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5-Fluorouracil loaded nanogels attenuate hepatotoxicity by modulating PI3K/AKT, NF- κ B, and METTL14 pathways

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ABSTRACT

Objective: To evaluate the effect of a gamma-irradiation-synthesized sodium alginate/acrylamide (SA/AAm) nanogel drug delivery formulation on 5-fluorouracil (5-FU)-induced hepatotoxicity.

Methods: Network pharmacology analysis was used to identify overlapping 5-FU targets from the GeneCards and Comparative Toxicogenomics Database, followed by GO and KEGG enrichment analyses. For *in vivo* validation, male Wistar rats were divided into three groups ($n = 6/\text{group}$) and treated for one month with saline (control), free 5-FU (12.5 mg/kg b.wt, *i.p.*, three times/week), or poly(AAm/SA) nanogel-encapsulated 5-FU (12.5 mg/kg b.wt, *i.p.*, three times/week). Serum liver enzymes, inflammatory markers, pro-survival signaling cascades, metabolic enzymes, and epigenetic targets were subsequently quantified.

Results: Network pharmacology analysis identified 539 overlapping 5-FU-related targets from the GeneCards and Comparative Toxicogenomics Database, with enrichment predominantly in liver tissue and pathways associated with inflammation, apoptosis, and pro-survival signaling, including NF- κ B and PI3K/AKT. *In vivo* experiments demonstrated that 5-FU loaded nanogels effectively attenuated conventional 5-FU-induced hepatotoxicity. The nanogel formulation minimized liver injury by normalizing serum aspartate aminotransferase and alanine aminotransferase activities. Mechanistically, it suppressed hepatic inflammation, fibrogenic signaling, cellular proliferation, and metabolic reprogramming by downregulating NF- κ B, COX-2, TGF- β 1, PI3K, AKT, ERK1/2, Ki-67, and PKM2. Additionally, the nanogels restored hepatic METTL14 expression, mitigating 5-FU-induced disruptions in m⁶A RNA methylation.

Conclusions: The nanogel formulation mitigates 5-FU-induced hepatotoxicity by modulating inflammatory, pro-survival, and metabolic stress pathways, highlighting its potential to improve

the hepatic safety profile of 5-FU. However, additional studies investigating histopathology, pharmacokinetics, long-term safety, and antitumor efficacy in tumor-bearing models are required before clinical translation can be considered.

KEYWORDS: 5-Fluorouracil; Nanogel drug delivery; Hepatotoxicity; NF- κ B signaling; PI3K/AKT/mTOR pathway; Network pharmacology

Summary

Question: Can a sodium alginate/acrylamide nanogel drug delivery system mitigate 5-fluorouracil-induced hepatotoxicity by modulating specific inflammatory and pro-survival pathways?

Findings: 5-Fluorouracil loaded nanogels significantly suppressed chemotherapy-induced liver toxic alterations, restored METTL14 expression levels, and effectively decreased serum liver enzymes toward normal baseline values, thereby preventing severe hepatic inflammation, metabolic stress, and cellular injury.

Meaning: Sodium alginate/acrylamide nanogel encapsulation effectively attenuates 5-fluorouracil chemotherapy-induced hepatotoxicity, highlighting its potential as a safer therapeutic formulation.

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1. Introduction

Chemotherapy is a vital cancer treatment that has been widely used in clinical practice. However, traditional chemotherapeutic agents often distribute rapidly into healthy tissues and organs and have short blood half-lives, leading to significant side effects[1]. Moreover, as a chemotherapeutic agent, 5-fluorouracil (5-FU) exerts systemic effects, meaning that its toxicity can also damage healthy tissue cells[2]. This systemic action of 5-FU is associated with numerous side effects, which can lead to treatment discontinuation and ultimately reduce its overall effectiveness[3]. The majority of published data indicate that the adverse effects of 5-FU are most commonly observed in organs with high proliferative cell activity, such as the intestines and bone marrow[4,5]. Nevertheless, the liver, kidneys, and lungs, which are essential organs with a low-proliferation capability, are frequently exposed to 5-FU metabolites and can undoubtedly be adversely affected. Veno-occlusive disease, hepatitis, steatosis, steatohepatitis, nephropathy, and chest pain are among the reported side effects of 5-FU treatment[6]. Therefore, it is imperative to explore and develop new, effective strategies to improve cancer chemotherapy. With the advancement of nanomedicine, multifunctional nanocarriers have shown significant potential in enhancing the efficacy of chemotherapeutic treatments[1].

Nanocarrier-based drug delivery systems, including organic and inorganic nanoparticles, liposomes, and polymeric micelles, have attracted considerable attention in recent years for cancer treatment due to their unique chemical and physical properties[7]. Nanocarrier-based drug delivery systems can reduce the side effects associated with high-dose chemotherapy by enabling the delivery of larger drug quantities specifically to tumor tissues *via* the enhanced permeability and retention effect—a mechanism that conventional, non-carrier-based anticancer drugs do not utilize[7,8]. In addition to increasing the solubility of chemotherapeutic agents, nanocarrier-based drug delivery systems can also reduce the damage that systemic chemotherapy causes to healthy tissues[1].

Recently, in the field of cancer therapy, nanogel systems based on the combination of acrylamide (AAm) and sodium alginate (SA) monomers have attracted considerable interest. However, this is primarily due to their excellent biocompatibility, high water content, and tunable physicochemical properties, which make them suitable for controlled drug release. SA, a naturally derived polysaccharide, enhances biodegradability and reduces toxicity, while AAm contributes to the mechanical stability of the gel network. Together, these components form a nanogel system capable of encapsulating chemotherapeutic agents and releasing them in a sustained manner, particularly in response to specific stimuli such as pH or temperature changes in the tumor microenvironment. As a result, AAm-SA nanogels offer a promising platform for improving drug targeting,

reducing systemic side effects, and enhancing the overall efficacy of cancer treatments. The synthesis of SA-based nanogels typically involves a polymerization process that can be initiated by heat, light, or chemical initiators. In this study, the polymerization was initiated using gamma irradiation. Gamma irradiation, in addition to its sterilizing capabilities, can induce crosslinking and modify the structural properties of polymers, making it a suitable method for nanogel synthesis[9]. Moreover, polymers crosslinked by gamma irradiation tend to form non-toxic nanogels, in contrast to chemically crosslinked systems, which may release toxic monomers from the polymer matrix during degradation[10].

On the other hand, network pharmacology, an emerging field at the intersection of pharmacology and bioinformatics, employs a comprehensive network-based approach to explore the complex interactions among compounds, proteins, genes, and diseases. It effectively facilitates drug discovery by identifying potential ‘compound-protein/gene-disease’ pathways. This study aimed to establish a scientific basis for clinical intervention by elucidating the fundamental molecular mechanisms of 5-FU. Moreover, we evaluated whether 5-FU loaded nanogels cause less damage to rat liver tissue compared to free 5-FU. To achieve this, the study evaluated inflammatory responses and biochemical parameters in the examined organs.

2. Methods

2.1. Chemicals and reagents

SA, monomers of AAm, and all reagents were acquired from Sigma (St. Louis, Mo., USA).

2.2. Irradiation operation

Using a ^{60}Co Gamma cell at the National Center for Radiation Research and Technology, Egyptian Atomic Energy Authority, the polymer/monomer was irradiated with gamma radiation in an aqueous solution. Approximately 6.83 hours were required to administer the total irradiation dosage of 5 kGy at a dose rate of 0.732 kGy/h.

2.3. Radiation fabrication of poly(AAm/SA) 5-FU nanogels

SA (0.5 g) was dissolved in hot water (5 mL), followed by the addition of ethanol (5 mL) and homogenization at 1000 rpm for 45 min to ensure homogeneity and increase the crosslinking potential. Separately, 1.5 g of AAm was dissolved in 10 mL of 0.1 M HCl, yielding an acidic AAm monomer solution with a pH of 1. The

two solutions were then mixed and irradiated with 5 kGy gamma rays to induce polymerization and nanogel production. Following polymerization, the pH of the resultant suspension was adjusted to 1-2 with HCl or NaOH to control structural stability and the degree of crosslinking. To ensure the integrity of the poly(AAm/SA) nanogel suspension, it was stored at 4 °C. Subsequently, the pH was elevated to 5-6, which induced the decomplexation of SA and polyacrylamide. In this phase, hydrogen bonding was disrupted, causing the nanogel network to open. For drug loading, 500 ppm of 5-FU was introduced to the nanogel suspension, and the pH was modified to 4.5, yielding the final poly(AAm/SA)/5-FU nanogel system intended for drug delivery[11].

2.4. Animals and ethical approval

All animal handling and experimental procedures were conducted in accordance with the guidelines of the National Research Center Ethics Committee, following the U.S. National Institutes of Health Guide for the Care and Use of Laboratory Animals (NIH Publication No. 85-23, revised 1996). This study was approved by the Research Ethics Committee of the National Center for Radiation Research and Technology (Approval No. 36 PA/25) on February 24, 2025. Male Wistar rats (100-120 g) were obtained from the institutional animal house facility of the National Center for Radiation Research and Technology. The animals were acclimated to laboratory conditions for one week prior to the start of the experiment. They were housed in standard clean cages under controlled environmental conditions at (22±2) °C, with a 12-hour light/dark cycle. The rats were maintained on a standard commercial pellet diet and had free access to water throughout the study period.

2.5. Experimental design

The rats from the experimental group were divided into three groups, each with 6 rats.

Control group: Rats were injected with saline intraperitoneally;

5-FU group: Rats were injected intraperitoneally with 5-FU (12.5

mg/kg b.wt.) three times per week for one month[12];

Poly(AAm/SA)/5-FU nanogel (5-FU nanogel) group: Rats were injected intraperitoneally with 5-FU nanogel (12.5 mg/kg b.wt.) three times per week for one month[9].

Animals were fasted overnight with free access to water. Following intraperitoneal induction of anesthesia with ketamine (87 mg/kg) and xylazine (13 mg/kg), blood was collected by cardiac puncture. Animals were then euthanized by cervical dislocation. Blood samples were allowed to clot and centrifuged at 1500 ×g for 10 min to obtain serum. The liver was removed, washed with ice-cold saline, and processed for biochemical analyses.

2.6. Biochemical measurement

The levels of cyclooxygenase-2 (COX-2) (Cat. No. ER0350), phosphoinositide 3-kinase (PI3K) (Code. No. ER1910), and pyruvate kinase M2 (PKM2) (Cat. No. ER6824) were measured in liver homogenates using a rat ELISA kit from Wuhan Fine Biotech in China. Serum samples were used to determine the levels of COX-2 (Cat. No. ER0350), PI3K (Code. No. ER1910), extracellular signal-regulated kinase 1/2 (ERK1/2) (Cat. No. ER 0926), Protein Kinase B (also known as AKT) (Cat. No. ER1268), and PKM2 (Cat. No. ER6824) using the same kit. Absorbance at 450 nm was measured using a microplate reader (Model 680, Bio-Rad, USA).

Liver function was assessed by determining the serum activities of aspartate aminotransferase (AST; EC 2.6.1.1) and alanine aminotransferase (ALT; EC 2.6.1.2) in accordance with the protocols provided with commercial assay kits (Spectrum Diagnostic Company, Cairo, Egypt).

2.7. RNA extraction, reverse transcription, and real-time quantitative polymerase chain reaction (RT-PCR) analysis

Total RNA was extracted from liver tissue using the RNeasy Mini Kit (Qiagen, Cat. No. 74104) following the manufacturer's instructions. The RNA was used as a template for first-strand complementary deoxyribonucleic acid (cDNA) production using the

Table 1. Primer sequences for RT-PCR analysis.

Gene	Sequence 5' - 3'	Annealing temperature (°C)	Product length (bp)
<i>METTL14</i>	Forward: TGGGGATCAAAGGAACCGTG Reverse: GCCTGATAGTGCTGTCCCTC	57	195
<i>Ki-67</i>	Forward: TTTCAGTTCGCGCAATCC Reverse: GGCTTCCGTCTTCATACCTAAA	55	119
<i>TGF-β1</i>	Forward: AACTGTGGAGCAACACGTAGA Reverse: CCCTGTATTCCGTCTCCTTGG	57	162
<i>NF-κB</i>	Forward: TGCAGGCTCCTGTGCGAGTG Reverse: TCCGGTGGCGATCGTCTGTGT	58	108
<i>GAPDH</i>	Forward: CACCCTGTTGCTGTAGCCATATTC Reverse: GACATCAAGAAGGTGGTGAAGCAG	57	204

Revert Aid First Strand cDNA synthesis kit (Thermo Scientific, Cat. No. K1622). The Rotor-Gene Q RT-PCR cyclor from QIAGEN was used for quantitative RT-PCR. The cDNA (3 μ L) was amplified in a 20 μ L reaction mixture using PowerUp™ SYBR™ Green Master Mix (Thermo Scientific, Cat. No. A25741). The amplification program consisted of UDG activation at 50 °C for 2 min, followed by Dual-Lock DNA polymerase activation at 95 °C for 2 min, and then 45 cycles of denaturation at 95 °C for 15 s, annealing at 55-58 °C (Table 1) for 15 s, and extension at 72 °C for 1 min. The fold changes in gene expression were calculated using the $2^{-\Delta\Delta Ct}$ method[13].

2.8. Prediction of related targets

The targets of 5-FU were retrieved from the GeneCards database[14] and the Comparative Toxicogenomics Database[15]. Overlapping targets between the two databases were identified using Venny 2.1 (<https://bioinfo.gp.cnb.csic.es/tools/venny/>) and considered as potential targets for subsequent analyses[14].

2.9. Gene Ontology (GO) and Koto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analyses

GO is extensively employed to investigate gene functions, including biological process, molecular function, and cell component. KEGG is a comprehensive database containing genomic, chemical, and system functional information, frequently employed to identify significantly enriched biological pathways. GO and KEGG enrichment analyses of 5-FU targets were performed using the Enrichr platform[16]. The results were visualized using R packages[15].

2.10. Protein–protein interaction (PPI) network

PPI analysis was performed using the STRING database (<http://string-db.org>)[17]. A combined score > 0.9 (indicating high confidence) was deemed significant, and the PPI network was subsequently visualized using Cytoscape (Version 3.5.1). The top hub genes/proteins were selected based on a degree centrality threshold of > 50[16].

2.11. Statistical analysis

Data are expressed as mean $\pm$ standard error of the mean (SEM) ($n = 6$). Statistical comparisons between groups were performed using one-way analysis of variance (ANOVA), followed by Tukey's *post hoc* multiple comparison test. All analyses were conducted using GraphPad Prism software (version 8.0; GraphPad Software Inc., USA). $P < 0.05$ was considered statistically significant.

3. Results

3.1. 5-FU targets

A total of 2166 candidate targets of 5-FU were extracted from the GeneCards database (Supplementary Table 1). Additionally, a total of 1650 candidate targets of 5-FU were extracted from the Comparative Toxicogenomics Database (Supplementary Table 2). However, 539 overlapping targets were obtained among these gene sets and were used for further analysis (Figure 1A).

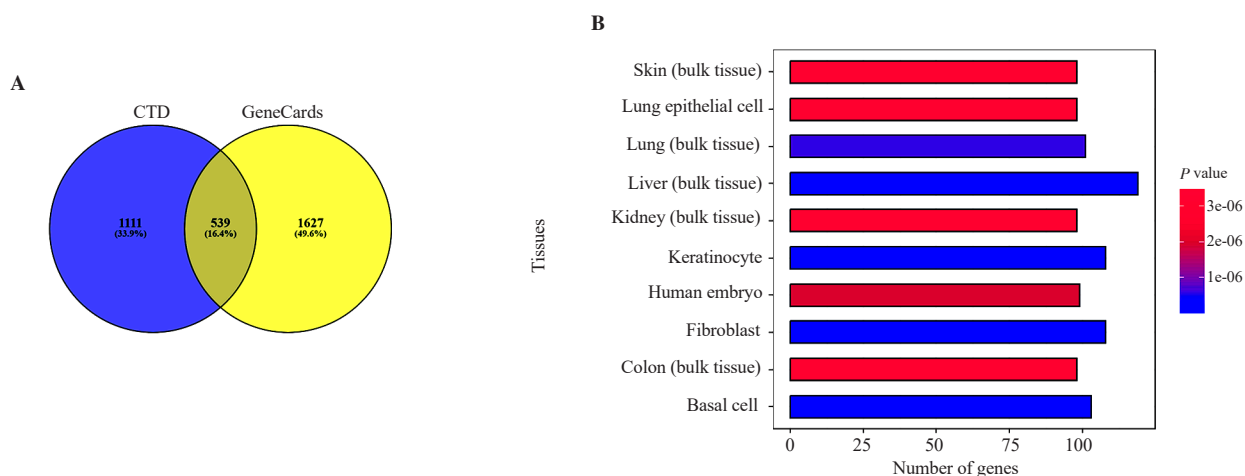


Figure 1. Common 5-FU targets and tissue targets. (A) A Venn diagram shows the common targets between the GeneCards database and the CTD. (B) A bar chart shows the tissue targets. 5-FU: 5-fluorouracil; CTD: Comparative Toxicogenomics Database.

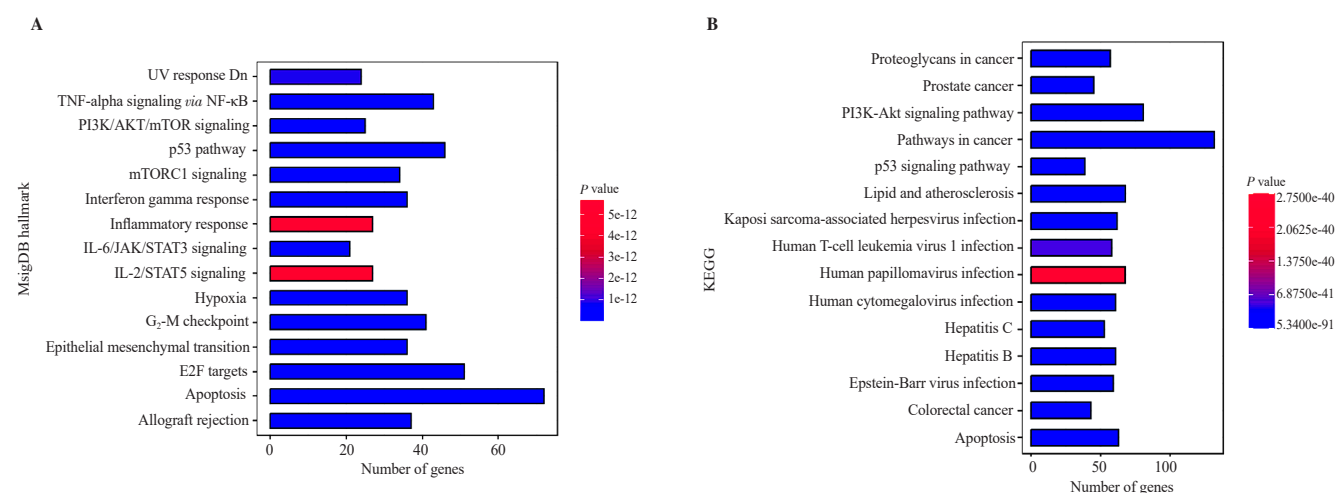


Figure 2. Molecular hallmark and KEGG pathways for 5-FU targets. (A) Key hallmark pathways. (B) KEGG pathways.

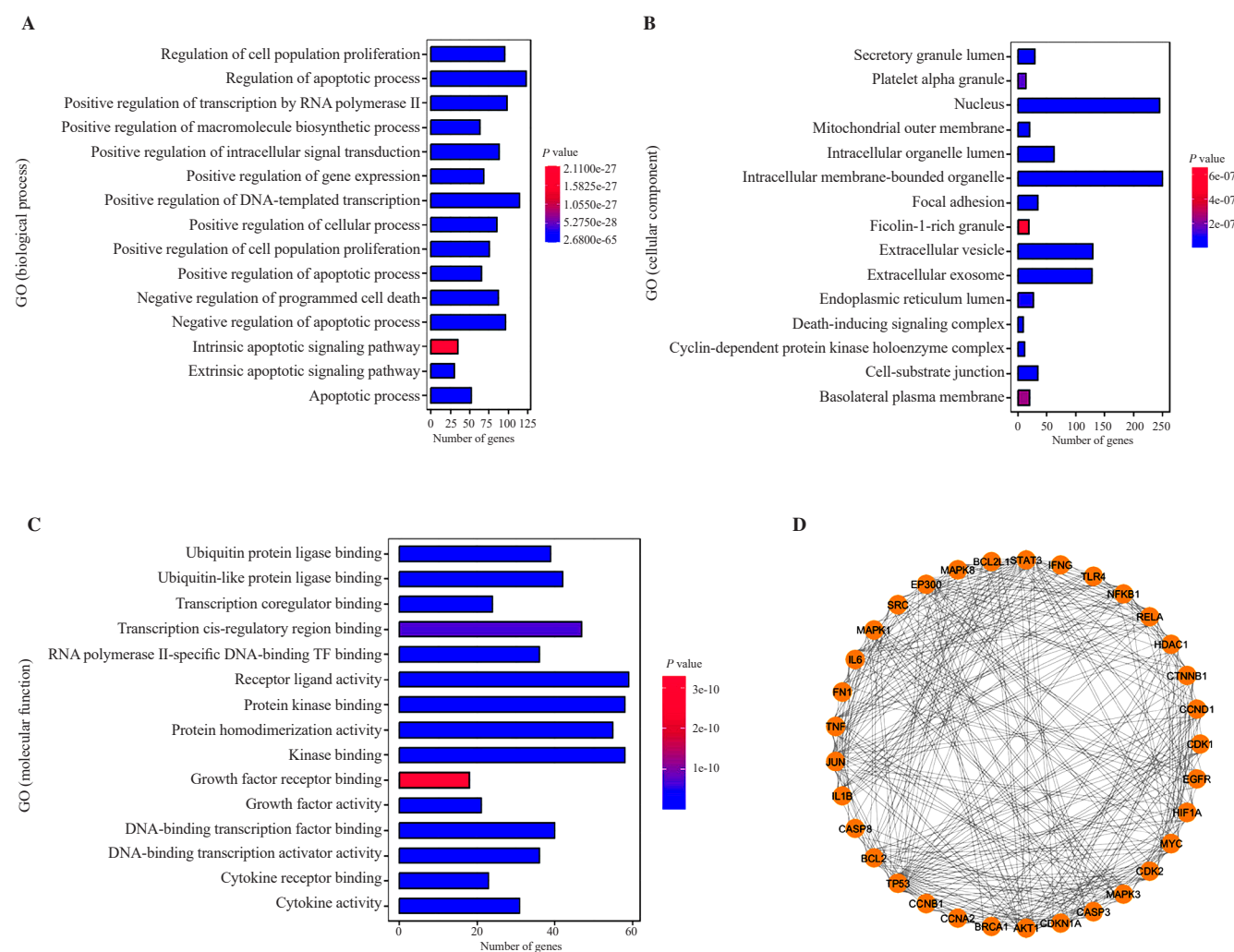


Figure 3. GO analysis and network analysis for 5-FU targets. (A) Biological process of GO terms. (B) Cellular component of GO terms. (C) Molecular function of GO terms. (D) PPI network of 33 potential 5-FU targets with the highest degrees of interaction.

3.2. Tissue targets

Using the Enrichr database, the tissue distribution of the common genes was analyzed. The results revealed that these genes were enriched across multiple tissues, including liver (bulk tissue), fibroblast, keratinocyte, basal cell, lung (bulk tissue), human embryo, colon (bulk tissue), kidney (bulk tissue), lung epithelial cell, and skin (bulk tissue). Among these, the liver showed the highest level of significance and the greatest number of associated genes (Figure 1B).

3.3. Molecular hallmarks

Analysis using the MSigDB Hallmark gene sets revealed that the common genes were significantly enriched in several key biological pathways, including apoptosis, TNF- α signaling *via* NF- κ B, PI3K/AKT/mTOR signaling, and the inflammatory response (Figure 2A).

3.4. Enrichment analysis results

KEGG pathway analysis revealed that the common genes were significantly enriched in several molecular pathways, particularly

the apoptosis and PI3K-AKT signaling pathways (Figure 2B). Moreover, GO analysis demonstrated that intersecting genes shared between the Comparative Toxicogenomics Database and GeneCards were predominantly associated with key biological processes, including apoptosis and cell proliferation (Figure 3A). In terms of cellular components, these common genes were primarily localized to the nucleus, mitochondrion, endoplasmic reticulum, focal adhesions, and the intracellular and extracellular compartments (Figure 3B). Furthermore, molecular function analysis revealed that these genes were significantly enriched in activities related to receptor, kinase, and cytokine binding, protein kinase activity, ubiquitin binding, and transcription factor/DNA-binding regulation (Figure 3C).

3.5. Potential targets

PPI network analysis identified 33 potential target genes associated with 5-FU, each exhibiting a degree of connectivity greater than 50 (Figure 3D). These highly connected nodes represent key regulatory components that may mediate the drug's pharmacological and toxicological effects.

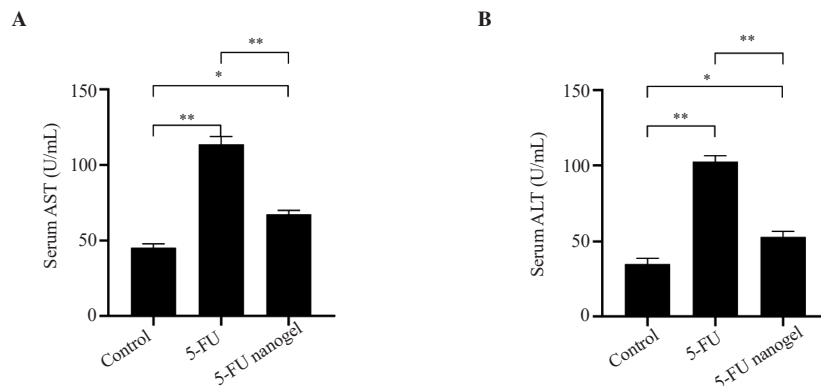


Figure 4. Effect of 5-FU loaded nanogels on serum AST and ALT activities in rats. The data are expressed as mean $\pm$ SEM ($n = 6$) and analyzed by one-way analysis of variance (ANOVA), followed by Tukey's *post hoc* multiple comparison test. * $P < 0.05$, ** $P < 0.001$. AST: aspartate aminotransferase; ALT: alanine aminotransferase.

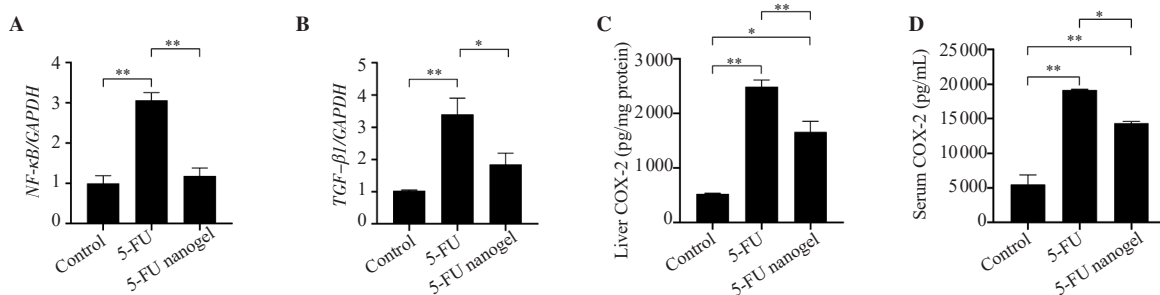


Figure 5. Effect of 5-FU loaded nanogels on liver inflammation and fibrosis in rats. (A-B) RT-PCR was used to determine the expression of NF- κ B and TGF- β 1, with GAPDH as a loading control. (C-D) COX-2 level in the liver and serum. The data are expressed as mean $\pm$ SEM ($n = 6$) and analyzed by ANOVA, followed by Tukey's *post hoc* multiple comparison test. * $P < 0.05$, ** $P < 0.001$.

3.6. Effect of 5-FU loaded nanogels on liver enzymes

Serum ALT and AST activities were markedly increased following conventional 5-FU administration compared with the control group. In contrast, treatment with 5-FU loaded nanogels significantly attenuated these elevations, resulting in substantially lower ALT and AST activities compared with the 5-FU alone group (Figure 4).

3.7. Effect of 5-FU loaded nanogels on inflammation

Based on the network pharmacology findings, we selected inflammation-related targets—specifically the NF- κ B and PI3K pathways—for *in vivo* validation. 5-FU markedly upregulated the mRNA expression of NF- κ B and TGF- β 1 in liver tissue and increased COX-2 level in serum and liver tissues ($P < 0.001$). However, 5-FU loaded nanogels induced a significant reduction in the expression of NF- κ B, TGF- β 1, and COX-2 ($P < 0.05$), indicating attenuation of both inflammatory and fibrotic responses (Figure 5).

3.8. Effect of 5-FU loaded nanogels on the PI3K/AKT/ERK1/2 pathways, Ki-67 and METTL14 expression, and metabolic reprogramming

Conventional 5-FU administration notably altered key hepatic

signaling, regulatory, and metabolic pathways compared to the control group. Specifically, 5-FU notably caused a rise in the expression of PI3K, ERK1/2, AKT, and Ki-67 compared with the control ($P < 0.05$). However, after treatment with 5-FU loaded nanogels, these expressions were markedly downregulated ($P < 0.05$) (Figure 6A-E). Given the role of METTL14 in m⁶A RNA methylation and the regulation of hepatic stress responses, we assessed its expression in liver tissue following treatment with 5-FU and 5-FU loaded nanogels. Conventional 5-FU significantly decreased METTL14 expression compared to the control ($P < 0.05$), suggesting impaired RNA methylation and disruption of hepatocyte regulatory pathways. Treatment with 5-FU loaded nanogels restored METTL14 expression toward normal ($P < 0.05$), indicating a protective effect against 5-FU-induced hepatotoxicity and normalization of RNA methylation (Figure 6F). Moreover, conventional 5-FU administration induced a notable rise in PKM2 levels in both hepatic tissue and serum ($P < 0.001$). In contrast, 5-FU loaded nanogel formulation significantly lowered PKM2 levels ($P < 0.001$), indicating improved metabolic response (Figure 6G-H).

4. Discussion

The results of the present study provide important insights into the

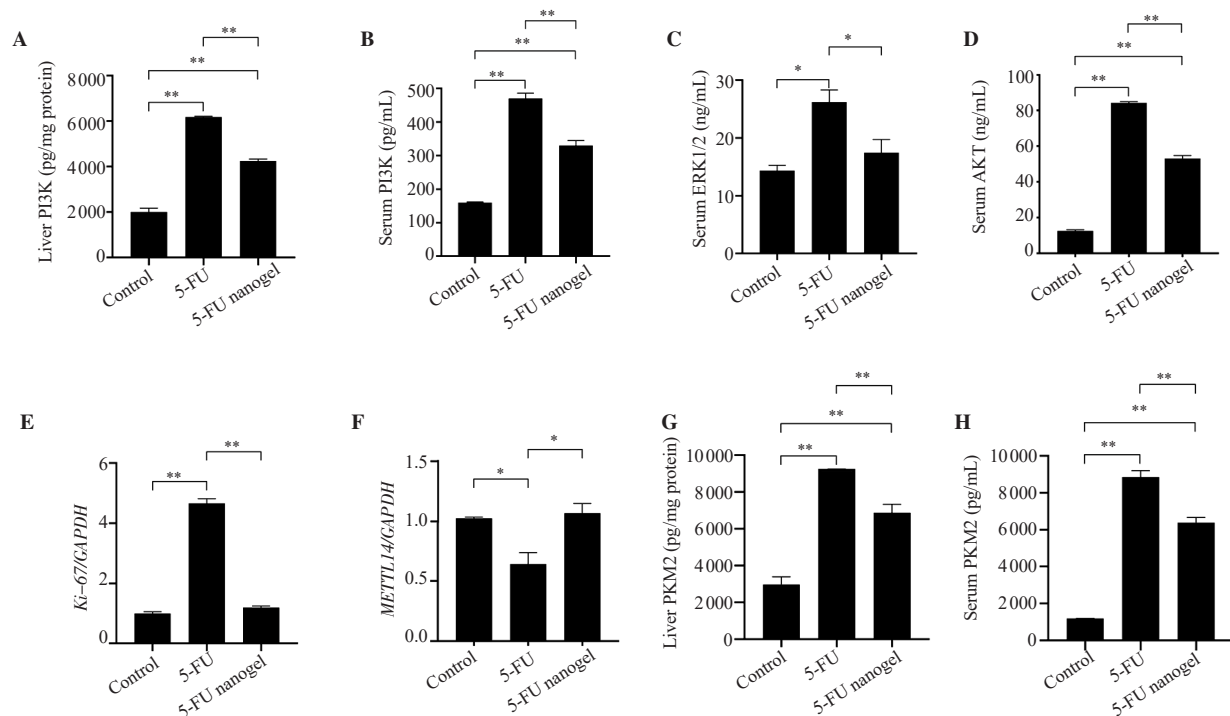


Figure 6. Effect of 5-FU loaded nanogels on the expression of PI3K, AKT, ERK1/2, PKM2, Ki-67, and METTL14. (A-B) PI3K level in the liver and serum. (C-D) ERK1/2 and AKT level in the serum. (E-F) RT-PCR was used to determine the expression of Ki-67 and METTL14, with GAPDH as a loading control. (G-H) PKM2 level in the liver and serum. The data are expressed as mean $\pm$ SEM ($n = 6$) and analyzed by ANOVA, followed by Tukey's *post hoc* multiple comparison test. * $P < 0.05$, ** $P < 0.001$.

molecular mechanisms underlying 5-FU-induced hepatotoxicity and highlight the therapeutic advantages of 5-FU-encapsulated nanogels. Our findings demonstrate that 5-FU-encapsulated nanogels markedly attenuate some adverse effects associated with conventional 5-FU treatment, including hepatic inflammation, activation of pro-survival signaling pathways, fibrogenic responses, and metabolic reprogramming.

Network pharmacology analysis identified 539 overlapping targets from the GeneCards and Comparative Toxicogenomics Database, establishing a comprehensive gene set potentially involved in 5-FU-related biological effects. Tissue enrichment analysis revealed that these targets were predominantly associated with the liver, consistent with the organ's central role in drug metabolism and toxicity. This finding underscores the liver as a critical therapeutic target for mitigating chemotherapy-induced adverse effects.

The nanogel system used in this study, composed of SA and AAm, represents a promising drug delivery platform. SA is a naturally derived, biocompatible, and biodegradable polymer, while AAm is a widely used synthetic monomer in polymerization processes. Their combination enables the formation of nanogels with tunable physicochemical properties suitable for controlled drug delivery, thereby improving therapeutic efficacy and reducing systemic toxicity.

The physicochemical suitability of the poly(AAm/SA)/5-FU nanogels for targeted drug delivery was previously established, demonstrating well-defined, monodisperse structures with a particle size consistently below 50 nm[9]. This nanoscale dimension is highly favorable for enhanced cellular uptake and sustained drug release, supporting the therapeutic efficacy observed in the current study.

Bioinformatics analyses further demonstrated that the common targets of 5-FU are significantly involved in key cellular processes, including apoptosis, inflammation, NF- κ B signaling, and the PI3K/AKT/mTOR pathway. Both NF- κ B and PI3K/AKT signaling play pivotal roles in regulating hepatocyte survival and inflammatory responses, making them particularly relevant in chemotherapy-induced liver injury[18]. NF- κ B signaling, originally characterized as a regulator of inflammation, is now known to participate in diverse biological processes and disease states, including liver development, inflammation, and regeneration[19]. In the liver, NF- κ B promotes hepatocyte survival and regulates cytokine and growth factor expression during inflammatory responses[19].

Similarly, the PI3K/AKT pathway is a central regulator of cell survival, growth, senescence, and cell cycle progression under both physiological and pathological conditions, including cancer[20]. Importantly, PI3K and NF- κ B pathways are functionally interconnected; PI3K activation can stimulate NF- κ B signaling *via* AKT-dependent and independent mechanisms, contributing to adverse outcomes in various malignancies[18]. Consistent with these

findings, our PPI analysis suggests that 5-FU-induced liver injury is mediated, at least in part, by PI3K/AKT/NF- κ B signaling pathway.

In line with these mechanistic insights, *in vivo* results showed that 5-FU significantly increased hepatic *TGF- β 1* and *Ki-67* expression, indicating enhanced fibrogenic signaling and hepatocyte proliferative activity. TGF- β 1 is a central profibrotic cytokine that drives hepatic stellate cell activation, extracellular matrix deposition, and the progression of liver inflammation and fibrosis[21]. TGF- β 1 itself is a multifunctional cytokine that controls cell growth, apoptosis, immune responses, and fibrogenic pathways in the liver, and its elevated expression is frequently observed in models of hepatic injury and fibrosis[22]. TGF- β is a central mediator in liver injury, inflammation, and fibrosis across the spectrum of liver disease progression[23]. Importantly, Ki-67 is a well established marker of cellular proliferation that reflects regenerative responses and the proliferative state of hepatocytes following injury or toxic insult; higher Ki-67 expression has been associated with more aggressive proliferative phenotypes and correlates with TGF- β 1 levels in liver disease contexts[24]. Similarly, Ki-67, a nuclear antigen expressed in actively proliferating cells, serves as a marker of hepatocyte proliferation in response to injury, with elevated expression correlating with increased regenerative activity and potentially more severe tissue response to toxic insults[25].

Notably, 5-FU also reduced *METTL14* expression, consistent with recent evidence indicating that METTL14 expression is decreased in hepatic fibrosis, and its reduction worsens fibrogenesis *via* altered m⁶A methylation of target genes, supporting its role in fibrotic and inflammatory regulation in liver disease[26]. METTL14, a core component of the m⁶A RNA methyltransferase complex, modulates posttranscriptional RNA methylation and has been implicated in liver disease progression. Dysregulated METTL14 expression is associated with altered m⁶A methylation profiles in liver fibrosis and hepatocarcinogenesis, where reduced METTL14 expression correlates with enhanced fibrogenic and proliferative signaling in hepatic cells and poor clinical outcomes in liver disorders[26]. These molecular alterations further support the hepatotoxic profile of conventional 5-FU.

Notably, one of the most significant findings of this study is the ability of 5-FU loaded nanogels to attenuate 5-FU-induced hepatic inflammation and fibrosis. The nanogels markedly reduced the expression of COX-2, NF- κ B, *TGF- β 1*, and *Ki-67* while restoring *METTL14* expression. Given that NF- κ B is a master regulator of inflammatory responses and directly induces COX-2 expression[27], its inhibition by 5-FU loaded nanogels suggests effective suppression of inflammatory signaling. The concurrent downregulation of fibrotic and proliferative markers and upregulation of *METTL14* indicate that the nanogel formulation modulates inflammation, fibrogenesis, and RNA methylation, thereby mitigating liver injury

and enhancing therapeutic safety. These observations are consistent with emerging evidence demonstrating that restoration of METTL14 activity attenuates hepatic inflammation and fibrosis, partly *via* modulation of macrophage activation and NF- κ B signaling in liver disease models[26,28]. Furthermore, this finding is supported by previous studies that have demonstrated the effectiveness of nanogel formulations in reducing the inflammatory response in other disease models, highlighting the potential of 5-FU loaded nanogels as an innovative approach to improving chemotherapy outcomes[29].

Additionally, the MAPK signaling network consists of four main cascades: ERK1/2, JNK1/2/3, p38-MAPK, and ERK5. Among them, the MAPK/ERK pathway plays a key role in regulating essential cellular processes such as proliferation, differentiation, migration, senescence, and apoptosis. The *in vivo* results explored that the PI3K/AKT and MAPK/ERK1/2 pathways, which are known to govern cell viability, were considerably activated after 5-FU administration[30]. Interestingly, treatment with 5-FU loaded nanogels resulted in a significant reduction in PI3K, AKT, and ERK1/2 levels, implying that the nanogel formulation may prevent the activation of pro-survival pathways, potentially reducing toxicity to normal tissues[31]. Moreover, nanocarrier-based drug delivery systems have been reported to modulate these pathways more effectively than free drug formulations, leading to improved therapeutic specificity and reduced off-target effects. These findings align with previous reports demonstrating that downregulation of these survival signaling cascades can attenuate chemotherapy-induced hepatotoxicity and enhance tolerability[9].

Metabolic reprogramming also emerged as a critical aspect of 5-FU-induced hepatotoxicity. PKM2, a key glycolytic enzyme, plays an essential role in regulating cellular metabolism and gene transcription[32]. Elevated PKM2 levels have been reported in cirrhosis and non-alcoholic fatty liver disease, highlighting its potential as a biomarker for hepatic dysfunction[32]. Moreover, our study revealed that 5-FU induces metabolic reprogramming in hepatocytes, specifically through the PI3K-PKM2 axis. The upregulation of PKM2 in both liver tissue and serum following 5-FU treatment is associated with metabolic alterations and cell damage. However, it can trigger a stress response in liver cells[6].

Hepatocytes exposed to 5-FU undergo metabolic and oxidative stress, even in otherwise normal liver tissue. To maintain survival, cells activate the PI3K pathway, which regulates PKM2, a key enzyme in metabolic reprogramming. Through this axis, hepatocytes shift from oxidative phosphorylation toward glycolysis, preserving ATP generation and redox balance under stress conditions[33,34]. Thus, the PI3K-PKM2-metabolic reprogramming pathway represents a critical adaptive mechanism to counteract 5-FU-induced hepatic toxicity[33,35].

The improved safety profile of 5-FU loaded nanogels may be

attributed to their controlled and sustained drug release, enhanced tumor accumulation through the enhanced permeability and retention effect, and the absence of toxic chemical crosslinkers due to gamma irradiation-mediated synthesis. Collectively, these findings support the potential of SA/AAm-based nanogels as a promising platform for safer and more effective chemotherapy delivery.

While this study successfully demonstrates the protective mechanism of the poly(AAm/SA) nanogels against 5-FU hepatotoxicity *in vivo*, some limitations warrant mention. First, experiments were conducted in healthy rodent models to selectively isolate drug-induced hepatic responses; validating this system in tumor-bearing models will be an important next step to confirm matching antitumor efficacy. Second, while gamma-irradiated poly(AAm/SA) is well-established as non-toxic and highly biocompatible, evaluating a blank nanogel cohort in future protocols will provide additional baseline data. Finally, detailed pharmacokinetic profiles and tissue accumulation ratios remain to be characterized. However, additional studies investigating histopathology, pharmacokinetics, long-term safety, and antitumor efficacy in tumor-bearing models are required before clinical translation can be considered.

In conclusion, the present findings suggest that SA/AAm nanogel encapsulation may reduce 5-fluorouracil-induced hepatotoxicity by modulation of inflammatory, pro-survival, metabolic, and epigenetic pathways, including NF- κ B signaling, PI3K/AKT signaling, and METTL14-associated responses. The nanogel formulation attenuated liver enzyme elevation and reduced several molecular markers associated with hepatic inflammation and stress in rats compared with conventional 5-FU treatment. These findings support the potential of SA/AAm-based nanogels as a promising drug delivery approach for improving the hepatic safety profile of 5-FU.

Conflict of interest statement

The authors declare no conflict of interest.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author upon request.

Authors' contributions

GRAH, AH, and MMMB conceived and designed the study. GRAH, AH, and MMMB collected and curated the data and conducted the investigation. AH, AFAE, and ESE developed the methodology. HM, DEEN, AFAE, and MMMB performed data visualization and contributed to data interpretation. GRAH, AH, HM, DEEN, and MMMB drafted the manuscript. AH and MMMB critically revised the manuscript for important intellectual content. AH supervised the project. All authors reviewed and approved the final version of the manuscript for publication.

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Supplementary Table 1. Candidate therapeutic targets of 5-fluorouracil (5-FU) retrieved from the GeneCards database.

Gene	Description
<i>DPYD</i>	Dihydropyrimidine Dehydrogenase
<i>TYMS</i>	Thymidylate Synthetase
<i>TYMP</i>	Thymidine Phosphorylase
<i>UMPS</i>	Uridine Monophosphate Synthetase
<i>TP53</i>	Tumor Protein P53
<i>DPYS</i>	Dihydropyrimidinase
<i>DPYD-AS1</i>	DPYD Antisense RNA 1
<i>IFNA1</i>	Interferon Alpha 1
<i>IFNA2</i>	Interferon Alpha 2
<i>MTHFR</i>	Methylenetetrahydrofolate Reductase
<i>BCL2</i>	BCL2 Apoptosis Regulator
<i>MBD4</i>	Methyl-CpG Binding Domain 4, DNA Glycosylase
<i>IL2</i>	Interleukin 2
<i>LOC129930998</i>	ATAC-STARR-Seq Lymphoblastoid Silent Region 1109
<i>VEGFA</i>	Vascular Endothelial Growth Factor A
<i>BAX</i>	BCL2 Associated X, Apoptosis Regulator
<i>EGFR</i>	Epidermal Growth Factor Receptor
<i>UGT1A1</i>	UDP Glucuronosyltransferase Family 1 Member A1
<i>UPP1</i>	Uridine Phosphorylase 1
<i>SLC29A1</i>	Solute Carrier Family 29 Member 1 (Augustine Blood Group)
<i>CDKN1A</i>	Cyclin Dependent Kinase Inhibitor 1A
<i>IFNG</i>	Interferon Gamma
<i>ERBB2</i>	Erb-B2 Receptor Tyrosine Kinase 2
<i>FAS</i>	Fas Cell Surface Death Receptor
<i>ABCC11</i>	ATP Binding Cassette Subfamily C Member 11
<i>ERCC1</i>	ERCC Excision Repair 1, Endonuclease Non-Catalytic Subunit
<i>GSTP1</i>	Glutathione S-Transferase Pi 1
<i>ABCB1</i>	ATP Binding Cassette Subfamily B Member 1
<i>XRCC1</i>	X-Ray Repair Cross Complementing 1
<i>KRAS</i>	KRAS Proto-Oncogene, GTPase
<i>CASP3</i>	Caspase 3
<i>MLH1</i>	MutL Homolog 1
<i>CSF3</i>	Colony Stimulating Factor 3
<i>ABCC1</i>	ATP Binding Cassette Subfamily C Member 1 (ABCC1 Blood Group)
<i>BIRC5</i>	Baculoviral IAP Repeat Containing 5
<i>FPGS</i>	Folypolyglutamate Synthase
<i>CYP2A6</i>	Cytochrome P450 Family 2 Subfamily A Member 6
<i>ERCC2</i>	ERCC Excision Repair 2, TFIIH Core Complex Helicase Subunit
<i>TKT</i>	Transketolase

<i>E2F1</i>	E2F Transcription Factor 1
<i>ABCC2</i>	ATP Binding Cassette Subfamily C Member 2
<i>ABCG2</i>	ATP Binding Cassette Subfamily G Member 2 (JR Blood Group)
<i>TOP1</i>	DNA Topoisomerase I
<i>ABCC5</i>	ATP Binding Cassette Subfamily C Member 5
<i>UPB1</i>	Beta-Ureidopropionase 1
<i>PCNA</i>	Proliferating Cell Nuclear Antigen
<i>ATM</i>	ATM Serine/Threonine Kinase
<i>CYP2C9</i>	Cytochrome P450 Family 2 Subfamily C Member 9
<i>CASP8</i>	Caspase 8
<i>BCL2L1</i>	BCL2 Like 1
<i>CCND1</i>	Cyclin D1
<i>CSF2</i>	Colony Stimulating Factor 2
<i>CHEK1</i>	Checkpoint Kinase 1
<i>ABCC4</i>	ATP Binding Cassette Subfamily C Member 4 (PEL Blood Group)
<i>ENOSF1</i>	Enolase Superfamily Member 1
<i>UPP2</i>	Uridine Phosphorylase 2
<i>IL3</i>	Interleukin 3
<i>MIR7-3HG</i>	MIR7-3 Host Gene
<i>SMAD4</i>	SMAD Family Member 4
<i>PTEN</i>	Phosphatase And Tensin Homolog
<i>NFE2L2</i>	NFE2 Like BZIP Transcription Factor 2
<i>IL6</i>	Interleukin 6
<i>UCK2</i>	Uridine-Cytidine Kinase 2
<i>FGFR2</i>	Fibroblast Growth Factor Receptor 2
<i>MUC2</i>	Mucin 2, Oligomeric Mucus/Gel-Forming
<i>H19</i>	H19 Imprinted Maternally Expressed Transcript
<i>PIK3CA</i>	Phosphatidylinositol-4,5-Bisphosphate 3-Kinase Catalytic Subunit Alpha
<i>ABCC3</i>	ATP Binding Cassette Subfamily C Member 3
<i>MGMT</i>	O-6-Methylguanine-DNA Methyltransferase
<i>IL2RA</i>	Interleukin 2 Receptor Subunit Alpha
<i>TOP2A</i>	DNA Topoisomerase II Alpha
<i>PTGS2</i>	Prostaglandin-Endoperoxide Synthase 2
<i>DHFR</i>	Dihydrofolate Reductase
<i>FGFR4</i>	Fibroblast Growth Factor Receptor 4
<i>FOXO1</i>	Forkhead Box O1
<i>IGFBP3</i>	Insulin Like Growth Factor Binding Protein 3
<i>XRCC3</i>	X-Ray Repair Cross Complementing 3
<i>CYP19A1</i>	Cytochrome P450 Family 19 Subfamily A Member 1
<i>SLC19A1</i>	Solute Carrier Family 19 Member 1
<i>TPT1</i>	Tumor Protein, Translationally-Controlled 1
<i>TNF</i>	Tumor Necrosis Factor
<i>NQO1</i>	NAD(P)H Quinone Dehydrogenase 1

<i>TERT</i>	Telomerase Reverse Transcriptase
<i>IL11</i>	Interleukin 11
<i>PVT1</i>	Pvt1 Oncogene
<i>APEX1</i>	Apurinic/Apyrimidinic Endodeoxyribonuclease 1
<i>DNMT1</i>	DNA Methyltransferase 1
<i>ALB</i>	Albumin
<i>SELE</i>	Selectin E
<i>IFNB1</i>	Interferon Beta 1
<i>TK1</i>	Thymidine Kinase 1
<i>HRAS</i>	HRas Proto-Oncogene, GTPase
<i>ATAD2</i>	ATPase Family AAA Domain Containing 2
<i>LGR5</i>	Leucine Rich Repeat Containing G Protein-Coupled Receptor 5
<i>EGF</i>	Epidermal Growth Factor
<i>MSH6</i>	MutS Homolog 6
<i>ADSL</i>	Adenylosuccinate Lyase
<i>ERCC6</i>	ERCC Excision Repair 6, Chromatin Remodeling Factor
<i>DKK1</i>	Dickkopf Wnt Signaling Pathway Inhibitor 1
<i>PPAT</i>	Phosphoribosyl Pyrophosphate Amidotransferase
<i>CYP3A4</i>	Cytochrome P450 Family 3 Subfamily A Member 4
<i>CDKN2A</i>	Cyclin Dependent Kinase Inhibitor 2A
<i>IFNAR2</i>	Interferon Alpha And Beta Receptor Subunit 2
<i>CXCL8</i>	C-X-C Motif Chemokine Ligand 8
<i>CEACAM5</i>	CEA Cell Adhesion Molecule 5
<i>UGT1A7</i>	UDP Glucuronosyltransferase Family 1 Member A7
<i>UNG</i>	Uracil DNA Glycosylase
<i>SST</i>	Somatostatin
<i>IL1B</i>	Interleukin 1 Beta
<i>KITLG</i>	KIT Ligand
<i>CERNA3</i>	Competing Endogenous LncRNA 3 For MiR-645
<i>CHEK2</i>	Checkpoint Kinase 2
<i>HSPB1</i>	Heat Shock Protein Family B (Small) Member 1
<i>UGT1A4</i>	UDP Glucuronosyltransferase Family 1 Member A4
<i>UGT1A6</i>	UDP Glucuronosyltransferase Family 1 Member A6
<i>UGT1A10</i>	UDP Glucuronosyltransferase Family 1 Member A10
<i>UGT1A8</i>	UDP Glucuronosyltransferase Family 1 Member A8
<i>MIR494</i>	MicroRNA 494
<i>WT1</i>	WT1 Transcription Factor
<i>MIR215</i>	MicroRNA 215
<i>CYP1A2</i>	Cytochrome P450 Family 1 Subfamily A Member 2
<i>SERPINA7</i>	Serpin Family A Member 7
<i>MDM2</i>	MDM2 Proto-Oncogene
<i>TNFSF10</i>	TNF Superfamily Member 10
<i>IL18</i>	Interleukin 18

<i>MIR21</i>	MicroRNA 21
<i>CEACAM3</i>	CEA Cell Adhesion Molecule 3
<i>PARP1</i>	Poly(ADP-Ribose) Polymerase 1
<i>MIR543</i>	MicroRNA 543
<i>DUT</i>	Deoxyuridine Triphosphatase
<i>TPMT</i>	Thiopurine S-Methyltransferase
<i>CYP2C19</i>	Cytochrome P450 Family 2 Subfamily C Member 19
<i>HK2</i>	Hexokinase 2
<i>CDKN1B</i>	Cyclin Dependent Kinase Inhibitor 1B
<i>NR2E3</i>	Nuclear Receptor Subfamily 2 Group E Member 3
<i>STAT3</i>	Signal Transducer And Activator Of Transcription 3
<i>BRAF</i>	B-Raf Proto-Oncogene, Serine/Threonine Kinase
<i>MIR141</i>	MicroRNA 141
<i>MELK</i>	Maternal Embryonic Leucine Zipper Kinase
<i>MIR27A</i>	MicroRNA 27a
<i>CD36</i>	CD36 Molecule (CD36 Blood Group)
<i>FASLG</i>	Fas Ligand
<i>SOD2-OT1</i>	SOD2 Overlapping Transcript 1
<i>CYP3A5</i>	Cytochrome P450 Family 3 Subfamily A Member 5
<i>HSPA5</i>	Heat Shock Protein Family A (Hsp70) Member 5
<i>ABCB6</i>	ATP Binding Cassette Subfamily B Member 6 (LAN Blood Group)
<i>TUG1</i>	Taurine Up-Regulated 1
<i>CBR3</i>	Carbonyl Reductase 3
<i>SOD1</i>	Superoxide Dismutase 1
<i>NOS3</i>	Nitric Oxide Synthase 3
<i>ESR1</i>	Estrogen Receptor 1
<i>SLC22A8</i>	Solute Carrier Family 22 Member 8
<i>MYC</i>	MYC Proto-Oncogene, BHLH Transcription Factor
<i>CDH1</i>	Cadherin 1
<i>THBS1</i>	Thrombospondin 1
<i>PLK1</i>	Polo Like Kinase 1
<i>SLC22A7</i>	Solute Carrier Family 22 Member 7
<i>HBB</i>	Hemoglobin Subunit Beta
<i>TGFB1</i>	Transforming Growth Factor Beta 1
<i>EGR1</i>	Early Growth Response 1
<i>AKT1</i>	AKT Serine/Threonine Kinase 1
<i>PROM1</i>	Prominin 1
<i>TNFRSF1B</i>	TNF Receptor Superfamily Member 1B
<i>TS13</i>	Temperature Sensitivity Complementation, Ts13
<i>CYP2E1</i>	Cytochrome P450 Family 2 Subfamily E Member 1
<i>MET</i>	MET Proto-Oncogene, Receptor Tyrosine Kinase
<i>PDGFRB</i>	Platelet Derived Growth Factor Receptor Beta
<i>CDC25C</i>	Cell Division Cycle 25C

<i>CYP1B1</i>	Cytochrome P450 Family 1 Subfamily B Member 1
<i>IGF2BP2</i>	Insulin Like Growth Factor 2 mRNA Binding Protein 2
<i>XRCC4</i>	X-Ray Repair Cross Complementing 4
<i>ALCAM</i>	Activated Leukocyte Cell Adhesion Molecule
<i>WNT5B</i>	Wnt Family Member 5B
<i>MAPK1</i>	Mitogen-Activated Protein Kinase 1
<i>SLC2A1</i>	Solute Carrier Family 2 Member 1
<i>CFLAR</i>	CASP8 And FADD Like Apoptosis Regulator
<i>CYCS</i>	Cytochrome C, Somatic
<i>ANXA5</i>	Annexin A5
<i>TDG</i>	Thymine DNA Glycosylase
<i>EPCAM</i>	Epithelial Cell Adhesion Molecule
<i>SAT1</i>	Spermidine/Spermine N1-Acetyltransferase 1
<i>MAP2K1</i>	Mitogen-Activated Protein Kinase Kinase 1
<i>AURKA</i>	Aurora Kinase A
<i>PTPRC</i>	Protein Tyrosine Phosphatase Receptor Type C
<i>IL6R</i>	Interleukin 6 Receptor
<i>NRAS</i>	NRAS Proto-Oncogene, GTPase
<i>KCNQ1</i>	Potassium Voltage-Gated Channel Subfamily Q Member 1
<i>MYB</i>	MYB Proto-Oncogene, Transcription Factor
<i>PIK3R2</i>	Phosphoinositide-3-Kinase Regulatory Subunit 2
<i>PPARD</i>	Peroxisome Proliferator Activated Receptor Delta
<i>ALDH3A1</i>	Aldehyde Dehydrogenase 3 Family Member A1
<i>TWIST1</i>	Twist Family BHLH Transcription Factor 1
<i>MUTYH</i>	MutY DNA Glycosylase
<i>SHMT1</i>	Serine Hydroxymethyltransferase 1
<i>HMMR</i>	Hyaluronan Mediated Motility Receptor
<i>REV3L</i>	REV3 Like, DNA Directed Polymerase Zeta Catalytic Subunit
<i>GCKR</i>	Glucokinase Regulator
<i>KLC3</i>	Kinesin Light Chain 3
<i>GALNT14</i>	Polypeptide N-Acetylgalactosaminyltransferase 14
<i>NT5C1A</i>	5'-Nucleotidase, Cytosolic IA
<i>NFKB1</i>	Nuclear Factor Kappa B Subunit 1
<i>MCL1</i>	MCL1 Apoptosis Regulator, BCL2 Family Member
<i>SIRT1</i>	Sirtuin 1
<i>MVP</i>	Major Vault Protein
<i>SOD2</i>	Superoxide Dismutase 2
<i>FDXR</i>	Ferredoxin Reductase
<i>FGF7</i>	Fibroblast Growth Factor 7
<i>FOXM1</i>	Forkhead Box M1
<i>GGH</i>	Gamma-Glutamyl Hydrolase
<i>MMP2</i>	Matrix Metalloproteinase 2
<i>BNIP3</i>	BCL2 Interacting Protein 3

<i>TAC1</i>	Tachykinin Precursor 1
<i>CYP2C8</i>	Cytochrome P450 Family 2 Subfamily C Member 8
<i>FOS</i>	Fos Proto-Oncogene, AP-1 Transcription Factor Subunit
<i>SHH</i>	Sonic Hedgehog Signaling Molecule
<i>APC</i>	APC Regulator Of Wnt Signaling Pathway
<i>CASP7</i>	Caspase 7
<i>NME1</i>	NME/NM23 Nucleoside Diphosphate Kinase 1
<i>HSPA4</i>	Heat Shock Protein Family A (Hsp70) Member 4
<i>MAD2L1</i>	Mitotic Arrest Deficient 2 Like 1
<i>MIR125B1</i>	MicroRNA 125b-1
<i>MIR302A</i>	MicroRNA 302a
<i>PGR-AS1</i>	PGR Antisense RNA 1
<i>MIR320A</i>	MicroRNA 320a
<i>IVL</i>	Involucrin
<i>CHUK</i>	Component Of Inhibitor Of Nuclear Factor Kappa B Kinase Complex
<i>FOLH1</i>	Folate Hydrolase 1
<i>GAL</i>	Galanin And GMAP Prepropeptide
<i>HOTAIRM1</i>	HOXA Transcript Antisense RNA, Myeloid-Specific 1
<i>INSR</i>	Insulin Receptor
<i>IDH1</i>	Isocitrate Dehydrogenase (NADP(+)) 1
<i>GNAS</i>	GNAS Complex Locus
<i>NOS1</i>	Nitric Oxide Synthase 1
<i>BDNF</i>	Brain Derived Neurotrophic Factor
<i>PCSK9</i>	Proprotein Convertase Subtilisin/Kexin Type 9
<i>CSPG4</i>	Chondroitin Sulfate Proteoglycan 4
<i>IRS1</i>	Insulin Receptor Substrate 1
<i>ITGAL</i>	Integrin Subunit Alpha L
<i>PON1</i>	Paraoxonase 1
<i>SCN1A</i>	Sodium Voltage-Gated Channel Alpha Subunit 1
<i>ATRX</i>	ATRX Chromatin Remodeler
<i>CD47</i>	CD47 Molecule
<i>MECP2</i>	Methyl-CpG Binding Protein 2
<i>SLCO1B1</i>	Solute Carrier Organic Anion Transporter Family Member 1B1
<i>TLR9</i>	Toll Like Receptor 9
<i>NLGNI</i>	Neurologin 1
<i>PPP2R5D</i>	Protein Phosphatase 2 Regulatory Subunit B'Delta
<i>PVR</i>	PVR Cell Adhesion Molecule
<i>CBR1</i>	Carbonyl Reductase 1
<i>CGA</i>	Glycoprotein Hormones, Alpha Polypeptide
<i>DTYMK</i>	Deoxythymidylate Kinase
<i>HLA-G</i>	Major Histocompatibility Complex, Class I, G
<i>RAD51C</i>	RAD51 Paralog C
<i>ABCG1</i>	ATP Binding Cassette Subfamily G Member 1

<i>CCR8</i>	C-C Motif Chemokine Receptor 8
<i>EXO1</i>	Exonuclease 1
<i>KLC1</i>	Kinesin Light Chain 1
<i>RALBP1</i>	RalA Binding Protein 1
<i>RBX1</i>	Ring-Box 1
<i>OSGEP</i>	O-Sialoglycoprotein Endopeptidase
<i>CCNK</i>	Cyclin K
<i>GNL3</i>	G Protein Nucleolar 3
<i>CHN2</i>	Chimerin 2
<i>COLEC10</i>	Collectin Subfamily Member 10
<i>DLG5</i>	Discs Large MAGUK Scaffold Protein 5
<i>PIGB</i>	Phosphatidylinositol Glycan Anchor Biosynthesis Class B
<i>TSHB</i>	Thyroid Stimulating Hormone Subunit Beta
<i>RGS5</i>	Regulator Of G Protein Signaling 5
<i>PERP</i>	P53 Apoptosis Effector Related To PMP22
<i>SLC22A16</i>	Solute Carrier Family 22 Member 16
<i>PARD3B</i>	Par-3 Family Cell Polarity Regulator Beta
<i>CYP4X1</i>	Cytochrome P450 Family 4 Subfamily X Member 1
<i>TP53AIP1</i>	Tumor Protein P53 Regulated Apoptosis Inducing Protein 1
<i>MEGF11</i>	Multiple EGF Like Domains 11
<i>NYNRIN</i>	NYN Domain And Retroviral Integrase Containing
<i>TMEM167A</i>	Transmembrane Protein 167A
<i>GIN1</i>	Gypsy Retrotransposon Integrase 1
<i>TYMSOS</i>	TYMS Opposite Strand RNA
<i>PSMB3P1</i>	Proteasome Subunit Beta 3 Pseudogene 1
<i>OR10AE3P</i>	Olfactory Receptor Family 10 Subfamily AE Member 3 Pseudogene
<i>CTNNB1</i>	Catenin Beta 1
<i>FADD</i>	Fas Associated Via Death Domain
<i>EPO</i>	Erythropoietin
<i>BAK1</i>	BCL2 Antagonist/Killer 1
<i>ITGB3</i>	Integrin Subunit Beta 3
<i>REG4</i>	Regenerating Family Member 4
<i>MIR125B2</i>	MicroRNA 125b-2
<i>MIR15B</i>	MicroRNA 15b
<i>ATR</i>	ATR Checkpoint Kinase
<i>HULC</i>	Hepatocellular Carcinoma Up-Regulated Long Non-Coding RNA
<i>SRC</i>	SRC Proto-Oncogene, Non-Receptor Tyrosine Kinase
<i>NOS2</i>	Nitric Oxide Synthase 2
<i>CYP2D6</i>	Cytochrome P450 Family 2 Subfamily D Member 6 (Gene/Pseudogene)
<i>MSH2</i>	MutS Homolog 2
<i>CCNA2</i>	Cyclin A2
<i>BAG1</i>	BAG Cochaperone 1
<i>MIR133B</i>	MicroRNA 133b

<i>MIRLET7C</i>	MicroRNA Let-7c
<i>IGF1R</i>	Insulin Like Growth Factor 1 Receptor
<i>PSG2</i>	Pregnancy Specific Beta-1-Glycoprotein 2
<i>CDX2</i>	Caudal Type Homeobox 2
<i>COL11A1</i>	Collagen Type XI Alpha 1 Chain
<i>IL1RN</i>	Interleukin 1 Receptor Antagonist
<i>PTK2</i>	Protein Tyrosine Kinase 2
<i>SP1</i>	Sp1 Transcription Factor
<i>IL10</i>	Interleukin 10
<i>CLOCK</i>	Clock Circadian Regulator
<i>MIR520G</i>	MicroRNA 520g
<i>PTGDS</i>	Prostaglandin D2 Synthase
<i>MMP9</i>	Matrix Metalloproteinase 9
<i>NOTCH1</i>	Notch Receptor 1
<i>MAPK3</i>	Mitogen-Activated Protein Kinase 3
<i>TIMP1</i>	TIMP Metalloproteinase Inhibitor 1
<i>MIR200C</i>	MicroRNA 200c
<i>MIR23A</i>	MicroRNA 23a
<i>MTRR</i>	5-Methyltetrahydrofolate-Homocysteine Methyltransferase Reductase
<i>F2</i>	Coagulation Factor II, Thrombin
<i>MAPK8</i>	Mitogen-Activated Protein Kinase 8
<i>BRCA2</i>	BRCA2 DNA Repair Associated
<i>RPL5</i>	Ribosomal Protein L5
<i>ELAVL1</i>	ELAV Like RNA Binding Protein 1
<i>YBX1</i>	Y-Box Binding Protein 1
<i>MIR204</i>	MicroRNA 204
<i>UCA1</i>	Urothelial Cancer Associated 1
<i>MIR31</i>	MicroRNA 31
<i>MIR17</i>	MicroRNA 17
<i>MIR199B</i>	MicroRNA 199b
<i>BUB1B</i>	BUB1 Mitotic Checkpoint Serine/Threonine Kinase B
<i>DAPK1</i>	Death Associated Protein Kinase 1
<i>HSPA8</i>	Heat Shock Protein Family A (Hsp70) Member 8
<i>CASP6</i>	Caspase 6
<i>MIF</i>	Macrophage Migration Inhibitory Factor
<i>GRM4</i>	Glutamate Metabotropic Receptor 4
<i>MUC5AC</i>	Mucin 5AC, Oligomeric Mucus/Gel-Forming
<i>MIR100</i>	MicroRNA 100
<i>MIR26A1</i>	MicroRNA 26a-1
<i>MIR203A</i>	MicroRNA 203a
<i>CCAT1</i>	Colon Cancer Associated Transcript 1
<i>MPO</i>	Myeloperoxidase
<i>GAPDH</i>	Glyceraldehyde-3-Phosphate Dehydrogenase

<i>FOXO3</i>	Forkhead Box O3
<i>FCGR3A</i>	Fc Gamma Receptor IIIa
<i>RUNX3</i>	RUNX Family Transcription Factor 3
<i>SRF</i>	Serum Response Factor
<i>SMUG1</i>	Single-Strand-Selective Monofunctional Uracil-DNA Glycosylase 1
<i>HSPB2</i>	Heat Shock Protein Family B (Small) Member 2
<i>MTDH</i>	Metadherin
<i>TET1</i>	Tet Methylcytosine Dioxygenase 1
<i>BCL2L12</i>	BCL2 Like 12
<i>MIR200A</i>	MicroRNA 200a
<i>CBR3-AS1</i>	CBR3 Antisense RNA 1
<i>HIF1A</i>	Hypoxia Inducible Factor 1 Subunit Alpha
<i>GSTM1</i>	Glutathione S-Transferase Mu 1
<i>ABAT</i>	4-Aminobutyrate Aminotransferase
<i>SUOX</i>	Sulfite Oxidase
<i>DPYD-AS2</i>	DPYD Antisense RNA 2
<i>DPYD-IT1</i>	DPYD Intronic Transcript 1
<i>ENO2</i>	Enolase 2
<i>TK2</i>	Thymidine Kinase 2
<i>GJA1</i>	Gap Junction Protein Alpha 1
<i>ANXA2</i>	Annexin A2
<i>PRKAB1</i>	Protein Kinase AMP-Activated Non-Catalytic Subunit Beta 1
<i>MAPK10</i>	Mitogen-Activated Protein Kinase 10
<i>HES1</i>	Hes Family BHLH Transcription Factor 1
<i>PTPRM</i>	Protein Tyrosine Phosphatase Receptor Type M
<i>CCK</i>	Cholecystokinin
<i>TNFRSF6B</i>	TNF Receptor Superfamily Member 6b
<i>MUC6</i>	Mucin 6, Oligomeric Mucus/Gel-Forming (Gene/Pseudogene)
<i>DCTPP1</i>	DCTP Pyrophosphatase 1
<i>MIR210</i>	MicroRNA 210
<i>MIR106A</i>	MicroRNA 106a
<i>MIR551A</i>	MicroRNA 551a
<i>LINC01270</i>	Long Intergenic Non-Protein Coding RNA 1270
<i>MIR421</i>	MicroRNA 421
<i>OVAAL</i>	Ovarian Adenocarcinoma Amplified Long Non-Coding RNA
<i>LINC01419</i>	Long Intergenic Non-Protein Coding RNA 1419
<i>MIR522</i>	MicroRNA 522
<i>LINC02617</i>	Long Intergenic Non-Protein Coding RNA 2617
<i>SLC28A1</i>	Solute Carrier Family 28 Member 1
<i>MTOR</i>	Mechanistic Target Of Rapamycin Kinase
<i>CASP9</i>	Caspase 9
<i>DCLK1</i>	Doublecortin Like Kinase 1
<i>SLC6A2</i>	Solute Carrier Family 6 Member 2

<i>SLC6A4</i>	Solute Carrier Family 6 Member 4
<i>TMEM97</i>	Transmembrane Protein 97
<i>MIR181A2</i>	MicroRNA 181a-2
<i>MIR181A1</i>	MicroRNA 181a-1
<i>MIR30D</i>	MicroRNA 30d
<i>MIR133A1</i>	MicroRNA 133a-1
<i>BRCA1</i>	BRCA1 DNA Repair Associated
<i>CDK2</i>	Cyclin Dependent Kinase 2
<i>BIRC3</i>	Baculoviral IAP Repeat Containing 3
<i>BID</i>	BH3 Interacting Domain Death Agonist
<i>DCK</i>	Deoxycytidine Kinase
<i>CXCL12</i>	C-X-C Motif Chemokine Ligand 12
<i>BAD</i>	BCL2 Associated Agonist Of Cell Death
<i>MKI67</i>	Marker Of Proliferation Ki-67
<i>HDAC2</i>	Histone Deacetylase 2
<i>HDAC9</i>	Histone Deacetylase 9
<i>AFP</i>	Alpha Fetoprotein
<i>FGF2</i>	Fibroblast Growth Factor 2
<i>CSF1</i>	Colony Stimulating Factor 1
<i>BDNF-AS</i>	BDNF Antisense RNA
<i>MIR34A</i>	MicroRNA 34a
<i>UGT1A</i>	UDP Glucuronosyltransferase Family 1 Member A Complex Locus
<i>XIAP</i>	X-Linked Inhibitor Of Apoptosis
<i>BIRC2</i>	Baculoviral IAP Repeat Containing 2
<i>POR</i>	Cytochrome P450 Oxidoreductase
<i>H2AX</i>	H2A.X Variant Histone
<i>MIR145</i>	MicroRNA 145
<i>MIR149</i>	MicroRNA 149
<i>IL1A</i>	Interleukin 1 Alpha
<i>SERPINE2</i>	Serpin Family E Member 2
<i>CSMD1</i>	CUB And Sushi Multiple Domains 1
<i>ARAP2</i>	ArfGAP With RhoGAP Domain, Ankyrin Repeat And PH Domain 2
<i>LINC01924</i>	Long Intergenic Non-Protein Coding RNA 1924
<i>CREBBP</i>	CREB Binding Lysine Acetyltransferase
<i>CXCR4</i>	C-X-C Motif Chemokine Receptor 4
<i>PPARG</i>	Peroxisome Proliferator Activated Receptor Gamma
<i>CTSB</i>	Cathepsin B
<i>JUN</i>	Jun Proto-Oncogene, AP-1 Transcription Factor Subunit
<i>MUC1</i>	Mucin 1, Cell Surface Associated
<i>YAP1</i>	Yes1 Associated Transcriptional Regulator
<i>IGF1</i>	Insulin Like Growth Factor 1
<i>TGFA</i>	Transforming Growth Factor Alpha
<i>UGT1A9</i>	UDP Glucuronosyltransferase Family 1 Member A9

<i>GAS5</i>	Growth Arrest Specific 5
<i>MAPK14</i>	Mitogen-Activated Protein Kinase 14
<i>ADAM17</i>	ADAM Metallopeptidase Domain 17
<i>ATP2A2</i>	ATPase Sarcoplasmic/Endoplasmic Reticulum Ca ²⁺ Transporting 2
<i>PKM</i>	Pyruvate Kinase M1/2
<i>PIK3CG</i>	Phosphatidylinositol-4,5-Bisphosphate 3-Kinase Catalytic Subunit Gamma
<i>RHOA</i>	Ras Homolog Family Member A
<i>ABCC6</i>	ATP Binding Cassette Subfamily C Member 6
<i>CDK1</i>	Cyclin Dependent Kinase 1
<i>GLI1</i>	GLI Family Zinc Finger 1
<i>RPL11</i>	Ribosomal Protein L11
<i>TGFB3</i>	Transforming Growth Factor Beta 3
<i>CRP</i>	C-Reactive Protein
<i>CTSH</i>	Cathepsin H
<i>NAT2</i>	N-Acetyltransferase 2
<i>PF4</i>	Platelet Factor 4
<i>MIR200B</i>	MicroRNA 200b
<i>MIR373</i>	MicroRNA 373
<i>SNORD44</i>	Small Nucleolar RNA, C/D Box 44
<i>HAX1</i>	HCLS1 Associated Protein X-1
<i>UCK1</i>	Uridine-Cytidine Kinase 1
<i>SLC28A2</i>	Solute Carrier Family 28 Member 2
<i>CDK4</i>	Cyclin Dependent Kinase 4
<i>HSP90AA1</i>	Heat Shock Protein 90 Alpha Family Class A Member 1
<i>PLAU</i>	Plasminogen Activator, Urokinase
<i>PAK1</i>	P21 (RAC1) Activated Kinase 1
<i>PRKDC</i>	Protein Kinase, DNA-Activated, Catalytic Subunit
<i>GGT1</i>	Gamma-Glutamyltransferase 1
<i>KEAP1</i>	Kelch Like ECH Associated Protein 1
<i>KRT18</i>	Keratin 18
<i>VDR</i>	Vitamin D Receptor
<i>WEE1</i>	WEE1 G2 Checkpoint Kinase
<i>CASP2</i>	Caspase 2
<i>ITGAV</i>	Integrin Subunit Alpha V
<i>ANXA1</i>	Annexin A1
<i>ODC1</i>	Ornithine Decarboxylase 1
<i>POLB</i>	DNA Polymerase Beta
<i>DROSHA</i>	Drosha Ribonuclease III
<i>GDF15</i>	Growth Differentiation Factor 15
<i>PRL</i>	Prolactin
<i>FLT3LG</i>	Fms Related Receptor Tyrosine Kinase 3 Ligand
<i>RPL23</i>	Ribosomal Protein L23
<i>TSC22D1</i>	TSC22 Domain Family Member 1

<i>UGT1A3</i>	UDP Glucuronosyltransferase Family 1 Member A3
<i>ABCC12</i>	ATP Binding Cassette Subfamily C Member 12
<i>UGT1A5</i>	UDP Glucuronosyltransferase Family 1 Member A5
<i>MIR34C</i>	MicroRNA 34c
<i>MIR497</i>	MicroRNA 497
<i>SCARNA5</i>	Small Cajal Body-Specific RNA 5
<i>EPHA2</i>	EPH Receptor A2
<i>NGF</i>	Nerve Growth Factor
<i>CXCR2</i>	C-X-C Motif Chemokine Receptor 2
<i>NFKBIA</i>	NFKB Inhibitor Alpha
<i>RIPK1</i>	Receptor Interacting Serine/Threonine Kinase 1
<i>ICAM1</i>	Intercellular Adhesion Molecule 1
<i>IFNAR1</i>	Interferon Alpha And Beta Receptor Subunit 1
<i>PNP</i>	Purine Nucleoside Phosphorylase
<i>HSPD1</i>	Heat Shock Protein Family D (Hsp60) Member 1
<i>HMGR</i>	3-Hydroxy-3-Methylglutaryl-CoA Reductase
<i>MPL</i>	MPL Proto-Oncogene, Thrombopoietin Receptor
<i>ATP7A</i>	ATPase Copper Transporting Alpha
<i>CCND3</i>	Cyclin D3
<i>MDM4</i>	MDM4 Regulator Of P53
<i>PXN</i>	Paxillin
<i>TMPO</i>	Thymopoietin
<i>BMI1</i>	BMI1 Proto-Oncogene, Polycomb Ring Finger
<i>CHKA</i>	Choline Kinase Alpha
<i>NAGLU</i>	N-Acetyl-Alpha-Glucosaminidase
<i>STUB1</i>	STIP1 Homology And U-Box Containing Protein 1
<i>CXCR1</i>	C-X-C Motif Chemokine Receptor 1
<i>KRT19</i>	Keratin 19
<i>LIF</i>	LIF Interleukin 6 Family Cytokine
<i>TP53BP1</i>	Tumor Protein P53 Binding Protein 1
<i>CCNA1</i>	Cyclin A1
<i>RPL3</i>	Ribosomal Protein L3
<i>CCL3</i>	C-C Motif Chemokine Ligand 3
<i>HSPH1</i>	Heat Shock Protein Family H (Hsp110) Member 1
<i>PER1</i>	Period Circadian Regulator 1
<i>TIMP2</i>	TIMP Metalloproteinase Inhibitor 2
<i>USP22</i>	Ubiquitin Specific Peptidase 22
<i>ABCC10</i>	ATP Binding Cassette Subfamily C Member 10
<i>SMOX</i>	Spermine Oxidase
<i>ATG9B</i>	Autophagy Related 9B
<i>CPNE7</i>	Copine 7
<i>TFAP2E</i>	Transcription Factor AP-2 Epsilon
<i>MIR219A1</i>	MicroRNA 219a-1

<i>MIR223</i>	MicroRNA 223
<i>MIR216A</i>	MicroRNA 216a
<i>MIR381</i>	MicroRNA 381
<i>MIR338</i>	MicroRNA 338
<i>MIR98</i>	MicroRNA 98
<i>MIR519D</i>	MicroRNA 519d
<i>MIR495</i>	MicroRNA 495
<i>TRE-TTC3-1</i>	TRNA-Glu (Anticodon TTC) 3-1
<i>TRG-GCC2-6</i>	TRNA-Gly (Anticodon GCC) 2-6
<i>TRG-TCC1-1</i>	TRNA-Gly (Anticodon TCC) 1-1
<i>SMARCA2</i>	SWI/SNF Related BAF Chromatin Remodeling Complex Subunit ATPase 2
<i>CTH</i>	Cystathionine Gamma-Lyase
<i>CDH13</i>	Cadherin 13
<i>ALOX5AP</i>	Arachidonate 5-Lipoxygenase Activating Protein
<i>PSMB7</i>	Proteasome 20S Subunit Beta 7
<i>BCL9</i>	BCL9 Transcription Coactivator
<i>MYO1B</i>	Myosin IB
<i>LHX2</i>	LIM Homeobox 2
<i>SCIN</i>	Scinderin
<i>DENND1A</i>	DENN Domain Containing 1A
<i>LCORL</i>	Ligand Dependent Nuclear Receptor Corepressor Like
<i>ARL4A</i>	ARF Like GTPase 4A
<i>PRPF18</i>	Pre-mRNA Processing Factor 18
<i>NABP1</i>	Nucleic Acid Binding Protein 1
<i>USPL1</i>	Ubiquitin Specific Peptidase Like 1
<i>MEDAG</i>	Mesenteric Estrogen Dependent Adipogenesis
<i>SNORA70</i>	Small Nucleolar RNA, H/ACA Box 70
<i>SLC44A3-AS1</i>	SLC44A3 Antisense RNA 1
<i>ENSG00000234921</i>	Novel Transcript, Antisense To LHX2
<i>LINC01916</i>	Long Intergenic Non-Protein Coding RNA 1916
<i>LINC02438</i>	Long Intergenic Non-Protein Coding RNA 2438
<i>RN7SL592P</i>	RNA, 7SL, Cytoplasmic 592, Pseudogene
<i>lnc-LHX2-3</i>	
<i>HSALNG0096135</i>	
<i>LOC107987043</i>	Uncharacterized LOC107987043
<i>LOC124903146</i>	Uncharacterized LOC124903146
<i>USP21P1</i>	USP21 Pseudogene 1
<i>lnc-USPL1-2</i>	
<i>ENSG00000309798</i>	Novel Transcript
<i>LOC105378861</i>	Uncharacterized LOC105378861
<i>piR-57133-629</i>	
<i>HSALNG0033191</i>	
<i>ERBB3</i>	Erb-B2 Receptor Tyrosine Kinase 3

<i>HDAC4</i>	Histone Deacetylase 4
<i>HGF</i>	Hepatocyte Growth Factor
<i>PIK3R1</i>	Phosphoinositide-3-Kinase Regulatory Subunit 1
<i>PTCH1</i>	Patched 1
<i>LDHA</i>	Lactate Dehydrogenase A
<i>CP</i>	Ceruloplasmin
<i>KAT2B</i>	Lysine Acetyltransferase 2B
<i>PTK2B</i>	Protein Tyrosine Kinase 2 Beta
<i>RAC1</i>	Rac Family Small GTPase 1
<i>SERPINC1</i>	Serpin Family C Member 1
<i>SQSTM1</i>	Sequestosome 1
<i>ANGPT2</i>	Angiopoietin 2
<i>BRIP1</i>	BRCA1 Interacting DNA Helicase 1
<i>RAB7A</i>	RAB7A, Member RAS Oncogene Family
<i>RRM2</i>	Ribonucleotide Reductase Regulatory Subunit M2
<i>SLC2A3</i>	Solute Carrier Family 2 Member 3
<i>SMPD1</i>	Sphingomyelin Phosphodiesterase 1
<i>TAP1</i>	Transporter 1, ATP Binding Cassette Subfamily B Member
<i>FCGR2A</i>	Fc Gamma Receptor IIa
<i>MMP7</i>	Matrix Metalloproteinase 7
<i>YES1</i>	YES Proto-Oncogene 1, Src Family Tyrosine Kinase
<i>AQP5</i>	Aquaporin 5
<i>CTPS1</i>	CTP Synthase 1
<i>FBXW7</i>	F-Box And WD Repeat Domain Containing 7
<i>FEN1</i>	Flap Structure-Specific Endonuclease 1
<i>PAK6</i>	P21 (RAC1) Activated Kinase 6
<i>CEACAM1</i>	CEA Cell Adhesion Molecule 1
<i>LCN2</i>	Lipocalin 2
<i>MALT1</i>	MALT1 Paracaspase
<i>SIRT5</i>	Sirtuin 5
<i>ALPP</i>	Alkaline Phosphatase, Placental
<i>ATF3</i>	Activating Transcription Factor 3
<i>LAMP2</i>	Lysosomal Associated Membrane Protein 2
<i>ORAI1</i>	ORAI Calcium Release-Activated Calcium Modulator 1
<i>ABCB5</i>	ATP Binding Cassette Subfamily B Member 5
<i>ANXA3</i>	Annexin A3
<i>DUOX2</i>	Dual Oxidase 2
<i>NHERF1</i>	NHERF Family PDZ Scaffold Protein 1
<i>PER2</i>	Period Circadian Regulator 2
<i>RAN</i>	RAN, Member RAS Oncogene Family
<i>SLC22A2</i>	Solute Carrier Family 22 Member 2
<i>DGCR8</i>	DGCR8 Microprocessor Complex Subunit
<i>HEY1</i>	Hes Related Family BHLH Transcription Factor With YRPW Motif 1

<i>IL15</i>	Interleukin 15
<i>POU2F1</i>	POU Class 2 Homeobox 1
<i>TFF3</i>	Trefoil Factor 3
<i>ID1</i>	Inhibitor Of DNA Binding 1
<i>TRPC5</i>	Transient Receptor Potential Cation Channel Subfamily C Member 5
<i>ABCF1</i>	ATP Binding Cassette Subfamily F Member 1
<i>ATP5PF</i>	ATP Synthase Peripheral Stalk Subunit F6
<i>DDX20</i>	DEAD-Box Helicase 20
<i>HOXD13</i>	Homeobox D13
<i>PPP1R15A</i>	Protein Phosphatase 1 Regulatory Subunit 15A
<i>XPO5</i>	Exportin 5
<i>CALB2</i>	Calbindin 2
<i>MUC4</i>	Mucin 4, Cell Surface Associated
<i>PROK2</i>	Prokineticin 2
<i>ZBTB7A</i>	Zinc Finger And BTB Domain Containing 7A
<i>GEMIN4</i>	Gem Nuclear Organelle Associated Protein 4
<i>MTIF2</i>	Mitochondrial Translational Initiation Factor 2
<i>RBFOX3</i>	RNA Binding Fox-1 Homolog 3
<i>TARBP2</i>	TARBP2 Subunit Of RISC Loading Complex
<i>CRIP1</i>	Cysteine Rich Protein 1
<i>GALNT10</i>	Polypeptide N-Acetylgalactosaminyltransferase 10
<i>CD24</i>	CD24 Molecule
<i>LAPTM4A</i>	Lysosomal Protein Transmembrane 4 Alpha
<i>MUC3A</i>	Mucin 3A, Cell Surface Associated
<i>ASCL2</i>	Achaete-Scute Family BHLH Transcription Factor 2
<i>RHBDD2</i>	Rhomboid Domain Containing 2
<i>SLC38A6</i>	Solute Carrier Family 38 Member 6
<i>SHISA4</i>	Shisa Family Member 4
<i>MIR146A</i>	MicroRNA 146a
<i>MIR93</i>	MicroRNA 93
<i>MIR16-1</i>	MicroRNA 16-1
<i>MIR196A2</i>	MicroRNA 196a-2
<i>MIR197</i>	MicroRNA 197
<i>LINC00261</i>	Long Intergenic Non-Protein Coding RNA 261
<i>MIR30A</i>	MicroRNA 30a
<i>MIR423</i>	MicroRNA 423
<i>MIR485</i>	MicroRNA 485
<i>MIR15A</i>	MicroRNA 15a
<i>TMPO-AS1</i>	TMPO Antisense RNA 1
<i>MIR20B</i>	MicroRNA 20b
<i>MIR604</i>	MicroRNA 604
<i>CCAT2</i>	Colon Cancer Associated Transcript 2
<i>TRX-CAT1-2</i>	TRNA-IMet (Anticodon CAT) 1-2

<i>MIR1291</i>	MicroRNA 1291
<i>NT5C3A</i>	5'-Nucleotidase, Cytosolic IIIA
<i>PIGN</i>	Phosphatidylinositol Glycan Anchor Biosynthesis Class N
<i>DPH5</i>	Diphthamide Biosynthesis 5
<i>HS3ST3B1</i>	Heparan Sulfate-Glucosamine 3-Sulfotransferase 3B1
<i>PTER</i>	Phosphotriesterase Related
<i>SOX14</i>	SRY-Box Transcription Factor 14
<i>OR52B2</i>	Olfactory Receptor Family 52 Subfamily B Member 2
<i>OR6P1</i>	Olfactory Receptor Family 6 Subfamily P Member 1
<i>GMNN</i>	Geminin DNA Replication Inhibitor
<i>UCKL1</i>	Uridine-Cytidine Kinase 1 Like 1
<i>ATAD5</i>	ATPase Family AAA Domain Containing 5
<i>RAF1</i>	Raf-1 Proto-Oncogene, Serine/Threonine Kinase
<i>EP300</i>	EP300 Lysine Acetyltransferase
<i>SMO</i>	Smoothened, Frizzled Class Receptor
<i>DNMT3B</i>	DNA Methyltransferase 3 Beta
<i>EPAS1</i>	Endothelial PAS Domain Protein 1
<i>FN1</i>	Fibronectin 1
<i>MAP3K1</i>	Mitogen-Activated Protein Kinase Kinase Kinase 1
<i>SCN5A</i>	Sodium Voltage-Gated Channel Alpha Subunit 5
<i>STAT5A</i>	Signal Transducer And Activator Of Transcription 5A
<i>WNT5A</i>	Wnt Family Member 5A
<i>EIF4E</i>	Eukaryotic Translation Initiation Factor 4E
<i>ENO1</i>	Enolase 1
<i>NLRP3</i>	NLR Family Pyrin Domain Containing 3
<i>OPRM1</i>	Opioid Receptor Mu 1
<i>TRPV1</i>	Transient Receptor Potential Cation Channel Subfamily V Member 1
<i>CAD</i>	Carbamoyl-Phosphate Synthetase 2, Aspartate Transcarbamylase, And Dihydroorotase
<i>CYBB</i>	Cytochrome B-245 Beta Chain
<i>ESR2</i>	Estrogen Receptor 2
<i>RRM2B</i>	Ribonucleotide Reductase Regulatory TP53 Inducible Subunit M2B
<i>ANGPT1</i>	Angiopietin 1
<i>COL1A2</i>	Collagen Type I Alpha 2 Chain
<i>CPS1</i>	Carbamoyl-Phosphate Synthase 1
<i>DVL1</i>	Dishevelled Segment Polarity Protein 1
<i>HPRT1</i>	Hypoxanthine Phosphoribosyltransferase 1
<i>PC</i>	Pyruvate Carboxylase
<i>PRKCH</i>	Protein Kinase C Eta
<i>SLC2A4</i>	Solute Carrier Family 2 Member 4
<i>TTR</i>	Transthyretin
<i>USP9X</i>	Ubiquitin Specific Peptidase 9 X-Linked
<i>YY1</i>	YY1 Transcription Factor

<i>ALDH5A1</i>	Aldehyde Dehydrogenase 5 Family Member A1
<i>BUB3</i>	BUB3 Mitotic Checkpoint Protein
<i>CBLB</i>	Cbl Proto-Oncogene B
<i>EZH1</i>	Enhancer Of Zeste 1 Polycomb Repressive Complex 2 Subunit
<i>IHH</i>	Indian Hedgehog Signaling Molecule
<i>KRT8</i>	Keratin 8
<i>MTHFD1</i>	Methylenetetrahydrofolate Dehydrogenase, Cyclohydrolase And Formyltetrahydrofolate Synthetase 1
<i>NME2</i>	NME/NM23 Nucleoside Diphosphate Kinase 2
<i>NSD2</i>	Nuclear Receptor Binding SET Domain Protein 2
<i>PFN1</i>	Profilin 1
<i>PRDX6</i>	Peroxiredoxin 6
<i>PRPS1</i>	Phosphoribosyl Pyrophosphate Synthetase 1
<i>SEMA4D</i>	Semaphorin 4D
<i>SHMT2</i>	Serine Hydroxymethyltransferase 2
<i>TRAF2</i>	TNF Receptor Associated Factor 2
<i>TXN</i>	Thioredoxin
<i>WNT1</i>	Wnt Family Member 1
<i>CALM1</i>	Calmodulin 1
<i>KLKB1</i>	Kallikrein B1
<i>SFN</i>	Stratifin
<i>BMP6</i>	Bone Morphogenetic Protein 6
<i>CXADR</i>	CXADR Cell Adhesion Molecule
<i>DNAJB1</i>	DnaJ Heat Shock Protein Family (Hsp40) Member B1
<i>ERCC5</i>	ERCC Excision Repair 5, Endonuclease
<i>NAT1</i>	N-Acetyltransferase 1
<i>NNMT</i>	Nicotinamide N-Methyltransferase
<i>PALB2</i>	Partner And Localizer Of BRCA2
<i>PNPT1</i>	Polyribonucleotide Nucleotidyltransferase 1
<i>PYCR1</i>	Pyrroline-5-Carboxylate Reductase 1
<i>S1PR2</i>	Sphingosine-1-Phosphate Receptor 2
<i>SI</i>	Sucrase-Isomaltase
<i>SOX9</i>	SRY-Box Transcription Factor 9
<i>STMN1</i>	Stathmin 1
<i>TGIF1</i>	TGFB Induced Factor Homeobox 1
<i>ADORA3</i>	Adenosine A3 Receptor
<i>CHRNA7</i>	Cholinergic Receptor Nicotinic Alpha 7 Subunit
<i>CYSLTR1</i>	Cysteinyl Leukotriene Receptor 1
<i>EPHX1</i>	Epoxide Hydrolase 1
<i>G6PC1</i>	Glucose-6-Phosphatase Catalytic Subunit 1
<i>H6PD</i>	Hexose-6-Phosphate Dehydrogenase/Glucose 1-Dehydrogenase
<i>ICAM2</i>	Intercellular Adhesion Molecule 2
<i>KRT10</i>	Keratin 10

<i>NFIB</i>	Nuclear Factor I B
<i>NSUN2</i>	NOP2/Sun RNA Methyltransferase 2
<i>OSM</i>	Oncostatin M
<i>SLC25A10</i>	Solute Carrier Family 25 Member 10
<i>BNIP3L</i>	BCL2 Interacting Protein 3 Like
<i>HSPE1</i>	Heat Shock Protein Family E (Hsp10) Member 1
<i>KSR1</i>	Kinase Suppressor Of Ras 1
<i>LTA</i>	Lymphotoxin Alpha
<i>MAP3K14</i>	Mitogen-Activated Protein Kinase Kinase Kinase 14
<i>MDC1</i>	Mediator Of DNA Damage Checkpoint 1
<i>PDCD4</i>	Programmed Cell Death 4
<i>PTGES</i>	Prostaglandin E Synthase
<i>SDC2</i>	Syndecan 2
<i>SIX1</i>	SIX Homeobox 1
<i>SUFU</i>	SUFU Negative Regulator Of Hedgehog Signaling
<i>TNFRSF12A</i>	TNF Receptor Superfamily Member 12A
<i>BBC3</i>	BCL2 Binding Component 3
<i>CCNO</i>	Cyclin O
<i>CTNNBIP1</i>	Catenin Beta Interacting Protein 1
<i>DDX17</i>	DEAD-Box Helicase 17
<i>ICAM3</i>	Intercellular Adhesion Molecule 3
<i>PROKR2</i>	Prokineticin Receptor 2
<i>RPL17</i>	Ribosomal Protein L17
<i>SORBS1</i>	Sorbin And SH3 Domain Containing 1
<i>TFCP2</i>	Transcription Factor CP2
<i>TXNIP</i>	Thioredoxin Interacting Protein
<i>CD109</i>	CD109 Molecule
<i>GOLPH3</i>	Golgi Phosphoprotein 3
<i>KRT9</i>	Keratin 9
<i>METTL1</i>	Methyltransferase 1, tRNA Methylguanosine
<i>NUAK1</i>	NUAK Family Kinase 1
<i>ORC6</i>	Origin Recognition Complex Subunit 6
<i>PFN2</i>	Profilin 2
<i>RBKS</i>	Ribokinase
<i>SCG5</i>	Secretogranin V
<i>SRM</i>	Spermidine Synthase
<i>TERF2IP</i>	TERF2 Interacting Protein
<i>ISG20</i>	Interferon Stimulated Exonuclease Gene 20
<i>UTS2</i>	Urotensin 2
<i>H3C1</i>	H3 Clustered Histone 1
<i>KLF8</i>	KLF Transcription Factor 8
<i>NKRF</i>	NFKB Repressing Factor
<i>SSRP1</i>	Structure Specific Recognition Protein 1

<i>NLRC5</i>	NLR Family CARD Domain Containing 5
<i>SART1</i>	Spliceosome Associated Factor 1, Recruiter Of U4/U6.U5 Tri-SnRNP
<i>TMSB10</i>	Thymosin Beta 10
<i>ADPRH</i>	ADP-Ribosylarginine Hydrolase
<i>H4C1</i>	H4 Clustered Histone 1
<i>MESP1</i>	Mesoderm Posterior BHLH Transcription Factor 1
<i>OPN3</i>	Opsin 3
<i>PLEKHA8</i>	Pleckstrin Homology Domain Containing A8
<i>ARHGAP17</i>	Rho GTPase Activating Protein 17
<i>CTPS2</i>	CTP Synthase 2
<i>MRPL23</i>	Mitochondrial Ribosomal Protein L23
<i>UPRT</i>	Uracil Phosphoribosyltransferase Homolog
<i>DEFA5</i>	Defensin Alpha 5
<i>KLF17</i>	KLF Transcription Factor 17
<i>ZNF24</i>	Zinc Finger Protein 24
<i>DUSP8</i>	Dual Specificity Phosphatase 8
<i>BTG3</i>	BTG Anti-Proliferation Factor 3
<i>SERTAD1</i>	SERTA Domain Containing 1
<i>SLC35F5</i>	Solute Carrier Family 35 Member F5
<i>B3GNT8</i>	UDP-GlcNAc:BetaGal Beta-1,3-N-Acetylglucosaminyltransferase 8
<i>ECRG4</i>	ECRG4 Augurin Precursor
<i>BCL2L15</i>	BCL2 Like 15
<i>TERC</i>	Telomerase RNA Component
<i>MIAT</i>	Myocardial Infarction Associated Transcript
<i>HOTAIR</i>	HOX Transcript Antisense RNA
<i>SOX2-OT</i>	SOX2 Overlapping Transcript
<i>LINC00467</i>	Long Intergenic Non-Protein Coding RNA 467
<i>MIR10B</i>	MicroRNA 10b
<i>MIR192</i>	MicroRNA 192
<i>MIR326</i>	MicroRNA 326
<i>MIR433</i>	MicroRNA 433
<i>DGCR5</i>	DiGeorge Syndrome Critical Region Gene 5
<i>MIR129-2</i>	MicroRNA 129-2
<i>MIR29B1</i>	MicroRNA 29b-1
<i>MIR375</i>	MicroRNA 375
<i>MIR503</i>	MicroRNA 503
<i>MIR1224</i>	MicroRNA 1224
<i>MIR16-2</i>	MicroRNA 16-2
<i>MIR181D</i>	MicroRNA 181d
<i>MIR195</i>	MicroRNA 195
<i>MIR103A1</i>	MicroRNA 103a-1
<i>MIR103A2</i>	MicroRNA 103a-2
<i>MIR129-1</i>	MicroRNA 129-1

<i>MIR218-1</i>	MicroRNA 218-1
<i>MIR501</i>	MicroRNA 501
<i>FOXD3-AS1</i>	FOXD3 Antisense RNA 1
<i>MIR218-2</i>	MicroRNA 218-2
<i>MIR513A1</i>	MicroRNA 513a-1
<i>MIR532</i>	MicroRNA 532
<i>PCAT6</i>	Prostate Cancer Associated Transcript 6
<i>SCARNA8</i>	Small Cajal Body-Specific RNA 8
<i>MIR492</i>	MicroRNA 492
<i>MIR320C1</i>	MicroRNA 320c-1
<i>MIR487A</i>	MicroRNA 487a
<i>BACE1-AS</i>	BACE1 Antisense RNA
<i>MIR638</i>	MicroRNA 638
<i>P2RX5-TAX1BP3</i>	P2RX5-TAX1BP3 Readthrough (NMD Candidate)
<i>APCDD1L-DT</i>	APCDD1L Divergent Transcript
<i>MIR320C2</i>	MicroRNA 320c-2
<i>MIR300</i>	MicroRNA 300
<i>SLC1A2-AS1</i>	SLC1A2 Antisense RNA 1
<i>LOC111365171</i>	Long Non-Coding RNA ENST00000547547
<i>LOC111832670</i>	Alpha Fetoprotein (AFP) 5' Regulatory Region
<i>CD4</i>	CD4 Molecule
<i>IL4</i>	Interleukin 4
<i>KRT16</i>	Keratin 16
<i>RPA1</i>	Replication Protein A1
<i>IL2RB</i>	Interleukin 2 Receptor Subunit Beta
<i>LBR</i>	Lamin B Receptor
<i>ADAM12</i>	ADAM Metallopeptidase Domain 12
<i>HMGB2</i>	High Mobility Group Box 2
<i>VPS33B</i>	VPS33B Late Endosome And Lysosome Associated
<i>POU2F3</i>	POU Class 2 Homeobox 3
<i>GLIPR1</i>	GLI Pathogenesis Related 1
<i>PTBP3</i>	Polypyrimidine Tract Binding Protein 3
<i>MIR26B</i>	MicroRNA 26b
<i>MIR106B</i>	MicroRNA 106b
<i>MIR30B</i>	MicroRNA 30b
<i>MIR330</i>	MicroRNA 330
<i>MIR96</i>	MicroRNA 96
<i>MIR19A</i>	MicroRNA 19a
<i>MIR582</i>	MicroRNA 582
<i>MIR186</i>	MicroRNA 186
<i>MIR301A</i>	MicroRNA 301a
<i>MIR99B</i>	MicroRNA 99b
<i>MIRLET7G</i>	MicroRNA Let-7g

<i>MIR133A2</i>	MicroRNA 133a-2
<i>MIR19B1</i>	MicroRNA 19b-1
<i>MIR323A</i>	MicroRNA 323a
<i>MIR224</i>	MicroRNA 224
<i>RNY3</i>	RNA, Ro60-Associated Y3
<i>MIR320D1</i>	MicroRNA 320d-1
<i>MIR320D2</i>	MicroRNA 320d-2
<i>MIR19B2</i>	MicroRNA 19b-2
<i>MIR513B</i>	MicroRNA 513b
<i>MIR623</i>	MicroRNA 623
<i>MIR374C</i>	MicroRNA 374c
<i>SMAD7</i>	SMAD Family Member 7
<i>IL5</i>	Interleukin 5
<i>IL13</i>	Interleukin 13
<i>IL17A</i>	Interleukin 17A
<i>IL22</i>	Interleukin 22
<i>FLG</i>	Filaggrin
<i>TSLP</i>	Thymic Stromal Lymphopoietin
<i>CCL17</i>	C-C Motif Chemokine Ligand 17
<i>IL31</i>	Interleukin 31
<i>FLG2</i>	Filaggrin 2
<i>LORICRIN</i>	Loricrin Cornified Envelope Precursor Protein
<i>OR2B3</i>	Olfactory Receptor Family 2 Subfamily B Member 3
<i>RNF43</i>	Ring Finger Protein 43
<i>PGR</i>	Progesterone Receptor
<i>GSTT1</i>	Glutathione S-Transferase Theta 1
<i>CDA</i>	Cytidine Deaminase
<i>POLH</i>	DNA Polymerase Eta
<i>TOMM34</i>	Translocase Of Outer Mitochondrial Membrane 34
<i>FASTKD3</i>	FAST Kinase Domains 3
<i>TNFRSF10B</i>	TNF Receptor Superfamily Member 10b
<i>CES1</i>	Carboxylesterase 1
<i>KIT</i>	KIT Proto-Oncogene, Receptor Tyrosine Kinase
<i>CD44</i>	CD44 Molecule (IN Blood Group)
<i>RB1</i>	RB Transcriptional Corepressor 1
<i>LINC02605</i>	Long Intergenic Non-Protein Coding RNA 2605
<i>KDR</i>	Kinase Insert Domain Receptor
<i>GSK3B</i>	Glycogen Synthase Kinase 3 Beta
<i>TNFRSF10A</i>	TNF Receptor Superfamily Member 10a
<i>SIRT7</i>	Sirtuin 7
<i>SLC15A1</i>	Solute Carrier Family 15 Member 1
<i>IFI27</i>	Interferon Alpha Inducible Protein 27
<i>PCAT1</i>	Prostate Cancer Associated Transcript 1

<i>GSR</i>	Glutathione-Disulfide Reductase
<i>MTR</i>	5-Methyltetrahydrofolate-Homocysteine Methyltransferase
<i>ALDH1A3</i>	Aldehyde Dehydrogenase 1 Family Member A3
<i>CD274</i>	CD274 Molecule
<i>NR4A2</i>	Nuclear Receptor Subfamily 4 Group A Member 2
<i>XRCC6</i>	X-Ray Repair Cross Complementing 6
<i>PTPRU</i>	Protein Tyrosine Phosphatase Receptor Type U
<i>MIR155</i>	MicroRNA 155
<i>FLT1</i>	Fms Related Receptor Tyrosine Kinase 1
<i>PRKCB</i>	Protein Kinase C Beta
<i>SPARC</i>	Secreted Protein Acidic And Cysteine Rich
<i>TUBB</i>	Tubulin Beta Class I
<i>NRP1</i>	Neuropilin 1
<i>CCNB1</i>	Cyclin B1
<i>CA9</i>	Carbonic Anhydrase 9
<i>PRKAA1</i>	Protein Kinase AMP-Activated Catalytic Subunit Alpha 1
<i>XPA</i>	XPA, DNA Damage Recognition And Repair Factor
<i>GADD45A</i>	Growth Arrest And DNA Damage Inducible Alpha
<i>CES2</i>	Carboxylesterase 2
<i>THPO</i>	Thrombopoietin
<i>TNFRSF10C</i>	TNF Receptor Superfamily Member 10c
<i>YBX3</i>	Y-Box Binding Protein 3
<i>MALAT1</i>	Metastasis Associated Lung Adenocarcinoma Transcript 1
<i>NEAT1</i>	Nuclear Paraspeckle Assembly Transcript 1
<i>MIR148A</i>	MicroRNA 148a
<i>DLGAP1-AS1</i>	DLGAP1 Antisense RNA 1
<i>BANCR</i>	BRAF-Activated Non-Protein Coding RNA
<i>ABL1</i>	ABL Proto-Oncogene 1, Non-Receptor Tyrosine Kinase
<i>AKT2</i>	AKT Serine/Threonine Kinase 2
<i>EZH2</i>	Enhancer Of Zeste 2 Polycomb Repressive Complex 2 Subunit
<i>JAK2</i>	Janus Kinase 2
<i>STAT1</i>	Signal Transducer And Activator Of Transcription 1
<i>CAT</i>	Catalase
<i>HDAC1</i>	Histone Deacetylase 1
<i>RELA</i>	RELA Proto-Oncogene, NF-KB Subunit
<i>TUBB3</i>	Tubulin Beta 3 Class III
<i>HSPA9</i>	Heat Shock Protein Family A (Hsp70) Member 9
<i>KLK3</i>	Kallikrein Related Peptidase 3
<i>UBE2I</i>	Ubiquitin Conjugating Enzyme E2 I
<i>BCL2L11</i>	BCL2 Like 11
<i>NUMB</i>	NUMB Endocytic Adaptor Protein
<i>BSG</i>	Basigin (Ok Blood Group)
<i>DAXX</i>	Death Domain Associated Protein

<i>DDB1</i>	Damage Specific DNA Binding Protein 1
<i>NQO2</i>	N-Ribosyldihydronicotinamide:Quinone Dehydrogenase 2
<i>SRPK2</i>	SRSF Protein Kinase 2
<i>TNFSF13</i>	TNF Superfamily Member 13
<i>TP73</i>	Tumor Protein P73
<i>XRCC5</i>	X-Ray Repair Cross Complementing 5
<i>FADS1</i>	Fatty Acid Desaturase 1
<i>GAS1</i>	Growth Arrest Specific 1
<i>AKR7A2</i>	Aldo-Keto Reductase Family 7 Member A2
<i>SRI</i>	Sorcin
<i>BIRC7</i>	Baculoviral IAP Repeat Containing 7
<i>CES3</i>	Carboxylesterase 3
<i>RNGTT</i>	RNA Guanylyltransferase And 5'-Phosphatase
<i>RPL22L1</i>	Ribosomal Protein L22 Like 1
<i>TM9SF4</i>	Transmembrane 9 Superfamily Member 4
<i>UBXN2A</i>	UBX Domain Protein 2A
<i>MIR143</i>	MicroRNA 143
<i>XIST</i>	X Inactive Specific Transcript
<i>SNHG6</i>	Small Nucleolar RNA Host Gene 6
<i>MIR519C</i>	MicroRNA 519c
<i>PWAR6</i>	Prader Willi/Angelman Region RNA 6
<i>FLT3</i>	Fms Related Receptor Tyrosine Kinase 3
<i>CTSD</i>	Cathepsin D
<i>HMOX1</i>	Heme Oxygenase 1
<i>PRKCD</i>	Protein Kinase C Delta
<i>SMAD2</i>	SMAD Family Member 2
<i>DPP4</i>	Dipeptidyl Peptidase 4
<i>GSK3A</i>	Glycogen Synthase Kinase 3 Alpha
<i>KCNH2</i>	Potassium Voltage-Gated Channel Subfamily H Member 2
<i>RARA</i>	Retinoic Acid Receptor Alpha
<i>TLR3</i>	Toll Like Receptor 3
<i>STK11</i>	Serine/Threonine Kinase 11
<i>CCNE1</i>	Cyclin E1
<i>MYH7</i>	Myosin Heavy Chain 7
<i>POU5F1</i>	POU Class 5 Homeobox 1
<i>PPARGC1A</i>	PPARG Coactivator 1 Alpha
<i>VEGFC</i>	Vascular Endothelial Growth Factor C
<i>BECN1</i>	Beclin 1
<i>ERCC4</i>	ERCC Excision Repair 4, Endonuclease Catalytic Subunit
<i>F5</i>	Coagulation Factor V
<i>HNRNPK</i>	Heterogeneous Nuclear Ribonucleoprotein K
<i>HP</i>	Haptoglobin
<i>SOX2</i>	SRY-Box Transcription Factor 2

<i>TOP2B</i>	DNA Topoisomerase II Beta
<i>LGALS3</i>	Galectin 3
<i>RHOB</i>	Ras Homolog Family Member B
<i>SKP2</i>	S-Phase Kinase Associated Protein 2
<i>SNAIL</i>	Snail Family Transcriptional Repressor 1
<i>SPP1</i>	Secreted Phosphoprotein 1
<i>TRAP1</i>	TNF Receptor Associated Protein 1
<i>UBE2C</i>	Ubiquitin Conjugating Enzyme E2 C
<i>CHGA</i>	Chromogranin A
<i>CRADD</i>	CARD And Death Domain Containing Adaptor Protein
<i>CUL4A</i>	Cullin 4A
<i>EFEMP1</i>	EGF Containing Fibulin Extracellular Matrix Protein 1
<i>FZD7</i>	Frizzled Class Receptor 7
<i>KRT7</i>	Keratin 7
<i>POSTN</i>	Periostin
<i>SERPINB5</i>	Serpin Family B Member 5
<i>CD276</i>	CD276 Molecule
<i>CIB1</i>	Calcium And Integrin Binding 1
<i>CUL4B</i>	Cullin 4B
<i>SLC46A1</i>	Solute Carrier Family 46 Member 1
<i>PAWR</i>	Pro-Apoptotic WT1 Regulator
<i>GAST</i>	Gastrin
<i>PRPF8</i>	Pre-mRNA Processing Factor 8
<i>RBL1</i>	RB Transcriptional Corepressor Like 1
<i>RRAGB</i>	Ras Related GTP Binding B
<i>PIDD1</i>	P53-Induced Death Domain Protein 1
<i>XAF1</i>	XIAP Associated Factor 1
<i>PGAM5</i>	PGAM Family Member 5, Mitochondrial Serine/Threonine Protein Phosphatase
<i>IFI6</i>	Interferon Alpha Inducible Protein 6
<i>RTKN</i>	Rhotekin
<i>SIVA1</i>	SIVA1 Apoptosis Inducing Factor
<i>MARCHF1</i>	Membrane Associated Ring-CH-Type Finger 1
<i>MIR140</i>	MicroRNA 140
<i>MIR211</i>	MicroRNA 211
<i>MIR196B</i>	MicroRNA 196b
<i>MIR193A</i>	MicroRNA 193a
<i>SNHG16</i>	Small Nucleolar RNA Host Gene 16
<i>FEZF1-AS1</i>	FEZF1 Antisense RNA 1
<i>MIR320E</i>	MicroRNA 320e
<i>PWAR1</i>	Prader Willi/Angelman Region RNA 1
<i>MIR762</i>	MicroRNA 762
<i>LOC110806263</i>	TERT 5' Regulatory Region
<i>AKT3</i>	AKT Serine/Threonine Kinase 3

<i>HDAC6</i>	Histone Deacetylase 6
<i>FLT4</i>	Fms Related Receptor Tyrosine Kinase 4
<i>ACVRL1</i>	Activin A Receptor Like Type 1
<i>CD40</i>	CD40 Molecule
<i>HMGB1</i>	High Mobility Group Box 1
<i>KAT5</i>	Lysine Acetyltransferase 5
<i>RRM1</i>	Ribonucleotide Reductase Catalytic Subunit M1
<i>TF</i>	Transferrin
<i>TGFB2</i>	Transforming Growth Factor Beta 2
<i>ALOX5</i>	Arachidonate 5-Lipoxygenase
<i>ANPEP</i>	Alanyl Aminopeptidase, Membrane
<i>ASAH1</i>	N-Acylsphingosine Amidohydrolase 1
<i>B2M</i>	Beta-2-Microglobulin
<i>CASP1</i>	Caspase 1
<i>FASN</i>	Fatty Acid Synthase
<i>G6PD</i>	Glucose-6-Phosphate Dehydrogenase
<i>GUSB</i>	Glucuronidase Beta
<i>ITGA6</i>	Integrin Subunit Alpha 6
<i>MMP3</i>	Matrix Metallopeptidase 3
<i>P4HB</i>	Prolyl 4-Hydroxylase Subunit Beta
<i>PGK1</i>	Phosphoglycerate Kinase 1
<i>PRDX1</i>	Peroxiredoxin 1
<i>IGF2</i>	Insulin Like Growth Factor 2
<i>MRE11</i>	MRE11 Homolog, Double Strand Break Repair Nuclease
<i>PMS2</i>	PMS1 Homolog 2, Mismatch Repair System Component
<i>ZEB1</i>	Zinc Finger E-Box Binding Homeobox 1
<i>AHR</i>	Aryl Hydrocarbon Receptor
<i>ATF4</i>	Activating Transcription Factor 4
<i>CDH5</i>	Cadherin 5
<i>ENG</i>	Endoglin
<i>IL1R1</i>	Interleukin 1 Receptor Type 1
<i>P2RX7</i>	Purinergic Receptor P2X 7
<i>PDCD1</i>	Programmed Cell Death 1
<i>PDK1</i>	Pyruvate Dehydrogenase Kinase 1
<i>PIK3C2A</i>	Phosphatidylinositol-4-Phosphate 3-Kinase Catalytic Subunit Type 2 Alpha
<i>PRMT5</i>	Protein Arginine Methyltransferase 5
<i>TYR</i>	Tyrosinase
<i>XPO1</i>	Exportin 1
<i>ACLY</i>	ATP Citrate Lyase
<i>APRT</i>	Adenine Phosphoribosyltransferase
<i>ASNS</i>	Asparagine Synthetase (Glutamine-Hydrolyzing)
<i>CYP2B6</i>	Cytochrome P450 Family 2 Subfamily B Member 6
<i>FTO</i>	FTO Alpha-Ketoglutarate Dependent Dioxxygenase

<i>GSS</i>	Glutathione Synthetase
<i>HNRNPA2B1</i>	Heterogeneous Nuclear Ribonucleoprotein A2/B1
<i>HTRA2</i>	HtrA Serine Peptidase 2
<i>IGFBP7</i>	Insulin Like Growth Factor Binding Protein 7
<i>LEP</i>	Leptin
<i>LOXL2</i>	Lysyl Oxidase Like 2
<i>NR1H2</i>	Nuclear Receptor Subfamily 1 Group H Member 2
<i>OTC</i>	Ornithine Transcarbamylase
<i>TPI1</i>	Triosephosphate Isomerase 1
<i>TRAF6</i>	TNF Receptor Associated Factor 6
<i>TSPO</i>	Translocator Protein
<i>ATIC</i>	5-Aminoimidazole-4-Carboxamide Ribonucleotide Formyltransferase/IMP Cyclohydrolase
<i>DLAT</i>	Dihydrolipoamide S-Acetyltransferase
<i>NTN1</i>	Netrin 1
<i>PDX1</i>	Pancreatic And Duodenal Homeobox 1
<i>PTPA</i>	Protein Phosphatase 2 Phosphatase Activator
<i>TP63</i>	Tumor Protein P63
<i>TXNRD1</i>	Thioredoxin Reductase 1
<i>AKR1C3</i>	Aldo-Keto Reductase Family 1 Member C3
<i>CCKBR</i>	Cholecystokinin B Receptor
<i>DYRK1B</i>	Dual Specificity Tyrosine Phosphorylation Regulated Kinase 1B
<i>FOXA1</i>	Forkhead Box A1
<i>HMGA2</i>	High Mobility Group AT-Hook 2
<i>NRCAM</i>	Neuronal Cell Adhesion Molecule
<i>RAD21</i>	RAD21 Cohesin Complex Component
<i>SMARCE1</i>	SWI/SNF Related BAF Chromatin Remodeling Complex Subunit E1
<i>TFAM</i>	Transcription Factor A, Mitochondrial
<i>TRIM28</i>	Tripartite Motif Containing 28
<i>TUBA1B</i>	Tubulin Alpha 1b
<i>CD226</i>	CD226 Molecule
<i>CDH17</i>	Cadherin 17
<i>LDHB</i>	Lactate Dehydrogenase B
<i>MCCC2</i>	Methylcrotonyl-CoA Carboxylase Subunit 2
<i>MED1</i>	Mediator Complex Subunit 1
<i>MSH3</i>	MutS Homolog 3
<i>PGF</i>	Placental Growth Factor
<i>RASSF1</i>	Ras Association Domain Family Member 1
<i>RPS27A</i>	Ribosomal Protein S27a
<i>SLC29A2</i>	Solute Carrier Family 29 Member 2
<i>SOAT1</i>	Sterol O-Acyltransferase 1
<i>SP3</i>	Sp3 Transcription Factor
<i>SP11</i>	Spi-1 Proto-Oncogene

<i>SRPK1</i>	SRSF Protein Kinase 1
<i>UGT2B7</i>	UDP Glucuronosyltransferase Family 2 Member B7
<i>VEGFB</i>	Vascular Endothelial Growth Factor B
<i>ACP3</i>	Acid Phosphatase 3
<i>ALDH9A1</i>	Aldehyde Dehydrogenase 9 Family Member A1
<i>BAG3</i>	BAG Cochaperone 3
<i>CITED2</i>	Cbp/P300 Interacting Transactivator With Glu/Asp Rich Carboxy-Terminal Domain 2
<i>COPS5</i>	COP9 Signalosome Subunit 5
<i>GCG</i>	Glucagon
<i>GSTA1</i>	Glutathione S-Transferase Alpha 1
<i>HNRNPH1</i>	Heterogeneous Nuclear Ribonucleoprotein H1
<i>ING1</i>	Inhibitor Of Growth Family Member 1
<i>LCP1</i>	Lymphocyte Cytosolic Protein 1
<i>METTL3</i>	Methyltransferase 3, N6-Adenosine-Methyltransferase Complex Catalytic Subunit
<i>MTA1</i>	Metastasis Associated 1
<i>RAB1A</i>	RAB1A, Member RAS Oncogene Family
<i>RECQL</i>	RecQ Like Helicase
<i>VAV3</i>	Vav Guanine Nucleotide Exchange Factor 3
<i>BAAT</i>	Bile Acid-CoA:Amino Acid N-Acyltransferase
<i>CDKN3</i>	Cyclin Dependent Kinase Inhibitor 3
<i>CRTC1</i>	CREB Regulated Transcription Coactivator 1
<i>PECAM1</i>	Platelet And Endothelial Cell Adhesion Molecule 1
<i>PYCARD</i>	PYD And CARD Domain Containing
<i>RAD18</i>	RAD18 E3 Ubiquitin Protein Ligase
<i>TNFSF4</i>	TNF Superfamily Member 4
<i>AMD1</i>	Adenosylmethionine Decarboxylase 1
<i>BIK</i>	BCL2 Interacting Killer
<i>CMPK1</i>	Cytidine/Uridine Monophosphate Kinase 1
<i>CSE1L</i>	Chromosome Segregation 1 Like
<i>DKK3</i>	Dickkopf Wnt Signaling Pathway Inhibitor 3
<i>GNRH1</i>	Gonadotropin Releasing Hormone 1
<i>HMGB3</i>	High Mobility Group Box 3
<i>IFITM1</i>	Interferon Induced Transmembrane Protein 1
<i>KIF4A</i>	Kinesin Family Member 4A
<i>KISS1</i>	KiSS-1 Metastasis Suppressor
<i>KRT20</i>	Keratin 20
<i>RBBP7</i>	RB Binding Protein 7, Chromatin Remodeling Factor
<i>RGS6</i>	Regulator Of G Protein Signaling 6
<i>TNFRSF10D</i>	TNF Receptor Superfamily Member 10d
<i>WNT6</i>	Wnt Family Member 6
<i>AGR2</i>	Anterior Gradient 2, Protein Disulphide Isomerase Family Member
<i>ASGR2</i>	Asialoglycoprotein Receptor 2
<i>BTG2</i>	BTG Anti-Proliferation Factor 2

<i>CXCL9</i>	C-X-C Motif Chemokine Ligand 9
<i>DAB2IP</i>	DAB2 Interacting Protein
<i>DYRK3</i>	Dual Specificity Tyrosine Phosphorylation Regulated Kinase 3
<i>KLK10</i>	Kallikrein Related Peptidase 10
<i>LSP1</i>	Lymphocyte Specific Protein 1
<i>MUC16</i>	Mucin 16, Cell Surface Associated
<i>SESN2</i>	Sestrin 2
<i>SPOCK1</i>	SPARC (Osteonectin), Cwcv And Kazal Like Domains Proteoglycan 1
<i>SYNCRIP</i>	Synaptotagmin Binding Cytoplasmic RNA Interacting Protein
<i>PSMD10</i>	Proteasome 26S Subunit, Non-ATPase 10
<i>WDR77</i>	WD Repeat Domain 77
<i>ATP6V1H</i>	ATPase H ⁺ Transporting V1 Subunit H
<i>CEACAM7</i>	CEA Cell Adhesion Molecule 7
<i>GBP1</i>	Guanylate Binding Protein 1
<i>NUS1</i>	NUS1 Dehydrololichyl Diphosphate Synthase Subunit
<i>RPL28</i>	Ribosomal Protein L28
<i>UBE2R2</i>	Ubiquitin Conjugating Enzyme E2 R2
<i>WWTR1</i>	WW Domain Containing Transcription Regulator 1
<i>CCNG2</i>	Cyclin G2
<i>DCAF7</i>	DDB1 And CUL4 Associated Factor 7
<i>DNAH8</i>	Dynein Axonemal Heavy Chain 8
<i>DTL</i>	Denticleless E3 Ubiquitin Protein Ligase Homolog
<i>TRMT2A</i>	TRNA Methyltransferase 2A
<i>MAML2</i>	Mastermind Like Transcriptional Coactivator 2
<i>SCARA5</i>	Scavenger Receptor Class A Member 5
<i>ARHGAP18</i>	Rho GTPase Activating Protein 18
<i>BCL6B</i>	BCL6B Transcription Repressor
<i>EP400</i>	E1A Binding Protein P400
<i>FXYD3</i>	FXYD Domain Containing Ion Transport Regulator 3
<i>OXGR1</i>	Oxoglutarate Receptor 1
<i>PINX1</i>	PIN2 (TERF1) Interacting Telomerase Inhibitor 1
<i>POLR1H</i>	RNA Polymerase I Subunit H
<i>RPS27L</i>	Ribosomal Protein S27 Like
<i>CAVIN2</i>	Caveolae Associated Protein 2
<i>MT1G</i>	Metallothionein 1G
<i>MT-ND2</i>	Mitochondrially Encoded NADH:Ubiquinone Oxidoreductase Core Subunit 2
<i>PRAP1</i>	Proline Rich Acidic Protein 1
<i>COPS4</i>	COP9 Signalosome Subunit 4
<i>FOXK1</i>	Forkhead Box K1
<i>DCAF11</i>	DDB1 And CUL4 Associated Factor 11
<i>DCAF5</i>	DDB1 And CUL4 Associated Factor 5
<i>TRMT2B</i>	TRNA Methyltransferase 2B
<i>ZKSCAN3</i>	Zinc Finger With KRAB And SCAN Domains 3

<i>MT1M</i>	Metallothionein 1M
<i>ATOX8</i>	Atonal BHLH Transcription Factor 8
<i>WT1-AS</i>	WT1 Antisense RNA
<i>MIR22HG</i>	MIR22 Host Gene
<i>ATXN8OS</i>	ATXN8 Opposite Strand LncRNA
<i>PLEKHA8P1</i>	Pleckstrin Homology Domain Containing A8 Pseudogene 1
<i>MIR125A</i>	MicroRNA 125a
<i>MIR130A</i>	MicroRNA 130a
<i>MIR185</i>	MicroRNA 185
<i>TRA</i>	T Cell Receptor Alpha Locus
<i>MAPKAPK5-AS1</i>	MAPKAPK5 Antisense RNA 1
<i>MIR135B</i>	MicroRNA 135b
<i>MIR23B</i>	MicroRNA 23b
<i>MIR335</i>	MicroRNA 335
<i>MIRLET7B</i>	MicroRNA Let-7b
<i>SNHG1</i>	Small Nucleolar RNA Host Gene 1
<i>HOXA-AS2</i>	HOXA Cluster Antisense RNA 2
<i>HOXA-AS3</i>	HOXA Cluster Antisense RNA 3
<i>MIR365A</i>	MicroRNA 365a
<i>MIR675</i>	MicroRNA 675
<i>LINC01194</i>	Long Intergenic Non-Protein Coding RNA 1194
<i>EIF3J-DT</i>	EIF3J Divergent Transcript
<i>MIR3173</i>	MicroRNA 3173
<i>SNORD15A</i>	Small Nucleolar RNA, C/D Box 15A
<i>CCDC144NL-AS1</i>	CCDC144NL Antisense RNA 1
<i>DDX11-AS1</i>	DDX11 Antisense RNA 1
<i>HAR1B</i>	Highly Accelerated Region 1B
<i>LINC01133</i>	Long Intergenic Non-Protein Coding RNA 1133
<i>LINC01503</i>	Long Intergenic Non-Protein Coding RNA 1503
<i>MIR498</i>	MicroRNA 498
<i>MIR663A</i>	MicroRNA 663a
<i>FAS-AS1</i>	FAS Antisense RNA 1
<i>LINC00964</i>	Long Intergenic Non-Protein Coding RNA 964
<i>LINC01614</i>	Long Intergenic Non-Protein Coding RNA 1614
<i>MIR1246</i>	MicroRNA 1246
<i>PRNCR1</i>	Prostate Cancer Associated Non-Coding RNA 1
<i>MIR1229</i>	MicroRNA 1229
<i>MIR3940</i>	MicroRNA 3940
<i>MT-TP</i>	Mitochondrially Encoded tRNA-Pro (CCN)
<i>LINC01526</i>	Long Intergenic Non-Protein Coding RNA 1526
<i>MIR3195</i>	MicroRNA 3195
<i>LINC01525</i>	Long Intergenic Non-Protein Coding RNA 1525
<i>MIR520H</i>	MicroRNA 520h

<i>PPP1R13B-DT</i>	PPP1R13B Divergent Transcript
<i>DUXAP9</i>	Double Homeobox A Pseudogene 9
<i>MIR1185-2</i>	MicroRNA 1185-2
<i>MIR1204</i>	MicroRNA 1204
<i>MIR1469</i>	MicroRNA 1469
<i>MIR3621</i>	MicroRNA 3621
<i>LINC00973</i>	Long Intergenic Non-Protein Coding RNA 973
<i>MIR941-1</i>	MicroRNA 941-1
<i>MIR941-2</i>	MicroRNA 941-2
<i>MIR941-4</i>	MicroRNA 941-4
<i>LINC01567</i>	Long Intergenic Non-Protein Coding RNA 1567
<i>LNCAROD</i>	LncRNA Activating Regulator Of DKK1
<i>NCRUPAR</i>	Non-Protein Coding RNA, Upstream Of F2R/PAR1
<i>MIR664B</i>	MicroRNA 664b
<i>LINC01527</i>	Long Intergenic Non-Protein Coding RNA 1527
<i>MIR4467</i>	MicroRNA 4467
<i>MIR941-3</i>	MicroRNA 941-3
<i>MIR941-5</i>	MicroRNA 941-5
<i>SLC23A4P</i>	Solute Carrier Family 23 Member 4, Pseudogene
<i>TRG-CCC2-2</i>	TRNA-Gly (Anticodon CCC) 2-2
<i>MIR6778</i>	MicroRNA 6778
<i>LINC03145</i>	Long Intergenic Non-Protein Coding RNA 3145
<i>FRA1E</i>	Fragile Site, Aphidicolin Type, Common, Fra(1)(P21.2)
<i>PTPN11</i>	Protein Tyrosine Phosphatase Non-Receptor Type 11
<i>RET</i>	Ret Proto-Oncogene
<i>IKBKB</i>	Inhibitor Of Nuclear Factor Kappa B Kinase Subunit Beta
<i>PSEN1</i>	Presenilin 1
<i>AGTR1</i>	Angiotensin II Receptor Type 1
<i>AR</i>	Androgen Receptor
<i>AXL</i>	AXL Receptor Tyrosine Kinase
<i>BCR</i>	BCR Activator Of RhoGEF And GTPase
<i>CDK6</i>	Cyclin Dependent Kinase 6
<i>NOTCH2</i>	Notch Receptor 2
<i>PLCG2</i>	Phospholipase C Gamma 2
<i>PRKCA</i>	Protein Kinase C Alpha
<i>PROC</i>	Protein C, Inactivator Of Coagulation Factors Va And VIIIa
<i>RAD51</i>	RAD51 Recombinase
<i>UCHL1</i>	Ubiquitin C-Terminal Hydrolase L1
<i>ADA</i>	Adenosine Deaminase
<i>CBL</i>	Cbl Proto-Oncogene
<i>TLR2</i>	Toll Like Receptor 2
<i>ACAT1</i>	Acetyl-CoA Acetyltransferase 1
<i>AIFM1</i>	Apoptosis Inducing Factor Mitochondria Associated 1

<i>ALPL</i>	Alkaline Phosphatase, Biomineralization Associated
<i>APOA1</i>	Apolipoprotein A1
<i>CASR</i>	Calcium Sensing Receptor
<i>CBS</i>	Cystathionine Beta-Synthase
<i>CPT2</i>	Carnitine Palmitoyltransferase 2
<i>DYRK1A</i>	Dual Specificity Tyrosine Phosphorylation Regulated Kinase 1A
<i>GAA</i>	Alpha Glucosidase
<i>GATA3</i>	GATA Binding Protein 3
<i>HSP90AB1</i>	Heat Shock Protein 90 Alpha Family Class B Member 1
<i>IL6ST</i>	Interleukin 6 Cytokine Family Signal Transducer
<i>ITGB1</i>	Integrin Subunit Beta 1
<i>LMNA</i>	Lamin A/C
<i>PSEN2</i>	Presenilin 2
<i>PTPN6</i>	Protein Tyrosine Phosphatase Non-Receptor Type 6
<i>RPS6KA1</i>	Ribosomal Protein S6 Kinase A1
<i>RPS6KB1</i>	Ribosomal Protein S6 Kinase B1
<i>SGK1</i>	Serum/Glucocorticoid Regulated Kinase 1
<i>TBXA2R</i>	Thromboxane A2 Receptor
<i>TFRC</i>	Transferrin Receptor
<i>TLR4</i>	Toll Like Receptor 4
<i>VIM</i>	Vimentin
<i>ASS1</i>	Argininosuccinate Synthase 1
<i>BMP4</i>	Bone Morphogenetic Protein 4
<i>CACNA1G</i>	Calcium Voltage-Gated Channel Subunit Alpha1 G
<i>CCL2</i>	C-C Motif Chemokine Ligand 2
<i>CD40LG</i>	CD40 Ligand
<i>CDC25A</i>	Cell Division Cycle 25A
<i>CSNK1A1</i>	Casein Kinase 1 Alpha 1
<i>CYP17A1</i>	Cytochrome P450 Family 17 Subfamily A Member 1
<i>EIF2AK2</i>	Eukaryotic Translation Initiation Factor 2 Alpha Kinase 2
<i>FGA</i>	Fibrinogen Alpha Chain
<i>FLNA</i>	Filamin A
<i>GDNF</i>	Glial Cell Derived Neurotrophic Factor
<i>GLS</i>	Glutaminase
<i>HNF4A</i>	Hepatocyte Nuclear Factor 4 Alpha
<i>ITGB4</i>	Integrin Subunit Beta 4
<i>LEF1</i>	Lymphoid Enhancer Binding Factor 1
<i>MAP2K3</i>	Mitogen-Activated Protein Kinase Kinase 3
<i>MAP3K7</i>	Mitogen-Activated Protein Kinase Kinase Kinase 7
<i>MST1R</i>	Macrophage Stimulating 1 Receptor
<i>MTAP</i>	Methylthioadenosine Phosphorylase
<i>NCSTN</i>	Nicastrin
<i>NEK2</i>	NIMA Related Kinase 2

<i>NR3C1</i>	Nuclear Receptor Subfamily 3 Group C Member 1
<i>NTRK1</i>	Neurotrophic Receptor Tyrosine Kinase 1
<i>PDE4D</i>	Phosphodiesterase 4D
<i>PDPK1</i>	3-Phosphoinositide Dependent Protein Kinase 1
<i>PIM1</i>	Pim-1 Proto-Oncogene, Serine/Threonine Kinase
<i>PRKAA2</i>	Protein Kinase AMP-Activated Catalytic Subunit Alpha 2
<i>PRKCZ</i>	Protein Kinase C Zeta
<i>PRMT1</i>	Protein Arginine Methyltransferase 1
<i>RXRA</i>	Retinoid X Receptor Alpha
<i>SCD</i>	Stearoyl-CoA Desaturase
<i>SPR</i>	Sepiapterin Reductase
<i>STAT2</i>	Signal Transducer And Activator Of Transcription 2
<i>STIM1</i>	Stromal Interaction Molecule 1
<i>TNFRSF1A</i>	TNF Receptor Superfamily Member 1A
<i>ACTA1</i>	Actin Alpha 1, Skeletal Muscle
<i>ADAM9</i>	ADAM Metallopeptidase Domain 9
<i>ATF6</i>	Activating Transcription Factor 6
<i>ATP7B</i>	ATPase Copper Transporting Beta
<i>CAV1</i>	Caveolin 1
<i>GRK2</i>	G Protein-Coupled Receptor Kinase 2
<i>MYD88</i>	MYD88 Innate Immune Signal Transduction Adaptor
<i>NCOA3</i>	Nuclear Receptor Coactivator 3
<i>THRB</i>	Thyroid Hormone Receptor Beta
<i>TSC1</i>	TSC Complex Subunit 1
<i>ADAR</i>	Adenosine Deaminase RNA Specific
<i>AXIN1</i>	Axin 1
<i>CDC25B</i>	Cell Division Cycle 25B
<i>CDC7</i>	Cell Division Cycle 7
<i>CLU</i>	Clusterin
<i>COL3A1</i>	Collagen Type III Alpha 1 Chain
<i>CUL3</i>	Cullin 3
<i>CYP24A1</i>	Cytochrome P450 Family 24 Subfamily A Member 1
<i>DCN</i>	Decorin
<i>DES</i>	Desmin
<i>EPHA3</i>	EPH Receptor A3
<i>FANCC</i>	FA Complementation Group C
<i>FECH</i>	Ferrochelataase
<i>FLNB</i>	Filamin B
<i>FUCA1</i>	Alpha-L-Fucosidase 1
<i>GATA6</i>	GATA Binding Protein 6
<i>HNRNPA1</i>	Heterogeneous Nuclear Ribonucleoprotein A1
<i>INPPL1</i>	Inositol Polyphosphate Phosphatase Like 1
<i>INS</i>	Insulin

<i>ITCH</i>	Itchy E3 Ubiquitin Protein Ligase
<i>ITGA3</i>	Integrin Subunit Alpha 3
<i>KIF11</i>	Kinesin Family Member 11
<i>L1CAM</i>	L1 Cell Adhesion Molecule
<i>LIG1</i>	DNA Ligase 1
<i>MAPK13</i>	Mitogen-Activated Protein Kinase 13
<i>MARK2</i>	Microtubule Affinity Regulating Kinase 2
<i>MAT2A</i>	Methionine Adenosyltransferase 2A
<i>NGFR</i>	Nerve Growth Factor Receptor
<i>NOTCH4</i>	Notch Receptor 4
<i>NR4A1</i>	Nuclear Receptor Subfamily 4 Group A Member 1
<i>NRG1</i>	Neuregulin 1
<i>PARK7</i>	Parkinsonism Associated Deglycase
<i>PCCA</i>	Propionyl-CoA Carboxylase Subunit Alpha
<i>PDP1</i>	Pyruvate Dehydrogenase Phosphatase Catalytic Subunit 1
<i>PKN1</i>	Protein Kinase N1
<i>PLA2G2A</i>	Phospholipase A2 Group IIA
<i>PTK6</i>	Protein Tyrosine Kinase 6
<i>PTPRJ</i>	Protein Tyrosine Phosphatase Receptor Type J
<i>SORD</i>	Sorbitol Dehydrogenase
<i>ST14</i>	ST14 Transmembrane Serine Protease Matriptase
<i>TCF7L2</i>	Transcription Factor 7 Like 2
<i>TGM2</i>	Transglutaminase 2
<i>TLR1</i>	Toll Like Receptor 1
<i>TNNT2</i>	Troponin T2, Cardiac Type
<i>UBE3A</i>	Ubiquitin Protein Ligase E3A
<i>VHL</i>	Von Hippel-Lindau Tumor Suppressor
<i>VWF</i>	Von Willebrand Factor
<i>WNT3A</i>	Wnt Family Member 3A
<i>WRN</i>	WRN RecQ Like Helicase
<i>XDH</i>	Xanthine Dehydrogenase
<i>YWHAB</i>	Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Beta
<i>YWHAG</i>	Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Gamma
<i>YWHAQ</i>	Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Theta
<i>A2M</i>	Alpha-2-Macroglobulin
<i>ABCB4</i>	ATP Binding Cassette Subfamily B Member 4
<i>ADIPOQ</i>	Adiponectin, C1Q And Collagen Domain Containing
<i>ALPI</i>	Alkaline Phosphatase, Intestinal
<i>APOB</i>	Apolipoprotein B
<i>AQP3</i>	Aquaporin 3 (Gill Blood Group)
<i>ATF2</i>	Activating Transcription Factor 2
<i>ATP5F1A</i>	ATP Synthase F1 Subunit Alpha

<i>BCL6</i>	BCL6 Transcription Repressor
<i>CA12</i>	Carbonic Anhydrase 12
<i>CAST</i>	Calpastatin
<i>CD38</i>	CD38 Molecule
<i>CD59</i>	CD59 Molecule (CD59 Blood Group)
<i>CDH3</i>	Cadherin 3
<i>COMP</i>	Cartilage Oligomeric Matrix Protein
<i>DDIT3</i>	DNA Damage Inducible Transcript 3
<i>DDX5</i>	DEAD-Box Helicase 5
<i>DHODH</i>	Dihydroorotate Dehydrogenase (Quinone)
<i>DIABLO</i>	Diablo IAP-Binding Mitochondrial Protein
<i>DOCK1</i>	Dedicator Of Cytokinesis 1
<i>EFNB2</i>	Ephrin B2
<i>FSHR</i>	Follicle Stimulating Hormone Receptor
<i>GFPT1</i>	Glutamine--Fructose-6-Phosphate Transaminase 1
<i>GRM7</i>	Glutamate Metabotropic Receptor 7
<i>GZMB</i>	Granzyme B
<i>HMGCS2</i>	3-Hydroxy-3-Methylglutaryl-CoA Synthase 2
<i>HTR3A</i>	5-Hydroxytryptamine Receptor 3A
<i>IL1RAP</i>	Interleukin 1 Receptor Accessory Protein
<i>ILK</i>	Integrin Linked Kinase
<i>IRF8</i>	Interferon Regulatory Factor 8
<i>ISG15</i>	ISG15 Ubiquitin Like Modifier
<i>KCNA2</i>	Potassium Voltage-Gated Channel Subfamily A Member 2
<i>KCNA5</i>	Potassium Voltage-Gated Channel Subfamily A Member 5
<i>MAD1L1</i>	Mitotic Arrest Deficient 1 Like 1
<i>MAP4K4</i>	Mitogen-Activated Protein Kinase Kinase Kinase Kinase 4
<i>MB</i>	Myoglobin
<i>MMP12</i>	Matrix Metalloproteinase 12
<i>MYCN</i>	MYCN Proto-Oncogene, BHLH Transcription Factor
<i>MYH6</i>	Myosin Heavy Chain 6
<i>PKLR</i>	Pyruvate Kinase L/R
<i>PPP2R1B</i>	Protein Phosphatase 2 Scaffold Subunit Abeta
<i>PRDX2</i>	Peroxiredoxin 2
<i>RPS6KA5</i>	Ribosomal Protein S6 Kinase A5
<i>SELP</i>	Selectin P
<i>SERPINH1</i>	Serpin Family H Member 1
<i>SETD2</i>	SET Domain Containing 2, Histone Lysine Methyltransferase
<i>SH2B3</i>	SH2B Adaptor Protein 3
<i>SUMO1</i>	Small Ubiquitin Like Modifier 1
<i>SYP</i>	Synaptophysin
<i>THBS2</i>	Thrombospondin 2
<i>TNKS</i>	Tankyrase

<i>WWOX</i>	WW Domain Containing Oxidoreductase
<i>XPB1</i>	X-Box Binding Protein 1
<i>ACOX1</i>	Acyl-CoA Oxidase 1
<i>ATG5</i>	Autophagy Related 5
<i>BMP2</i>	Bone Morphogenetic Protein 2
<i>CDC45</i>	Cell Division Cycle 45
<i>CDON</i>	Cell Adhesion Associated, Oncogene Regulated
<i>CEBPB</i>	CCAAT Enhancer Binding Protein Beta
<i>CSNK2A2</i>	Casein Kinase 2 Alpha 2
<i>GHR</i>	Growth Hormone Receptor
<i>HDC</i>	Histidine Decarboxylase
<i>KRT5</i>	Keratin 5
<i>LAMB2</i>	Laminin Subunit Beta 2
<i>LSS</i>	Lanosterol Synthase
<i>MBP</i>	Myelin Basic Protein
<i>MMUT</i>	Methylmalonyl-CoA Mutase
<i>NCOA1</i>	Nuclear Receptor Coactivator 1
<i>PCK2</i>	Phosphoenolpyruvate Carboxykinase 2, Mitochondrial
<i>PTH</i>	Parathyroid Hormone
<i>PTPRO</i>	Protein Tyrosine Phosphatase Receptor Type O
<i>SMAD9</i>	SMAD Family Member 9
<i>SOC1</i>	Suppressor Of Cytokine Signaling 1
<i>SORT1</i>	Sortilin 1
<i>TACSTD2</i>	Tumor Associated Calcium Signal Transducer 2
<i>THBD</i>	Thrombomodulin
<i>WFS1</i>	Wolframin ER Transmembrane Glycoprotein
<i>ACADSB</i>	Acyl-CoA Dehydrogenase Short/Branched Chain
<i>ADCY2</i>	Adenylate Cyclase 2
<i>AKR1C2</i>	Aldo-Keto Reductase Family 1 Member C2
<i>AKR1C4</i>	Aldo-Keto Reductase Family 1 Member C4
<i>ARID1A</i>	AT-Rich Interaction Domain 1A
<i>ATP5F1B</i>	ATP Synthase F1 Subunit Beta
<i>BGN</i>	Biglycan
<i>BLMH</i>	Bleomycin Hydrolase
<i>COX5A</i>	Cytochrome C Oxidase Subunit 5A
<i>DHX9</i>	DEXH-Box Helicase 9
<i>EEF1A1</i>	Eukaryotic Translation Elongation Factor 1 Alpha 1
<i>EIF2AK4</i>	Eukaryotic Translation Initiation Factor 2 Alpha Kinase 4
<i>FOSL1</i>	FOS Like 1, AP-1 Transcription Factor Subunit
<i>GALC</i>	Galactosylceramidase
<i>GALNT3</i>	Polypeptide N-Acetylgalactosaminyltransferase 3
<i>GLO1</i>	Glyoxalase I
<i>GPD2</i>	Glycerol-3-Phosphate Dehydrogenase 2

<i>HIPK2</i>	Homeodomain Interacting Protein Kinase 2
<i>HSPA1L</i>	Heat Shock Protein Family A (Hsp70) Member 1 Like
<i>LARS2</i>	Leucyl-TRNA Synthetase 2, Mitochondrial
<i>MMP11</i>	Matrix Metalloproteinase 11
<i>NCL</i>	Nucleolin
<i>NDRG1</i>	N-Myc Downstream Regulated 1
<i>NDUFV1</i>	NADH:Ubiquinone Oxidoreductase Core Subunit V1
<i>NFS1</i>	NFS1 Cysteine Desulfurase
<i>NONO</i>	Non-POU Domain Containing Octamer Binding
<i>NRP2</i>	Neuropilin 2
<i>NUMA1</i>	Nuclear Mitotic Apparatus Protein 1
<i>P2RY2</i>	Purinergic Receptor P2Y2
<i>PDGFA</i>	Platelet Derived Growth Factor Subunit A
<i>PLK3</i>	Polo Like Kinase 3
<i>PON2</i>	Paraoxonase 2
<i>PPARA</i>	Peroxisome Proliferator Activated Receptor Alpha
<i>PPOX</i>	Protoporphyrinogen Oxidase
<i>PRDM1</i>	PR/SET Domain 1
<i>PRDX3</i>	Peroxiredoxin 3
<i>PRDX5</i>	Peroxiredoxin 5
<i>PRKAG1</i>	Protein Kinase AMP-Activated Non-Catalytic Subunit Gamma 1
<i>PTH1H</i>	Parathyroid Hormone Like Hormone
<i>PTK7</i>	Protein Tyrosine Kinase 7 (Inactive)
<i>RBL2</i>	RB Transcriptional Corepressor Like 2
<i>RBP4</i>	Retinol Binding Protein 4
<i>RPL15</i>	Ribosomal Protein L15
<i>RPS6</i>	Ribosomal Protein S6
<i>S100A4</i>	S100 Calcium Binding Protein A4
<i>SKI</i>	SKI Proto-Oncogene
<i>SLC17A5</i>	Solute Carrier Family 17 Member 5
<i>SLC31A1</i>	Solute Carrier Family 31 Member 1
<i>TGFB1</i>	Transforming Growth Factor Beta Induced
<i>TLR6</i>	Toll Like Receptor 6
<i>TREM2</i>	Triggering Receptor Expressed On Myeloid Cells 2
<i>TUFM</i>	Tu Translation Elongation Factor, Mitochondrial
<i>UGCG</i>	UDP-Glucose Ceramide Glucosyltransferase
<i>ULK1</i>	Unc-51 Like Autophagy Activating Kinase 1
<i>ACTG2</i>	Actin Gamma 2, Smooth Muscle
<i>AKR1B10</i>	Aldo-Keto Reductase Family 1 Member B10
<i>AKR1C1</i>	Aldo-Keto Reductase Family 1 Member C1
<i>ANP32A</i>	Acidic Nuclear Phosphoprotein 32 Family Member A
<i>AOX1</i>	Aldehyde Oxidase 1
<i>BCAR1</i>	BCAR1 Scaffold Protein, Cas Family Member

<i>BRCC3</i>	BRCA1/BRCA2-Containing Complex Subunit 3
<i>CALCA</i>	Calcitonin Related Polypeptide Alpha
<i>CCNB2</i>	Cyclin B2
<i>CD82</i>	CD82 Molecule
<i>CDC37</i>	Cell Division Cycle 37, HSP90 Cochaperone
<i>CDK19</i>	Cyclin Dependent Kinase 19
<i>CLDN18</i>	Claudin 18
<i>CRY1</i>	Cryptochrome Circadian Regulator 1
<i>DDIT4</i>	DNA Damage Inducible Transcript 4
<i>DGUOK</i>	Deoxyguanosine Kinase
<i>DOCK6</i>	Dedicator Of Cytokinesis 6
<i>DOT1L</i>	DOT1 Like Histone Lysine Methyltransferase
<i>EFNA1</i>	Ephrin A1
<i>ESRRG</i>	Estrogen Related Receptor Gamma
<i>FANCG</i>	FA Complementation Group G
<i>FUT8</i>	Fucosyltransferase 8
<i>GBE1</i>	1,4-Alpha-Glucan Branching Enzyme 1
<i>GHI</i>	Growth Hormone 1
<i>GJA4</i>	Gap Junction Protein Alpha 4
<i>HLCS</i>	Holocarboxylase Synthetase
<i>HNRNPU</i>	Heterogeneous Nuclear Ribonucleoprotein U
<i>IL12A</i>	Interleukin 12A
<i>IL18R1</i>	Interleukin 18 Receptor 1
<i>IL9</i>	Interleukin 9
<i>KMT2C</i>	Lysine Methyltransferase 2C
<i>KMT2D</i>	Lysine Methyltransferase 2D
<i>LAMA5</i>	Laminin Subunit Alpha 5
<i>LAP3</i>	Leucine Aminopeptidase 3
<i>MT2A</i>	Metallothionein 2A
<i>NCOR2</i>	Nuclear Receptor Corepressor 2
<i>NR1I2</i>	Nuclear Receptor Subfamily 1 Group I Member 2
<i>NRIP1</i>	Nuclear Receptor Interacting Protein 1
<i>P2RY6</i>	Pyrimidinergic Receptor P2Y6
<i>PFKFB3</i>	6-Phosphofructo-2-Kinase/Fructose-2,6-Biphosphatase 3
<i>PPBP</i>	Pro-Platelet Basic Protein
<i>RB1CC1</i>	RB1 Inducible Coiled-Coil 1
<i>RICTOR</i>	RPTOR Independent Companion Of MTOR Complex 2
<i>RIPK3</i>	Receptor Interacting Serine/Threonine Kinase 3
<i>ROR1</i>	Receptor Tyrosine Kinase Like Orphan Receptor 1
<i>SDC1</i>	Syndecan 1
<i>SH3GL1</i>	SH3 Domain Containing GRB2 Like 1, Endophilin A2
<i>SOX4</i>	SRY-Box Transcription Factor 4
<i>SOX6</i>	SRY-Box Transcription Factor 6

<i>ST3GAL4</i>	ST3 Beta-Galactoside Alpha-2,3-Sialyltransferase 4
<i>TIMP3</i>	TIMP Metallopeptidase Inhibitor 3
<i>TNFRSF4</i>	TNF Receptor Superfamily Member 4
<i>TREM1</i>	Triggering Receptor Expressed On Myeloid Cells 1
<i>TRPS1</i>	Transcriptional Repressor GATA Binding 1
<i>UQCRB</i>	Ubiquinol-Cytochrome C Reductase Binding Protein
<i>ABCA2</i>	ATP Binding Cassette Subfamily A Member 2
<i>ADGRG1</i>	Adhesion G Protein-Coupled Receptor G1
<i>AQP9</i>	Aquaporin 9
<i>AREG</i>	Amphiregulin
<i>ASXL1</i>	ASXL Transcriptional Regulator 1
<i>BIRC6</i>	Baculoviral IAP Repeat Containing 6
<i>CDK16</i>	Cyclin Dependent Kinase 16
<i>CNN1</i>	Calponin 1
<i>CXCR5</i>	C-X-C Motif Chemokine Receptor 5
<i>CYP21A2</i>	Cytochrome P450 Family 21 Subfamily A Member 2
<i>DNAJA1</i>	DnaJ Heat Shock Protein Family (Hsp40) Member A1
<i>E2F3</i>	E2F Transcription Factor 3
<i>EARS2</i>	Glutamyl-TRNA Synthetase 2, Mitochondrial
<i>EBF1</i>	EBF Transcription Factor 1
<i>EIF4B</i>	Eukaryotic Translation Initiation Factor 4B
<i>FERMT3</i>	FERM Domain Containing Kindlin 3
<i>IL1RL1</i>	Interleukin 1 Receptor Like 1
<i>IL7</i>	Interleukin 7
<i>MCM6</i>	Minichromosome Maintenance Complex Component 6
<i>MIB1</i>	MIB E3 Ubiquitin Protein Ligase 1
<i>MYBL2</i>	MYB Proto-Oncogene Like 2
<i>NLRP2</i>	NLR Family Pyrin Domain Containing 2
<i>NOP56</i>	NOP56 Ribonucleoprotein
<i>PARG</i>	Poly(ADP-Ribose) Glycohydrolase
<i>PGM3</i>	Phosphoglucomutase 3
<i>POLR1C</i>	RNA Polymerase I And III Subunit C
<i>PPM1B</i>	Protein Phosphatase, Mg ²⁺ /Mn ²⁺ Dependent 1B
<i>PREP</i>	Prolyl Endopeptidase
<i>PSMC4</i>	Proteasome 26S Subunit, ATPase 4
<i>PTPRT</i>	Protein Tyrosine Phosphatase Receptor Type T
<i>PTX3</i>	Pentraxin 3
<i>PUS1</i>	Pseudouridine Synthase 1
<i>RPL26</i>	Ribosomal Protein L26
<i>RPS14</i>	Ribosomal Protein S14
<i>RPS3</i>	Ribosomal Protein S3
<i>SAMHD1</i>	SAM And HD Domain Containing Deoxynucleoside Triphosphate Triphosphohydrolase 1

<i>SEMA3F</i>	Semaphorin 3F
<i>SLAMF7</i>	SLAM Family Member 7
<i>SLC22A1</i>	Solute Carrier Family 22 Member 1
<i>SLC25A5</i>	Solute Carrier Family 25 Member 5
<i>SLC2A5</i>	Solute Carrier Family 2 Member 5
<i>SNCG</i>	Synuclein Gamma
<i>STAG3</i>	STAG3 Cohesin Complex Component
<i>SUMO2</i>	Small Ubiquitin Like Modifier 2
<i>TUBA1C</i>	Tubulin Alpha 1c
<i>ADAMTS18</i>	ADAM Metallopeptidase With Thrombospondin Type 1 Motif 18
<i>ARPC1B</i>	Actin Related Protein 2/3 Complex Subunit 1B
<i>CCT2</i>	Chaperonin Containing TCP1 Subunit 2
<i>CNDP2</i>	Carnosine Dipeptidase 2
<i>CYB5B</i>	Cytochrome B5 Type B
<i>GJA3</i>	Gap Junction Protein Alpha 3
<i>GPX3</i>	Glutathione Peroxidase 3
<i>KLRC1</i>	Killer Cell Lectin Like Receptor C1
<i>LIN28A</i>	Lin-28 Homolog A
<i>MTMR14</i>	Myotubularin Related Protein 14
<i>MUS81</i>	MUS81 Structure-Specific Endonuclease Subunit
<i>PPFIBP1</i>	PPFIA Binding Protein 1
<i>PTPN5</i>	Protein Tyrosine Phosphatase Non-Receptor Type 5
<i>RPS7</i>	Ribosomal Protein S7
<i>S100A2</i>	S100 Calcium Binding Protein A2
<i>SELENBP1</i>	Selenium Binding Protein 1
<i>SIRT4</i>	Sirtuin 4
<i>SLC39A4</i>	Solute Carrier Family 39 Member 4
<i>SUCLG2</i>	Succinate-CoA Ligase GDP-Forming Subunit Beta
<i>TAX1BP1</i>	Tax1 Binding Protein 1
<i>TRADD</i>	TNFRSF1A Associated Via Death Domain
<i>TRAF1</i>	TNF Receptor Associated Factor 1
<i>UBQLN1</i>	Ubiquilin 1
<i>ADAMTSL1</i>	ADAMTS Like 1
<i>APIG1</i>	Adaptor Related Protein Complex 1 Subunit Gamma 1
<i>ARFGEF1</i>	ARF Guanine Nucleotide Exchange Factor 1
<i>CLDN4</i>	Claudin 4
<i>CPD</i>	Carboxypeptidase D
<i>CRY2</i>	Cryptochrome Circadian Regulator 2
<i>CXCL13</i>	C-X-C Motif Chemokine Ligand 13
<i>DIS3L2</i>	DIS3 Like 3'-5' Exoribonuclease 2
<i>DNMBP</i>	Dynamin Binding Protein
<i>EHD1</i>	EH Domain Containing 1
<i>EREG</i>	Epiregulin

<i>EXOC2</i>	Exocyst Complex Component 2
<i>FERMT1</i>	FERM Domain Containing Kindlin 1
<i>FOXRED1</i>	FAD Dependent Oxidoreductase Domain Containing 1
<i>GIT1</i>	GIT ArfGAP 1
<i>GLP2R</i>	Glucagon Like Peptide 2 Receptor
<i>GPC5</i>	Glypican 5
<i>GTF2I</i>	General Transcription Factor Ii
<i>HIP1R</i>	Huntingtin Interacting Protein 1 Related
<i>HLA-E</i>	Major Histocompatibility Complex, Class I, E
<i>HNRNPH2</i>	Heterogeneous Nuclear Ribonucleoprotein H2
<i>HOXA10</i>	Homeobox A10
<i>IGF2BP1</i>	Insulin Like Growth Factor 2 mRNA Binding Protein 1
<i>IL24</i>	Interleukin 24
<i>KLF2</i>	KLF Transcription Factor 2
<i>KMT2E</i>	Lysine Methyltransferase 2E (Inactive)
<i>LIN28B</i>	Lin-28 Homolog B
<i>MAGT1</i>	Magnesium Transporter 1
<i>MASTL</i>	Microtubule Associated Serine/Threonine Kinase Like
<i>MCC</i>	MCC Regulator Of Wnt Signaling Pathway
<i>METAP1</i>	Methionyl Aminopeptidase 1
<i>MICB</i>	MHC Class I Polypeptide-Related Sequence B
<i>MTA3</i>	Metastasis Associated 1 Family Member 3
<i>MTHFS</i>	Methenyltetrahydrofolate Synthetase
<i>MX1</i>	MX Dynamin Like GTPase 1
<i>P3H2</i>	Prolyl 3-Hydroxylase 2
<i>PARP4</i>	Poly(ADP-Ribose) Polymerase Family Member 4
<i>PCDH10</i>	Protocadherin 10
<i>PDLIM7</i>	PDZ And LIM Domain 7
<i>PDZK1</i>	PDZ Domain Containing 1
<i>PEA15</i>	Proliferation And Apoptosis Adaptor Protein 15
<i>PEG10</i>	Paternally Expressed 10
<i>PFKFB2</i>	6-Phosphofructo-2-Kinase/Fructose-2,6-Biphosphatase 2
<i>PGM2</i>	Phosphoglucomutase 2
<i>PPA1</i>	Inorganic Pyrophosphatase 1
<i>PRRX1</i>	Paired Related Homeobox 1
<i>PTGES2</i>	Prostaglandin E Synthase 2
<i>RAD51B</i>	RAD51 Paralog B
<i>RPL4</i>	Ribosomal Protein L4
<i>SAFB</i>	Scaffold Attachment Factor B
<i>SGO1</i>	Shugoshin 1
<i>SIGLEC7</i>	Sialic Acid Binding Ig Like Lectin 7
<i>SLC5A8</i>	Solute Carrier Family 5 Member 8
<i>SMARCA1</i>	SNF2 Related Chromatin Remodeling ATPase With DExD Box 1

<i>SMPD2</i>	Sphingomyelin Phosphodiesterase 2
<i>SNX1</i>	Sorting Nexin 1
<i>STC1</i>	Stanniocalcin 1
<i>TFAP2C</i>	Transcription Factor AP-2 Gamma
<i>TP53RK</i>	TP53 Regulating Kinase
<i>TRPM2</i>	Transient Receptor Potential Cation Channel Subfamily M Member 2
<i>TST</i>	Thiosulfate Sulfurtransferase
<i>TUSC3</i>	Tumor Suppressor Candidate 3
<i>UBE3C</i>	Ubiquitin Protein Ligase E3C
<i>UBE4B</i>	Ubiquitination Factor E4B
<i>UVRAG</i>	UV Radiation Resistance Associated
<i>VPS53</i>	VPS53 Subunit Of GARP Complex
<i>ZNF148</i>	Zinc Finger Protein 148
<i>ANXA4</i>	Annexin A4
<i>ARAP1</i>	ArfGAP With RhoGAP Domain, Ankyrin Repeat And PH Domain 1
<i>ARIH2</i>	Ariadne RBR E3 Ubiquitin Protein Ligase 2
<i>CCN1</i>	Cellular Communication Network Factor 1
<i>CCN3</i>	Cellular Communication Network Factor 3
<i>CISD2</i>	CDGSH Iron Sulfur Domain 2
<i>CLDN6</i>	Claudin 6
<i>CREM</i>	CAMP Responsive Element Modulator
<i>DAP3</i>	Death Associated Protein 3
<i>DAPK2</i>	Death Associated Protein Kinase 2
<i>DNAJC3</i>	DnaJ Heat Shock Protein Family (Hsp40) Member C3
<i>DPP7</i>	Dipeptidyl Peptidase 7
<i>ELF3</i>	E74 Like ETS Transcription Factor 3
<i>ELF4</i>	E74 Like ETS Transcription Factor 4
<i>FLAD1</i>	Flavin Adenine Dinucleotide Synthetase 1
<i>IL18BP</i>	Interleukin 18 Binding Protein
<i>KIF3B</i>	Kinesin Family Member 3B
<i>KRT12</i>	Keratin 12
<i>KYAT1</i>	Kynurenine Aminotransferase 1
<i>LPIN2</i>	Lipin 2
<i>LRIG1</i>	Leucine Rich Repeats And Immunoglobulin Like Domains 1
<i>MORC2</i>	MORC Family CW-Type Zinc Finger 2
<i>NEUROG1</i>	Neurogenin 1
<i>PANX2</i>	Pannexin 2
<i>PDE4DIP</i>	Phosphodiesterase 4D Interacting Protein
<i>PHLPP1</i>	PH Domain And Leucine Rich Repeat Protein Phosphatase 1
<i>PJA1</i>	Praja Ring Finger Ubiquitin Ligase 1
<i>PPP2R5E</i>	Protein Phosphatase 2 Regulatory Subunit B'Epsilon
<i>RNPEP</i>	Arginyl Aminopeptidase
<i>RPL6</i>	Ribosomal Protein L6

<i>RPS3A</i>	Ribosomal Protein S3A
<i>SNX5</i>	Sorting Nexin 5
<i>TMEFF2</i>	Transmembrane Protein With EGF Like And Two Follistatin Like Domains 2
<i>TMEM106B</i>	Transmembrane Protein 106B
<i>TMPRSS4</i>	Transmembrane Serine Protease 4
<i>TPM4</i>	Tropomyosin 4
<i>TRIM27</i>	Tripartite Motif Containing 27
<i>TUBGCP6</i>	Tubulin Gamma Complex Component 6
<i>UBQLN4</i>	Ubiquilin 4
<i>USP24</i>	Ubiquitin Specific Peptidase 24
<i>VGF</i>	VGF Nerve Growth Factor Inducible
<i>XRCC2</i>	X-Ray Repair Cross Complementing 2
<i>ABCE1</i>	ATP Binding Cassette Subfamily E Member 1
<i>AMOT</i>	Angiomotin
<i>ANAPC7</i>	Anaphase Promoting Complex Subunit 7
<i>ATP6V1G3</i>	ATPase H ⁺ Transporting V1 Subunit G3
<i>BCLAF1</i>	BCL2 Associated Transcription Factor 1
<i>CDKAL1</i>	CDKAL1 Threonylcarbamoyladenosine tRNA Methylthiotransferase
<i>CENPA</i>	Centromere Protein A
<i>CLIC4</i>	Chloride Intracellular Channel 4
<i>CTCFL</i>	CCCTC-Binding Factor Like
<i>E2F5</i>	E2F Transcription Factor 5
<i>EHF</i>	ETS Homologous Factor
<i>HTATIP2</i>	HIV-1 Tat Interactive Protein 2
<i>KHDRBS3</i>	KH RNA Binding Domain Containing, Signal Transduction Associated 3
<i>LSR</i>	Lipolysis Stimulated Lipoprotein Receptor
<i>MICA</i>	MHC Class I Polypeptide-Related Sequence A
<i>NCOA4</i>	Nuclear Receptor Coactivator 4
<i>PRSS23</i>	Serine Protease 23
<i>RPS2</i>	Ribosomal Protein S2
<i>SEC24A</i>	SEC24 Homolog A, COPII Coat Complex Component
<i>STRAP</i>	Serine/Threonine Kinase Receptor Associated Protein
<i>STRN</i>	Striatin
<i>TELO2</i>	Telomere Maintenance 2
<i>TLX1</i>	T Cell Leukemia Homeobox 1
<i>TNIP1</i>	TNFAIP3 Interacting Protein 1
<i>UBE4A</i>	Ubiquitination Factor E4A
<i>WASHC5</i>	WASH Complex Subunit 5
<i>WLS</i>	Wnt Ligand Secretion Mediator
<i>APOBEC3B</i>	Apolipoprotein B mRNA Editing Enzyme Catalytic Subunit 3B
<i>ARHGAP29</i>	Rho GTPase Activating Protein 29
<i>ARID4A</i>	AT-Rich Interaction Domain 4A
<i>ATOH1</i>	Atonal BHLH Transcription Factor 1

<i>ATP5ME</i>	ATP Synthase Membrane Subunit E
<i>CD248</i>	CD248 Molecule
<i>DAD1</i>	Defender Against Cell Death 1
<i>DSC1</i>	Desmocollin 1
<i>EIF5A2</i>	Eukaryotic Translation Initiation Factor 5A2
<i>FGF20</i>	Fibroblast Growth Factor 20
<i>FYCO1</i>	FYVE And Coiled-Coil Domain Autophagy Adaptor 1
<i>GAS7</i>	Growth Arrest Specific 7
<i>GLMN</i>	Glomulin, FKBP Associated Protein
<i>GUF1</i>	GTP Binding Elongation Factor GUF1
<i>HOXC13</i>	Homeobox C13
<i>LCN1</i>	Lipocalin 1
<i>LLGL2</i>	LLGL Scribble Cell Polarity Complex Component 2
<i>METTL14</i>	Methyltransferase 14, N6-Adenosine-Methyltransferase Non-Catalytic Subunit
<i>NANOG</i>	Nanog Homeobox
<i>NEMF</i>	Nuclear Export Mediator Factor
<i>PATZ1</i>	POZ/BTB And AT Hook Containing Zinc Finger 1
<i>PLXNB2</i>	Plexin B2
<i>PSME4</i>	Proteasome Activator Subunit 4
<i>RAB27B</i>	RAB27B, Member RAS Oncogene Family
<i>RIOK2</i>	RIO Kinase 2
<i>RPL29</i>	Ribosomal Protein L29
<i>RPL30</i>	Ribosomal Protein L30
<i>RPS8</i>	Ribosomal Protein S8
<i>SND1</i>	Staphylococcal Nuclease And Tudor Domain Containing 1
<i>SPAG9</i>	Sperm Associated Antigen 9
<i>SUMO3</i>	Small Ubiquitin Like Modifier 3
<i>SUPV3L1</i>	Suv3 Like RNA Helicase
<i>TFCP2L1</i>	Transcription Factor CP2 Like 1
<i>TRIP10</i>	Thyroid Hormone Receptor Interactor 10
<i>TWF2</i>	Twinfilin Actin Binding Protein 2
<i>UBE2L6</i>	Ubiquitin Conjugating Enzyme E2 L6
<i>ULK3</i>	Unc-51 Like Kinase 3
<i>USP19</i>	Ubiquitin Specific Peptidase 19
<i>ZFX</i>	Zinc Finger Protein X-Linked
<i>C1GALT1</i>	Core 1 Synthase, Glycoprotein-N-Acetylgalactosamine 3-Beta-Galactosyltransferase 1
<i>CACYBP</i>	Calcyclin Binding Protein
<i>CCL22</i>	C-C Motif Chemokine Ligand 22
<i>CERS5</i>	Ceramide Synthase 5
<i>CHODL</i>	Chondrolectin
<i>CKS2</i>	CDC28 Protein Kinase Regulatory Subunit 2
<i>COPS2</i>	COP9 Signalosome Subunit 2
<i>COPS8</i>	COP9 Signalosome Subunit 8

<i>CYP39A1</i>	Cytochrome P450 Family 39 Subfamily A Member 1
<i>ELP2</i>	Elongator Acetyltransferase Complex Subunit 2
<i>EPS8L2</i>	EPS8 Signaling Adaptor L2
<i>ERCC6L</i>	ERCC Excision Repair 6 Like, Spindle Assembly Checkpoint Helicase
<i>EXOC8</i>	Exocyst Complex Component 8
<i>GAS2</i>	Growth Arrest Specific 2
<i>GLYR1</i>	Glyoxylate Reductase 1 Homolog
<i>HNRNPAB</i>	Heterogeneous Nuclear Ribonucleoprotein A/B
<i>KLHL22</i>	Kelch Like Family Member 22
<i>LPCAT1</i>	Lysophosphatidylcholine Acyltransferase 1
<i>LRRC8B</i>	Leucine Rich Repeat Containing 8 VRAC Subunit B
<i>MAP1S</i>	Microtubule Associated Protein 1S
<i>MIA</i>	MIA SH3 Domain Containing
<i>PHLDA2</i>	Pleckstrin Homology Like Domain Family A Member 2
<i>PKP3</i>	Plakophilin 3
<i>PTGFRN</i>	Prostaglandin F2 Receptor Inhibitor
<i>REG3A</i>	Regenerating Family Member 3 Alpha
<i>RHOD</i>	Ras Homolog Family Member D
<i>RNF6</i>	Ring Finger Protein 6
<i>RPS18</i>	Ribosomal Protein S18
<i>SLC28A3</i>	Solute Carrier Family 28 Member 3
<i>SRGAP2</i>	SLIT-ROBO Rho GTPase Activating Protein 2
<i>STK38</i>	Serine/Threonine Kinase 38
<i>TSPAN8</i>	Tetraspanin 8
<i>UBA6</i>	Ubiquitin Like Modifier Activating Enzyme 6
<i>ACAP2</i>	ArfGAP With Coiled-Coil, Ankyrin Repeat And PH Domains 2
<i>AFAPIL2</i>	Actin Filament Associated Protein 1 Like 2
<i>CEMIP</i>	Cell Migration Inducing Hyaluronidase 1
<i>CRYL1</i>	Crystallin Lambda 1
<i>DCAF8</i>	DDB1 And CUL4 Associated Factor 8
<i>DUSP13B</i>	Dual Specificity Phosphatase 13B
<i>EGFL7</i>	EGF Like Domain Multiple 7
<i>ERGIC1</i>	Endoplasmic Reticulum-Golgi Intermediate Compartment 1
<i>EXOC6B</i>	Exocyst Complex Component 6B
<i>FOXI1</i>	Forkhead Box I1
<i>HSPA14</i>	Heat Shock Protein Family A (Hsp70) Member 14
<i>MORF4L2</i>	Mortality Factor 4 Like 2
<i>NDUFAF5</i>	NADH:Ubiquinone Oxidoreductase Complex Assembly Factor 5
<i>OGFR</i>	Opioid Growth Factor Receptor
<i>PROK1</i>	Prokineticin 1
<i>RPRD1B</i>	Regulation Of Nuclear Pre-mRNA Domain Containing 1B
<i>SLC13A1</i>	Solute Carrier Family 13 Member 1
<i>TXNDC5</i>	Thioredoxin Domain Containing 5

<i>UHMK1</i>	U2AF Homology Motif Kinase 1
<i>ALPK3</i>	Alpha Kinase 3
<i>ARHGAP44</i>	Rho GTPase Activating Protein 44
<i>ARID3A</i>	AT-Rich Interaction Domain 3A
<i>BUD23</i>	BUD23 RRNA Methyltransferase And Ribosome Maturation Factor
<i>CAPG</i>	Capping Actin Protein, Gelsolin Like
<i>CDC42BPG</i>	CDC42 Binding Protein Kinase Gamma
<i>CXXC4</i>	CXXC Finger Protein 4
<i>DPCD</i>	Deleted In Primary Ciliary Dyskinesia Homolog (Mouse)
<i>DYNC1LI1</i>	Dynein Cytoplasmic 1 Light Intermediate Chain 1
<i>GKN1</i>	Gastrokine 1
<i>GNL1</i>	G Protein Nucleolar 1 (Putative)
<i>HRNR</i>	Hornerin
<i>KIN</i>	Kin17 DNA And RNA Binding Protein
<i>ME3</i>	Malic Enzyme 3
<i>MTPN</i>	Myotrophin
<i>OSBP2</i>	Oxysterol Binding Protein 2
<i>PDXDC1</i>	Pyridoxal Dependent Decarboxylase Domain Containing 1
<i>PDZD8</i>	PDZ Domain Containing 8
<i>PRTG</i>	Protogenin
<i>SAFB2</i>	Scaffold Attachment Factor B2
<i>SCGB2A1</i>	Secretoglobin Family 2A Member 1
<i>SEC11A</i>	SEC11 Homolog A, Signal Peptidase Complex Subunit
<i>SPEF2</i>	Sperm Flagellar 2
<i>TRIM14</i>	Tripartite Motif Containing 14
<i>TRIM72</i>	Tripartite Motif Containing 72
<i>UFL1</i>	UFM1 Specific Ligase 1
<i>VMP1</i>	Vacuole Membrane Protein 1
<i>ABHD10</i>	Abhydrolase Domain Containing 10, Depalmitoylase
<i>AKAP11</i>	A-Kinase Anchoring Protein 11
<i>ANXA10</i>	Annexin A10
<i>ATMIN</i>	ATM Interactor
<i>BOP1</i>	BOP1 Ribosomal Biogenesis Factor
<i>CDK5RAP3</i>	CDK5 Regulatory Subunit Associated Protein 3
<i>CIAPIN1</i>	Cytokine Induced Apoptosis Inhibitor 1
<i>CMIP</i>	C-Maf Inducing Protein
<i>DDRGK1</i>	DDRGK Domain Containing 1
<i>DNAJC2</i>	DnaJ Heat Shock Protein Family (Hsp40) Member C2
<i>FAM3D</i>	FAM3 Metabolism Regulating Signaling Molecule D
<i>GCNT3</i>	Glucosaminyl (N-Acetyl) Transferase 3, Mucin Type
<i>GNPDA1</i>	Glucosamine-6-Phosphate Deaminase 1
<i>GRIPAP1</i>	GRIP1 Associated Protein 1
<i>H1-6</i>	H1.6 Linker Histone, Cluster Member

<i>HECTD4</i>	HECT Domain E3 Ubiquitin Protein Ligase 4
<i>HERC4</i>	HECT And RLD Domain Containing E3 Ubiquitin Protein Ligase 4
<i>HS3ST2</i>	Heparan Sulfate-Glucosamine 3-Sulfotransferase 2
<i>HSPA4L</i>	Heat Shock Protein Family A (Hsp70) Member 4 Like
<i>KCTD2</i>	Potassium Channel Tetramerization Domain Containing 2
<i>KIAA1549</i>	KIAA1549
<i>MATN2</i>	Matrilin 2
<i>MRPL43</i>	Mitochondrial Ribosomal Protein L43
<i>NCR3LG1</i>	Natural Killer Cell Cytotoxicity Receptor 3 Ligand 1
<i>OSBPL11</i>	Oxysterol Binding Protein Like 11
<i>PDE12</i>	Phosphodiesterase 12
<i>PTGR2</i>	Prostaglandin Reductase 2
<i>RAB13</i>	RAB13, Member RAS Oncogene Family
<i>SIT1</i>	Signaling Threshold Regulating Transmembrane Adaptor 1
<i>ST6GALNAC2</i>	ST6 N-Acetylgalactosaminide Alpha-2,6-Sialyltransferase 2
<i>STK17A</i>	Serine/Threonine Kinase 17a
<i>TRAPPC8</i>	Trafficking Protein Particle Complex Subunit 8
<i>VIRMA</i>	Vir Like M6A Methyltransferase Associated
<i>ASCC2</i>	Activating Signal Cointegrator 1 Complex Subunit 2
<i>CARD16</i>	Caspase Recruitment Domain Family Member 16
<i>GSX1</i>	GS Homeobox 1
<i>IGHG1</i>	Immunoglobulin Heavy Constant Gamma 1 (G1m Marker)
<i>MACC1</i>	MET Transcriptional Regulator MACC1
<i>MLLT11</i>	MLLT11 Transcription Factor 7 Cofactor
<i>MYDGF</i>	Myeloid Derived Growth Factor
<i>OSTC</i>	Oligosaccharyltransferase Complex Non-Catalytic Subunit
<i>SART3</i>	Spliceosome Associated Factor 3, U4/U6 Recycling Protein
<i>SYPL1</i>	Synaptophysin Like 1
<i>TMC5</i>	Transmembrane Channel Like 5
<i>ZNF536</i>	Zinc Finger Protein 536
<i>AP3M2</i>	Adaptor Related Protein Complex 3 Subunit Mu 2
<i>APOL3</i>	Apolipoprotein L3
<i>CREBZF</i>	CREB/ATF BZIP Transcription Factor
<i>DDA1</i>	DET1 And DDB1 Associated 1
<i>DMKN</i>	Dermokine
<i>ETV7</i>	ETS Variant Transcription Factor 7
<i>FGD6</i>	FYVE, RhoGEF And PH Domain Containing 6
<i>GTPBP10</i>	GTP Binding Protein 10
<i>GTSE1</i>	G2 And S-Phase Expressed 1
<i>HECTD3</i>	HECT Domain E3 Ubiquitin Protein Ligase 3
<i>KAZN</i>	Kazrin, Periplakin Interacting Protein
<i>MRPL50</i>	Mitochondrial Ribosomal Protein L50
<i>MT-CO3</i>	Mitochondrially Encoded Cytochrome C Oxidase III

<i>PAIP1</i>	Poly(A) Binding Protein Interacting Protein 1
<i>PCYOX1L</i>	Prenylcysteine Oxidase 1 Like
<i>PDCL3</i>	Phosducin Like 3
<i>SLC38A10</i>	Solute Carrier Family 38 Member 10
<i>SMG8</i>	SMG8 Nonsense Mediated mRNA Decay Factor
<i>SRCIN1</i>	SRC Kinase Signaling Inhibitor 1
<i>TICAM2</i>	TIR Domain Containing Adaptor Molecule 2
<i>USP35</i>	Ubiquitin Specific Peptidase 35
<i>AKNAD1</i>	AKNA Domain Containing 1
<i>ASMTL</i>	Acetylserotonin O-Methyltransferase Like
<i>C11orf65</i>	Chromosome 11 Open Reading Frame 65
<i>DENND1C</i>	DENN Domain Containing 1C
<i>EML3</i>	EMAP Like 3
<i>HEATR6</i>	HEAT Repeat Containing 6
<i>ING2</i>	Inhibitor Of Growth Family Member 2
<i>LHPP</i>	Phospholysine Phosphohistidine Inorganic Pyrophosphate Phosphatase
<i>MLXIP</i>	MLX Interacting Protein
<i>NAA40</i>	N-Alpha-Acetyltransferase 40, NatD Catalytic Subunit
<i>NSG2</i>	Neuronal Vesicle Trafficking Associated 2
<i>PRPF39</i>	Pre-mRNA Processing Factor 39
<i>PRSS27</i>	Serine Protease 27
<i>TECTB</i>	Tectorin Beta
<i>TRIM6</i>	Tripartite Motif Containing 6
<i>USP27X</i>	Ubiquitin Specific Peptidase 27 X-Linked
<i>ZFAND1</i>	Zinc Finger AN1-Type Containing 1
<i>AARSD1</i>	Alanyl-TRNA Synthetase Domain Containing 1
<i>ARFIP1</i>	ARF Interacting Protein 1
<i>BATF2</i>	Basic Leucine Zipper ATF-Like Transcription Factor 2
<i>FAM50B</i>	Family With Sequence Similarity 50 Member B
<i>FOXQ1</i>	Forkhead Box Q1
<i>PYM1</i>	PYM Homolog 1, Exon Junction Complex Associated Factor
<i>RUFY3</i>	RUN And FYVE Domain Containing 3
<i>RWDD3</i>	RWD Domain Containing 3
<i>SLC44A5</i>	Solute Carrier Family 44 Member 5
<i>ZNF236</i>	Zinc Finger Protein 236
<i>CGB7</i>	Chorionic Gonadotropin Subunit Beta 7
<i>MRPL18</i>	Mitochondrial Ribosomal Protein L18
<i>TEX10</i>	Testis Expressed 10
<i>WASHC1</i>	WASH Complex Subunit 1
<i>ZNF165</i>	Zinc Finger Protein 165
<i>CCL15</i>	C-C Motif Chemokine Ligand 15
<i>LRCH3</i>	Leucine Rich Repeats And Calponin Homology Domain Containing 3
<i>MIS18A</i>	MIS18 Kinetochore Protein A

<i>MTCL2</i>	Microtubule Crosslinking Factor 2
<i>SH2D4B</i>	SH2 Domain Containing 4B
<i>SPZ1</i>	Spermatogenic Leucine Zipper 1
<i>TBRG4</i>	Transforming Growth Factor Beta Regulator 4
<i>THNSL1</i>	Threonine Synthase Like 1
<i>ZBTB10</i>	Zinc Finger And BTB Domain Containing 10
<i>ZNF689</i>	Zinc Finger Protein 689
<i>CCDC3</i>	Coiled-Coil Domain Containing 3
<i>DEFB126</i>	Defensin Beta 126
<i>DEXI</i>	Dexi Homolog
<i>H2BC12L</i>	H2B Clustered Histone 12 Like
<i>SUSD6</i>	Sushi Domain Containing 6
<i>TMEM131L</i>	Transmembrane 131 Like
<i>C19orf33</i>	Chromosome 19 Open Reading Frame 33
<i>WASHC2C</i>	WASH Complex Subunit 2C
<i>ZNF420</i>	Zinc Finger Protein 420
<i>DLEU1</i>	Deleted In Lymphocytic Leukemia 1
<i>PHLDB3</i>	Pleckstrin Homology Like Domain Family B Member 3
<i>MEG3</i>	Maternally Expressed 3
<i>R3HCC1</i>	R3H Domain And Coiled-Coil Containing 1
<i>MIR17HG</i>	MiR-17-92a-1 Cluster Host Gene
<i>C19orf48P</i>	Chromosome 19 Open Reading Frame 48, Pseudogene
<i>MYCNOS</i>	MYCN Opposite Strand
<i>NANOGP8</i>	Nanog Homeobox Retrogene P8
<i>TINCR</i>	TINCR Ubiquitin Domain Containing
<i>CDKN2B-AS1</i>	CDKN2B And CDKN2A Antisense Cis And Trans Regulatory RNA 1
<i>LINC01559</i>	Long Intergenic Non-Protein Coding RNA 1559
<i>MIR214</i>	MicroRNA 214
<i>CYTOR</i>	Cytoskeleton Regulator RNA
<i>MIR139</i>	MicroRNA 139
<i>MIR142</i>	MicroRNA 142
<i>MIR182</i>	MicroRNA 182
<i>MIR29A</i>	MicroRNA 29a
<i>MIRLET7D</i>	MicroRNA Let-7d
<i>SNHG7</i>	Small Nucleolar RNA Host Gene 7
<i>MIR122</i>	MicroRNA 122
<i>MIR155HG</i>	MIR155 Host Gene
<i>MIR27B</i>	MicroRNA 27b
<i>SNHG15</i>	Small Nucleolar RNA Host Gene 15
<i>FAM215A</i>	Family With Sequence Similarity 215 Member A
<i>LINC00324</i>	Long Intergenic Non-Protein Coding RNA 324
<i>MIR138-1</i>	MicroRNA 138-1
<i>MIR146B</i>	MicroRNA 146b

<i>MIR193B</i>	MicroRNA 193b
<i>MIR221</i>	MicroRNA 221
<i>MIR302C</i>	MicroRNA 302c
<i>MIR302D</i>	MicroRNA 302d
<i>MIR455</i>	MicroRNA 455
<i>MIR92B</i>	MicroRNA 92b
<i>FTCDNL1</i>	Formiminotransferase Cyclodeaminase N-Terminal Like
<i>LINC00511</i>	Long Intergenic Non-Protein Coding RNA 511
<i>MIR107</i>	MicroRNA 107
<i>MIR137</i>	MicroRNA 137
<i>MIR183</i>	MicroRNA 183
<i>MIR205HG</i>	MIR205 Host Gene
<i>MIR24-1</i>	MicroRNA 24-1
<i>MIR424</i>	MicroRNA 424
<i>MIR874</i>	MicroRNA 874
<i>ADAMTS9-AS2</i>	ADAMTS9 Antisense RNA 2
<i>FOXD2-AS1</i>	FOXD2 Adjacent Opposite Strand RNA 1
<i>LINC01550</i>	Long Intergenic Non-Protein Coding RNA 1550
<i>MAPT-AS1</i>	MAPT Antisense RNA 1
<i>MIR100HG</i>	Mir-100-Let-7a-2-Mir-125b-1 Cluster Host Gene
<i>MIR144</i>	MicroRNA 144
<i>MIR885</i>	MicroRNA 885
<i>NORAD</i>	Non-Coding RNA Activated By DNA Damage
<i>SFTA1P</i>	Surfactant Associated 1, LncRNA
<i>SNHG14</i>	Small Nucleolar RNA Host Gene 14
<i>CASC11</i>	Cancer Susceptibility 11
<i>FGD5-AS1</i>	FGD5 Antisense RNA 1
<i>MIR296</i>	MicroRNA 296
<i>MIR302B</i>	MicroRNA 302b
<i>MIR376C</i>	MicroRNA 376c
<i>MIR450B</i>	MicroRNA 450b
<i>MIR451A</i>	MicroRNA 451a
<i>MIR608</i>	MicroRNA 608
<i>RUNX1-IT1</i>	RUNX1 Intronic Transcript 1
<i>MIR372</i>	MicroRNA 372
<i>MIR484</i>	MicroRNA 484
<i>MIR629</i>	MicroRNA 629
<i>MIR671</i>	MicroRNA 671
<i>MIR7-1</i>	MicroRNA 7-1
<i>DLGAP1-AS2</i>	DLGAP1 Antisense RNA 2
<i>LINC00662</i>	Long Intergenic Non-Protein Coding RNA 662
<i>MIR502</i>	MicroRNA 502
<i>MIR509-1</i>	MicroRNA 509-1

<i>MIR577</i>	MicroRNA 577
<i>LINC01638</i>	Long Intergenic Non-Protein Coding RNA 1638
<i>SNORD3A</i>	Small Nucleolar RNA, C/D Box 3A
<i>GIHCG</i>	GIHCG Inhibitor Of MiR-200b/200a/429 Expression
<i>LINP1</i>	LncRNA In Non-Homologous End Joining Pathway 1
<i>MIR190B</i>	MicroRNA 190b
<i>MIR4496</i>	MicroRNA 4496
<i>DLEU7-AS1</i>	DLEU7 Antisense RNA 1
<i>EPIC1</i>	Epigenetically Induced MYC Interacting LncRNA 1
<i>MIR580</i>	MicroRNA 580
<i>RPL13AP3</i>	Ribosomal Protein L13a Pseudogene 3
<i>DEFB109B</i>	Defensin Beta 109B
<i>GNG12-AS1</i>	GNG12, DIRAS3 And WLS Antisense RNA 1
<i>LINC00680</i>	Long Intergenic Non-Protein Coding RNA 680
<i>MIR4260</i>	MicroRNA 4260
<i>LINC02418</i>	Long Intergenic Non-Protein Coding RNA 2418
<i>MIR1260B</i>	MicroRNA 1260b
<i>MIR711</i>	MicroRNA 711
<i>DINOL</i>	Damage Induced Long Noncoding RNA
<i>MIR4516</i>	MicroRNA 4516
<i>MIR612</i>	MicroRNA 612
<i>PCBP2-OT1</i>	PCBP2 Overlapping Transcript 1
<i>PWAR4</i>	Prader Willi/Angelman Region RNA 4
<i>LINC01149</i>	Long Intergenic Non-Protein Coding RNA 1149
<i>MIR1248</i>	MicroRNA 1248
<i>MIR2113</i>	MicroRNA 2113
<i>MIR587</i>	MicroRNA 587
<i>SNAP25-AS1</i>	SNAP25 Antisense RNA 1
<i>ANP32A-IT1</i>	ANP32A Intronic Transcript 1
<i>LINC00601</i>	Long Intergenic Non-Protein Coding RNA 601
<i>MIR3148</i>	MicroRNA 3148
<i>MIR3153</i>	MicroRNA 3153
<i>MIR509-3</i>	MicroRNA 509-3
<i>LINC02325</i>	Long Intergenic Non-Protein Coding RNA 2325
<i>MIR2682</i>	MicroRNA 2682
<i>MIR3918</i>	MicroRNA 3918
<i>MIR509-2</i>	MicroRNA 509-2
<i>TRA-TGC7-1</i>	TRNA-Ala (Anticodon TGC) 7-1
<i>TRD-GTC9-1</i>	TRNA-Asp (Anticodon GTC) 9-1
<i>CDR1-AS</i>	CDR1 Antisense RNA
<i>LINC02291</i>	Long Intergenic Non-Protein Coding RNA 2291
<i>MIR1268A</i>	MicroRNA 1268a
<i>MIR297</i>	MicroRNA 297

<i>GIRGL</i>	Glutamine Insufficiency Regulator Of Glutaminase LncRNA
<i>LINC02159</i>	Long Intergenic Non-Protein Coding RNA 2159
<i>NPTN-IT1</i>	NPTN Intronic Transcript 1
<i>RAB9BP1</i>	RAB9B, Member RAS Oncogene Family Pseudogene 1
<i>LINC01854</i>	Long Intergenic Non-Protein Coding RNA 1854
<i>LOC100420587</i>	SHC Binding And Spindle Associated 1 Pseudogene
<i>PLPPR5-AS1</i>	PLPPR5 Antisense RNA 1
<i>LOC254896</i>	Uncharacterized LOC254896
<i>RPS16P2</i>	Ribosomal Protein S16 Pseudogene 2
<i>LOC101929200</i>	Uncharacterized LOC101929200
<i>RPL36AP45</i>	Ribosomal Protein L36a Pseudogene 45
<i>LOC107980440</i>	ABL Breakpoint Recombination Region
<i>MIR6783</i>	MicroRNA 6783
<i>MIR6883</i>	MicroRNA 6883
<i>TRG-GCC3-1</i>	TRNA-Gly (Anticodon GCC) 3-1
<i>LOC107963955</i>	BCR-ABL Major-Breakpoint Cluster Region
<i>SRSF10P2</i>	Serine And Arginine Rich Splicing Factor 10 Pseudogene 2
<i>LOC100131425</i>	LSM5 Homolog, U6 Small Nuclear RNA Associated (S. Cerevisiae) Pseudogene
<i>LOC100505995</i>	Apoptosis-Inducing, TAF9-Like Domain 1 Pseudogene
<i>LOC107963951</i>	BCR-ABL Minor-Breakpoint Cluster Region
<i>LOC100421527</i>	DnaJ Heat Shock Protein Family (Hsp40) Member C8 Pseudogene
<i>LOC107963948</i>	BCR-ABL Micro-Breakpoint Cluster Region
<i>LOC651644</i>	LIM Zinc Finger Domain Containing 2 Pseudogene
<i>LOC100131680</i>	52 KDa Repressor Of The Inhibitor Of The Protein Kinase-Like
<i>LOC130067121</i>	ATAC-STARR-Seq Lymphoblastoid Active Region 18778

Supplementary Table 2. Candidate therapeutic targets of 5-fluorouracil (5-FU) retrieved from the Comparative Toxicogenomics Database.

Gene	Gene ID
<i>TP53</i>	7157
<i>TYMS</i>	7298
<i>CASP3</i>	836
<i>DPYD</i>	1806
<i>BCL2</i>	596
<i>CDKN1A</i>	1026
<i>BAX</i>	581
<i>CASP8</i>	841
<i>CASP9</i>	842
<i>BCL2L1</i>	598
<i>PARP1</i>	142
<i>FAS</i>	355

<i>PTGS2</i>	5743
<i>ERBB2</i>	2064
<i>IL6</i>	3569
<i>BIRC5</i>	332
<i>UBE2C</i>	11065
<i>VEGFA</i>	7422
<i>EGFR</i>	1956
<i>IFNA1</i>	3439
<i>MDM2</i>	4193
<i>RELA</i>	5970
<i>CCND1</i>	595
<i>TNF</i>	7124
<i>TNFSF10</i>	8743
<i>CAT</i>	847
<i>RNF34</i>	80196
<i>TGFB1</i>	7040
<i>UMPS</i>	7372
<i>CFLAR</i>	8837
<i>HIF1A</i>	3091
<i>IL1B</i>	3553
<i>TYMP</i>	1890
<i>XAF1</i>	54739
<i>CXCL8</i>	3576
<i>GADD45A</i>	1647
<i>MYC</i>	4609
<i>AKT1</i>	207
<i>CHEK1</i>	1111
<i>CYP2A6</i>	1548
<i>SAT1</i>	6303
<i>BBC3</i>	27113
<i>FDXR</i>	2232
<i>MT2A</i>	4502
<i>MTHFR</i>	4524
<i>TERT</i>	7015
<i>ABCB1</i>	5243
<i>CCNB1</i>	891
<i>EGR1</i>	1958
<i>TCF7L2</i>	6934
<i>TNFRSF10B</i>	8795
<i>TRP53</i>	22059
<i>BID</i>	637
<i>CXCL1</i>	2919
<i>H2AX</i>	3014

<i>MKI67</i>	4288
<i>NFKBIA</i>	4792
<i>PCNA</i>	5111
<i>SLC29A1</i>	2030
<i>THBS1</i>	7057
<i>XIAP</i>	331
<i>CCN1</i>	3491
<i>CCNA2</i>	890
<i>CCNG1</i>	900
<i>ERCC1</i>	2067
<i>IFNG</i>	3458
<i>RB1</i>	5925
<i>TOP2A</i>	7153
<i>TP53I3</i>	9540
<i>CES2</i>	8824
<i>EGF</i>	1950
<i>ERBB3</i>	2065
<i>MAPK1</i>	5594
<i>MAPK3</i>	5595
<i>NFE2L2</i>	4780
<i>NFKB1</i>	4790
<i>NOS2</i>	4843
<i>PTTG1</i>	9232
<i>RRM2</i>	6241
<i>S100A11</i>	6282
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<i>JUNB</i>	3726
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<i>CDC25C</i>	995
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<i>AQP9</i>	366
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<i>CCNJL</i>	79616
<i>CD109</i>	135228
<i>CD24</i>	100133941
<i>CD274</i>	29126
<i>CD38</i>	952
<i>CD40LG</i>	959
<i>CD44</i>	960
<i>CD63</i>	967
<i>CD8A</i>	925
<i>CD9</i>	928
<i>CDC20</i>	991
<i>CDC25A</i>	993
<i>CDC34</i>	997
<i>CDC40</i>	51362
<i>CDC42EP1</i>	11135
<i>CDC73</i>	79577
<i>CDCA5</i>	113130
<i>CDCA7</i>	83879
<i>CDCA8</i>	55143
<i>CDH6</i>	1004
<i>CDIPT</i>	10423
<i>CDK5R1</i>	8851
<i>CDKN2AIP</i>	55602
<i>CDKN2C</i>	1031
<i>CDKN3</i>	1033
<i>CENPU</i>	79682
<i>CENPX</i>	201254
<i>CEP55</i>	55165
<i>CES1</i>	1066
<i>CHEK2</i>	11200
<i>CHI3L1</i>	1116
<i>CHRNA4</i>	1137
<i>CHST7</i>	56548
<i>CIAO1</i>	9391
<i>CITED2</i>	10370
<i>CKB</i>	1152
<i>CLCN3</i>	1182

<i>CLIC1</i>	1192
<i>CNK</i>	36952
<i>COCH</i>	1690
<i>COL1A2</i>	1278
<i>COL3A1</i>	1281
<i>COL5A2</i>	1290
<i>COX14</i>	84987
<i>COX5B</i>	1329
<i>COX6C</i>	1345
<i>COX7C</i>	1350
<i>COXFA4</i>	4697
<i>CP</i>	1356
<i>CPA4</i>	51200
<i>CPT1A</i>	1374
<i>CPXM1</i>	56265
<i>CRABP2</i>	1382
<i>CRHBP</i>	1393
<i>CRK</i>	1398
<i>CRMP</i>	40675
<i>CRYGS</i>	1427
<i>CRYL1</i>	51084
<i>CSE1L</i>	1434
<i>CSF2</i>	1437
<i>CSNK1E</i>	1454
<i>CSRP1</i>	1465
<i>CST8</i>	10047
<i>CTNNB1</i>	1499
<i>CTNND2</i>	1501
<i>CTPS1</i>	1503
<i>CUL4A</i>	8451
<i>CUL4B</i>	8450
<i>CUL5</i>	8065
<i>CXCL9</i>	4283
<i>CXCR1</i>	3577
<i>CXCR4</i>	7852
<i>CYC1</i>	1537
<i>CYCS</i>	54205
<i>CYLD</i>	1540
<i>CYP1A1</i>	1543
<i>CYP2F1</i>	1572
<i>CYP2S1</i>	29785
<i>CYP3A4</i>	1576
<i>CYP51A1</i>	1595

<i>CYP51AIP2</i>	83530
<i>DARSI</i>	1615
<i>DBF4</i>	10926
<i>DBNDD2</i>	55861
<i>DCC</i>	1630
<i>DCK</i>	1633
<i>DCLK1</i>	9201
<i>DCT</i>	1638
<i>DCX</i>	1641
<i>DCXR</i>	51181
<i>DDAH2</i>	23564
<i>DDX39B</i>	7919
<i>DDX4</i>	54514
<i>DENND2C</i>	163259
<i>DEPDC7</i>	91614
<i>DES</i>	1674
<i>DFFA</i>	1676
<i>DHX15</i>	1665
<i>DICER1</i>	23405
<i>DIMT1</i>	27292
<i>DKK4</i>	27121
<i>DLC1</i>	10395
<i>DLG1</i>	1739
<i>DNAH2</i>	146754
<i>DNER</i>	92737
<i>DNMT3B</i>	1789
<i>DPAGT1</i>	1798
<i>DPY19L1</i>	23333
<i>DPYSL3</i>	1809
<i>DRD5</i>	1816
<i>DST</i>	667
<i>DTWD1</i>	56986
<i>DUSP14</i>	11072
<i>DUSP5</i>	1847
<i>DUSP6</i>	1848
<i>E2F1</i>	1869
<i>E2F3</i>	1871
<i>E2F8</i>	79733
<i>ECHDC3</i>	79746
<i>ECHS1</i>	1892
<i>EDIL3</i>	10085
<i>EDNRA</i>	1909
<i>EDNRB</i>	1910

<i>EEIG1</i>	399665
<i>EFEMP1</i>	2202
<i>EFHD1</i>	80303
<i>EFHD2</i>	79180
<i>EHD2</i>	30846
<i>EHF</i>	26298
<i>EIF2S1</i>	1965
<i>EIF4EBP1</i>	1978
<i>EIF5</i>	1983
<i>EIPR1</i>	7260
<i>ELMO2</i>	63916
<i>ELN</i>	2006
<i>ELOA</i>	6924
<i>ELOVL5</i>	60481
<i>EMC1</i>	23065
<i>EML2</i>	24139
<i>EMP3</i>	2014
<i>ENAH</i>	55740
<i>ENTPD1</i>	953
<i>ENTREP3</i>	10712
<i>EOMES</i>	8320
<i>EP300</i>	2033
<i>EP400</i>	57634
<i>EPAS1</i>	2034
<i>EPB41L3</i>	23136
<i>EPHA2</i>	1969
<i>EPOR</i>	2057
<i>EPPK1</i>	83481
<i>EPRS1</i>	2058
<i>EPYC</i>	1833
<i>ERAP2</i>	64167
<i>ERAS</i>	3266
<i>ERBB4</i>	2066
<i>EREG</i>	2069
<i>ERN1</i>	2081
<i>ESPL1</i>	9700
<i>ETF1</i>	2107
<i>ETFB</i>	2109
<i>ETNK1</i>	55500
<i>F2</i>	2147
<i>F7</i>	2155
<i>F8</i>	2157
<i>F8A3</i>	474384

<i>FABP7</i>	2173
<i>FADD</i>	8772
<i>FADSI</i>	3992
<i>FAH</i>	2184
<i>FAM107B</i>	83641
<i>FAM114A1</i>	92689
<i>FAM171A1</i>	221061
<i>FAM20C</i>	56975
<i>FAM234B</i>	57613
<i>FAM76B</i>	143684
<i>FANCC</i>	2176
<i>FANCI</i>	55215
<i>FARS2</i>	10667
<i>FASTK</i>	10922
<i>FCRLA</i>	84824
<i>FERMT2</i>	10979
<i>FGD6</i>	55785
<i>FGF10</i>	2255
<i>FGF4</i>	2249
<i>FGF5</i>	2250
<i>FHL2</i>	2274
<i>FHL3</i>	2275
<i>FIBCD1</i>	84929
<i>FKBP11</i>	51303
<i>FKBP1B</i>	2281
<i>FKBP5</i>	2289
<i>FKBPL</i>	63943
<i>FLII</i>	2314
<i>FLRT2</i>	23768
<i>FMOD</i>	2331
<i>FN1</i>	2335
<i>FNBPI</i>	23048
<i>FOLR1</i>	2348
<i>FOSL1</i>	8061
<i>FOXA2</i>	3170
<i>FOXC1</i>	2296
<i>FOXD3</i>	27022
<i>FOXG1</i>	2290
<i>FOXL2</i>	668
<i>FOXMI</i>	2305
<i>FOXO3</i>	2309
<i>FPGS</i>	2356
<i>FTLP3</i>	284764

<i>FUT1</i>	2523
<i>FXVD3</i>	5349
<i>FYN</i>	2534
<i>FZD2</i>	2535
<i>GABRB3</i>	2562
<i>GADD45G</i>	10912
<i>GAL</i>	51083
<i>GALNT2</i>	2590
<i>GALNT3</i>	2591
<i>GART</i>	2618
<i>GAST</i>	2520
<i>GATA4</i>	2626
<i>GATA6</i>	2627
<i>GATD3A</i>	28295
<i>GCLC</i>	2729
<i>GCLM</i>	2730
<i>GCSH</i>	2653
<i>GDF1</i>	2657
<i>GDF3</i>	9573
<i>GEM</i>	2669
<i>GFAP</i>	2670
<i>GFRA1</i>	2674
<i>GIN1</i>	9837
<i>GIN2</i>	51659
<i>GJC1</i>	10052
<i>GLA</i>	2717
<i>GLIPR1</i>	11010
<i>GNAI2</i>	2771
<i>GNB2</i>	2783
<i>GOLGA8A</i>	23015
<i>GOLPH3</i>	64083
<i>GP1BB</i>	2812
<i>GPR132</i>	29933
<i>GPR137C</i>	283554
<i>GPR87</i>	53836
<i>GRB7</i>	2886
<i>GRHL3</i>	57822
<i>GRINA</i>	2907
<i>GSK3B</i>	2932
<i>GSPT1</i>	2935
<i>GSR</i>	2936
<i>GSTA4</i>	2941
<i>GSTM1</i>	2944

<i>GTPBP4</i>	23560
<i>GUCY1B1</i>	2983
<i>GYG2</i>	8908
<i>H1-3</i>	3007
<i>H1F0</i>	14958
<i>H3-7</i>	440686
<i>H4C14</i>	8370
<i>HACD1</i>	9200
<i>HAND1</i>	9421
<i>HAND2</i>	9464
<i>HAPLN2</i>	60484
<i>HBA2</i>	3040
<i>HBB-B2</i>	15130
<i>HBZ</i>	3050
<i>HDAC3</i>	8841
<i>HDAC4</i>	9759
<i>HDAC7</i>	51564
<i>HDAC9</i>	9734
<i>HERPUD1</i>	9709
<i>HES1</i>	3280
<i>HEXO1</i>	38528
<i>HGF</i>	3082
<i>HIC2</i>	23119
<i>HLA-DQA1</i>	3117
<i>HLA-F</i>	3134
<i>HLA-G</i>	3135
<i>HMI3</i>	81502
<i>HMCEs</i>	56941
<i>HMG1</i>	373332
<i>HMG20B</i>	10362
<i>HMGN5</i>	79366
<i>HMMR</i>	3161
<i>HNF1A</i>	6927
<i>HNF4A</i>	3172
<i>HNRNPA2B1</i>	3181
<i>HNRNPF</i>	3185
<i>HNRNPH1</i>	3187
<i>HNRNPL</i>	3191
<i>HOXA1</i>	3198
<i>HOXB3</i>	3213
<i>HOXD1</i>	3231
<i>HPX</i>	3263
<i>HS6ST2</i>	90161

<i>HSD17B2</i>	3294
<i>HSPA8</i>	3312
<i>HSPB8</i>	26353
<i>HSPE1</i>	3336
<i>HTATSF1</i>	27336
<i>HTR7</i>	3363
<i>IAPP</i>	3375
<i>ICAM3</i>	3385
<i>IDI1</i>	3422
<i>IDO1</i>	3620
<i>IER5</i>	51278
<i>IFI16</i>	3428
<i>IFI27L2</i>	83982
<i>IFI35</i>	3430
<i>IFIT1</i>	3434
<i>IFIT2</i>	3433
<i>IFITM2</i>	10581
<i>IFITM4P</i>	340198
<i>IFNA2</i>	3440
<i>IGFBP2</i>	3485
<i>IGFBP4</i>	3487
<i>IGFBP5</i>	3488
<i>IGHV4-4</i>	28401
<i>IGHV5-10-1</i>	28386
<i>IKBKB</i>	3551
<i>IL12B</i>	3593
<i>IL1A</i>	3552
<i>IL1R2</i>	7850
<i>IL2</i>	3558
<i>IL20RA</i>	53832
<i>IL27RA</i>	9466
<i>IL3</i>	3562
<i>IL4</i>	3565
<i>IL7</i>	3574
<i>IMPA2</i>	3613
<i>IMPDH2</i>	3615
<i>INKA2</i>	55924
<i>INPP1</i>	3628
<i>INPP5E</i>	56623
<i>INS2</i>	16334
<i>INSIG1</i>	3638
<i>IPF1</i>	445683
<i>IQGAP2</i>	10788

<i>IREB2</i>	3658
<i>IRGM1</i>	15944
<i>ISL1</i>	3670
<i>ITGAV</i>	3685
<i>ITGB2</i>	3689
<i>ITGB4</i>	3691
<i>ITPR1</i>	3708
<i>ITSN1</i>	6453
<i>ITSN2</i>	50618
<i>JAG1</i>	182
<i>JMJD4</i>	65094
<i>JUND</i>	3727
<i>KANSL1</i>	284058
<i>KCNA5</i>	3741
<i>KCNQ2</i>	3785
<i>KCTD12</i>	115207
<i>KDM5A</i>	5927
<i>KEAP1</i>	9817
<i>KIAA0040</i>	9674
<i>KIF14</i>	9928
<i>KIF15</i>	56992
<i>KIF23</i>	9493
<i>KIF26B</i>	55083
<i>KIF2C</i>	11004
<i>KIF3A</i>	11127
<i>KITLG</i>	4254
<i>KLF5</i>	688
<i>KLF6</i>	1316
<i>KLHL24</i>	54800
<i>KLHL7</i>	55975
<i>KLHL9</i>	55958
<i>KLK15</i>	55554
<i>KMT2E</i>	55904
<i>KNG1</i>	3827
<i>KPNA3</i>	3839
<i>KRT1</i>	3848
<i>KRT16</i>	3868
<i>KRT17</i>	3872
<i>KRT6A</i>	3853
<i>LITD1</i>	54596
<i>LAMA1</i>	284217
<i>LAMB1</i>	3912
<i>LAMP2</i>	3920

<i>LARP4B</i>	23185
<i>LASP1</i>	3927
<i>LDHA</i>	3939
<i>LDHB</i>	3945
<i>LEFTY1</i>	10637
<i>LGALS3BP</i>	3959
<i>LGALS8</i>	3964
<i>LGR4</i>	55366
<i>LGR5</i>	8549
<i>LHX1</i>	3975
<i>LIFR</i>	3977
<i>LIG1</i>	3978
<i>LIMD2</i>	80774
<i>LIMK1</i>	3984
<i>LIMK2</i>	3985
<i>LIN28A</i>	79727
<i>LIN-29</i>	174830
<i>LIPH</i>	200879
<i>LMF1</i>	64788
<i>LMNA</i>	4000
<i>LMNB2</i>	84823
<i>LMO7</i>	4008
<i>LPAR6</i>	10161
<i>LPO</i>	4025
<i>LPXN</i>	9404
<i>LRATD1</i>	151354
<i>LRBA</i>	987
<i>LRP8</i>	7804
<i>LRRC15</i>	131578
<i>LSS</i>	4047
<i>LXN</i>	56925
<i>LY6G6C</i>	80740
<i>LY6G6D</i>	58530
<i>LYPLA1</i>	10434
<i>M6PR</i>	4074
<i>MACF1</i>	23499
<i>MAD2L2</i>	10459
<i>MADD</i>	8567
<i>MAF</i>	4094
<i>MAFF</i>	23764
<i>MAGEA4</i>	4103
<i>MAGED4B</i>	81557
<i>MAMDC2</i>	256691

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<i>MANEA</i>	79694
<i>MAP1LC3B</i>	81631
<i>MAP2</i>	4133
<i>MAP3K1</i>	4214
<i>MAP3K20</i>	51776
<i>MAP4K5</i>	11183
<i>MAPK8</i>	5599
<i>MAPKAP1</i>	79109
<i>MAPT</i>	4137
<i>MARS1</i>	4141
<i>MAST4</i>	375449
<i>MBD4</i>	8930
<i>MBNL1</i>	4154
<i>MCCC2</i>	64087
<i>MCF2</i>	4168
<i>MCM10</i>	55388
<i>MCM2</i>	4171
<i>MCM4</i>	4173
<i>MCM6</i>	4175
<i>MCMBP</i>	79892
<i>MDFIC</i>	29969
<i>MED13L</i>	23389
<i>MEF2B</i>	100271849
<i>MEOX1</i>	4222
<i>MESPI</i>	55897
<i>MESP2</i>	145873
<i>METAP2</i>	10988
<i>METRN</i>	79006
<i>MFN1</i>	55669
<i>MGAT2</i>	4247
<i>MGAT4B</i>	11282
<i>MICA</i>	100507436
<i>MICB</i>	4277
<i>MIR532</i>	693124
<i>MIR577</i>	693162
<i>MKX</i>	283078
<i>MLF1</i>	4291
<i>MLLT11</i>	10962
<i>MMP3</i>	4314
<i>MMS19</i>	64210
<i>MNX1</i>	3110

<i>MORF4L2</i>	9643
<i>MPC2</i>	25874
<i>MPIG6B</i>	80739
<i>MPP7</i>	143098
<i>MPRIIP</i>	23164
<i>MR1</i>	3140
<i>MRAS</i>	22808
<i>MS4A1</i>	931
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<i>MTAP</i>	4507
<i>MTTP</i>	4547
<i>MTUS1</i>	57509
<i>MXI1</i>	4601
<i>MYCL</i>	4610
<i>MYCN</i>	4613
<i>MYF5</i>	4617
<i>MYL4</i>	4635
<i>MYL9</i>	10398
<i>MYLIP</i>	29116
<i>MYO1E</i>	4643
<i>MYO6</i>	4646
<i>MYOD1</i>	4654
<i>MYRF</i>	745
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<i>NBN</i>	4683
<i>NBPF10</i>	100132406
<i>NCAPG</i>	64151
<i>NCL</i>	4691
<i>NCOR1</i>	9611
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<i>NDUFAB1</i>	4706
<i>NDUFAF1</i>	51103
<i>NDUFAF3</i>	25915
<i>NDUFAF4</i>	29078
<i>NDUFB10</i>	4716
<i>NDUFB2</i>	4708
<i>NDUFB9</i>	4715
<i>NDUFC1</i>	4717

<i>NDUFV1</i>	4723
<i>NDUFV3</i>	4731
<i>NEDD4</i>	4734
<i>NEK1</i>	4750
<i>NEK4</i>	6787
<i>NEK6</i>	10783
<i>NEK9</i>	91754
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<i>NEUROG2</i>	63973
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<i>NFIB</i>	4781
<i>NFIC</i>	4782
<i>NINJ1</i>	4814
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<i>NME4</i>	4833
<i>NODAL</i>	4838
<i>NOG</i>	9241
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<i>NT5M</i>	56953
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<i>NTS</i>	4922
<i>NUPR1</i>	26471
<i>OAS2</i>	4939
<i>ODC1</i>	4953
<i>OGFRL1</i>	79627
<i>OLFM4</i>	10562
<i>OLIG3</i>	167826

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<i>ORC6</i>	23594
<i>OTX2</i>	5015
<i>P4HB</i>	5034
<i>PAFAH1B1</i>	5048
<i>PAICS</i>	10606
<i>PAIP1</i>	10605
<i>PANK1</i>	53354
<i>PAQR8</i>	85315
<i>PARD3</i>	56288
<i>PARP14</i>	54625
<i>PAX3</i>	5077
<i>PAX5</i>	5079
<i>PAX8-AS1</i>	654433
<i>PBX3</i>	5090
<i>PCOLCE2</i>	26577
<i>PDCD1LG2</i>	80380
<i>PDCD4</i>	27250
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