.99	-0.03	0.24	-0.48	0.43	Yes	0.09	0.24	-0.37	0.51	Yes	-0.02	0.34	-0.62	0.64	Yes
NFATC1	0.81	0.29	0.79	0.99	0.39	0.99	0.03	0.13	-0.22	0.28	Yes	0.14	0.13	-0.12	0.40	Yes	-0.05	0.19	-0.42	0.31	Yes
NFATC2	0.67	0.31	0.82	0.97	0.39	0.99	0.06	0.15	-0.22	0.35	Yes	0.16	0.15	-0.14	0.45	Yes	0.05	0.22	-0.37	0.47	Yes
NFATC3	0.12	0.07	0.38	0.89	0.36	0.99	-0.22	0.14	-0.45	0.04	Yes	-0.26	0.14	-0.49	-0.01	No	0.18	0.2	-0.17	0.5	Yes
NFIL3	0.57	0.02	0.43	0.94	0.33	0.99	-0.05	0.09	-0.22	0.12	Yes	-0.22	0.09	-0.39	-0.04	No	0.1	0.13	-0.15	0.35	Yes
NFKB1	0.1	0.1	0.47	0.89	0.36	0.99	-0.21	0.13	0	Inf	Yes	-0.22	0.13	-0.45	0.03	Yes	0.13	0.18	-0.22	0.47	Yes
NFKB2	0.95	0.44	0.9	0.99	0.44	0.99	-0.01	0.13	-0.25	0.23	Yes	-0.10	0.13	-0.35	0.15	Yes	-0.02	0.18	-0.37	0.33	Yes
NFKBIA	0.23	0.12	0.16	0.89	0.36	0.99	-0.11	0.09	-0.28	0.06	Yes	-0.14	0.09	-0.32	0.03	Yes	0.18	0.13	-0.07	0.43	Yes
NFKBIZ	0.28	0	0.52	0.89	0	0.99	-0.16	0.14	-0.44	0.12	Yes	-0.77	0.15	-1.06	-0.48	No	0.13	0.21	-0.28	0.54	Yes
NOD2	0.94	0.31	0.33	0.99	0.39	0.99	-0.01	0.09	-0.18	0.16	Yes	-0.09	0.09	-0.27	0.08	Yes	0.13	0.13	-0.12	0.37	Yes
NOS2	0.16	0.17	0.29	0.89	0.36	0.99	0.43	0.3	-0.14	1.02	Yes	0.43	0.31	-0.16	1.02	Yes	-0.47	0.44	-1.31	0.37	Yes
NOTCH1	0.58	0.46	0.26	0.94	0.46	0.99	-0.08	0.15	-0.37	0.2	Yes	-0.11	0.15	-0.40	0.18	Yes	0.24	0.21	-0.17	0.65	Yes
NOTCH2	0.93	0.58	0.37	0.99	0.47	0.99	-0.01	0.11	-0.22	0.2	Yes	0.06	0.11	-0.15	0.27	Yes	-0.14	0.16	-0.44	0.16	Yes
PDCD2	0.94	0.14	0.92	0.99	0.36	0.99	0.01	0.1	-0.19	0.21	Yes	0.16	0.11	-0.05	0.37	Yes	0.02	0.15	-0.28	0.31	Yes
PIGR	0.96	0.22	0.26	0.99	0.38	0.99	0.01	0.14	-0.27	0.28	Yes	0.18	0.15	-0.10	0.46	Yes	-0.24	0.21	-0.64	0.16	Yes
PLAUR	0.91	0.78	0.93	0.99	0.51	0.99	0.04	0.32	-0.55	0.64	Yes	-0.09	0.32	-0.68	0.50	Yes	-0.04	0.46	-0.87	0.8	Yes
PML	0.07	0.25	0.15	0.89	0.39	0.99	0.19	0.1	-0.01	0.39	Yes	0.12	0.11	-0.08	0.33	Yes	-0.22	0.15	-0.51	0.07	Yes
PRDM1	0.26	0.02	0.27	0.89	0.33	0.99	-0.16	0.14	0	Inf	Yes	-0.34	0.14	-0.61	-0.07	No	0.22	0.2	-0.16	0.61	Yes
PRF1	0.53	0.58	0.63	0.91	0.47	0.99	-0.17	0.26	-0.68	0.34	Yes	-0.15	0.27	-0.67	0.37	Yes	0.19	0.38	-0.55	0.92	Yes

PRKCD	0.88	0.92	0.53	0.99	0.52	0.99	0.02	0.12	-0.21	0.25	Yes	0.01	0.12	-0.23	0.25	Yes	0.11	0.17	-0.23	0.45	Yes
PSMB10	0.27	0.26	0.15	0.89	0.39	0.99	0.1	0.09	-0.07	0.26	Yes	0.10	0.09	-0.07	0.27	Yes	-0.18	0.12	-0.42	0.06	Yes
PSMB7	0.63	0.22	0.95	0.95	0.38	0.99	-0.04	0.08	-0.2	0.12	Yes	-0.11	0.08	-0.27	0.06	Yes	0.01	0.12	-0.23	0.24	Yes
PSMB8	0.72	0.66	0.81	0.98	0.48	0.99	0.04	0.11	-0.17	0.25	Yes	-0.05	0.11	-0.27	0.17	Yes	-0.04	0.16	-0.34	0.27	Yes
PSMB9	0.29	0.6	0.77	0.89	0.47	0.99	0.17	0.16	-0.13	0.47	Yes	0.09	0.16	-0.22	0.39	Yes	-0.07	0.23	-0.5	0.37	Yes
PSMC2	0.97	0.4	0.5	0.99	0.42	0.99	0	0.1	-0.19	0.2	Yes	-0.09	0.11	-0.29	0.12	Yes	-0.1	0.15	-0.39	0.19	Yes
PSMD7	0.05	0.11	0.33	0.89	0.36	0.99	0.16	0.08	0.01	0.31	No	0.13	0.08	-0.02	0.28	Yes	-0.11	0.11	-0.33	0.1	Yes
PTAFR	0.45	0.82	0.81	0.89	0.51	0.99	0.12	0.16	-0.18	0.42	Yes	0.04	0.16	-0.27	0.35	Yes	0.06	0.23	-0.38	0.5	Yes
PTGER4	0.03	0.01	0.08	0.89	0.33	0.99	-0.2	0.09	-0.38	-0.03	No	-0.26	0.09	-0.44	-0.08	No	0.24	0.13	-0.02	0.49	Yes
PTGS2	0.26	0.04	0.37	0.89	0.36	0.99	-0.15	0.14	-0.42	0.11	Yes	-0.30	0.14	-0.56	-0.03	No	0.18	0.2	-0.2	0.55	Yes
PTK2	0.4	0.98	0.98	0.89	0.54	0.99	-0.07	0.08	-0.22	0.08	Yes	0.00	0.08	-0.15	0.16	Yes	0	0.11	-0.22	0.21	Yes
PTPN2	0.44	0.06	0.5	0.89	0.36	0.99	0.07	0.09	-0.1	0.25	Yes	0.18	0.09	0.00	0.36	No	-0.09	0.13	-0.35	0.17	Yes
PTPN22	0.38	0.66	0.38	0.89	0.48	0.99	-0.13	0.14	-0.4	0.15	Yes	-0.06	0.15	-0.31	0.22	Yes	0.18	0.21	-0.18	0.53	Yes
PTPN6	0.23	0.26	0.27	0.89	0.39	0.99	-0.13	0.11	-0.34	0.08	Yes	-0.13	0.11	-0.34	0.09	Yes	0.17	0.16	-0.13	0.47	Yes
PTPRC	0.28	0.61	0.46	0.89	0.47	0.99	-0.27	0.24	-0.74	0.2	Yes	-0.13	0.25	-0.56	0.29	Yes	0.26	0.35	-0.32	0.88	Yes
RARRES3	0.89	0.57	0.86	0.99	0.47	0.99	0.02	0.12	-0.22	0.25	Yes	-0.07	0.12	-0.31	0.17	Yes	-0.03	0.17	-0.37	0.31	Yes
RELA	0.65	0.56	0.5	0.97	0.47	0.99	-0.04	0.09	-0.22	0.13	Yes	-0.05	0.09	-0.23	0.13	Yes	-0.09	0.13	-0.34	0.16	Yes
RORC	0.21	0.29	0.24	0.89	0.39	0.99	-0.2	0.15	-0.49	0.1	Yes	-0.17	0.16	-0.47	0.13	Yes	0.27	0.22	-0.16	0.69	Yes
RUNX1	0.86	0.55	0.75	0.99	0.47	0.99	0.02	0.13	-0.23	0.28	Yes	0.08	0.14	-0.18	0.35	Yes	0.06	0.19	-0.31	0.44	Yes
SERPING1	0.41	0.69	0.33	0.89	0.48	0.99	-0.23	0.27	-0.75	0.29	Yes	-0.11	0.28	-0.65	0.42	Yes	0.39	0.39	-0.37	1.15	Yes
SIGIRR	0.48	0.17	0.97	0.9	0.36	0.99	0.09	0.13	-0.15	0.33	Yes	0.18	0.13	-0.07	0.43	Yes	-0.01	0.18	-0.36	0.34	Yes
SKI	0.19	0.53	0.05	0.89	0.47	0.99	-0.15	0.12	-0.38	0.07	Yes	-0.07	0.12	-0.30	0.15	Yes	0.33	0.17	0.01	0.66	No
SLAMF7	0.26	0.16	0.22	0.89	0.36	0.99	-0.19	0.16	-0.5	0.13	Yes	0.24	0.17	-0.08	0.57	Yes	-0.29	0.24	-0.75	0.16	Yes
SMAD3	0.48	0.55	0.37	0.9	0.47	0.99	-0.09	0.12	-0.31	0.14	Yes	-0.07	0.12	-0.31	0.16	Yes	0.15	0.17	-0.18	0.49	Yes
SMAD5	0.18	0.12	0.56	0.89	0.36	0.99	-0.16	0.12	-0.39	0.07	Yes	-0.19	0.12	-0.43	0.04	Yes	0.1	0.17	-0.23	0.43	Yes
SOCS3	0.66	0.08	0.48	0.97	0.36	0.99	0.13	0.29	-0.43	0.69	Yes	-0.54	0.30	-1.12	0.03	Yes	0.3	0.42	-0.38	1.03	Yes
SRC	0.13	0.15	0.35	0.89	0.36	0.99	0.13	0.09	-0.03	0.29	Yes	0.13	0.09	-0.04	0.30	Yes	-0.12	0.12	-0.35	0.12	Yes
STAT1	0.74	0.71	0.7	0.98	0.48	0.99	0.07	0.21	-0.33	0.47	Yes	0.08	0.21	-0.33	0.49	Yes	-0.12	0.3	-0.7	0.47	Yes
STAT2	0.62	0.18	0.59	0.94	0.37	0.99	0.07	0.13	-0.19	0.33	Yes	0.19	0.14	-0.08	0.45	Yes	-0.1	0.19	-0.48	0.27	Yes
STAT3	0.23	0.15	0.62	0.89	0.36	0.99	0.14	0.11	-0.08	0.35	Yes	0.17	0.11	-0.05	0.39	Yes	-0.08	0.16	-0.39	0.23	Yes

STAT4	0.18	0.17	0.09	0.89	0.36	0.99	0.15	0.11	-0.06	0.37	Yes	0.16	0.11	-0.06	0.38	Yes	-0.28	0.16	-0.59	0.03	Yes
STAT5A	0.3	0.12	0.33	0.89	0.36	0.99	-0.08	0.07	-0.22	0.06	Yes	0.12	0.08	-0.03	0.26	Yes	0.11	0.11	-0.1	0.31	Yes
STAT5B	0.04	0.11	0.2	0.89	0.36	0.99	-0.33	0.15	-0.61	-0.04	No	-0.26	0.15	-0.53	0.04	Yes	0.29	0.22	-0.12	0.69	Yes
STAT6	0.39	0.25	0.92	0.89	0.39	0.99	0.15	0.17	-0.18	0.48	Yes	0.20	0.17	-0.14	0.53	Yes	-0.03	0.25	-0.5	0.45	Yes
SYK	0.28	0.5	0.38	0.89	0.47	0.99	-0.13	0.12	-0.35	0.09	Yes	-0.08	0.12	-0.30	0.15	Yes	0.15	0.17	-0.17	0.47	Yes
TAGAP	0.45	0.39	0.73	0.89	0.42	0.99	-0.21	0.28	-0.75	0.32	Yes	-0.24	0.28	-0.79	0.30	Yes	0.14	0.4	-0.63	0.91	Yes
TAP1	0.57	0.83	0.93	0.94	0.52	0.99	0.11	0.19	-0.26	0.47	Yes	0.04	0.19	-0.33	0.41	Yes	-0.03	0.27	-0.55	0.5	Yes
TAPBP	0.44	0.65	0.21	0.89	0.48	0.99	-0.07	0.09	-0.23	0.1	Yes	-0.04	0.09	-0.21	0.13	Yes	0.16	0.12	-0.08	0.4	Yes
TBK1	0.26	0.06	0.48	0.89	0.36	0.99	-0.09	0.08	-0.24	0.06	Yes	-0.16	0.08	-0.31	0.00	Yes	0.08	0.11	-0.14	0.3	Yes
TCF4	0.45	0.36	0.81	0.89	0.42	0.99	-0.06	0.08	-0.21	0.09	Yes	-0.07	0.08	-0.23	0.08	Yes	-0.03	0.11	-0.25	0.19	Yes
TCF7	0.51	0.7	0.54	0.9	0.48	0.99	-0.11	0.17	-0.43	0.22	Yes	-0.07	0.18	-0.38	0.25	Yes	0.15	0.25	-0.29	0.61	Yes
TFRC	0.42	0.53	0.67	0.89	0.47	0.99	-0.17	0.21	-0.58	0.23	Yes	-0.14	0.22	-0.55	0.28	Yes	0.13	0.3	-0.46	0.71	Yes
TGFB1	0.45	0.16	0.76	0.89	0.36	0.99	0.13	0.17	-0.19	0.45	Yes	0.24	0.17	-0.09	0.57	Yes	-0.07	0.24	-0.54	0.39	Yes
TGFBI	0.8	0.29	0.96	0.99	0.39	0.99	0.06	0.23	-0.35	0.49	Yes	0.25	0.23	0.00	Inf	Yes	0.02	0.33	-0.54	0.65	Yes
TGFBR1	0.44	0.05	0.46	0.89	0.36	0.99	0.09	0.12	-0.13	0.31	Yes	0.24	0.12	0.01	0.47	No	-0.13	0.17	-0.45	0.2	Yes
TGFBR2	0.9	0.3	0.83	0.99	0.39	0.99	0.01	0.12	-0.21	0.24	Yes	0.13	0.12	-0.11	0.36	Yes	-0.04	0.17	-0.37	0.29	Yes
TIRAP	0.63	0.09	0.62	0.96	0.36	0.99	0.06	0.13	-0.19	0.31	Yes	0.23	0.13	-0.03	0.48	Yes	-0.09	0.19	-0.45	0.27	Yes
TLR1	0.59	0.87	0.88	0.94	0.52	0.99	-0.07	0.12	-0.3	0.17	Yes	-0.02	0.12	-0.26	0.22	Yes	0.03	0.18	-0.31	0.37	Yes
TLR2	0.86	0.26	0.42	0.99	0.39	0.99	-0.02	0.12	-0.25	0.21	Yes	0.14	0.12	-0.09	0.37	Yes	-0.14	0.17	-0.47	0.19	Yes
TLR4	0.39	0.79	0.72	0.89	0.51	0.99	-0.16	0.18	-0.5	0.19	Yes	0.05	0.18	-0.30	0.40	Yes	0.1	0.26	-0.41	0.6	Yes
TLR5	0.34	0.4	0.36	0.89	0.42	0.99	-0.13	0.14	-0.4	0.13	Yes	-0.12	0.14	-0.39	0.15	Yes	0.19	0.2	-0.2	0.57	Yes
TMEM173	0.15	0.19	0.23	0.89	0.37	0.99	0.12	0.08	-0.04	0.28	Yes	0.11	0.09	-0.05	0.28	Yes	-0.15	0.12	-0.38	0.09	Yes
TNFAIP3	0.4	0.01	0.28	0.89	0.33	0.99	-0.08	0.1	-0.27	0.11	Yes	-0.26	0.10	-0.45	-0.06	No	0.16	0.14	-0.12	0.43	Yes
TNFRSF11A	0.33	0.08	0.2	0.89	0.36	0.99	0.12	0.12	-0.11	0.34	Yes	0.22	0.12	-0.01	0.45	Yes	-0.22	0.17	-0.55	0.1	Yes
TNFRSF13C	0.92	0.21	0.66	0.99	0.38	0.99	-0.01	0.11	-0.23	0.21	Yes	0.15	0.12	-0.08	0.37	Yes	0.07	0.16	-0.25	0.39	Yes
TNFRSF14	0.41	0.49	0.53	0.89	0.47	0.99	-0.06	0.07	-0.2	0.08	Yes	0.05	0.07	-0.09	0.20	Yes	0.07	0.11	-0.14	0.27	Yes
TNFRSF1B	0.77	0.86	0.31	0.98	0.52	0.99	-0.06	0.2	-0.45	0.33	Yes	-0.04	0.21	-0.44	0.36	Yes	0.3	0.29	-0.26	0.87	Yes
TNFSF10	0.41	0.09	0.29	0.89	0.36	0.99	0.13	0.15	-0.17	0.43	Yes	0.27	0.16	-0.03	0.58	Yes	-0.24	0.22	-0.67	0.19	Yes
TNFSF12	0.43	0.1	0.58	0.89	0.36	0.99	-0.09	0.11	-0.31	0.13	Yes	0.19	0.12	-0.03	0.42	Yes	0.09	0.16	-0.22	0.41	Yes
TOLLIP	0.47	0.96	0.17	0.9	0.54	0.99	-0.06	0.08	-0.22	0.1	Yes	0.00	0.09	-0.17	0.16	Yes	0.17	0.12	-0.06	0.4	Yes

TP53	0.3	0.17	0.86	0.89	0.36	0.99	-0.12	0.12	-0.35	0.1	Yes	-0.17	0.12	-0.39	0.06	Yes	0.03	0.17	-0.29	0.35	Yes
TRAF1	0.74	0.38	0.37	0.98	0.42	0.99	-0.03	0.1	-0.23	0.16	Yes	0.09	0.10	-0.12	0.29	Yes	0.13	0.15	-0.01	0.37	Yes
TRAF2	0.93	0.7	0.87	0.99	0.48	0.99	-0.01	0.07	-0.15	0.14	Yes	0.03	0.08	-0.12	0.17	Yes	-0.02	0.11	-0.22	0.19	Yes
TRAF3	1	0.61	0.79	1	0.47	0.99	0	0.14	-0.27	0.27	Yes	0.07	0.14	-0.20	0.34	Yes	0.05	0.2	-0.33	0.44	Yes
TRAF4	0.28	0.06	0.3	0.89	0.36	0.99	-0.1	0.09	-0.28	0.08	Yes	-0.18	0.10	-0.37	0.00	Yes	0.14	0.13	-0.12	0.4	Yes
TRAF5	0.11	0.84	0.35	0.89	0.52	0.99	-0.17	0.1	-0.37	0.03	Yes	0.02	0.11	-0.18	0.23	Yes	0.14	0.15	-0.15	0.43	Yes
TRAF6	0.32	0.88	0.42	0.89	0.52	0.99	-0.1	0.1	-0.28	0.09	Yes	-0.02	0.10	-0.20	0.18	Yes	0.11	0.14	-0.16	0.38	Yes
TYK2	0.88	0.65	0.92	0.99	0.48	0.99	-0.01	0.1	-0.2	0.17	Yes	0.04	0.10	-0.14	0.24	Yes	-0.01	0.14	-0.28	0.25	Yes
UBE2L3	0.7	0.7	0.97	0.98	0.48	0.99	0.03	0.08	-0.12	0.18	Yes	0.03	0.08	-0.13	0.19	Yes	0	0.12	-0.22	0.23	Yes
XBP1	0.15	0.04	0.25	0.89	0.36	0.99	0.27	0.18	-0.05	0.61	Yes	0.40	0.18	0.06	0.72	No	-0.3	0.26	-0.76	0.18	Yes
ZAP70	0.87	0.28	0.8	0.99	0.39	0.99	0.02	0.14	-0.25	0.3	Yes	0.16	0.15	-0.12	0.44	Yes	-0.05	0.21	-0.45	0.35	Yes

mRNA	p-value (Diesel)	p-value (Allergen)	q-value (Diesel)	q-value (Allergen)	Interaction p-value from log-likelihood ratio test	Interaction q-value from log-likelihood ratio test	Evidence of Interaction (criteria: $q < 0.05$)	Fixed Effect (Diesel)	Standard Error (Diesel)	Confidence Bound (lower 2.5%; Diesel)	Confidence Bound (upper 97.5%; Diesel)	Zero covered by CI (Diesel)	Fixed Effect (Allergen)	Standard Error (Allergen)	Confidence Bound (lower 2.5%; Allergen)	Confidence Bound (upper 97.5%; Allergen)	Zero covered by CI (Allergen)
NFKBIZ	0.37	0.00	1.00	0.00	0.51	0.98	No	-0.09	0.10	-0.30	0.11	Yes	-0.70	0.10	-0.91	-0.50	No
CDKN1A	0.98	0.00	1.00	0.08	0.61	0.98	No	0.00	0.07	-0.14	0.14	Yes	-0.26	0.07	-0.40	-0.12	No
STAT5A	0.60	0.00	1.00	0.15	0.31	0.98	No	-0.03	0.05	-0.13	0.08	Yes	0.17	0.05	0.07	0.28	No
IFNGR1	0.04	0.00	1.00	0.17	0.72	0.98	No	-0.18	0.08	-0.34	-0.02	No	-0.26	0.08	-0.42	-0.09	No
TNFSF12	0.57	0.01	1.00	0.18	0.56	0.98	No	-0.05	0.08	-0.20	0.11	Yes	0.24	0.08	0.08	0.40	No
CIITA	0.04	0.01	1.00	0.18	0.68	0.98	No	0.21	0.10	0.01	0.40	No	0.29	0.10	0.10	0.48	No
CXCL1	0.29	0.01	1.00	0.19	0.58	0.98	No	-0.12	0.11	-0.35	0.10	Yes	-0.32	0.11	-0.54	-0.10	No
CXCL2	0.33	0.01	1.00	0.19	0.47	0.98	No	-0.11	0.11	-0.33	0.11	Yes	-0.31	0.11	-0.53	-0.09	No
FKBP5	0.44	0.01	1.00	0.19	0.54	0.98	No	0.07	0.08	-0.10	0.23	Yes	0.23	0.08	0.06	0.39	No
HLA-DRB3	0.12	0.01	1.00	0.19	0.81	0.98	No	0.20	0.13	-0.04	0.45	Yes	0.33	0.13	0.08	0.58	No
C4A	0.59	0.01	1.00	0.19	0.53	0.98	No	0.07	0.13	-0.18	0.32	Yes	0.33	0.13	0.08	0.58	No
AHR	0.07	0.01	1.00	0.19	0.59	0.98	No	-0.10	0.05	-0.20	0.00	Yes	-0.14	0.05	-0.24	-0.03	No
NFIL3	0.97	0.01	1.00	0.19	0.41	0.98	No	0.00	0.06	-0.13	0.12	Yes	-0.17	0.06	-0.29	-0.04	No
IRF5	0.53	0.01	1.00	0.19	0.52	0.98	No	0.07	0.10	-0.14	0.27	Yes	0.27	0.10	0.06	0.47	No
TNFAIP3	0.91	0.02	1.00	0.20	0.26	0.98	No	-0.01	0.07	-0.15	0.13	Yes	-0.18	0.07	-0.32	-0.04	No
CD74	0.08	0.02	1.00	0.20	0.76	0.98	No	0.13	0.07	-0.01	0.28	Yes	0.19	0.07	0.04	0.33	No
FCER1A	0.33	0.02	1.00	0.20	0.27	0.98	No	-0.12	0.12	-0.35	0.12	Yes	-0.30	0.12	-0.53	-0.06	No
C4B	0.51	0.02	1.00	0.20	0.31	0.98	No	0.09	0.14	-0.18	0.36	Yes	0.34	0.14	0.07	0.61	No
HLA-A	0.01	0.02	1.00	0.20	0.75	0.98	No	0.21	0.07	0.07	0.35	No	0.17	0.07	0.03	0.31	No
CD82	0.27	0.02	1.00	0.20	0.50	0.98	No	0.09	0.08	-0.07	0.25	Yes	0.20	0.08	0.04	0.36	No
HLA-DRB1	0.12	0.03	1.00	0.23	0.69	0.98	No	0.18	0.11	-0.04	0.39	Yes	0.25	0.11	0.04	0.47	No

TNFRSF13C	0.78	0.03	1.00	0.23	0.65	0.98	No	0.02	0.08	-0.14	0.18	Yes	0.18	0.08	0.02	0.34	No
C2	0.33	0.03	1.00	0.23	0.76	0.98	No	0.12	0.12	-0.12	0.37	Yes	0.28	0.12	0.04	0.52	No
PRDM1	0.60	0.03	1.00	0.23	0.25	0.98	No	-0.05	0.10	-0.25	0.14	Yes	-0.23	0.10	-0.43	-0.03	No
PDCD2	0.84	0.03	1.00	0.23	0.92	0.99	No	0.02	0.07	-0.13	0.16	Yes	0.17	0.07	0.02	0.32	No
TRAF1	0.70	0.04	1.00	0.25	0.35	0.98	No	0.03	0.07	-0.11	0.18	Yes	0.16	0.07	0.01	0.30	No
IKBKG	0.22	0.04	1.00	0.25	0.98	0.99	No	0.12	0.10	-0.07	0.32	Yes	0.21	0.10	0.02	0.40	No
PTGS2	0.48	0.04	1.00	0.25	0.35	0.98	No	-0.07	0.10	-0.26	0.12	Yes	-0.21	0.10	-0.40	-0.02	No
TGFBR1	0.71	0.04	1.00	0.25	0.44	0.98	No	0.03	0.08	-0.13	0.20	Yes	0.18	0.08	0.02	0.34	No
CASP8	0.58	0.04	1.00	0.25	0.71	0.98	No	-0.03	0.06	-0.15	0.08	Yes	-0.12	0.06	-0.24	-0.01	No
PTGER4	0.18	0.04	1.00	0.25	0.07	0.98	No	-0.09	0.07	-0.23	0.04	Yes	-0.14	0.07	-0.27	-0.01	No
PTPN2	0.67	0.04	1.00	0.25	0.48	0.98	No	0.03	0.07	-0.10	0.16	Yes	0.14	0.07	0.01	0.27	No
BCAP31	0.46	0.05	1.00	0.25	0.65	0.98	No	0.05	0.06	-0.08	0.17	Yes	0.13	0.06	0.01	0.26	No
IL8	0.28	0.05	1.00	0.25	0.61	0.98	No	-0.16	0.15	-0.45	0.13	Yes	-0.30	0.15	-0.59	-0.01	No
TBK1	0.37	0.05	1.00	0.25	0.46	0.98	No	-0.05	0.06	-0.16	0.06	Yes	-0.12	0.06	-0.23	0.00	No
IRF3	0.68	0.05	1.00	0.25	0.89	0.99	No	0.03	0.07	-0.11	0.17	Yes	0.15	0.07	0.01	0.29	No
CD209	0.46	0.05	1.00	0.25	0.77	0.98	No	-0.05	0.06	-0.17	0.08	Yes	0.13	0.06	0.01	0.26	No
CD46	0.37	0.06	1.00	0.27	0.72	0.98	No	-0.07	0.07	-0.21	0.08	Yes	-0.15	0.07	-0.29	0.00	No
TIRAP	0.85	0.06	1.00	0.27	0.60	0.98	No	0.02	0.09	-0.16	0.20	Yes	0.18	0.09	0.00	0.36	No
SIGIRR	0.34	0.06	1.00	0.28	0.96	0.99	No	0.09	0.09	-0.09	0.26	Yes	0.17	0.09	0.00	0.35	Yes
XBP1	0.36	0.07	1.00	0.29	0.23	0.98	No	0.12	0.13	-0.13	0.38	Yes	0.25	0.13	-0.01	0.50	Yes
SOCS3	0.20	0.07	1.00	0.29	0.46	0.98	No	0.27	0.21	-0.14	0.68	Yes	-0.40	0.21	-0.80	0.01	Yes
DPP4	0.62	0.07	1.00	0.29	0.73	0.98	No	-0.08	0.15	-0.37	0.22	Yes	0.28	0.15	-0.01	0.58	Yes
PSMC2	0.55	0.07	1.00	0.29	0.48	0.98	No	-0.04	0.07	-0.19	0.10	Yes	-0.14	0.07	-0.28	0.01	Yes
TP53	0.20	0.07	1.00	0.30	0.86	0.99	No	-0.11	0.08	-0.27	0.05	Yes	-0.15	0.08	-0.31	0.01	Yes
IKKB	0.25	0.08	1.00	0.31	0.50	0.98	No	0.11	0.10	-0.08	0.31	Yes	0.18	0.10	-0.01	0.37	Yes
IKBKAP	0.39	0.08	1.00	0.31	0.74	0.98	No	0.07	0.09	-0.09	0.24	Yes	0.16	0.09	-0.01	0.32	Yes
HLA-B	0.03	0.08	1.00	0.31	0.78	0.98	No	0.16	0.07	0.02	0.30	No	0.13	0.07	-0.01	0.27	Yes
CCBP2	0.23	0.08	1.00	0.31	0.39	0.98	No	0.15	0.13	-0.10	0.40	Yes	0.23	0.13	-0.02	0.47	Yes
NFATC3	0.18	0.08	1.00	0.31	0.35	0.98	No	-0.13	0.10	-0.33	0.06	Yes	-0.17	0.10	-0.36	0.02	Yes
HLA-C	0.07	0.09	1.00	0.32	0.45	0.98	No	0.16	0.09	-0.01	0.34	Yes	0.16	0.09	-0.02	0.33	Yes
LTBR	0.50	0.09	1.00	0.32	0.47	0.98	No	0.06	0.09	-0.12	0.25	Yes	0.16	0.09	-0.02	0.35	Yes
PSMB7	0.53	0.09	1.00	0.32	0.95	0.99	No	-0.04	0.06	-0.15	0.08	Yes	-0.10	0.06	-0.22	0.01	Yes
TGFB1	0.45	0.09	1.00	0.32	0.75	0.98	No	0.09	0.12	-0.14	0.32	Yes	0.20	0.12	-0.03	0.43	Yes
NFATC2	0.42	0.10	1.00	0.33	0.82	0.98	No	0.09	0.11	-0.12	0.30	Yes	0.18	0.11	-0.03	0.39	Yes

NFKB1	0.11	0.10	1.00	0.33	0.45	0.98	No	-0.15	0.09	-0.33	0.03	Yes	-0.15	0.09	-0.33	0.03	Yes
CD4	0.57	0.10	1.00	0.33	0.47	0.98	No	0.04	0.08	-0.10	0.19	Yes	0.13	0.08	-0.02	0.27	Yes
SMAD5	0.19	0.11	1.00	0.33	0.54	0.98	No	-0.11	0.09	-0.28	0.05	Yes	-0.14	0.09	-0.31	0.03	Yes
CCL22	0.23	0.11	1.00	0.33	0.88	0.99	No	0.11	0.09	-0.07	0.28	Yes	0.15	0.09	-0.03	0.32	Yes
TRAF4	0.61	0.11	1.00	0.33	0.28	0.98	No	-0.03	0.07	-0.17	0.10	Yes	-0.11	0.07	-0.24	0.02	Yes
IRAK4	0.20	0.11	1.00	0.33	0.81	0.98	No	0.07	0.05	-0.04	0.18	Yes	0.09	0.05	-0.02	0.20	Yes
TNFRSF14	0.57	0.11	1.00	0.34	0.51	0.98	No	-0.03	0.05	-0.13	0.07	Yes	0.08	0.05	-0.02	0.19	Yes
STAT3	0.23	0.12	1.00	0.34	0.61	0.98	No	0.10	0.08	-0.06	0.25	Yes	0.13	0.08	-0.03	0.28	Yes
TGFB1	0.68	0.12	1.00	0.34	0.96	0.99	No	0.07	0.16	-0.25	0.38	Yes	0.26	0.16	-0.06	0.57	Yes
TCF4	0.20	0.12	1.00	0.34	0.80	0.98	No	-0.07	0.06	-0.18	0.04	Yes	-0.09	0.06	-0.20	0.02	Yes
LTB4R	0.36	0.13	1.00	0.34	0.97	0.99	No	0.13	0.14	-0.14	0.39	Yes	0.21	0.14	-0.05	0.48	Yes
IRF8	0.22	0.13	1.00	0.34	0.32	0.98	No	-0.14	0.11	-0.36	0.08	Yes	0.18	0.11	-0.04	0.40	Yes
CASP2	0.43	0.13	1.00	0.34	0.22	0.98	No	-0.05	0.06	-0.17	0.07	Yes	0.10	0.06	-0.02	0.22	Yes
STAT6	0.27	0.13	1.00	0.34	0.91	0.99	No	0.14	0.12	-0.10	0.37	Yes	0.19	0.12	-0.05	0.42	Yes
IKBKE	0.48	0.13	1.00	0.34	0.50	0.98	No	0.07	0.10	-0.13	0.27	Yes	0.16	0.10	-0.04	0.36	Yes
IFNAR2	0.97	0.13	1.00	0.35	0.43	0.98	No	0.00	0.05	-0.10	0.11	Yes	0.08	0.05	-0.02	0.19	Yes
CTNNB1	0.22	0.13	1.00	0.35	0.81	0.98	No	-0.10	0.08	-0.26	0.06	Yes	-0.12	0.08	-0.28	0.04	Yes
LITAF	0.59	0.14	1.00	0.35	0.76	0.98	No	0.04	0.07	-0.10	0.19	Yes	0.11	0.07	-0.03	0.26	Yes
RELA	0.21	0.14	1.00	0.35	0.48	0.98	No	-0.08	0.07	-0.21	0.04	Yes	-0.10	0.07	-0.23	0.03	Yes
CEACAM6	0.80	0.15	1.00	0.38	0.79	0.98	No	0.03	0.11	-0.19	0.24	Yes	-0.16	0.11	-0.38	0.06	Yes
IGF2R	0.63	0.16	1.00	0.39	0.29	0.98	No	-0.03	0.07	-0.16	0.10	Yes	0.09	0.07	-0.03	0.22	Yes
ITGAL	0.26	0.16	1.00	0.39	0.43	0.98	No	0.14	0.12	-0.10	0.38	Yes	0.17	0.12	-0.07	0.41	Yes
IKZF2	0.33	0.17	1.00	0.40	0.65	0.98	No	-0.07	0.07	-0.20	0.06	Yes	-0.09	0.07	-0.22	0.04	Yes
STAT2	0.85	0.17	1.00	0.40	0.58	0.98	No	0.02	0.10	-0.17	0.21	Yes	0.13	0.10	-0.06	0.32	Yes
TNFSF10	0.89	0.18	1.00	0.40	0.27	0.98	No	0.02	0.11	-0.20	0.24	Yes	0.15	0.11	-0.07	0.38	Yes
ITGB1	0.05	0.18	1.00	0.40	0.67	0.98	No	-0.11	0.06	-0.22	0.00	No	-0.08	0.06	-0.19	0.04	Yes
CD99	0.13	0.18	1.00	0.40	0.50	0.98	No	0.13	0.09	-0.03	0.30	Yes	0.12	0.09	-0.05	0.28	Yes
IFI16	0.85	0.18	1.00	0.40	0.93	0.99	No	0.02	0.08	-0.14	0.17	Yes	-0.11	0.08	-0.26	0.05	Yes
CSF2RB	0.56	0.18	1.00	0.40	0.68	0.98	No	0.12	0.20	-0.27	0.52	Yes	0.27	0.20	-0.12	0.66	Yes
CRADD	0.47	0.19	1.00	0.40	0.47	0.98	No	0.08	0.11	-0.13	0.29	Yes	0.14	0.11	-0.07	0.35	Yes
PSMD7	0.08	0.19	1.00	0.40	0.30	0.98	No	0.10	0.06	-0.01	0.21	Yes	0.07	0.06	-0.03	0.18	Yes
TOLLIP	0.74	0.19	1.00	0.40	0.15	0.98	No	0.02	0.06	-0.10	0.14	Yes	0.08	0.06	-0.04	0.20	Yes
IRF7	0.41	0.20	1.00	0.40	0.90	0.99	No	0.11	0.13	-0.15	0.38	Yes	0.18	0.13	-0.09	0.44	Yes
FYN	0.80	0.20	1.00	0.40	0.61	0.98	No	0.02	0.10	-0.17	0.22	Yes	0.13	0.10	-0.07	0.32	Yes

ZAP70	0.99	0.20	1.00	0.40	0.79	0.98	No	0.00	0.10	-0.20	0.20	Yes	0.13	0.10	-0.07	0.33	Yes
LTF	0.19	0.20	1.00	0.40	0.85	0.99	No	-0.33	0.25	-0.81	0.16	Yes	0.32	0.25	-0.16	0.80	Yes
CD9	0.74	0.20	1.00	0.40	0.68	0.98	No	-0.03	0.08	-0.19	0.14	Yes	-0.11	0.08	-0.27	0.06	Yes
IRF1	0.82	0.20	1.00	0.40	0.70	0.98	No	0.02	0.10	-0.17	0.22	Yes	-0.13	0.10	-0.32	0.07	Yes
ILF3	0.48	0.20	1.00	0.40	0.66	0.98	No	-0.05	0.06	-0.17	0.08	Yes	-0.08	0.06	-0.21	0.04	Yes
MARCO	0.83	0.21	1.00	0.40	0.98	0.99	No	0.09	0.40	-0.70	0.88	Yes	0.52	0.40	-0.30	1.30	Yes
TGFBR2	0.97	0.21	1.00	0.40	0.82	0.98	No	0.00	0.08	-0.17	0.16	Yes	0.11	0.08	-0.06	0.27	Yes
CD164	0.33	0.21	1.00	0.40	0.50	0.98	No	-0.10	0.10	-0.30	0.10	Yes	-0.13	0.10	-0.33	0.07	Yes
NFATC1	0.94	0.21	1.00	0.40	0.78	0.98	No	0.01	0.09	-0.18	0.19	Yes	0.12	0.09	-0.07	0.30	Yes
NFKB2	0.83	0.22	1.00	0.40	0.89	0.99	No	-0.02	0.09	-0.20	0.15	Yes	-0.11	0.09	-0.29	0.06	Yes
TNFRSF11A	0.90	0.22	1.00	0.40	0.17	0.98	No	0.01	0.09	-0.16	0.18	Yes	0.11	0.09	-0.06	0.27	Yes
LAIR1	0.97	0.22	1.00	0.40	0.60	0.98	No	0.01	0.20	-0.39	0.40	Yes	0.25	0.20	-0.15	0.64	Yes
IL16	0.99	0.22	1.00	0.40	0.96	0.99	No	0.00	0.14	-0.27	0.26	Yes	0.17	0.14	-0.10	0.43	Yes
CD81	0.27	0.23	1.00	0.40	0.68	0.98	No	-0.19	0.17	-0.53	0.15	Yes	-0.21	0.17	-0.55	0.13	Yes
TRAF5	0.18	0.23	1.00	0.40	0.33	0.98	No	-0.10	0.07	-0.25	0.04	Yes	0.09	0.08	-0.05	0.24	Yes
ITGA6	0.74	0.23	1.00	0.40	0.67	0.98	No	-0.04	0.13	-0.29	0.21	Yes	-0.16	0.13	-0.41	0.10	Yes
CD59	0.11	0.23	1.00	0.40	0.96	0.99	No	0.15	0.09	-0.03	0.34	Yes	0.11	0.09	-0.07	0.30	Yes
IL1R1	0.71	0.23	1.00	0.40	0.71	0.98	No	-0.04	0.10	-0.23	0.16	Yes	0.12	0.10	-0.07	0.31	Yes
IL32	0.68	0.23	1.00	0.40	0.40	0.98	No	0.04	0.11	-0.17	0.25	Yes	0.13	0.11	-0.08	0.33	Yes
RUNX1	0.58	0.24	1.00	0.41	0.74	0.98	No	0.05	0.10	-0.13	0.24	Yes	0.12	0.10	-0.07	0.30	Yes
FN1	0.24	0.24	1.00	0.41	0.79	0.98	No	-0.36	0.30	-0.95	0.23	Yes	0.36	0.30	-0.23	0.95	Yes
MAPK14	0.25	0.24	1.00	0.41	0.57	0.98	No	0.09	0.08	-0.06	0.24	Yes	0.09	0.08	-0.06	0.24	Yes
CEBPB	0.14	0.25	1.00	0.42	0.11	0.98	No	-0.15	0.10	-0.35	0.04	Yes	-0.12	0.10	-0.31	0.08	Yes
SRC	0.23	0.25	1.00	0.42	0.33	0.98	No	0.08	0.06	-0.05	0.20	Yes	0.07	0.06	-0.05	0.19	Yes
CFD	0.26	0.26	1.00	0.42	0.51	0.98	No	0.11	0.10	-0.08	0.31	Yes	0.12	0.10	-0.08	0.31	Yes
BCL6	0.90	0.26	1.00	0.42	0.78	0.98	No	0.01	0.11	-0.21	0.23	Yes	0.13	0.11	-0.09	0.35	Yes
LILRA3	0.72	0.26	1.00	0.43	0.78	0.98	No	-0.07	0.18	-0.42	0.29	Yes	0.21	0.18	-0.15	0.56	Yes
CD8A	0.25	0.27	1.00	0.43	0.48	0.98	No	0.14	0.12	-0.10	0.37	Yes	0.13	0.12	-0.10	0.36	Yes
CFH	0.32	0.27	1.00	0.44	0.70	0.98	No	-0.11	0.11	-0.32	0.10	Yes	-0.12	0.11	-0.33	0.09	Yes
IL12A	0.96	0.28	1.00	0.44	0.32	0.98	No	0.00	0.07	-0.13	0.14	Yes	-0.08	0.07	-0.21	0.06	Yes
CXCR4	0.99	0.28	1.00	0.44	0.47	0.98	No	0.00	0.20	-0.40	0.39	Yes	-0.22	0.20	-0.61	0.18	Yes
IFI35	0.44	0.29	1.00	0.45	0.62	0.98	No	0.11	0.15	-0.17	0.40	Yes	0.16	0.15	-0.13	0.44	Yes
BCL2	0.42	0.29	1.00	0.45	0.94	0.99	No	0.08	0.10	-0.11	0.27	Yes	0.10	0.10	-0.09	0.29	Yes
SKI	0.94	0.30	1.00	0.45	0.04	0.98	No	0.01	0.09	-0.16	0.18	Yes	0.09	0.09	-0.08	0.26	Yes

IL6R	0.86	0.30	1.00	0.45	0.35	0.98	No	-0.01	0.08	-0.17	0.14	Yes	0.08	0.08	-0.08	0.24	Yes
IFIH1	1.00	0.31	1.00	0.45	0.92	0.99	No	0.00	0.13	-0.25	0.25	Yes	0.13	0.13	-0.12	0.39	Yes
CYBB	0.78	0.31	1.00	0.45	0.95	0.99	No	-0.08	0.27	-0.61	0.45	Yes	0.28	0.27	-0.25	0.81	Yes
FCGR2B	0.07	0.31	1.00	0.45	0.84	0.99	No	-0.25	0.13	-0.51	0.01	Yes	0.14	0.13	-0.12	0.40	Yes
CFI	0.39	0.31	1.00	0.45	0.13	0.98	No	0.08	0.09	-0.10	0.25	Yes	0.09	0.09	-0.08	0.27	Yes
KLRB1	0.39	0.31	1.00	0.45	0.79	0.98	No	-0.09	0.11	-0.30	0.11	Yes	-0.11	0.11	-0.32	0.10	Yes
STAT5B	0.09	0.32	1.00	0.45	0.18	0.98	No	-0.19	0.11	-0.41	0.02	Yes	-0.11	0.11	-0.33	0.11	Yes
HFE	0.23	0.32	1.00	0.45	0.28	0.98	No	0.08	0.06	-0.05	0.21	Yes	0.07	0.06	-0.06	0.19	Yes
TRAF3	0.79	0.32	1.00	0.45	0.78	0.98	No	0.03	0.10	-0.17	0.22	Yes	0.10	0.10	-0.10	0.29	Yes
RARRES3	0.98	0.32	1.00	0.45	0.85	0.99	No	0.00	0.09	-0.17	0.17	Yes	-0.09	0.09	-0.25	0.08	Yes
MAP4K2	0.44	0.32	1.00	0.46	0.45	0.98	No	0.07	0.10	-0.11	0.26	Yes	0.09	0.10	-0.09	0.28	Yes
CD58	0.02	0.33	1.00	0.46	0.46	0.98	No	-0.14	0.06	-0.25	-0.03	No	-0.06	0.06	-0.16	0.06	Yes
ITLN1	0.65	0.33	1.00	0.46	0.47	0.98	No	-0.11	0.24	-0.58	0.37	Yes	0.24	0.24	-0.23	0.71	Yes
C1QBP	0.95	0.33	1.00	0.46	0.86	0.99	No	0.00	0.07	-0.14	0.13	Yes	-0.07	0.07	-0.21	0.07	Yes
JAK2	0.23	0.34	1.00	0.46	0.60	0.98	No	-0.07	0.06	-0.19	0.04	Yes	0.06	0.06	-0.06	0.18	Yes
IFITM1	0.75	0.34	1.00	0.46	0.50	0.98	No	-0.09	0.29	-0.66	0.47	Yes	-0.28	0.29	-0.83	0.29	Yes
C3	0.03	0.34	1.00	0.46	0.49	0.98	No	-0.35	0.16	-0.65	-0.04	No	-0.15	0.16	-0.46	0.16	Yes
CD14	0.80	0.36	1.00	0.48	0.83	0.99	No	-0.04	0.17	-0.37	0.29	Yes	0.16	0.17	-0.17	0.48	Yes
MSR1	0.85	0.37	1.00	0.49	0.91	0.99	No	-0.07	0.36	-0.78	0.64	Yes	0.33	0.36	-0.39	1.03	Yes
HLA-DMB	0.39	0.37	1.00	0.49	0.88	0.99	No	-0.14	0.16	-0.45	0.17	Yes	-0.14	0.16	-0.45	0.17	Yes
MAP4K4	0.38	0.38	1.00	0.49	0.46	0.98	No	0.09	0.10	-0.11	0.28	Yes	0.09	0.10	-0.11	0.28	Yes
NOS2	0.34	0.38	1.00	0.49	0.26	0.98	No	0.21	0.22	-0.21	0.64	Yes	0.19	0.22	-0.23	0.62	Yes
TAGAP	0.47	0.38	1.00	0.49	0.71	0.98	No	-0.15	0.20	-0.53	0.24	Yes	-0.17	0.20	-0.56	0.21	Yes
CD44	0.40	0.39	1.00	0.49	0.75	0.98	No	0.10	0.11	-0.13	0.32	Yes	0.10	0.11	-0.12	0.32	Yes
PSMB8	0.78	0.39	1.00	0.49	0.80	0.98	No	0.02	0.08	-0.13	0.18	Yes	-0.07	0.08	-0.22	0.09	Yes
FCGR2C	0.33	0.39	1.00	0.49	0.67	0.98	No	-0.26	0.26	-0.78	0.25	Yes	-0.23	0.26	-0.74	0.29	Yes
BTK	0.76	0.40	1.00	0.50	0.62	0.98	No	-0.04	0.12	-0.28	0.21	Yes	0.11	0.12	-0.14	0.35	Yes
CTSC	0.44	0.40	1.00	0.50	0.15	0.98	No	-0.09	0.12	-0.32	0.14	Yes	0.10	0.12	-0.13	0.33	Yes
IL6ST	0.03	0.41	1.00	0.50	0.26	0.98	No	-0.19	0.08	-0.35	-0.02	No	-0.07	0.08	-0.24	0.10	Yes
FCGRT	0.68	0.41	1.00	0.50	0.13	0.98	No	-0.03	0.07	-0.16	0.10	Yes	0.06	0.07	-0.08	0.19	Yes
MAPK1	0.22	0.41	1.00	0.50	0.30	0.98	No	-0.10	0.08	-0.25	0.06	Yes	-0.06	0.08	-0.22	0.09	Yes
CD96	0.31	0.42	1.00	0.51	0.57	0.98	No	0.10	0.10	-0.09	0.30	Yes	0.08	0.10	-0.11	0.27	Yes
CASP3	0.20	0.42	1.00	0.51	0.53	0.98	No	0.13	0.10	-0.06	0.32	Yes	0.08	0.10	-0.11	0.27	Yes
SLAMF7	0.01	0.43	1.00	0.51	0.20	0.98	No	-0.32	0.12	-0.56	-0.09	No	0.10	0.12	-0.14	0.33	Yes

ATG16L1	0.73	0.43	1.00	0.51	0.55	0.98	No	0.03	0.07	-0.12	0.17	Yes	0.06	0.07	-0.09	0.20	Yes
TLR2	0.31	0.43	1.00	0.51	0.39	0.98	No	-0.09	0.09	-0.25	0.08	Yes	0.07	0.09	-0.10	0.24	Yes
NFKBIA	0.74	0.44	1.00	0.51	0.14	0.98	No	-0.02	0.07	-0.15	0.11	Yes	-0.05	0.07	-0.18	0.08	Yes
BST1	0.86	0.44	1.00	0.51	0.32	0.98	No	-0.02	0.10	-0.22	0.19	Yes	0.08	0.10	-0.12	0.29	Yes
PRKCD	0.42	0.44	1.00	0.51	0.51	0.98	No	0.07	0.09	-0.10	0.24	Yes	0.07	0.09	-0.10	0.24	Yes
TNFRSF1B	0.57	0.44	1.00	0.51	0.29	0.98	No	0.08	0.15	-0.20	0.37	Yes	0.11	0.15	-0.17	0.40	Yes
HLA-DPA1	0.87	0.45	1.00	0.52	0.41	0.98	No	0.03	0.16	-0.29	0.35	Yes	-0.13	0.16	-0.44	0.20	Yes
HLA-DRA	0.68	0.46	1.00	0.52	0.99	0.99	No	-0.06	0.15	-0.35	0.23	Yes	-0.11	0.15	-0.40	0.18	Yes
TLR4	0.39	0.46	1.00	0.52	0.70	0.98	No	-0.11	0.13	-0.36	0.14	Yes	0.10	0.13	-0.15	0.35	Yes
CD97	0.42	0.46	1.00	0.52	0.57	0.98	No	-0.05	0.07	-0.18	0.07	Yes	-0.05	0.07	-0.18	0.08	Yes
ARHGDIB	0.18	0.48	1.00	0.54	0.60	0.98	No	-0.15	0.11	-0.38	0.07	Yes	-0.08	0.11	-0.30	0.14	Yes
IRAK1	0.77	0.48	1.00	0.54	0.12	0.98	No	-0.01	0.05	-0.11	0.08	Yes	-0.03	0.05	-0.12	0.06	Yes
IL18	0.70	0.49	1.00	0.54	0.56	0.98	No	0.03	0.08	-0.12	0.18	Yes	-0.05	0.08	-0.20	0.10	Yes
CFB	0.57	0.50	1.00	0.55	0.10	0.98	No	-0.07	0.12	-0.30	0.16	Yes	-0.08	0.12	-0.31	0.15	Yes
TMEM173	0.39	0.51	1.00	0.55	0.21	0.98	No	0.05	0.06	-0.07	0.17	Yes	0.04	0.06	-0.08	0.16	Yes
MAPKAPK2	0.96	0.51	1.00	0.55	0.42	0.98	No	0.00	0.05	-0.10	0.11	Yes	0.04	0.05	-0.07	0.14	Yes
MUC1	0.80	0.51	1.00	0.55	0.18	0.98	No	0.02	0.09	-0.15	0.20	Yes	0.06	0.09	-0.11	0.23	Yes
ITGB2	0.74	0.51	1.00	0.55	0.48	0.98	No	-0.07	0.20	-0.46	0.32	Yes	0.13	0.20	-0.26	0.52	Yes
CCL18	0.41	0.52	1.00	0.56	0.96	0.99	No	-0.26	0.31	-0.86	0.35	Yes	0.20	0.31	-0.40	0.80	Yes
CD48	0.25	0.54	1.00	0.57	0.77	0.98	No	-0.19	0.16	-0.50	0.13	Yes	-0.10	0.16	-0.41	0.21	Yes
TAPBP	0.90	0.54	1.00	0.57	0.19	0.98	No	0.01	0.06	-0.11	0.13	Yes	0.04	0.06	-0.08	0.16	Yes
PIGR	0.31	0.55	1.00	0.57	0.24	0.98	No	-0.11	0.10	-0.31	0.10	Yes	0.06	0.10	-0.14	0.27	Yes
TRAF6	0.53	0.55	1.00	0.57	0.40	0.98	No	-0.04	0.07	-0.18	0.09	Yes	0.04	0.07	-0.09	0.18	Yes
IL7R	0.20	0.56	1.00	0.57	0.75	0.98	No	-0.26	0.20	-0.65	0.13	Yes	0.12	0.20	-0.27	0.51	Yes
UBE2L3	0.57	0.56	1.00	0.57	0.97	0.99	No	0.03	0.06	-0.08	0.14	Yes	0.03	0.06	-0.08	0.15	Yes
PTAFR	0.20	0.56	1.00	0.57	0.80	0.98	No	0.15	0.11	-0.07	0.37	Yes	0.07	0.11	-0.15	0.28	Yes
CUL9	0.42	0.56	1.00	0.57	0.64	0.98	No	-0.07	0.08	-0.23	0.10	Yes	-0.05	0.08	-0.22	0.12	Yes
CLEC4A	0.87	0.57	1.00	0.57	0.96	0.99	No	0.02	0.13	-0.23	0.27	Yes	0.08	0.13	-0.18	0.33	Yes
CD86	0.33	0.57	1.00	0.57	0.67	0.98	No	-0.16	0.16	-0.47	0.15	Yes	0.09	0.16	-0.22	0.41	Yes
C1QB	0.65	0.57	1.00	0.57	0.67	0.98	No	-0.13	0.29	-0.69	0.43	Yes	0.16	0.29	-0.40	0.72	Yes
CD36	0.73	0.59	1.00	0.59	0.08	0.98	No	-0.05	0.15	-0.35	0.25	Yes	-0.08	0.15	-0.38	0.22	Yes
TYK2	0.76	0.59	1.00	0.59	0.91	0.99	No	-0.02	0.07	-0.16	0.11	Yes	0.04	0.07	-0.10	0.17	Yes
CD3E	0.98	0.60	1.00	0.59	0.68	0.98	No	0.00	0.13	-0.25	0.25	Yes	0.07	0.13	-0.18	0.32	Yes
FCGR3A	0.43	0.61	1.00	0.60	0.72	0.98	No	-0.26	0.32	-0.90	0.37	Yes	-0.17	0.33	-0.80	0.47	Yes

PTPN6	0.54	0.61	1.00	0.60	0.25	0.98	No	-0.05	0.08	-0.20	0.10	Yes	-0.04	0.08	-0.19	0.11	Yes
CCL4	0.32	0.62	1.00	0.60	0.47	0.98	No	0.22	0.22	-0.21	0.65	Yes	-0.11	0.22	-0.54	0.32	Yes
CSF3R	0.82	0.63	1.00	0.60	0.74	0.98	No	-0.06	0.27	-0.60	0.47	Yes	-0.13	0.27	-0.67	0.40	Yes
FCER1G	0.88	0.63	1.00	0.60	0.91	0.99	No	-0.04	0.25	-0.53	0.45	Yes	0.12	0.25	-0.37	0.61	Yes
ETS1	0.82	0.63	1.00	0.60	0.75	0.98	No	-0.03	0.11	-0.24	0.19	Yes	0.05	0.11	-0.16	0.27	Yes
CX3CL1	0.16	0.63	1.00	0.60	0.30	0.98	No	-0.21	0.15	-0.50	0.08	Yes	-0.07	0.15	-0.36	0.22	Yes
PLAUR	0.94	0.63	1.00	0.60	0.93	0.99	No	0.02	0.23	-0.42	0.46	Yes	-0.11	0.23	-0.55	0.33	Yes
NCF4	0.81	0.64	1.00	0.60	0.94	0.99	No	-0.04	0.17	-0.37	0.29	Yes	0.08	0.17	-0.25	0.41	Yes
TFRC	0.47	0.64	1.00	0.60	0.66	0.98	No	-0.11	0.15	-0.40	0.18	Yes	-0.07	0.15	-0.36	0.22	Yes
PSMB9	0.23	0.64	1.00	0.60	0.76	0.98	No	0.14	0.11	-0.08	0.36	Yes	0.05	0.11	-0.17	0.27	Yes
NOD2	0.40	0.64	1.00	0.60	0.30	0.98	No	0.05	0.06	-0.07	0.18	Yes	-0.03	0.06	-0.15	0.09	Yes
FCGR2A	0.25	0.64	1.00	0.60	1.00	1.00	No	-0.26	0.22	-0.69	0.17	Yes	-0.10	0.22	-0.53	0.33	Yes
IL1RN	0.57	0.65	1.00	0.60	0.74	0.98	No	0.17	0.29	-0.41	0.74	Yes	-0.13	0.29	-0.71	0.44	Yes
BCL3	0.76	0.66	1.00	0.61	0.11	0.98	No	0.04	0.13	-0.22	0.30	Yes	-0.06	0.13	-0.32	0.20	Yes
APP	0.24	0.67	1.00	0.61	0.60	0.98	No	-0.11	0.09	-0.28	0.07	Yes	-0.04	0.09	-0.21	0.14	Yes
IL2RG	0.49	0.68	1.00	0.61	0.31	0.98	No	-0.11	0.16	-0.43	0.20	Yes	-0.07	0.16	-0.39	0.25	Yes
SERPING1	0.83	0.68	1.00	0.61	0.31	0.98	No	-0.04	0.20	-0.42	0.34	Yes	0.08	0.20	-0.30	0.46	Yes
CSF1	0.71	0.69	1.00	0.62	0.42	0.98	No	0.04	0.10	-0.16	0.23	Yes	0.04	0.10	-0.16	0.24	Yes
CCL3	0.75	0.70	1.00	0.62	0.25	0.98	No	0.07	0.21	-0.34	0.47	Yes	-0.08	0.21	-0.49	0.32	Yes
CD55	0.04	0.70	1.00	0.62	0.59	0.98	No	-0.15	0.07	-0.28	-0.01	No	-0.03	0.07	-0.16	0.11	Yes
GPI	0.74	0.70	1.00	0.62	0.62	0.98	No	0.02	0.06	-0.09	0.13	Yes	0.02	0.06	-0.09	0.13	Yes
TRAF2	0.77	0.70	1.00	0.62	0.86	0.99	No	-0.02	0.05	-0.12	0.09	Yes	0.02	0.05	-0.08	0.12	Yes
CD24	0.05	0.71	1.00	0.62	0.51	0.98	No	0.24	0.12	0.01	0.47	No	0.05	0.12	-0.19	0.28	Yes
LY96	0.67	0.72	1.00	0.63	0.59	0.98	No	-0.07	0.16	-0.39	0.25	Yes	0.06	0.16	-0.26	0.38	Yes
B2M	0.23	0.73	1.00	0.63	0.14	0.98	No	0.09	0.07	-0.05	0.24	Yes	0.03	0.07	-0.12	0.17	Yes
IL4R	0.11	0.74	1.00	0.64	0.42	0.98	No	-0.14	0.08	-0.30	0.03	Yes	0.03	0.08	-0.14	0.19	Yes
BLNK	0.54	0.75	1.00	0.65	0.77	0.98	No	0.03	0.05	-0.07	0.14	Yes	0.02	0.05	-0.09	0.12	Yes
RORC	0.54	0.76	1.00	0.65	0.21	0.98	No	-0.07	0.11	-0.29	0.15	Yes	-0.03	0.11	-0.25	0.18	Yes
MYD88	0.30	0.76	1.00	0.65	0.93	0.99	No	-0.08	0.08	-0.24	0.07	Yes	-0.02	0.08	-0.18	0.13	Yes
BST2	0.34	0.77	1.00	0.65	0.50	0.98	No	0.18	0.19	-0.19	0.54	Yes	0.06	0.19	-0.31	0.42	Yes
PRF1	0.68	0.77	1.00	0.65	0.61	0.98	No	-0.08	0.19	-0.45	0.29	Yes	-0.06	0.19	-0.43	0.31	Yes
CASP1	0.89	0.77	1.00	0.65	0.78	0.98	No	0.01	0.09	-0.17	0.19	Yes	0.03	0.09	-0.15	0.21	Yes
TLR5	0.65	0.78	1.00	0.66	0.34	0.98	No	-0.05	0.10	-0.24	0.15	Yes	-0.03	0.10	-0.22	0.17	Yes
PTPN22	0.70	0.80	1.00	0.67	0.36	0.98	No	-0.04	0.10	-0.24	0.16	Yes	0.03	0.10	-0.17	0.23	Yes

JAK1	0.19	0.82	1.00	0.67	0.85	0.99	No	-0.07	0.05	-0.17	0.03	Yes	-0.01	0.05	-0.11	0.09	Yes
IRAK3	0.71	0.82	1.00	0.67	0.01	0.98	No	0.03	0.09	-0.15	0.22	Yes	0.02	0.09	-0.16	0.21	Yes
MX1	0.96	0.83	1.00	0.67	0.97	0.99	No	0.01	0.22	-0.41	0.43	Yes	0.05	0.22	-0.38	0.47	Yes
KIT	0.55	0.83	1.00	0.67	0.06	0.98	No	0.07	0.12	-0.16	0.30	Yes	-0.03	0.12	-0.26	0.21	Yes
STAT4	0.84	0.83	1.00	0.67	0.07	0.98	No	0.02	0.08	-0.14	0.18	Yes	0.02	0.08	-0.14	0.18	Yes
JAK3	0.97	0.83	1.00	0.67	0.81	0.98	No	0.00	0.11	-0.23	0.22	Yes	-0.02	0.11	-0.25	0.20	Yes
TAP1	0.48	0.83	1.00	0.67	0.92	0.99	No	0.09	0.13	-0.17	0.36	Yes	0.03	0.13	-0.23	0.29	Yes
IL18R1	0.84	0.84	1.00	0.67	0.02	0.98	No	0.02	0.11	-0.19	0.24	Yes	0.02	0.11	-0.19	0.24	Yes
GZMA	0.98	0.84	1.00	0.67	0.65	0.98	No	0.01	0.19	-0.36	0.37	Yes	0.04	0.19	-0.33	0.40	Yes
IFNAR1	0.48	0.85	1.00	0.67	0.57	0.98	No	-0.06	0.08	-0.21	0.10	Yes	0.02	0.08	-0.14	0.17	Yes
ICAM1	0.74	0.85	1.00	0.67	0.72	0.98	No	0.04	0.13	-0.21	0.30	Yes	-0.03	0.13	-0.28	0.23	Yes
IFIT2	0.62	0.85	1.00	0.67	0.43	0.98	No	-0.13	0.25	-0.62	0.36	Yes	-0.05	0.25	-0.54	0.44	Yes
LCP2	0.85	0.85	1.00	0.67	0.70	0.98	No	-0.04	0.18	-0.39	0.32	Yes	-0.03	0.18	-0.39	0.32	Yes
ICAM3	0.78	0.86	1.00	0.68	0.65	0.98	No	-0.04	0.14	-0.30	0.23	Yes	-0.02	0.14	-0.29	0.24	Yes
PML	0.25	0.87	1.00	0.68	0.13	0.98	No	0.09	0.08	-0.06	0.24	Yes	0.01	0.08	-0.14	0.16	Yes
CCL15	0.96	0.87	1.00	0.68	0.91	0.99	No	0.00	0.08	-0.16	0.15	Yes	0.01	0.08	-0.14	0.17	Yes
STAT1	0.92	0.88	1.00	0.68	0.69	0.98	No	0.01	0.15	-0.28	0.31	Yes	0.02	0.15	-0.27	0.31	Yes
PSMB10	0.88	0.88	1.00	0.68	0.13	0.98	No	0.01	0.06	-0.11	0.13	Yes	0.01	0.06	-0.11	0.13	Yes
ABL1	0.90	0.88	1.00	0.68	0.15	0.98	No	0.01	0.07	-0.12	0.14	Yes	-0.01	0.07	-0.14	0.12	Yes
C6	0.85	0.90	1.00	0.69	0.19	0.98	No	0.04	0.21	-0.37	0.45	Yes	0.03	0.21	-0.38	0.43	Yes
CD83	0.79	0.90	1.00	0.69	0.26	0.98	No	-0.05	0.19	-0.42	0.31	Yes	0.02	0.19	-0.34	0.39	Yes
NOTCH2	0.33	0.91	1.00	0.69	0.35	0.98	No	-0.08	0.08	-0.23	0.08	Yes	-0.01	0.08	-0.16	0.14	Yes
IL13RA1	0.45	0.92	1.00	0.69	0.59	0.98	No	-0.04	0.05	-0.15	0.06	Yes	0.01	0.05	-0.10	0.11	Yes
NOTCH1	0.75	0.93	1.00	0.69	0.24	0.98	No	0.03	0.11	-0.18	0.24	Yes	0.01	0.11	-0.20	0.22	Yes
CHUK	0.50	0.93	1.00	0.69	0.08	0.98	No	-0.04	0.05	-0.14	0.07	Yes	0.00	0.05	-0.10	0.11	Yes
TLR1	0.54	0.93	1.00	0.69	0.87	0.99	No	-0.05	0.09	-0.22	0.12	Yes	-0.01	0.09	-0.18	0.16	Yes
ITGAX	0.82	0.93	1.00	0.69	0.85	0.99	No	-0.05	0.21	-0.46	0.36	Yes	-0.02	0.21	-0.43	0.39	Yes
HLA-DPB1	0.97	0.93	1.00	0.69	0.50	0.98	No	0.00	0.12	-0.24	0.23	Yes	-0.01	0.12	-0.25	0.23	Yes
IKZF3	0.59	0.94	1.00	0.69	0.17	0.98	No	0.05	0.08	-0.12	0.21	Yes	0.01	0.08	-0.16	0.17	Yes
C1R	0.81	0.95	1.00	0.69	0.56	0.98	No	-0.03	0.13	-0.29	0.23	Yes	-0.01	0.13	-0.27	0.25	Yes
IL10RA	0.66	0.95	1.00	0.69	0.35	0.98	No	0.06	0.13	-0.19	0.31	Yes	-0.01	0.13	-0.26	0.25	Yes
SYK	0.51	0.95	1.00	0.69	0.36	0.98	No	-0.06	0.08	-0.22	0.11	Yes	-0.01	0.08	-0.17	0.16	Yes
TCF7	0.75	0.95	1.00	0.69	0.52	0.98	No	-0.04	0.12	-0.28	0.20	Yes	0.01	0.12	-0.23	0.25	Yes
CCL5	0.36	0.95	1.00	0.69	0.64	0.98	No	0.16	0.17	-0.18	0.49	Yes	0.01	0.17	-0.33	0.34	Yes

SMAD3	0.89	0.97	1.00	0.70	0.35	0.98	No	-0.01	0.09	-0.18	0.16	Yes	0.00	0.09	-0.16	0.17	Yes
CD40	0.96	0.97	1.00	0.70	0.63	0.98	No	0.00	0.05	-0.11	0.10	Yes	0.00	0.05	-0.11	0.10	Yes
CD3D	0.63	0.98	1.00	0.70	0.62	0.98	No	-0.07	0.14	-0.35	0.21	Yes	0.00	0.14	-0.28	0.29	Yes
PTPRC	0.43	0.99	1.00	0.71	0.44	0.98	No	-0.14	0.18	-0.49	0.20	Yes	0.00	0.18	-0.34	0.35	Yes
PTK2	0.23	0.99	1.00	0.71	0.98	0.99	No	-0.07	0.06	-0.18	0.04	Yes	0.00	0.06	-0.11	0.11	Yes
IL1RAP	0.94	1.00	1.00	0.71	0.88	0.99	No	0.01	0.08	-0.15	0.16	Yes	0.00	0.08	-0.15	0.15	Yes