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Original Article

Prognostic significance of circulating insulin growth-like factor 1 and insulin growth-like factor binding protein 3 in renal cell carcinoma patients

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Abstract: Insulin growth-like factor-1 (IGF-1) and its main binding protein insulin growth-like factor binding protein 3 (IGFBP-3) play important roles in cancer development and progression. We hypothesize that circulating IGF-1 and IGFBP-3 may have significant prognostic values in renal cell carcinoma (RCC) patients. We used 1,010 histologically confirmed RCC patients in this case series study to test this hypothesis. We constructed a weighted genetic risk score (GRS) using a large panel of genome-wide association study (GWAS)-identified single nucleotide polymorphisms (SNPs) to predict circulating IGF-1 and IGFBP-3 level, respectively. We analyzed the associations of the GRS with the prognosis of RCC patients using multivariate Cox proportional hazards model. We found significant associations between genetically predicted circulating IGF-1 level, but not IGFBP-3, and RCC prognosis. RCC patients with better prognosis had significantly higher baseline circulating IGF-1 level than those with worse prognosis. Dichotomized at the median value of GRS, patients with high IGF-1 exhibited significantly lower risks of recurrence (HR=0.81, 95% CI, 0.65-0.99, P=0.045) and death (HR=0.74, 95% CI, 0.60-0.91, P=0.004). If patients were dichotomized at the 75% value of GRS, those with the highest quarter of GRS had 27% lower risk of recurrence (OR=0.73, 95% CI, 0.55-0.96, P=0.025) and 34% lower risk of death (OR=0.66, 95% CI, 0.50-0.87, P=0.003) than the other three quarters of patients. High IGF-1/IGFBP-3 ratio was also associated with reduced risks of recurrence and survival. In conclusion, high circulating IGF-1 level and IGF-1/IGFBP-3 ratio at diagnosis is associated with better prognosis in RCC patients.

Keywords: Renal cell carcinoma, IGF-1, IGFBP-3, recurrence, survival, genetic risk score

Introduction

Cancers of kidney and renal pelvis are the sixth most common cancer in men and ninth in women, with an estimated incidence of 76,080 in 2021 in the United States [1]. The incidences of kidney cancer continue to increase in both men and women in the U.S. [1, 2]. Renal cell carcinoma (RCC) accounts for approximately 90% of adult kidney cancers and is the most lethal genitourinary cancer. About two thirds of RCC patients present with localized diseases at diagnosis and one third are diagnosed with regional and distant metastatic diseases [2]. Patients with localized diseases can be cured by nephrectomy, however, up to 40% of patients will develop local and distant recurrence and eventually succumb to this disease [3]. To improve prognosis of locoregional RCC, effective adjuvant therapy is clearly needed. Targeted and immune checkpoint therapies have been and are being actively tested as adjuvant therapies for RCC in clinical trials [4, 5]. Sunitinib was approved by FDA as an adjuvant therapy for RCC and improved disease-free survival time by 1.2 years, but significant adverse events occurred that caused dose reductions in over one third and discontinua-

tions in 28.1% of the patients [6]. If clinicians can pre-select patient for adjuvant therapy based on accurate risk stratification algorithm, then only those patients with better prognosis would be good candidates for adjuvant therapy, maximizing clinical benefit whereas avoiding unnecessary adverse effects. The current clinically used nomograms for predicting recurrence risk in surgically resected RCC rely solely on clinicopathologic variables, such as histology, TNM stage, Fuhrman grade, tumor size, and performance status [4]. Identifying independent prognostic biomarkers has the potential to supplement clinical variables and improve the prediction efficiency of recurrence and survival in locoregional RCC patients [7, 8].

Insulin and insulin-like growth factor-1 (IGF-1) is a key molecule in energy metabolism and plays numerous cellular functions including proliferation, differentiation, migration, and apoptosis [9, 10]. Most IGF-1 proteins are bound by IGF-binding proteins (IGFBP), among which IGFBP-3 is the most abundant and binds to approximately 80% of IGF-1 [11, 12]. Binding of IGFBP-3 to IGF-1 blocks the binding of IGF-1 to its receptor and inhibits downstream signaling events, therefore, IGFBP-3 is a negative regulator of IGF-1. Dysregulation of IGF-1 signaling pathways has been implicated in a variety of cancer development and progression, including RCC [9, 10, 13-15]. IGF-1 is highly expressed in over 80% of RCC tumors, whereas IGF-2 is not detectable in RCC tumors [16]. Higher circulating level of IGF-1 has been associated with increased risks of prostate, breast, and colorectal cancers in large prospective UK Biobank study [17, 18]. The association of circulating IGF-1 and RCC risk remains controversial, with inverse, null, and positive associations all being reported [17-20]. In contrast to the numerous studies evaluating the associations between circulating IGF-1/IGFBP-3 levels and cancer risks [17, 18, 21-27], very few studies have assessed the associations of circulating IGF-1/IGFBP-3 with clinical outcomes. To date, only one early study evaluated the prognostic values of serum IGF-1 and IGFBP-3 in RCC, which reported high serum IGF-1 level at diagnosis was associated with better survival than those with low serum IGF-1 [28].

Serologic measurements of IGF-1/IGFBP-3 are influenced by numerous preanalytical variables including blood collection, handling, processing and storage procedures, environmental exposures and lifestyle factors, and physiological and medical conditions, as well as analytical variables including assay platforms and quality control procedures. Recently, there have been an increasing number of studies using genetic variants as instruments to predict a risk factor/biomarker and analyzing its association with disease risks and outcomes, an approach called Mendelian randomization (MR) [29]. Several recent MR studies have analyzed the associations of genetically predicted circulating IGF-1 and IGFBP-3 level with cancer risks [30-34]. No study has applied an MR approach to study IGF-1 and IGFBP-3 in RCC prognosis. In this study, for the first time, we analyzed the prognostic values of genetically predicted circulating IGF-1 and IGFBP-3 in RCC patients using an MR approach.

Materials and methods

Study population and data collection

This study included 1,010 histologically confirmed RCC patients recruited from the University of Texas MD Anderson Cancer Center. All patients were of European descent. Epidemiological data including demographics, tobacco exposure, occupational history, family history of cancer, medical history, and medication were collected via personal interview by trained MD Anderson study interviewers. Clinical and follow-up data, including histology, tumor size, clinical and pathological stage, tumor grade, treatment type (surgery, cytokine therapy, targeted therapy, chemotherapy, radiotherapy, and other therapy), local recurrence and distant metastasis (date of first recurrence/metastasis), current vital status (date of death and cause of death), co-morbid conditions, pre-treatment performance status, pre-treatment weight loss, were abstracted from medical records. Time to recurrence/death was computed from date of surgery to date of last follow-up or recurrence/death.

Genotyping and imputation

Whole genome SNP array was performed using the Illumina HumanHap660W chips and the bioinformatics and quality control for genotyping have been described previously [35]. We

Table 1. Selected characteristics of the study patients

Characteristics	N (%)
Age, Mean (SD)	59.3 (10.6)
Sex	
Men	674 (66.7)
Women	336 (33.3)
Smoking status at diagnosis	
Never-smoker	455 (45.9)
Former smoker	397 (40.1)
Current smoker	139 (14.0)
BMI at diagnosis, kg/m^2	
<25	154 (20.5)
25-29.99 (overweight)	277 (36.8)
≥30 (obese)	321 (42.7)
Histology	
Clear Cell	781 (77.3)
Other	229 (22.7)
Clinical Stage	
I	381 (38.4)
II	71 (7.2)
III	271 (27.4)
IV	267 (27.0)
Fuhrman Grade	
2	332 (35.9)
3	393 (42.5)
4	199 (21.5)
Surgery	
Yes	920 (93.6)
No	63 (6.4)
Recurrence	
Yes	389 (38.5)
No	621 (61.5)
Survival status	
Dead	415 (41.1)
Alive	595 (58.9)

randomly selected 2% of the samples as duplicates for genotyping and the genotype concordance rate for duplicated samples was 99.2%. We excluded samples with overall SNP call rates lower than 95%. We used the Michigan Imputation Server (https://imputationserver.sph.umich.edu/) for imputation [36]. The mean imputation accuracy (R^2) was 0.96. Previous GWAS identified 413 SNPs associated with circulating IGF-1 and 4 SNPs with IGFBP-3 [31, 32, 37, 38], and we used these SNPs to construct genetic risk scores.

Genetic Risk Score (GRS)

We constructed weighted GRS using 413 IGF-1 and four IGFBP-3 associated SNPs, respectively, according to the following formula,

$$GRS_i = \sum_{j=1}^{N} w_j \, x_{ij}$$

In which GRS_i is the risk score for individual i, x_{ij} (x_{ij}=0, 1 or 2) is the number of IGF-1 or IGFBP-3 risk alleles for the j-th SNP, and w_j is the effect coefficient (β estimate) for each SNP. The β estimates for SNP-IGF-1 and SNP-IGFBP-3 association were obtained from published GWAS [31, 32, 37, 38]. "N" is the number of SNPs. A higher GRS value represents higher genetically predicted circulating IGF-1 or IGFBP-3 level.

Statistical analysis

For each individual SNP, we evaluated its association with the risk of recurrence or death by calculating the hazard ratio (HR) and corresponding 95% confidence interval (95% CI) using multivariate Cox proportional hazards model, adjusting for age, gender, smoking status, BMI, stage, grade, and treatment. To analyze the association between GRS and the risk of recurrence or death, we dichotomized GRS at the median value or 75% value and used multivariate Cox proportional hazards model to calculate HR and corresponding 95% CI adjusting for age, gender, smoking status, BMI, stage, grade, and treatment.

Results

Patient characteristics

Table 1 shows the selected characteristics of the 1,010 RCC patients. The mean age (standard deviation) at diagnosis was 59.3 (10.6) years. About two thirds (674, 66.7%) of the patients were men and one third were women (336, 33.3%). The prevalence of never, former, and current smokers was 45.9%, 40.1%, and 14.0%, respectively. Most patients were either overweight (36.8%) or obese (42.7%). Clear cell RCC is the predominant histology (77.3%). The distribution of clinical stages was: stage I, 381 (38.4%); stage II, 71 (7.2%); stage III, 271 (27.4%), and stage IV, 267 (27.0%). The vast majority (93.6%) of patients received nephrectomy. Recurrence occurred in 389 (38.5%)

Table 2. GRS predictive of IGF-1 is associated with recurrence in RCC patients

GRS	No Recurrence N (%)	Recurrence N (%)	Adjusted HR (95% CI)*	*P* value
Continuous				
Mean (SD)	0.59 (0.27)	0.48 (0.25)	0.63 (0.42-0.93)	0.021
Dichotomize at median				
Low	273 (54.06)	232 (45.94)	Reference	
High	348 (68.91)	157 (31.09)	0.81 (0.65-0.99)	0.045
Dichotomize at 75% value				
Low	434 (57.26)	324 (42.74)	Reference	
High	187 (74.21)	65 (25.79)	0.73 (0.55-0.96)	0.025

*Adjusted by age, gender, smoking status, BMI, histology, stage, grade, and treatment.

Table 3. GRS predictive of IGF-1 is associated with survival in RCC patients

GRS	Alive N (%)	Dead N (%)	Adjusted HR (95% CI)*	*P* value
Continuous				
Mean (SD)	0.59 (0.27)	0.49 (0.25)	0.65 (0.44-0.95)	0.027
Dichotomize at median				
Low	261 (51.68)	244 (48.32)	Reference	
High	334 (66.14)	171 (33.86)	0.74 (0.60-0.91)	0.004
Dichotomize at 75% value				
Low	410 (54.09)	348 (45.91)	Reference	
High	185 (73.41)	67 (26.59)	0.66 (0.50-0.87)	0.003

*Adjusted by age, gender, smoking status, BMI, histology, stage, grade, and treatment.

patients and 415 (41.1%) patients died from the disease.

Associations of SNPs and GRS with prognosis of RCC

The individual associations of the 413 IGF-1-associated and 4 IGFBP-3-associated SNPs with recurrence and death were shown in Supplementary Table 1. There were 40 SNPs reaching nominal significance (P<0.05) and 12 SNPs reaching P<0.01 in recurrence analysis, and 39 SNPs with P<0.05 and 10 SNPs with P<0.01 in survival analysis. Ten SNPs showed consistent association (P<0.05) with both recurrence survival in the same direction. The host genes of these 10 SNPs included *AC07-3901.1*, *RAI1*, *TNXB*, *TIGD2*, *ZNRF3*, *RBFOX1*, *WLS*, *ATP6V1G2*, *ASTN2*, and *PAPPA2*. One of the four IGFBP-3 SNPs reached P<0.05 in either the recurrence or survival analysis (Supplementary Table 1). None of these individual associations reached significance after Bonferroni correction or false discovery rate calculation (data not shown).

We then constructed a weighted GRS to predict IGF-1 and IGFBP-3, respectively, and analyzed the associations of the GRS with RCC prognosis. As a continuous variable, GRS for IGF-1 exhibited a significant inverse association with recurrence (HR=0.63 per SD increase, 95% CI, 0.42-0.93, P=0.021). We also analyzed GRS as a categorical variable. We dichotomized patients into two groups based on the median value of GRS, patients with high GRS (high circulating IGF-1) had 19% reduced risk of recurrence (HR=0.81, 95% CI, 0.65-0.99, P=0.045) compared to those with low GRS (low circulating IGF-1). When we dichotomized patients into two groups based on the 75% value of GRS, those with the highest quarter of GRS had 27% lower risk of recurrence (OR=0.73, 95% CI, 0.55-0.96, P=0.025) than the other three quarters of patients (**Table 2**).

We observed similar associations between genetically predicted circulating IGF-1 level and risk of death. Patients with higher GRS had a significantly reduced risk of death (HR=0.65 per SD increase, 95% CI, 0.44-0.95, P=0.027). When GRS was analyzed as a categorical variable, the HR for patients with the high GRS was 0.74 (95% CI, 0.60-0.91, P=0.004) and 0.66 (95% CI, 0.50-0.87, P=0.003), respectively, compared to patient with low GRS when patients were dichotomized into two groups based on the median and 75% GRS values, respectively (**Table 3**).

Similar analyses were performed for IGFBP-3 and no significant association between genetically predicted IGFBP-3 and RCC prognosis was observed (HR=0.97 per SD increase, 95% CI, 0.63-1.52, P=0.910 for recurrence, and

Table 4. Associations of GRS predictive of IGFBP-3 with recurrence and survival in RCC patients

GRS	No Recurrence N (%)	Recurrence N (%)	Adjusted HR (95% CI)*	*P* value	Alive N (%)	Dead N (%)	Adjusted HR (95% CI)*	*P* value
Continuous								
Mean (SD)	0.59 (0.24)	0.59 (0.23)	0.97 (0.63-1.52)	0.910	0.59 (0.24)	0.59 (0.23)	0.91 (0.59-1.40)	0.659
Dichotomize at median								
Low	309 (60.71)	200 (39.29)	Reference		297 (58.35)	212 (41.65)	Reference	
High	312 (62.28)	189 (37.72)	0.98 (0.80-1.21)	0.874	298 (59.48)	203 (40.52)	1.00 (0.82-1.23)	0.958
Dichotomize at 75% value								
Low	466 (61.48)	292 (38.52)	Reference		466 (61.48)	292 (38.52)		
High	155 (61.51)	97 (38.49)	0.94 (0.74-1.19)	0.610	155 (61.51)	97 (38.49)	0.82 (0.64-1.04)	0.096

*Adjusted by age, gender, smoking status, BMI, histology, stage, grade, and treatment.

Table 5. Associations of IGF-1/IGFBP-3 ratio with recurrence and survival in RCC patients

GRS	No Recurrence N (%)	Recurrence N (%)	Adjusted HR (95% CI)*	*P* value	Alive N (%)	Dead N (%)	Adjusted HR (95% CI)*	*P* value
Continuous								
Mean (SD)	1.31 (1.28)	1.11 (1.28)	0.94 (0.86-1.03)	0.227	1.34 (1.42)	1.07 (1.04)	0.89 (0.81-0.99)	0.028
Dichotomize at median								
Low	278 (55.49)	223 (44.51)	Reference		267 (53.29)	234 (46.71)	Reference	
High	337 (67.27)	164 (32.73)	0.80 (0.65-0.99)	0.037	323 (64.47)	178 (35.53)	0.79 (0.65-0.97)	0.023
Dichotomize at 75% value								
Low	438 (58.24)	314 (41.76)	Reference		423 (56.25)	329 (43.75)	Reference	
High	177 (70.80)	73 (29.20)	0.71 (0.55-0.93)	0.011	167 (66.80)	83 (33.20)	0.65 (0.50-0.84)	0.001

*Adjusted by age, gender, smoking status, BMI, histology, stage, grade, and treatment.

HR=0.91 per SD increase, 95% CI, 0.59-1.40, P=0.659 for survival) (**Table 4**).

We then calculated the IGF-1/IGFBP-3 ratio and analyzed the associations of IGF-1/IGFBP-3 ratio with RCC prognosis (**Table 5**). As a continuous variable, IGF-1/IGFBP-3 ratio was associated with modestly reduced risks of recurrence (HR=0.94 per SD increase, 95% CI, 0.86-1.03, P=0.227) and survival (HR=0.89 per SD increase, 95% CI, 0.81-0.99, P=0.028). Dichotomized at the median value of IGF-1/IGFBP-3 ratio, patients with high IGF-1/IGFBP-3 ratio had 20% reduced risk of recurrence (HR=0.80, 95% CI, 0.65-0.99, P=0.037) and 21% reduced risk of death (HR=0.79, 95% CI, 0.65-0.97, P=0.023) compared to those with low IGF-1/IGFBP-3 ratio. Dichotomized at the 75% value of IGF-1/IGFBP-3 ratio, patients with the highest quarter of IGF-1/IGFBP-3 ratio had 29% lower risk of recurrence (OR=0.71, 95% CI, 0.55-0.93, P=0.011) and 35% lower risk of recurrence (OR=0.65, 95% CI, 0.50-0.84, P=0.001) than the other three quarters of patients (**Table 5**).

Discussion

In this study, we showed that genetically predicted circulating IGF-1 is an independent predictor of prognosis in RCC patients. To our knowledge, this is the first study to use an MR approach to investigate the prognostic roles of circulating IGF-1 and IGFBP-3 in RCC.

The involvement of insulin and insulin-like growth factors in cancer development and progression has been known for many years [9, 10, 15]. IGF-1 can stimulate cancer cell growth and its receptor, IGF-1R, is overexpressed in multiple human cancers [9, 10]. IGF-1R is a tyrosine kinase and targeting IGF-1R by specific antibody has shown anti-tumor efficacy in preclinical models and clinical trials [9, 10]. IGF-1 binds to IGF-1R and activates downstream cascades of kinases such as PI3K-Akt and Ras-MAPK signaling pathways [9]. Given the growth-stimulating effects of IGF-1, it follows that high circulating IGF-1 level should favor cancer development. Several recent analyses of the prospective UK Biobank cohort with baseline serum IGF-1 measurements and follow-up data have shown that high baseline serum IGF-1 level is associated with significantly increased risks of multiple cancers, including breast, prostate, colorectal, thyroid, and malignant skin cancer [17, 18, 30-32].

In contrast to the multiple reports of positive associations between high serum IGF-1 and

increased cancer risks from large prospective studies, the associations between serum IGF-1 and cancer prognosis were quite heterogeneous. Many studies demonstrated an inverse correlation, i.e., high circulating IGF-1 level at diagnosis is associated with reduced risk of death and longer survival [28, 39-43]. For example, an early lung study reported high pretreatment plasma IGF-1 level was predictive of longer progression-free (P=0.001) and overall survival (P=0.025) [39]. Two studies have shown that high baseline plasma IGF-1 level correlated with significantly reduced risk of death and longer overall survival in hepatocellular carcinoma patients [40, 41]. A study of 527 metastatic colorectal cancer patients enrolled in a randomized trial of first-line chemotherapy showed higher baseline plasma IGF-1 level was associated with improved overall survival (P=0.0001) [42]. Another recent large study consisting of 2,682 surgically resected invasive breast cancer patients found patients with high preoperative serum IGF-1 concentration had lower risks of all-cause mortality (HR, 0.53; 95% CI, 0.29-0.96) and breast cancer-specific mortality (HR, 0.53; 95% CI, 0.27-1.02) [43]. The only previous study in RCC showed that when patients were dichotomized at the median baseline serum IGF-1 level, those with high serum IGF-1 had a 38% reduced risk of death (HR=0.62, 95% CI, 0.41-0.95, P=0.028) compared to those with low serum IGF-1 [28]. Our results of significant associations between high genetically predicted circulating IGF-1 and reduced risks of recurrence and death are consistent with that RCC study using serologically measured IGF-1. Our study is the first to use an MR approach, which is not affected by preanalytical and analytical factors related to serological measurements of IGF-1. Our results provide strong evidence for a causal relationship between high circulating IGF-1 and better prognosis in RCC patients.

The inverse associations between circulating IGF-1 and prognosis appear counterintuitive because the growth-stimulating effect of IGF-1 would presumably promoter cancer progression. However, there was no correlation between circulating IGF-1 and RCC tumor stage and grade [28]. "Obesity paradox" is a well-known phenomenon in RCC that describes the opposing roles of obesity in cancer initiation and prognosis, i.e., obesity is a major risk factor for RCC [44-48], but obese and overweight RCC patients have better prognosis [49-51]. The IGF-1 axis contributes to obesity-induced biological changes and the association of high circulating IGF-1 with better prognosis of RCC patients may be related to obesity-related biology. In addition, IGF-1 is a marker of nutritional state [52] and low circulating IGF-1 may reflect poor nutritional status and impaired performance status, thus resulting in worse prognosis. The exact mechanisms underlying the inverse association between circulating IGF-1 and prognosis in RCC patients warrant further investigation.

This is the first MR study of circulating IGF-1 and IGFBP-3 in RCC prognosis. We found that genetically predicted higher circulating IGF-1, but not IGFBP-3, is associated with lower risks of recurrence and death in RCC patients. Our results are consistent with the only published report of serologically measured IGF-1 and IGFBP-3 in RCC prognosis [28]. There are a few limitations in this study. First, the genetic instruments only explain 9.4% and 6.1% of variability in circulating IGF-1 and IGFBP-3 levels, respectively [31]. Additional SNPs are needed to increase the instrument strength. Second, this is a single center study. Validations in additional RCC patient cohorts would further strengthen the notion that IGF-1 is a favorable prognostic factor in RCC patients. Third, we only included European ancestry patients in this study. Future studies are warranted to assess the prognostic roles of IGF-1 and IGFBP-3 in other races/ethnicities.

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Disclosure of conflict of interest

None.

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Supplementary Table 1. Association parameters of instrumental SNPs with risk factors (IGF-1 or IGFBP-3) and RCC recurrence and death

SNP ID	Chr.	Position	Gene	Allele*	EAF	β1	SNP-Recurrence			SNP-Death		
							β2	HR (95% CI)	*P* value	β3	HR (95% CI)	*P* value
IGF-1 SNPs												
rs10860237	12	98157010	AC007424.1	G/A	0.338	-0.030	-0.318	0.73 (0.61-0.86)	2.18×10^{-4}	-0.086	0.92 (0.79-1.07)	0.2647
rs7323205	13	110365525	LINC00676	C/T	0.381	0.015	-0.271	0.76 (0.65-0.89)	6.60×10^{-4}	-0.135	0.87 (0.75-1.01)	0.0712
rs702878	2	65702609	AC007389.1	A/G	0.439	0.014	-0.197	0.82 (0.71-0.95)	0.0070	-0.100	0.9 (0.79-1.04)	0.1591
rs12666306	7	115082406	**AC073901.1**	G/A	0.493	0.017	-0.246	0.78 (0.67-0.91)	0.0011	-0.175	0.84 (0.73-0.97)	**0.0190**
rs4394044	4	186607420	SORBS2	T/C	0.416	0.014	-0.244	0.78 (0.67-0.91)	0.0019	-0.083	0.92 (0.79-1.07)	0.2697
rs112436634	1	10637709	PEX14	C/T	0.320	-0.016	-0.258	0.77 (0.65-0.91)	0.0022	-0.135	0.87 (0.75-1.02)	0.0776
rs8075153	17	17622666	**RAI1**	C/T	0.412	0.021	-0.225	0.8 (0.69-0.93)	0.0030	-0.203	0.82 (0.71-0.94)	**0.0063**
rs17265513	20	39832628	ZHX3	C/T	0.820	-0.022	0.315	1.37 (1.11-1.69)	0.0032	-0.015	0.99 (0.81-1.2)	0.8835
rs1150752	6	32064726	**TNXB**	C/T	0.893	-0.031	0.362	1.44 (1.12-1.85)	0.0049	0.301	1.35 (1.05-1.73)	**0.0181**
rs12710648	2	17989500	SMC6	A/G	0.478	0.017	-0.197	0.82 (0.71-0.95)	0.0071	-0.023	0.98 (0.85-1.12)	0.7428
rs2280099	4	90035549	**TIGD2**	G/A	0.816	0.025	0.256	1.29 (1.07-1.56)	0.0081	0.200	1.22 (1.02-1.47)	**0.0332**
rs1532824	16	10532211	ATF7IP2	C/A	0.276	-0.017	0.219	1.24 (1.06-1.47)	0.0083	0.093	1.1 (0.93-1.29)	0.2566
rs12520263	5	44122508	RNU6-381P	G/T	0.269	-0.017	0.039	1.04 (0.89-1.22)	0.6361	0.257	1.29 (1.12-1.5)	6.42×10^{-4}
rs73954943	2	111890432	BCL2L11	G/A	0.059	-0.031	0.103	1.11 (0.81-1.52)	0.5220	0.473	1.6 (1.21-2.13)	0.0010
rs8138950	22	29448643	**ZNRF3**	C/T	0.519	0.015	-0.187	0.83 (0.71-0.96)	**0.0144**	-0.237	0.79 (0.68-0.91)	0.0014
rs74774288	16	5922263	**RBFOX1**	G/T	0.179	0.027	-0.240	0.79 (0.64-0.96)	**0.0184**	-0.312	0.73 (0.6-0.89)	0.0018
rs72858776	11	15772953	AC087379.1	G/T	0.061	0.030	0.261	1.3 (0.94-1.8)	0.1187	0.432	1.54 (1.16-2.05)	0.0030
rs2227819	5	76012745	F2R	C/T	0.094	-0.022	-0.116	0.89 (0.68-1.16)	0.3904	-0.388	0.68 (0.52-0.89)	0.0048
rs3791679	2	56096892	EFEMP1	A/G	0.234	-0.018	0.093	1.1 (0.93-1.3)	0.2816	0.235	1.26 (1.07-1.49)	0.0052
rs143885630	1	183482785	SMG7	G/A	0.116	0.030	-0.057	0.94 (0.74-1.2)	0.6457	0.303	1.35 (1.09-1.69)	0.0067
rs1170158	13	42701941	DGKH	T/G	0.190	0.021	-0.072	0.93 (0.77-1.12)	0.4440	-0.250	0.78 (0.65-0.94)	0.0080
rs218291	6	108467024	OSTM1/OSTM1-AS1	G/A	0.373	0.016	-0.069	0.93 (0.8-1.09)	0.3913	-0.205	0.81 (0.7-0.95)	0.0082
rs1430753	1	68692642	**WLS**	G/A	0.175	-0.021	0.248	1.28 (1.06-1.55)	**0.0111**	0.237	1.27 (1.05-1.52)	**0.0119**
rs9267488	6	31514247	**ATP6V1G2-DDX39B**	G/A	0.887	-0.031	0.264	1.3 (1.03-1.65)	**0.0278**	0.316	1.37 (1.08-1.75)	**0.0107**
rs7872812	9	119341544	**ASTN2**	C/T	0.143	-0.026	-0.227	0.8 (0.64-0.99)	**0.0386**	-0.234	0.79 (0.63-0.99)	**0.0394**
rs12749024	1	176522365	**PAPPA2**	C/T	0.127	-0.075	-0.246	0.78 (0.62-0.99)	**0.0438**	-0.271	0.76 (0.6-0.97)	**0.0283**
rs12593755	15	89111712	AC013489.2	G/T	0.403	-0.016	-0.132	0.88 (0.75-1.02)	0.0831	-0.064	0.94 (0.81-1.09)	0.3889
rs7719168	5	53292390	ARL15	A/C	0.118	-0.030	0.010	1.01 (0.81-1.26)	0.9277	0.013	1.01 (0.82-1.26)	0.9095
rs6827641	4	145653694	GYPA/HHIP	C/T	0.454	-0.014	-0.090	0.91 (0.79-1.06)	0.2385	-0.021	0.98 (0.85-1.13)	0.7778
rs8017377	14	24883887	NYNRIN	A/G	0.517	-0.017	0.033	1.03 (0.9-1.19)	0.6470	0.035	1.04 (0.9-1.19)	0.6240
rs17145738	7	72982874	TBL2	C/T	0.103	-0.034	-0.169	0.84 (0.66-1.08)	0.1807	-0.022	0.98 (0.77-1.25)	0.8569
rs117564283	12	52300110	ACVRL1	C/T	0.061	-0.029	0.323	1.38 (1.06-1.8)	**0.0174**	0.148	1.16 (0.87-1.54)	0.3128
rs116971887	16	51170026	SALL1	G/T	0.041	0.036	-0.313	0.73 (0.5-1.08)	0.1128	-0.167	0.85 (0.58-1.23)	0.3773
rs45505697	1	153651058	NPR1	C/A	0.015	0.030	0.264	1.3 (0.68-2.47)	0.4214	-0.027	0.97 (0.52-1.81)	0.9308

rs72758321	5	41464841	PLCXD3	A/G	0.023	-0.047	-0.093	0.91 (0.55-1.52)	0.7231	0.111	1.12 (0.69-1.81)	0.6536
rs118081390	13	49671053	FNDC3A	G/A	0.048	0.028	-0.077	0.93 (0.65-1.32)	0.6670	-0.108	0.9 (0.63-1.27)	0.5399
rs17393144	1	9210262	MIR34A	G/A	0.294	-0.016	-0.049	0.95 (0.81-1.12)	0.5470	-0.044	0.96 (0.82-1.12)	0.5941
rs4988483	16	1129010	SSTR5	A/C	0.992	-0.172	0.300	1.35 (0.53-3.41)	0.5254	0.403	1.5 (0.55-4.1)	0.4339
rs10851736	15	64940718	ZNF609	C/T	0.092	-0.027	-0.157	0.85 (0.66-1.1)	0.2282	-0.321	0.73 (0.56-0.94)	**0.0169**
rs11012712	10	21760015	-	C/T	0.203	0.022	-0.058	0.94 (0.79-1.13)	0.5313	-0.074	0.93 (0.78-1.1)	0.3997
rs1986692	7	133743393	EXOC4	A/G	0.373	-0.015	0.145	1.16 (0.97-1.38)	0.1062	0.014	1.01 (0.86-1.2)	0.8678
rs10892564	11	120224650	ARHGEF12	A/G	0.392	-0.017	-0.012	0.99 (0.85-1.15)	0.8773	0.021	1.02 (0.88-1.19)	0.7826
rs2819336	1	44015809	PTPRF	C/T	0.360	-0.027	-0.012	0.99 (0.85-1.15)	0.8704	-0.085	0.92 (0.8-1.06)	0.2498
rs2786185	6	147595554	STXBP5	G/A	0.453	0.019	0.088	1.09 (0.94-1.27)	0.2463	-0.093	0.91 (0.79-1.05)	0.2003
rs10246481	7	156184748	lincRNA	A/G	0.395	-0.015	0.075	1.08 (0.93-1.25)	0.3268	0.034	1.03 (0.89-1.2)	0.6456
rs11678946	2	222302730	EPHA4	C/A	0.487	-0.014	0.103	1.11 (0.95-1.3)	0.2010	0.093	1.1 (0.93-1.29)	0.2581
rs11230983	11	55541284	OR5D13	A/G	0.882	0.035	0.150	1.16 (0.92-1.46)	0.1990	0.005	1.01 (0.81-1.25)	0.9641
rs329122	5	133864599	JADE2	G/A	0.431	-0.018	0.035	1.04 (0.89-1.2)	0.6447	0.050	1.05 (0.91-1.22)	0.5016
rs10136874	14	101202022	DLK1	G/T	0.487	0.023	-0.041	0.96 (0.83-1.11)	0.5760	-0.019	0.98 (0.85-1.13)	0.7959
rs12442867	15	62489128	AC126323.2	C/A	0.396	-0.017	0.114	1.12 (0.95-1.32)	0.1651	0.068	1.07 (0.92-1.24)	0.3792
rs2424396	20	21630280	LINC01726	A/G	0.072	-0.033	0.110	1.12 (0.85-1.47)	0.4332	-0.142	0.87 (0.66-1.15)	0.3161
rs6895953	5	39084471	RICTOR	G/A	0.431	0.024	-0.023	0.98 (0.84-1.14)	0.7639	-0.121	0.89 (0.76-1.03)	0.1107
rs1046011	1	65898996	LEPR/LEPROT	C/T	0.302	-0.021	0.034	1.03 (0.88-1.22)	0.6807	-0.077	0.93 (0.79-1.08)	0.3269
rs4980661	11	69306579	CCND1	A/G	0.477	0.014	-0.161	0.85 (0.73-0.99)	**0.0348**	0.132	1.14 (0.99-1.32)	0.0744
rs7625680	3	11378069	ATG7	A/G	0.364	0.015	-0.053	0.95 (0.81-1.1)	0.4970	-0.061	0.94 (0.81-1.09)	0.4177
rs7545345	1	205690941	NUCKS1	T/C	0.123	-0.026	-0.008	0.99 (0.8-1.24)	0.9436	-0.177	0.84 (0.67-1.04)	0.1154
rs1050327	7	44808017	ZMIZ2	G/A	0.482	-0.017	-0.077	0.93 (0.8-1.08)	0.3183	0.122	1.13 (0.98-1.31)	0.1036
rs73382439	6	20404420	E2F3	C/T	0.166	0.019	-0.095	0.91 (0.74-1.11)	0.3534	-0.182	0.83 (0.68-1.03)	0.0869
rs12471768	2	64928603	SERTAD2	C/T	0.288	0.022	-0.072	0.93 (0.79-1.1)	0.3974	0.122	1.13 (0.96-1.33)	0.1352
rs6180	5	42719239	GHR	C/A	0.538	-0.035	0.010	1.01 (0.87-1.17)	0.8993	0.067	1.07 (0.92-1.24)	0.3757
rs62302688	4	46448465	GABRA2	G/A	0.057	0.039	-0.088	0.92 (0.66-1.26)	0.5913	-0.083	0.92 (0.68-1.24)	0.5896
rs2075995	1	23847464	E2F2	A/C	0.505	-0.014	-0.100	0.91 (0.78-1.05)	0.1939	-0.018	0.98 (0.85-1.13)	0.8074
rs9819762	3	178914879	PIK3CA	T/C	0.192	0.019	-0.045	0.96 (0.8-1.15)	0.6274	0.013	1.01 (0.85-1.21)	0.8832
rs34312198	7	99674870	ZNF3	C/A	0.109	-0.024	0.042	1.04 (0.84-1.3)	0.7026	-0.204	0.82 (0.65-1.03)	0.0876
rs7740433	6	42908013	CNPY3	A/G	0.238	0.017	-0.151	0.86 (0.72-1.03)	0.1033	-0.203	0.82 (0.68-0.98)	**0.0256**
rs9611565	22	41767486	TEF	T/C	0.236	0.029	0.118	1.13 (0.94-1.35)	0.2014	0.075	1.08 (0.9-1.29)	0.4077
rs6853741	4	148982559	ARHGAP10	A/G	0.256	0.024	-0.074	0.93 (0.78-1.11)	0.4110	-0.062	0.94 (0.79-1.11)	0.4730
rs7758644	6	156583467	snoRNA	C/A	0.164	-0.019	-0.018	0.98 (0.8-1.21)	0.8703	0.026	1.03 (0.84-1.26)	0.8034
rs11024614	11	18326758	HPS5	T/C	0.403	-0.023	-0.010	0.99 (0.85-1.16)	0.9029	-0.013	0.99 (0.85-1.14)	0.8627
rs4402747	2	225457173	CUL3	G/A	0.460	-0.016	-0.021	0.98 (0.84-1.14)	0.7789	-0.026	0.97 (0.84-1.13)	0.7269
rs2896395	7	127511705	SND1	C/T	0.297	0.015	-0.024	0.98 (0.83-1.15)	0.7688	0.023	1.02 (0.88-1.19)	0.7659
rs13195402	6	26463575	BTN2A1	T/G	0.928	-0.038	-0.011	0.99 (0.74-1.32)	0.9430	0.139	1.15 (0.86-1.54)	0.3541
rs13069961	3	124358715	KALRN	A/G	0.203	-0.018	0.027	1.03 (0.85-1.24)	0.7799	-0.195	0.82 (0.69-0.98)	**0.0311**

rs10769621	11	49860463	TRIM51FP	T/C	0.671	0.020	0.020	1.02 (0.87-1.2)	0.8053	-0.053	0.95 (0.81-1.1)	0.4949
rs13178887	5	88355993	MEF2C-AS1	T/C	0.391	0.023	0.117	1.12 (0.97-1.3)	0.1091	0.104	1.11 (0.96-1.28)	0.1449
rs41285260	6	126661502	CENPW	T/G	0.967	0.039	0.041	1.04 (0.65-1.67)	0.8643	-0.047	0.95 (0.6-1.52)	0.8442
rs4719393	7	14219213	DGKB	T/G	0.289	0.027	-0.097	0.91 (0.77-1.07)	0.2485	-0.103	0.9 (0.77-1.06)	0.2124
rs9398891	6	129314749	LAMA2	C/T	0.317	-0.017	0.006	1.01 (0.86-1.17)	0.9351	0.087	1.09 (0.94-1.27)	0.2524
rs13379043	14	74250126	ELMSAN1	T/C	0.288	0.025	-0.047	0.95 (0.8-1.13)	0.5957	-0.047	0.95 (0.81-1.13)	0.5809
rs12927172	16	27325021	IL4R	G/A	0.390	-0.015	0.079	1.08 (0.93-1.26)	0.3024	0.003	1 (0.87-1.16)	0.9681
rs77542162	17	67081278	ABCA6	G/A	0.989	0.054	0.127	1.14 (0.53-2.43)	0.7430	-0.144	0.87 (0.43-1.76)	0.6914
rs9321106	6	128355316	PTPRK	A/G	0.165	0.018	-0.074	0.93 (0.76-1.14)	0.4803	-0.154	0.86 (0.7-1.05)	0.1428
rs1498603	5	58333125	PDE4D	T/G	0.065	0.031	0.178	1.19 (0.89-1.61)	0.2441	-0.058	0.94 (0.7-1.27)	0.6986
rs11057265	12	123805950	SBNO1	G/A	0.024	0.044	0.048	1.05 (0.69-1.61)	0.8246	0.007	1.01 (0.65-1.55)	0.9758
rs33969824	3	42679777	NKTR	G/T	0.874	0.020	0.195	1.22 (0.97-1.52)	0.0892	-0.193	0.82 (0.67-1.01)	0.0599
rs1800574	12	121416864	HNF1A	T/C	0.983	0.145	0.037	1.04 (0.52-2.05)	0.9142	-0.535	0.59 (0.33-1.04)	0.0668
rs8112883	19	7179320	INSR	G/T	0.275	0.017	-0.019	0.98 (0.83-1.16)	0.8188	0.115	1.12 (0.95-1.32)	0.1630
rs35036084	4	97552791	LINC02267	T/C	0.389	0.017	0.024	1.02 (0.88-1.19)	0.7534	-0.028	0.97 (0.84-1.13)	0.7140
rs116454156	10	95347041	FFAR4	A/G	0.992	0.078	-0.241	0.79 (0.25-2.48)	0.6814	-0.858	0.42 (0.16-1.16)	0.0934
rs7910087	10	77209145	LRMDA	C/T	0.439	-0.017	-0.050	0.95 (0.82-1.11)	0.5145	-0.051	0.95 (0.82-1.1)	0.5001
rs2250243	7	6690240	ZNF316	T/C	0.238	-0.024	-0.008	0.99 (0.84-1.17)	0.9260	-0.077	0.93 (0.78-1.1)	0.3731
rs2362755	3	24716668	THRB-AS1	G/T	0.439	-0.016	-0.122	0.89 (0.75-1.05)	0.1518	-0.157	0.85 (0.73-1.01)	0.0596
rs10252510	7	31023108	GHRHR	G/A	0.265	0.020	-0.064	0.94 (0.78-1.13)	0.4968	0.112	1.12 (0.94-1.34)	0.2195
rs9292578	5	35230075	PRLR	C/A	0.034	0.040	-0.504	0.6 (0.37-0.98)	**0.0402**	-0.093	0.91 (0.6-1.39)	0.6657
rs67257872	11	8530218	STK33	A/G	0.431	0.014	0.120	1.13 (0.97-1.32)	0.1243	0.043	1.04 (0.9-1.21)	0.5704
rs78598185	14	92791479	SLC24A4	A/G	0.091	-0.029	0.083	1.09 (0.85-1.39)	0.5108	-0.014	0.99 (0.78-1.25)	0.9069
rs2378662	9	86707289	AL390838.1	A/G	0.448	-0.017	-0.016	0.98 (0.85-1.14)	0.8341	-0.036	0.96 (0.84-1.11)	0.6239
rs668799	17	40716235	COASY	C/T	0.260	0.018	-0.053	0.95 (0.8-1.12)	0.5453	-0.078	0.93 (0.79-1.08)	0.3344
rs4273010	15	44947434	SPG11	T/C	0.012	0.128	0.385	1.47 (0.59-3.63)	0.4045	0.203	1.23 (0.45-3.35)	0.6921
rs7254601	19	36147315	COX6B1	A/G	0.251	-0.016	-0.069	0.93 (0.79-1.11)	0.4352	-0.095	0.91 (0.77-1.07)	0.2595
rs6749680	2	73685852	ALMS1	A/G	0.393	0.015	-0.115	0.89 (0.77-1.04)	0.1344	0.050	1.05 (0.91-1.22)	0.5080
rs10841649	12	20954879	SLCO1B3	C/T	0.105	0.021	-0.136	0.87 (0.66-1.15)	0.3321	0.140	1.15 (0.9-1.47)	0.2606
rs28929474	14	94844947	SERPINA1	T/C	0.982	-0.063	0.110	1.12 (0.62-2.02)	0.7140	-0.393	0.68 (0.41-1.11)	0.1224
rs6924225	6	45584732	RUNX2	G/A	0.156	0.019	-0.115	0.89 (0.73-1.09)	0.2675	-0.024	0.98 (0.8-1.19)	0.8088
rs6701954	1	22022176	USP48	T/G	0.464	0.014	-0.130	0.88 (0.76-1.02)	0.0935	-0.069	0.93 (0.8-1.08)	0.3671
rs4823324	22	46238123	ATXN10	T/C	0.394	0.016	0.056	1.06 (0.91-1.22)	0.4552	-0.001	1 (0.87-1.15)	0.9877
rs10908903	9	92228559	GADD45G	T/G	0.472	0.015	0.075	1.08 (0.94-1.24)	0.2974	-0.002	1 (0.87-1.15)	0.9734
rs1535793	13	47154966	LRCH1	A/G	0.266	0.024	0.035	1.04 (0.88-1.23)	0.6784	-0.011	0.99 (0.85-1.16)	0.8929
rs6602909	13	114551993	GAS6	T/C	0.320	-0.020	-0.105	0.9 (0.76-1.06)	0.2154	0.051	1.05 (0.89-1.24)	0.5421
rs13418037	2	218314141	DIRC3	C/T	0.181	-0.020	0.055	1.06 (0.87-1.28)	0.5716	0.137	1.15 (0.96-1.38)	0.1396
rs114949263	7	150498245	TMEM176B/TMEM176A	T/C	0.088	0.027	0.113	1.12 (0.86-1.46)	0.4031	0.084	1.09 (0.85-1.4)	0.5112

rs7921105	10	13535398	BEND7	T/C	0.429	-0.016	-0.034	0.97 (0.84-1.12)	0.6512	0.170	1.19 (1.03-1.37)	**0.0176**
rs9657541	8	10643164	SOX7/PINX1/PINX1	C/T	0.224	0.020	0.002	1 (0.84-1.2)	0.9790	-0.054	0.95 (0.79-1.13)	0.5515
rs6544549	2	42693056	KCNG3	T/C	0.128	0.024	0.049	1.05 (0.84-1.32)	0.6712	-0.043	0.96 (0.77-1.19)	0.6957
rs1495741	8	18272881	NAT2	A/G	0.219	-0.026	0.059	1.06 (0.89-1.27)	0.5209	0.038	1.04 (0.87-1.24)	0.6757
rs28650790	5	55861464	C5orf67	C/T	0.191	-0.018	0.075	1.08 (0.89-1.3)	0.4425	0.102	1.11 (0.92-1.33)	0.2719
rs2250014	17	57836134	VMP1	T/C	0.164	-0.021	0.061	1.06 (0.88-1.29)	0.5326	0.163	1.18 (0.98-1.41)	0.0781
rs7783012	7	114116881	FOXP2	A/G	0.408	-0.016	-0.046	0.96 (0.83-1.1)	0.5334	-0.074	0.93 (0.81-1.07)	0.3093
rs79076440	15	63803863	USP3	A/G	0.163	0.019	0.083	1.09 (0.89-1.32)	0.4024	-0.007	0.99 (0.82-1.21)	0.9414
rs6532798	4	100054827	ADH4	T/C	0.312	0.037	0.001	1 (0.85-1.17)	0.9936	0.032	1.03 (0.88-1.21)	0.6915
rs10777540	12	94150321	CRADD	T/G	0.482	-0.018	-0.163	0.85 (0.73-0.99)	**0.0344**	0.077	1.08 (0.93-1.25)	0.3071
rs1786342	8	101676363	SNX31	T/C	0.395	0.017	-0.114	0.89 (0.77-1.03)	0.1313	-0.028	0.97 (0.84-1.13)	0.7076
rs2978062	8	134571618	ST3GAL1	T/G	0.163	-0.019	0.064	1.07 (0.87-1.3)	0.5263	-0.024	0.98 (0.8-1.19)	0.8115
rs10821713	10	62055781	ANK3	C/T	0.414	-0.017	-0.129	0.88 (0.75-1.03)	0.1043	-0.080	0.92 (0.79-1.07)	0.2927
rs1832007	10	5254847	AKR1C4	A/G	0.164	-0.057	-0.018	0.98 (0.81-1.19)	0.8536	-0.038	0.96 (0.8-1.16)	0.6896
rs6440008	3	141154542	ZBTB38	T/C	0.377	0.035	-0.029	0.97 (0.83-1.14)	0.7215	0.049	1.05 (0.9-1.23)	0.5307
rs1165196	6	25813150	SLC17A1	A/G	0.464	-0.029	0.157	1.17 (1-1.36)	**0.0430**	-0.029	0.97 (0.83-1.13)	0.7079
rs9892862	17	7439014	POLR2A	G/A	0.206	0.022	0.042	1.04 (0.87-1.25)	0.6558	-0.059	0.94 (0.78-1.13)	0.5260
rs6760135	2	26088769	ASXL2	C/T	0.204	-0.050	0.041	1.04 (0.87-1.25)	0.6636	0.192	1.21 (1.02-1.44)	**0.0327**
rs7574340	2	40621239	SLC8A1	C/T	0.285	-0.017	0.185	1.2 (1.01-1.43)	**0.0355**	0.082	1.09 (0.92-1.29)	0.3406
rs117529631	11	46159633	AC024475.4	C/T	0.034	-0.041	-0.099	0.91 (0.61-1.35)	0.6249	-0.034	0.97 (0.67-1.39)	0.8564
rs1061657	12	115108136	TBX3	T/C	0.260	-0.022	0.074	1.08 (0.88-1.31)	0.4654	-0.157	0.85 (0.7-1.04)	0.1136
rs585187	18	58177124	MRPS5P4	T/G	0.539	0.015	0.128	1.14 (0.98-1.31)	0.0858	0.036	1.04 (0.9-1.2)	0.6225
rs202676	11	49227620	FOLH1	G/A	0.767	0.021	-0.014	0.99 (0.82-1.18)	0.8809	0.016	1.02 (0.85-1.21)	0.8626
rs340837	1	214162734	PROX1	T/G	0.485	-0.021	-0.127	0.88 (0.76-1.02)	0.0900	-0.100	0.9 (0.78-1.04)	0.1700
rs11782452	8	26361601	BNIP3L	G/A	0.400	0.015	-0.194	0.82 (0.7-0.96)	**0.0163**	-0.133	0.88 (0.75-1.02)	0.0879
rs10509746	10	102656897	PAX2	C/T	0.431	0.027	0.081	1.08 (0.93-1.26)	0.3032	0.084	1.09 (0.93-1.26)	0.2778
rs8097893	18	74983055	GALR1	A/G	0.041	0.058	0.185	1.2 (0.81-1.79)	0.3591	0.163	1.18 (0.8-1.73)	0.4085
rs1825813	1	92708973	C1orf146	G/A	0.190	-0.023	-0.059	0.94 (0.78-1.14)	0.5485	-0.068	0.93 (0.77-1.13)	0.4855
rs4545755	15	51549044	MIR4713HG/CYP19A1	G/A	0.435	0.016	0.019	1.02 (0.88-1.19)	0.8029	-0.067	0.94 (0.8-1.09)	0.3872
rs78357146	17	64305051	PRKCA	A/G	0.010	-0.090	-0.007	0.99 (0.48-2.04)	0.9839	-0.075	0.93 (0.43-2)	0.8474
rs870796	7	45426435	ELK1P1	G/A	0.454	0.017	-0.056	0.95 (0.8-1.12)	0.5216	-0.061	0.94 (0.79-1.12)	0.4889
rs11031058	11	30375889	ARL14EP	C/T	0.146	-0.022	-0.129	0.88 (0.71-1.09)	0.2358	-0.077	0.93 (0.76-1.13)	0.4598
rs296361	19	48389363	SULT2A1	G/A	0.158	-0.025	0.056	1.06 (0.88-1.27)	0.5564	-0.156	0.86 (0.71-1.03)	0.1041
rs11111274	12	102838128	IGF1	A/G	0.270	-0.080	0.175	1.19 (1.02-1.4)	**0.0303**	0.086	1.09 (0.94-1.27)	0.2662
rs1039481	11	48182237	PTPRJ	A/G	0.262	-0.042	-0.069	0.93 (0.79-1.11)	0.4223	-0.008	0.99 (0.84-1.17)	0.9221
rs7314285	12	111522026	CUX2	T/G	0.074	-0.052	0.242	1.27 (0.99-1.65)	0.0640	0.093	1.1 (0.84-1.43)	0.4903
rs61904289	11	85994731	AP003084.1	C/T	0.311	-0.016	-0.012	0.99 (0.84-1.16)	0.8831	-0.160	0.85 (0.73-0.99)	**0.0423**
rs1351394	12	66351826	HMGA2	C/T	0.458	0.024	-0.056	0.95 (0.81-1.1)	0.4619	-0.021	0.98 (0.84-1.14)	0.7843
rs76708468	17	62206299	ERN1	T/C	0.008	-0.087	0.385	1.47 (0.68-3.17)	0.3267	0.000	1 (0.45-2.23)	0.9997

rs147491123	16	72567795	LINC01572	C/T	0.020	0.036	-0.022	0.98 (0.56-1.72)	0.9391	0.474	1.61 (1.04-2.47)	**0.0312**
rs8024330	15	67443926	SMAD3	C/T	0.305	0.018	-0.087	0.92 (0.78-1.08)	0.2976	0.029	1.03 (0.88-1.2)	0.7107
rs12141189	1	221053545	HLX	C/T	0.774	-0.045	-0.164	0.85 (0.72-1)	0.0535	0.020	1.02 (0.86-1.2)	0.8158
rs12108803	5	77158507	TBCA	T/G	0.042	-0.033	-0.007	0.99 (0.69-1.42)	0.9677	0.259	1.3 (0.92-1.82)	0.1365
rs708108	1	228189855	WNT3A	C/T	0.369	-0.015	-0.121	0.89 (0.75-1.05)	0.1632	0.035	1.04 (0.88-1.22)	0.6727
rs2207132	20	39142516	MAFB	G/A	0.006	0.048	-0.014	0.99 (0.45-2.18)	0.9717	0.211	1.24 (0.57-2.67)	0.5904
rs9532512	13	40769897	LINC00598	G/A	0.185	-0.043	-0.187	0.83 (0.68-1.01)	0.0637	-0.002	1 (0.83-1.2)	0.9848
rs11954036	5	59028853	PDE4D	T/C	0.347	0.037	-0.004	1 (0.85-1.17)	0.9643	-0.038	0.96 (0.83-1.12)	0.6291
rs2724373	1	207999200	C1orf132	C/T	0.330	0.019	-0.077	0.93 (0.79-1.08)	0.3320	-0.053	0.95 (0.81-1.11)	0.5068
rs569356	1	29136686	OPRD1	A/G	0.122	-0.027	-0.059	0.94 (0.76-1.18)	0.6049	-0.041	0.96 (0.78-1.19)	0.7034
rs11677980	2	30522137	LBH	A/G	0.318	-0.015	-0.158	0.85 (0.72-1.02)	0.0755	-0.082	0.92 (0.78-1.09)	0.3337
rs6501601	17	71124903	SLC39A11	G/A	0.354	0.015	0.014	1.01 (0.86-1.19)	0.8654	0.040	1.04 (0.89-1.22)	0.6109
rs16897515	6	27278020	POM121L2	A/C	0.845	-0.023	0.226	1.25 (1.01-1.56)	**0.0402**	0.076	1.08 (0.88-1.33)	0.4738
rs62136965	2	44347953	snRNA	T/C	0.037	-0.037	0.157	1.17 (0.83-1.65)	0.3754	-0.003	1 (0.71-1.41)	0.9869
rs11149612	16	83980965	AC009119.2	C/T	0.402	0.027	0.097	1.1 (0.92-1.32)	0.2882	0.062	1.06 (0.9-1.26)	0.4657
rs17714046	5	180661980	TRIM41	C/T	0.999	0.042	N/A	N/A	N/A	N/A	N/A	N/A
rs13301073	9	128284378	MAPKAP1	G/A	0.353	0.022	-0.029	0.97 (0.84-1.13)	0.7026	0.150	1.16 (1-1.34)	**0.0450**
rs17050272	2	121306440	AC073257.2	G/A	0.413	0.024	-0.100	0.9 (0.77-1.06)	0.2057	-0.042	0.96 (0.82-1.12)	0.5936
rs10913351	1	177447742	AL122019.1	G/A	0.056	-0.032	-0.109	0.9 (0.64-1.25)	0.5164	0.046	1.05 (0.77-1.42)	0.7672
rs76393968	8	16282937	MSR1	G/A	0.003	0.060	-0.064	0.94 (0.23-3.89)	0.9294	-0.363	0.7 (0.09-5.1)	0.7213
rs7267595	20	10643850	JAG1	A/C	0.481	0.015	-0.032	0.97 (0.84-1.12)	0.6715	0.024	1.02 (0.89-1.18)	0.7350
rs35641591	2	70323994	PCBP1-AS1	C/T	0.016	0.050	-0.295	0.74 (0.37-1.51)	0.4153	0.582	1.79 (1.04-3.09)	**0.0363**
rs58387407	2	152924773	CACNB4	A/G	0.202	-0.018	-0.065	0.94 (0.79-1.12)	0.4646	-0.109	0.9 (0.76-1.06)	0.2054
rs6916994	6	87991236	GJB7	C/T	0.505	0.029	-0.016	0.98 (0.85-1.14)	0.8303	-0.037	0.96 (0.84-1.11)	0.6134
rs10869022	9	74057313	TRPM3	C/T	0.203	0.021	0.068	1.07 (0.88-1.3)	0.4892	0.153	1.16 (0.97-1.4)	0.0998
rs142377191	17	61649170	DCAF7	G/A	0.002	-0.125	N/A	N/A	N/A	N/A	N/A	N/A
rs17258904	6	21928131	CASC15	A/G	0.264	-0.017	-0.153	0.86 (0.74-1)	0.0524	-0.038	0.96 (0.83-1.12)	0.6140
rs62182127	2	219279588	VIL1	A/G	0.455	0.019	-0.062	0.94 (0.81-1.09)	0.4118	0.008	1.01 (0.87-1.16)	0.9104
rs411717	7	94033031	COL1A2	C/T	0.448	-0.015	-0.045	0.96 (0.82-1.11)	0.5488	-0.025	0.98 (0.85-1.12)	0.7249
rs1061638	14	77928525	AHSA1	G/A	0.302	0.018	-0.083	0.92 (0.79-1.08)	0.3035	-0.042	0.96 (0.82-1.12)	0.6045
rs1465529	2	231039037	SP110	T/C	0.294	0.019	-0.100	0.91 (0.77-1.07)	0.2350	-0.134	0.87 (0.75-1.02)	0.0944
rs75088740	14	69819101	GALNT16	G/A	0.151	-0.019	0.113	1.12 (0.91-1.38)	0.2922	-0.063	0.94 (0.76-1.16)	0.5566
rs7539178	1	65383002	JAK1	A/C	0.112	-0.026	0.151	1.16 (0.94-1.43)	0.1578	-0.041	0.96 (0.77-1.2)	0.7182
rs78607331	12	57648644	R3HDM2	T/C	0.987	-0.037	-0.391	0.68 (0.36-1.28)	0.2320	-0.044	0.96 (0.5-1.84)	0.8948
rs2607748	3	14158725	CHCHD4	T/C	0.438	-0.017	0.012	1.01 (0.88-1.17)	0.8737	0.077	1.08 (0.94-1.24)	0.2815
rs10145154	14	79939525	NRXN3	C/T	0.202	-0.018	-0.054	0.95 (0.79-1.14)	0.5659	0.193	1.21 (1.02-1.45)	**0.0312**
rs11077337	16	3492048	AC025283.2/ZNF597	T/G	0.455	0.015	0.099	1.1 (0.95-1.28)	0.1916	-0.133	0.88 (0.76-1.01)	0.0709
rs11928797	3	33457493	UBP1	A/C	0.902	0.030	0.115	1.12 (0.87-1.45)	0.3827	-0.040	0.96 (0.77-1.2)	0.7239

rs4946810	6	107420270	BEND3	A/C	0.381	-0.016	0.014	1.01 (0.87-1.19)	0.8643	-0.083	0.92 (0.79-1.07)	0.2833
rs6437249	2	242175331	HDLBP	C/T	0.277	0.019	0.045	1.05 (0.88-1.25)	0.6169	0.137	1.15 (0.97-1.36)	0.1088
rs207212	7	130547217	LINC00513	C/T	0.033	0.028	-0.128	0.88 (0.5-1.56)	0.6616	0.161	1.17 (0.7-1.97)	0.5409
rs62280667	3	101084604	SENP7	T/C	0.315	-0.028	-0.110	0.9 (0.75-1.07)	0.2256	-0.039	0.96 (0.81-1.14)	0.6457
rs2366398	5	89437963	LINC01339	G/T	0.216	-0.018	-0.026	0.97 (0.81-1.17)	0.7849	0.025	1.03 (0.86-1.22)	0.7833
rs112893170	3	57211863	IL17RD	T/C	0.185	0.020	-0.035	0.97 (0.8-1.17)	0.7185	0.077	1.08 (0.89-1.31)	0.4283
rs3772102	3	98502628	ST3GAL6	T/G	0.453	-0.020	-0.036	0.96 (0.84-1.11)	0.6149	-0.040	0.96 (0.84-1.1)	0.5682
rs62263345	3	107252190	BBX	A/G	0.118	0.028	-0.069	0.93 (0.74-1.18)	0.5665	0.052	1.05 (0.84-1.32)	0.6494
rs11187838	10	96038686	PLCE1	G/A	0.426	0.024	0.023	1.02 (0.88-1.18)	0.7604	0.095	1.1 (0.96-1.26)	0.1772
rs11029620	11	3771924	NUP98	C/T	0.227	0.022	0.126	1.13 (0.95-1.35)	0.1605	-0.061	0.94 (0.79-1.12)	0.4968
rs35862187	7	69625029	AUTS2	A/G	0.035	0.031	-0.413	0.66 (0.43-1.03)	0.0647	-0.275	0.76 (0.5-1.15)	0.1933
rs7790246	7	32976416	AVL9/RP9P	C/T	0.287	-0.017	0.122	1.13 (0.96-1.32)	0.1295	-0.042	0.96 (0.82-1.12)	0.5929
rs504371	6	165724052	C6orf118	C/A	0.350	-0.015	-0.076	0.93 (0.78-1.1)	0.3766	0.058	1.06 (0.9-1.25)	0.4877
rs840809	5	87173927	TMEM161B	A/C	0.257	0.016	-0.100	0.9 (0.77-1.06)	0.2239	-0.153	0.86 (0.73-1)	0.0565
rs6435156	2	203425475	BMPR2	C/T	0.248	0.024	0.124	1.13 (0.96-1.34)	0.1407	0.040	1.04 (0.88-1.23)	0.6267
rs2674492	2	172422338	CYBRD1	G/A	0.379	-0.014	0.043	1.04 (0.89-1.22)	0.5863	0.043	1.04 (0.89-1.22)	0.5890
rs750952	16	31093954	ZNF646	C/T	0.396	0.032	0.026	1.03 (0.88-1.2)	0.7371	0.081	1.08 (0.94-1.26)	0.2840
rs165316	1	91533297	RPL5P6	A/G	0.203	-0.073	0.019	1.02 (0.86-1.21)	0.8280	-0.011	0.99 (0.84-1.16)	0.8953
rs13108218	4	3443931	HGFAC	G/A	0.401	0.017	0.175	1.19 (1.01-1.4)	**0.0383**	0.000	1 (0.86-1.17)	0.9965
rs2512525	11	77923019	USP35	T/C	0.165	0.024	0.003	1 (0.82-1.22)	0.9763	-0.146	0.86 (0.71-1.05)	0.1428
rs584955	6	7097141	RREB1	A/G	0.038	0.036	0.099	1.1 (0.77-1.59)	0.5939	0.133	1.14 (0.8-1.63)	0.4625
rs115805235	4	69764890	AC021146.3	C/T	0.040	0.039	0.165	1.18 (0.81-1.71)	0.3809	-0.091	0.91 (0.63-1.33)	0.6364
rs3734166	5	137665323	CDC25C	A/G	0.723	0.028	-0.152	0.86 (0.73-1.01)	0.0725	-0.151	0.86 (0.74-1.01)	0.0588
rs1051006	11	47306585	MADD	A/G	0.839	0.040	-0.071	0.93 (0.76-1.13)	0.4767	-0.042	0.96 (0.79-1.16)	0.6675
rs625245	11	94192103	MRE11	T/G	0.327	-0.016	0.030	1.03 (0.89-1.2)	0.7009	-0.041	0.96 (0.83-1.11)	0.5885
rs11175935	12	40693806	LRRK2	G/T	0.183	0.020	-0.004	1 (0.82-1.21)	0.9687	-0.102	0.9 (0.76-1.08)	0.2646
rs3858325	10	117988795	GFRA1	C/T	0.472	-0.019	0.043	1.04 (0.9-1.21)	0.5649	-0.004	1 (0.86-1.15)	0.9529
rs903908	1	2202967	SKI	T/C	0.502	-0.016	0.085	1.09 (0.93-1.27)	0.2805	0.036	1.04 (0.89-1.21)	0.6446
rs9361489	6	79816785	PHIP	T/C	0.459	0.022	0.116	1.12 (0.96-1.31)	0.1456	0.067	1.07 (0.92-1.24)	0.3688
rs2397112	6	52684333	GSTA6P	A/G	0.430	0.019	-0.084	0.92 (0.79-1.07)	0.2653	-0.050	0.95 (0.82-1.1)	0.4987
rs5755948	22	36179095	RBFOX2	G/A	0.130	-0.028	0.087	1.09 (0.88-1.35)	0.4231	0.042	1.04 (0.84-1.3)	0.7050
rs12106594	22	31885316	DRG1/EIF4ENIF1/SFI1	C/T	0.051	-0.036	0.132	1.14 (0.83-1.57)	0.4163	0.064	1.07 (0.77-1.48)	0.7033
rs7498665	16	28883241	SH2B1	G/A	0.583	0.019	-0.036	0.96 (0.83-1.12)	0.6397	-0.069	0.93 (0.8-1.08)	0.3705
rs17747633	15	40916237	KNL1	G/A	0.579	0.015	-0.095	0.91 (0.78-1.05)	0.2054	-0.157	0.85 (0.74-0.99)	**0.0357**
rs62334147	4	169345005	DDX60L	T/C	0.160	-0.019	0.243	1.27 (1.04-1.56)	**0.0179**	0.050	1.05 (0.86-1.29)	0.6325
rs2738787	20	62328375	TNFRSF6B/RTEL1	G/A	0.080	-0.037	0.012	1.01 (0.78-1.32)	0.9289	0.120	1.13 (0.87-1.47)	0.3717
rs9322822	6	105369598	LIN28B-AS1	C/T	0.326	0.015	-0.005	1 (0.85-1.16)	0.9537	-0.119	0.89 (0.77-1.03)	0.1112
rs9583151	13	107666257	-	C/T	0.502	0.014	0.001	1 (0.86-1.16)	0.9844	-0.005	1 (0.86-1.15)	0.9491
rs7517340	1	243710190	AKT3	C/T	0.198	0.035	-0.045	0.96 (0.79-1.15)	0.6402	-0.070	0.93 (0.78-1.12)	0.4532

rs3127579	6	160674632	SLC22A2	G/A	0.131	-0.033	0.131	1.14 (0.93-1.39)	0.2010	0.125	1.13 (0.93-1.38)	0.2203
rs12912439	15	95828705	LINC01197	C/T	0.318	-0.022	-0.152	0.86 (0.74-1)	0.0549	-0.028	0.97 (0.84-1.12)	0.7039
rs2104476	20	54852856	-	A/G	0.261	-0.020	-0.042	0.96 (0.81-1.14)	0.6270	-0.118	0.89 (0.76-1.04)	0.1482
rs1431015	8	77131580	HNF4G	C/T	0.401	0.020	0.043	1.04 (0.9-1.22)	0.5818	-0.025	0.98 (0.84-1.13)	0.7422
rs273956	7	137603188	CREB3L2	G/A	0.410	-0.021	-0.151	0.86 (0.74-1.01)	0.0583	-0.105	0.9 (0.78-1.04)	0.1616
rs2042253	5	143059433	MIR5197	T/C	0.212	0.023	-0.013	0.99 (0.82-1.19)	0.8906	0.005	1.01 (0.84-1.21)	0.9568
rs56352849	8	73769173	KCNB2	G/A	0.279	-0.016	-0.017	0.98 (0.83-1.17)	0.8452	0.029	1.03 (0.87-1.21)	0.7282
rs6106324	20	20964988	AL133465.1	T/C	0.392	0.019	-0.113	0.89 (0.76-1.05)	0.1582	0.120	1.13 (0.97-1.32)	0.1300
rs12194618	6	38091030	ZFAND3	G/A	0.369	-0.017	-0.030	0.97 (0.83-1.14)	0.7131	0.069	1.07 (0.92-1.25)	0.3918
rs12790261	11	66988048	KDM2A	C/A	0.026	-0.031	-0.020	0.98 (0.62-1.54)	0.9310	-0.206	0.81 (0.48-1.38)	0.4429
rs76914895	1	23292603	LACTBL1	T/C	0.043	-0.027	0.065	1.07 (0.72-1.57)	0.7438	-0.296	0.74 (0.49-1.13)	0.1627
rs4418728	10	94839724	CYP26A1	G/T	0.441	0.024	-0.139	0.87 (0.76-1)	**0.0493**	-0.041	0.96 (0.84-1.1)	0.5568
rs12975366	19	54759361	LILRB5	C/T	0.655	-0.020	-0.096	0.91 (0.73-1.12)	0.3766	-0.074	0.93 (0.74-1.16)	0.5204
rs60862542	8	109275071	EIF3E	G/A	0.221	0.017	0.022	1.02 (0.86-1.21)	0.8010	-0.115	0.89 (0.75-1.06)	0.1883
rs62102136	19	34700561	LSM14A	C/T	0.228	0.016	-0.119	0.89 (0.72-1.09)	0.2621	-0.122	0.88 (0.72-1.08)	0.2387
rs2230281	12	89917518	POC1B-GALNT4	G/A	0.276	-0.016	0.110	1.12 (0.95-1.31)	0.1835	0.106	1.11 (0.95-1.3)	0.1810
rs15052	19	41813375	HNRNPUL1/TGFB1	T/C	0.099	-0.018	0.104	1.11 (0.86-1.43)	0.4242	0.247	1.28 (1-1.64)	0.0523
rs168961	14	69282930	ZFP36L1	A/G	0.495	-0.018	0.089	1.09 (0.94-1.27)	0.2591	0.021	1.02 (0.88-1.19)	0.7912
rs75681856	1	174916323	RABGAP1L	C/T	0.115	-0.023	0.135	1.14 (0.9-1.45)	0.2639	-0.146	0.86 (0.67-1.11)	0.2462
rs2273058	20	20033319	CRNKL1	G/A	0.529	-0.022	0.011	1.01 (0.88-1.16)	0.8761	0.025	1.03 (0.9-1.18)	0.7133
rs67868323	19	4048561	ZBTB7A	T/G	0.216	0.016	-0.034	0.97 (0.8-1.17)	0.7305	-0.107	0.9 (0.74-1.09)	0.2840
rs17400325	2	178565913	PDE11A	C/T	0.973	0.054	0.100	1.1 (0.71-1.72)	0.6592	0.093	1.1 (0.7-1.73)	0.6883
rs12454712	18	60845884	BCL2	T/C	0.372	0.018	0.044	1.04 (0.9-1.21)	0.5598	0.019	1.02 (0.88-1.18)	0.8018
rs199525	17	44847834	WNT3	T/G	0.209	-0.020	0.116	1.12 (0.94-1.34)	0.2014	-0.188	0.83 (0.69-1)	**0.0483**
rs190102446	18	57048571	-	C/T	0.027	0.041	0.419	1.52 (1-2.3)	**0.0474**	0.019	1.02 (0.66-1.58)	0.9338
rs11152071	18	56087417	AC105105.3	C/T	0.238	0.020	-0.102	0.9 (0.76-1.07)	0.2355	0.016	1.02 (0.86-1.2)	0.8441
rs35668185	5	168256455	SLIT3	T/C	0.187	0.056	-0.029	0.97 (0.8-1.18)	0.7669	0.186	1.2 (1-1.45)	**0.0480**
rs8095538	18	1616505	-	T/G	0.304	-0.020	-0.053	0.95 (0.81-1.11)	0.5150	-0.070	0.93 (0.8-1.09)	0.3801
rs11079157	17	53360799	HLF	G/T	0.220	-0.020	0.043	1.04 (0.87-1.25)	0.6411	-0.112	0.89 (0.74-1.07)	0.2339
rs4789227	17	73794354	UNK	T/C	0.366	0.015	0.055	1.06 (0.9-1.24)	0.5044	-0.018	0.98 (0.84-1.15)	0.8261
rs1548917	16	56109333	CES5A	C/T	0.464	-0.015	-0.020	0.98 (0.84-1.15)	0.8038	0.059	1.06 (0.91-1.23)	0.4489
rs6510033	19	30710785	AC005597.1	A/G	0.265	0.020	-0.029	0.97 (0.81-1.17)	0.7551	0.008	1.01 (0.85-1.2)	0.9271
rs7578633	2	113978650	PAX8	C/T	0.358	-0.018	-0.039	0.96 (0.82-1.13)	0.6301	0.065	1.07 (0.92-1.24)	0.3847
rs445036	8	81408409	ZBTB10	T/C	0.292	0.019	-0.048	0.95 (0.81-1.12)	0.5574	-0.040	0.96 (0.82-1.13)	0.6235
rs12549853	8	145020636	PLEC	G/A	0.399	-0.016	-0.023	0.98 (0.83-1.15)	0.7865	-0.047	0.95 (0.81-1.12)	0.5633
rs111443396	4	124773202	LINC01091	T/C	0.125	-0.026	0.093	1.1 (0.89-1.35)	0.3877	-0.204	0.82 (0.65-1.02)	0.0690
rs4936759	11	122763516	C11orf63	C/T	0.449	0.016	0.189	1.21 (1.03-1.41)	**0.0177**	0.114	1.12 (0.97-1.3)	0.1337
rs17429745	4	106038169	AC096577.1	G/T	0.329	0.026	0.059	1.06 (0.91-1.24)	0.4650	-0.009	0.99 (0.85-1.16)	0.9125
rs2287922	19	49232226	RASIP1	A/G	0.512	-0.030	-0.030	0.97 (0.83-1.14)	0.7115	0.035	1.04 (0.89-1.21)	0.6527

rs28396553	14	36673392	lincRNA	T/C	0.443	0.015	-0.148	0.86 (0.72-1.04)	0.1128	0.152	1.16 (0.96-1.41)	0.1175
rs6037508	20	3217989	SLC4A11	T/G	0.287	-0.017	0.100	1.1 (0.93-1.31)	0.2423	-0.020	0.98 (0.83-1.16)	0.8166
rs17360994	1	27278573	KDF1	C/T	0.926	-0.042	0.024	1.02 (0.78-1.35)	0.8655	-0.055	0.95 (0.72-1.25)	0.6982
rs7628689	3	88216647	C3orf38	G/A	0.135	0.029	-0.066	0.94 (0.75-1.17)	0.5609	-0.057	0.94 (0.76-1.17)	0.6078
rs5896	11	46745003	F2	T/C	0.885	0.036	0.058	1.06 (0.84-1.34)	0.6246	-0.096	0.91 (0.73-1.13)	0.3982
rs2296198	6	18399750	RNF144B	C/T	0.248	0.016	0.062	1.06 (0.89-1.28)	0.5075	0.082	1.09 (0.91-1.3)	0.3680
rs66707192	3	186382065	HRG	G/A	0.256	0.018	-0.079	0.92 (0.78-1.1)	0.3640	-0.040	0.96 (0.82-1.13)	0.6244
rs62020698	15	43237414	UBR1	C/T	0.039	0.047	0.179	1.2 (0.75-1.91)	0.4554	0.080	1.08 (0.66-1.78)	0.7537
rs8059803	16	81603001	CMIP	A/G	0.285	0.031	0.042	1.04 (0.88-1.24)	0.6285	-0.024	0.98 (0.83-1.15)	0.7722
rs26822	5	102518795	PPIP5K2	A/G	0.289	-0.017	-0.174	0.84 (0.72-0.99)	**0.0319**	0.052	1.05 (0.91-1.22)	0.4931
rs9738365	12	31997635	-	C/A	0.261	-0.058	0.032	1.03 (0.88-1.21)	0.6953	-0.020	0.98 (0.84-1.15)	0.8034
rs17299478	16	69775500	-	C/T	0.143	0.032	-0.177	0.84 (0.67-1.05)	0.1237	-0.106	0.9 (0.73-1.11)	0.3323
rs247917	12	46265916	ARID2	C/T	0.497	-0.015	-0.050	0.95 (0.82-1.1)	0.5081	0.044	1.05 (0.9-1.22)	0.5671
rs13168379	5	173382761	CPEB4	G/A	0.070	-0.031	-0.145	0.86 (0.64-1.17)	0.3465	-0.144	0.87 (0.65-1.15)	0.3262
rs6974707	7	55982894	ZNF713	G/A	0.217	-0.019	0.124	1.13 (0.95-1.35)	0.1689	-0.032	0.97 (0.81-1.15)	0.7213
rs1427676	2	204741166	CTLA4	T/C	0.301	0.015	-0.111	0.89 (0.77-1.04)	0.1573	-0.096	0.91 (0.78-1.06)	0.2133
rs36086195	1	16510894	ARHGEF19-AS1	T/C	0.428	-0.019	0.048	1.05 (0.91-1.21)	0.5210	0.005	1.01 (0.87-1.16)	0.9433
rs8054322	16	85201405	GSE1	G/A	0.453	-0.015	0.067	1.07 (0.91-1.26)	0.4251	0.199	1.22 (1.04-1.44)	**0.0159**
rs117104648	11	65543736	AP5B1	T/C	0.030	-0.036	0.121	1.13 (0.73-1.74)	0.5836	0.451	1.57 (1.05-2.35)	**0.0282**
rs77369503	1	163027266	RGS4	G/A	0.008	0.045	-0.386	0.68 (0.27-1.7)	0.4081	-0.144	0.87 (0.37-2.01)	0.7378
rs7256521	19	53837110	ZNF845	A/G	0.484	-0.015	-0.006	0.99 (0.84-1.17)	0.9434	0.077	1.08 (0.92-1.27)	0.3600
rs998584	6	43757896	VEGFA	A/C	0.532	0.020	-0.124	0.88 (0.73-1.06)	0.1858	-0.055	0.95 (0.78-1.14)	0.5674
rs4547160	12	63503650	AVPR1A	G/T	0.356	-0.018	0.000	1 (0.86-1.17)	0.9978	-0.065	0.94 (0.8-1.1)	0.4216
rs4985062	16	8996636	USP7	T/C	0.428	0.015	-0.171	0.84 (0.72-0.99)	**0.0357**	-0.136	0.87 (0.75-1.02)	0.0862
rs79936318	14	64315556	SYNE2	G/A	0.075	-0.017	0.282	1.33 (0.9-1.95)	0.1530	0.301	1.35 (0.92-1.97)	0.1208
rs3804173	4	121719923	PRDM5	A/G	0.328	-0.020	0.112	1.12 (0.96-1.3)	0.1513	0.033	1.03 (0.89-1.19)	0.6550
rs12244851	10	114773926	TCF7L2	C/T	0.313	-0.015	0.004	1 (0.85-1.19)	0.9619	0.052	1.05 (0.9-1.23)	0.5267
rs1260326	2	27730940	GCKR	C/T	0.399	0.063	0.083	1.09 (0.93-1.27)	0.2976	0.011	1.01 (0.87-1.17)	0.8825
rs716100	8	135661278	ZFAT	G/A	0.301	-0.019	0.098	1.1 (0.94-1.29)	0.2317	0.108	1.11 (0.95-1.3)	0.1803
rs16995311	20	49201102	PTPN1	A/C	0.063	0.040	0.153	1.16 (0.88-1.54)	0.2857	0.128	1.14 (0.86-1.5)	0.3609
rs34040697	15	97125666	-	A/G	0.427	0.016	-0.031	0.97 (0.82-1.14)	0.7174	-0.084	0.92 (0.78-1.08)	0.3127
rs8084351	18	50726559	DCC	G/A	0.507	0.015	-0.072	0.93 (0.8-1.08)	0.3437	-0.088	0.92 (0.79-1.06)	0.2372
rs8033075	15	68353652	PIAS1	A/G	0.043	0.045	0.182	1.2 (0.83-1.72)	0.3261	0.423	1.53 (1.09-2.14)	**0.0137**
rs11242236	5	134586980	C5orf66	G/A	0.458	0.025	-0.146	0.86 (0.74-1.01)	0.0672	0.011	1.01 (0.87-1.18)	0.8900
rs16845929	4	72017058	SLC4A4	C/T	0.062	0.032	0.017	1.02 (0.77-1.35)	0.9057	-0.178	0.84 (0.62-1.13)	0.2417
rs6473015	8	78178485	lincRNA	A/C	0.282	-0.019	-0.016	0.98 (0.83-1.17)	0.8506	0.003	1 (0.85-1.18)	0.9698
rs33932084	6	28268824	PGBD1	G/A	0.922	-0.034	0.207	1.23 (0.92-1.65)	0.1653	0.197	1.22 (0.92-1.62)	0.1753
rs13073970	3	170630520	EIF5A2	G/T	0.192	-0.025	0.033	1.03 (0.86-1.24)	0.7212	-0.110	0.9 (0.75-1.08)	0.2436
rs2802330	1	26466831	PDIK1L	A/G	0.176	-0.031	-0.130	0.88 (0.72-1.07)	0.1989	-0.034	0.97 (0.8-1.17)	0.7235

rs73238159	3	142078759	XRN1	T/C	0.873	-0.025	0.230	1.26 (0.99-1.6)	0.0633	0.001	1 (0.79-1.27)	0.9911
rs80170948	5	64020316	SREK1IP1	T/G	0.025	-0.039	0.035	1.04 (0.66-1.63)	0.8812	-0.275	0.76 (0.44-1.3)	0.3162
rs293275	10	53215020	PRKG1	T/C	0.509	-0.014	-0.027	0.97 (0.84-1.13)	0.7207	-0.042	0.96 (0.83-1.11)	0.5663
rs55707100	15	43820717	MAP1A	T/C	0.974	-0.151	0.173	1.19 (0.69-2.06)	0.5347	-0.094	0.91 (0.56-1.48)	0.7051
rs5742915	15	74336633	PML	C/T	0.554	0.025	-0.077	0.93 (0.8-1.07)	0.3054	-0.004	1 (0.86-1.15)	0.9607
rs78460947	11	56143715	OR8U1	G/A	0.994	0.042	-0.137	0.87 (0.27-2.82)	0.8183	31.660	0.97 (0.72-1.31)	1.0000
rs111792934	16	69131293	HAS3	C/T	0.154	0.022	-0.017	0.98 (0.8-1.21)	0.8719	0.248	1.28 (1.06-1.56)	**0.0122**
rs3213223	11	2156930	IGF2/INS-IGF-2	G/A	0.179	-0.076	0.047	1.05 (0.86-1.28)	0.6363	-0.114	0.89 (0.72-1.1)	0.2886
rs12211977	6	161252770	lincRNA	G/A	0.093	-0.023	0.109	1.12 (0.86-1.44)	0.4029	0.232	1.26 (0.99-1.61)	0.0634
rs10779509	1	209728370	AL023754.1	T/C	0.433	-0.014	-0.032	0.97 (0.84-1.12)	0.6744	-0.115	0.89 (0.77-1.03)	0.1106
rs11717397	3	23368583	UBE2E2	G/A	0.449	0.015	-0.005	1 (0.86-1.16)	0.9488	-0.044	0.96 (0.83-1.11)	0.5551
rs17323117	2	230162971	PID1	A/G	0.059	-0.029	0.008	1.01 (0.74-1.36)	0.9611	-0.026	0.97 (0.72-1.31)	0.8639
rs175043	14	75471803	EIF2B2	G/A	0.444	0.018	-0.144	0.87 (0.75-1)	0.0515	-0.156	0.86 (0.74-0.99)	**0.0308**
rs12597502	16	53170069	CHD9	A/G	0.296	-0.015	-0.019	0.98 (0.82-1.17)	0.8367	0.000	1 (0.84-1.19)	0.9970
rs12538762	7	47264328	TNS3	C/T	0.089	0.026	0.079	1.08 (0.82-1.43)	0.5845	-0.144	0.87 (0.66-1.13)	0.2940
rs684818	1	234854779	AL160408.6	T/C	0.470	0.024	-0.067	0.93 (0.81-1.08)	0.3572	0.066	1.07 (0.93-1.23)	0.3637
rs2023762	16	19276597	SYT17	T/C	0.492	0.015	-0.021	0.98 (0.84-1.13)	0.7767	-0.039	0.96 (0.83-1.11)	0.6049
rs146345029	11	59596007	GIF	G/A	0.038	-0.034	0.011	1.01 (0.68-1.5)	0.9547	-0.290	0.75 (0.5-1.12)	0.1630
rs1055582	4	39700173	UBE2K	C/T	0.533	0.027	0.009	1.01 (0.86-1.18)	0.9148	0.034	1.03 (0.89-1.2)	0.6594
rs11064536	12	905582	WNK1	T/C	0.095	0.020	-0.070	0.93 (0.69-1.25)	0.6451	0.238	1.27 (0.98-1.64)	0.0722
rs4075483	17	79074817	BAIAP2	C/T	0.365	0.017	-0.025	0.98 (0.82-1.16)	0.7737	-0.107	0.9 (0.76-1.06)	0.2029
rs56062334	3	172299226	LINC02068	T/C	0.457	0.017	0.136	1.15 (0.97-1.36)	0.1144	0.088	1.09 (0.93-1.29)	0.2868
rs8079923	17	19869544	AKAP10	C/T	0.257	0.016	-0.145	0.86 (0.73-1.03)	0.1050	-0.150	0.86 (0.73-1.02)	0.0821
rs9573360	13	74771429	KLF12	A/C	0.445	0.014	0.067	1.07 (0.92-1.24)	0.3740	-0.056	0.95 (0.82-1.09)	0.4515
rs35135518	2	16120506	RN7SL104P	T/C	0.083	0.029	-0.193	0.82 (0.63-1.09)	0.1703	-0.015	0.99 (0.76-1.28)	0.9121
rs9978775	21	40694526	BRWD1-AS1	G/A	0.430	0.019	-0.018	0.98 (0.85-1.14)	0.8069	0.010	1.01 (0.87-1.17)	0.8971
rs7502910	17	1638718	WDR81	A/G	0.497	0.016	-0.078	0.92 (0.8-1.07)	0.2887	-0.121	0.89 (0.77-1.02)	0.0923
rs4917962	10	103931931	NOLC1	G/T	0.124	-0.024	-0.081	0.92 (0.74-1.15)	0.4796	0.048	1.05 (0.85-1.3)	0.6620
rs9809209	3	51281664	DOCK3	G/A	0.383	-0.017	0.033	1.03 (0.88-1.21)	0.6789	0.060	1.06 (0.91-1.24)	0.4429
rs58560372	19	38758752	SPINT2	C/T	0.134	0.020	-0.006	0.99 (0.79-1.26)	0.9580	0.125	1.13 (0.91-1.42)	0.2717
rs35023999	11	113266411	ANKK1	C/A	0.514	0.015	-0.037	0.96 (0.83-1.12)	0.6357	0.035	1.04 (0.89-1.2)	0.6446
rs62342064	4	104665972	TACR3	C/T	0.053	0.022	-0.165	0.85 (0.56-1.28)	0.4291	0.341	1.41 (0.99-2)	0.0564
rs11577063	1	179341999	AXDND1	G/T	0.220	-0.020	-0.024	0.98 (0.81-1.17)	0.8002	-0.060	0.94 (0.79-1.12)	0.5022
rs10745954	12	103483094	AC068643.1	G/A	0.501	0.015	0.092	1.1 (0.94-1.27)	0.2336	-0.021	0.98 (0.85-1.13)	0.7727
rs6088579	20	33284624	PIGU/NCOA6	G/A	0.160	0.027	0.206	1.23 (1-1.5)	**0.0453**	0.109	1.11 (0.92-1.36)	0.2796
rs72761177	16	1833508	NUBP2	A/G	0.902	0.077	-0.241	0.79 (0.62-1)	0.0538	-0.046	0.95 (0.75-1.21)	0.7011
rs61867536	11	1513700	MOB2	C/T	0.524	-0.018	-0.060	0.94 (0.8-1.1)	0.4566	0.008	1.01 (0.86-1.18)	0.9239
rs2228561	3	48628014	COL7A1	A/G	0.876	0.020	0.078	1.08 (0.86-1.36)	0.5007	0.034	1.03 (0.83-1.29)	0.7624
rs10114121	9	19440136	ACER2	G/A	0.130	-0.020	-0.277	0.76 (0.6-0.95)	**0.0171**	-0.086	0.92 (0.75-1.13)	0.4168

rs8182173	16	4420787	CORO7-PAM16	C/T	0.238	-0.018	-0.077	0.93 (0.77-1.12)	0.4193	0.056	1.06 (0.88-1.27)	0.5404
rs10811787	9	22871816	AL391117.1	T/C	0.503	-0.015	0.146	1.16 (0.99-1.35)	0.0597	-0.007	0.99 (0.86-1.15)	0.9222
rs11557154	9	34107505	DCAF12	T/C	0.884	0.024	0.048	1.05 (0.84-1.31)	0.6736	0.003	1 (0.81-1.25)	0.9749
rs9398171	6	108983527	FOXO3	T/C	0.279	0.050	0.060	1.06 (0.9-1.25)	0.4821	-0.072	0.93 (0.79-1.1)	0.3922
rs2737205	8	116610180	TRPS1	C/T	0.424	-0.023	0.124	1.13 (0.97-1.32)	0.1163	0.042	1.04 (0.9-1.21)	0.5894
rs72828596	6	19183591	AL589647.1	G/A	0.088	-0.019	0.090	1.09 (0.84-1.42)	0.4959	0.116	1.12 (0.87-1.45)	0.3777
rs12491473	3	46989904	CCDC12	G/A	0.423	0.020	-0.102	0.9 (0.77-1.06)	0.2015	0.033	1.03 (0.89-1.2)	0.6637
rs2412973	22	30529631	HORMAD2	C/A	0.463	-0.014	-0.076	0.93 (0.79-1.08)	0.3429	0.101	1.11 (0.95-1.29)	0.1919
rs75660441	9	97662448	C9orf3	A/G	0.053	0.039	-0.006	0.99 (0.71-1.4)	0.9730	0.065	1.07 (0.78-1.46)	0.6841
rs61780439	1	41490177	SLFNL1-AS1	G/A	0.229	0.021	-0.139	0.87 (0.73-1.04)	0.1275	-0.165	0.85 (0.71-1.01)	0.0620
rs33912345	14	60976537	SIX6	A/C	0.405	-0.023	-0.139	0.87 (0.74-1.02)	0.0808	-0.133	0.88 (0.75-1.02)	0.0834
rs4306136	1	221608720	AL360013.2	A/G	0.405	0.017	0.196	1.22 (1.03-1.43)	**0.0187**	0.011	1.01 (0.86-1.18)	0.8913
rs3890746	6	130371055	L3MBTL3	T/C	0.419	-0.020	-0.005	0.99 (0.86-1.15)	0.9447	0.063	1.07 (0.92-1.23)	0.3812
rs34670419	7	99130834	ZKSCAN5	G/T	0.033	-0.036	0.472	1.6 (1.06-2.42)	**0.0252**	0.070	1.07 (0.69-1.66)	0.7547
rs790513	6	154420368	OPRM1	C/A	0.241	0.025	-0.078	0.93 (0.78-1.1)	0.3833	-0.005	0.99 (0.83-1.19)	0.9541
rs12723255	1	21233570	EIF4G3	T/C	0.418	-0.017	-0.077	0.93 (0.8-1.07)	0.3002	-0.075	0.93 (0.8-1.07)	0.3014
rs2801482	10	12459773	CAMK1D	A/G	0.021	-0.050	0.329	1.39 (0.89-2.16)	0.1460	0.100	1.11 (0.69-1.77)	0.6752
rs12699547	7	2015970	MAD1L1	C/T	0.376	0.021	0.188	1.21 (1.03-1.41)	**0.0185**	-0.052	0.95 (0.81-1.11)	0.5039
rs3131646	1	40383552	MYCL	G/T	0.280	0.016	0.102	1.11 (0.93-1.32)	0.2503	-0.033	0.97 (0.82-1.15)	0.7050
rs1127313	1	154556425	ADAR	G/A	0.493	0.024	-0.026	0.97 (0.84-1.13)	0.7293	-0.159	0.85 (0.74-0.99)	**0.0335**
rs6416868	17	15924370	TTC19	G/A	0.453	-0.019	0.108	1.11 (0.96-1.29)	0.1520	0.012	1.01 (0.88-1.17)	0.8725
rs12935465	16	17476853	XYLT1	T/C	0.507	0.016	-0.035	0.97 (0.83-1.12)	0.6382	0.070	1.07 (0.93-1.24)	0.3418
rs2602717	19	4902950	UHRF1/ARRDC5	C/T	0.105	0.019	0.348	1.42 (0.98-2.04)	0.0609	0.171	1.19 (0.85-1.66)	0.3198
rs4788220	16	30063780	FAM57B	A/G	0.487	-0.017	-0.097	0.91 (0.78-1.05)	0.2005	0.007	1.01 (0.87-1.16)	0.9242
rs811332	3	138078348	MRAS	C/T	0.183	0.019	0.005	1.01 (0.83-1.22)	0.9598	0.027	1.03 (0.85-1.24)	0.7789
rs940400	1	200269134	LINC00862	C/A	0.108	0.025	-0.122	0.89 (0.68-1.14)	0.3505	-0.090	0.91 (0.7-1.19)	0.4966
rs687339	3	135932359	AC092991.1	T/C	0.227	0.040	-0.005	1 (0.84-1.18)	0.9574	-0.111	0.9 (0.76-1.06)	0.1908
rs7034716	9	101858382	TGFBR1	C/T	0.271	0.015	-0.030	0.97 (0.82-1.15)	0.7250	0.083	1.09 (0.93-1.27)	0.2866
rs71432868	13	106559402	SNORA25	T/C	0.016	-0.028	0.212	1.24 (0.65-2.37)	0.5209	0.119	1.13 (0.58-2.17)	0.7237
rs17037452	1	11895675	CLCN6	A/G	0.164	0.023	-0.061	0.94 (0.77-1.15)	0.5566	0.030	1.03 (0.85-1.25)	0.7592
rs2348604	5	136809831	SPOCK1	T/C	0.275	-0.016	-0.084	0.92 (0.78-1.09)	0.3307	0.030	1.03 (0.88-1.21)	0.7134
rs1055710	9	96214928	FAM120AOS	A/G	0.664	-0.018	-0.143	0.87 (0.74-1.01)	0.0676	0.009	1.01 (0.86-1.18)	0.9105
rs670049	6	100087024	PRDM13	A/C	0.318	0.019	-0.024	0.98 (0.83-1.14)	0.7626	0.040	1.04 (0.89-1.21)	0.6083
rs7947951	11	13356030	ARNTL	G/A	0.311	0.020	0.119	1.13 (0.96-1.32)	0.1522	-0.001	1 (0.85-1.17)	0.9866
rs1115897	14	93910816	UNC79	A/C	0.308	0.021	-0.114	0.89 (0.76-1.05)	0.1768	-0.019	0.98 (0.84-1.14)	0.8112
rs1182174	7	2875420	GNA12	G/A	0.305	-0.021	-0.026	0.97 (0.83-1.14)	0.7416	0.019	1.02 (0.87-1.19)	0.8087
rs34452566	11	27793470	AC103796.1	G/T	0.146	-0.018	-0.161	0.85 (0.67-1.09)	0.1946	-0.161	0.85 (0.67-1.08)	0.1862
rs6510177	19	31211647	ZNF536	C/T	0.108	-0.023	-0.039	0.96 (0.7-1.32)	0.8084	-0.047	0.95 (0.72-1.27)	0.7453
rs11556924	7	129663496	ZC3HC1	T/C	0.714	-0.016	0.054	1.06 (0.84-1.32)	0.6411	-0.102	0.9 (0.72-1.13)	0.3798

rs773116	12	56486159	ERBB3	G/A	0.458	0.016	0.098	1.1 (0.96-1.27)	0.1726	0.019	1.02 (0.88-1.17)	0.7965
rs28831479	9	98254526	PTCH1	C/A	0.245	0.022	0.115	1.12 (0.92-1.37)	0.2682	0.022	1.02 (0.84-1.25)	0.8280
rs599839	1	109822166	PSRC1/CELSR2	A/G	0.224	-0.031	-0.031	0.97 (0.81-1.17)	0.7450	-0.015	0.99 (0.83-1.18)	0.8727
rs4768	3	49758764	RNF123	A/G	0.322	-0.015	-0.017	0.98 (0.85-1.14)	0.8225	0.068	1.07 (0.92-1.24)	0.3693
rs6519133	22	39096602	JOSD1	T/C	0.458	0.029	-0.115	0.89 (0.74-1.08)	0.2380	0.131	1.14 (0.95-1.37)	0.1690
rs11856160	15	93452846	CHD2	A/G	0.140	0.021	-0.170	0.84 (0.68-1.05)	0.1273	-0.185	0.83 (0.67-1.03)	0.0913
rs41277821	9	109689972	ZNF462	T/C	0.984	0.062	0.090	1.09 (0.58-2.08)	0.7840	-0.253	0.78 (0.44-1.36)	0.3750
rs56030650	17	38131187	GSDMA	A/C	0.535	-0.022	0.052	1.05 (0.9-1.23)	0.5107	0.153	1.16 (0.99-1.37)	0.0627
rs2460488	12	116187660	-	G/A	0.114	0.026	0.022	1.02 (0.75-1.4)	0.8873	-0.262	0.77 (0.54-1.1)	0.1479
rs4709995	6	166313447	PDE10A	C/T	0.391	-0.042	-0.076	0.93 (0.8-1.08)	0.3202	-0.186	0.83 (0.72-0.96)	**0.0122**
rs7667562	4	129133826	LARP1B	C/A	0.253	0.016	-0.074	0.93 (0.78-1.11)	0.4054	-0.135	0.87 (0.74-1.04)	0.1209
rs73271090	5	132313550	AC010240.1	G/A	0.118	0.044	0.016	1.02 (0.79-1.31)	0.9037	0.164	1.18 (0.92-1.51)	0.1947
rs7802508	7	1191689	ZFAND2A	G/A	0.400	-0.021	-0.191	0.83 (0.71-0.96)	**0.0123**	-0.027	0.97 (0.84-1.13)	0.7197
rs7774230	6	152164239	ESR1	C/T	0.437	-0.026	-0.103	0.9 (0.77-1.05)	0.1941	-0.089	0.92 (0.79-1.06)	0.2512
rs174554	11	61579463	FADS1/FADS2	A/G	0.335	0.022	0.014	1.01 (0.87-1.18)	0.8500	-0.034	0.97 (0.84-1.12)	0.6416
rs11671304	19	47564643	ZC3H4	T/C	0.320	-0.018	-0.022	0.98 (0.78-1.23)	0.8537	-0.035	0.97 (0.75-1.25)	0.7881
rs6479003	9	102948685	INVS	G/A	0.056	0.024	-0.303	0.74 (0.53-1.03)	0.0703	0.103	1.11 (0.84-1.47)	0.4681
rs2856321	12	11855773	ETV6	A/G	0.349	-0.026	-0.064	0.94 (0.81-1.09)	0.4036	-0.002	1 (0.86-1.15)	0.9768
rs10047326	10	22839463	PIP4K2A	A/C	0.364	0.017	0.137	1.15 (0.98-1.34)	0.0789	0.044	1.04 (0.9-1.21)	0.5696
rs12935091	16	71525208	ZNF19	A/G	0.021	-0.035	0.180	1.2 (0.72-2)	0.4904	-0.233	0.79 (0.46-1.37)	0.4055
rs12231073	12	38526901	-	G/T	0.379	-0.017	0.074	1.08 (0.89-1.31)	0.4546	-0.221	0.8 (0.66-0.97)	**0.0246**
rs74657816	7	46670682	HMGN1P19	T/G	0.039	0.047	0.278	1.32 (0.92-1.9)	0.1351	0.106	1.11 (0.78-1.58)	0.5546
rs142354201	15	99524022	PGPEP1L	G/A	0.037	0.034	-0.017	0.98 (0.67-1.45)	0.9328	0.012	1.01 (0.7-1.47)	0.9485
rs10757291	9	22161884	CDKN2B-AS1	A/G	0.476	-0.019	0.022	1.02 (0.88-1.19)	0.7801	0.104	1.11 (0.96-1.29)	0.1673
rs10893499	11	126241979	ST3GAL4	G/A	0.138	0.022	-0.044	0.96 (0.77-1.19)	0.6869	-0.111	0.9 (0.73-1.1)	0.2991
rs1822825	3	12449963	PPARG	A/G	0.474	-0.014	-0.096	0.91 (0.78-1.05)	0.1988	-0.031	0.97 (0.84-1.12)	0.6627
rs55717031	3	138848505	MRPS22	G/T	0.285	0.032	0.060	1.06 (0.9-1.26)	0.4881	0.135	1.14 (0.97-1.35)	0.1144
rs2309401	17	5471902	NLRP1	T/G	0.392	0.015	0.068	1.07 (0.91-1.26)	0.4007	-0.100	0.9 (0.77-1.06)	0.2139
rs8105174	19	10347032	DNMT1	C/T	0.178	0.050	-0.056	0.95 (0.77-1.16)	0.5976	-0.164	0.85 (0.69-1.05)	0.1231
rs2270628	7	45949570	IGFBP3	C/T	0.204	-0.033	-0.030	0.97 (0.82-1.15)	0.7329	-0.083	0.92 (0.77-1.1)	0.3498
IGFBP-3 SNPs												
rs11977526	7	46008110	IGFBP3	A/G	0.593	0.287	0.028	1.03 (0.88-1.2)	0.7200	-0.048	0.95 (0.82-1.1)	0.5177
rs700753	7	46753684	TNS3	G/C	0.345	0.158	-0.055	0.95 (0.81-1.1)	0.4751	-0.008	0.99 (0.86-1.14)	0.9151
rs4234798	4	7219933	SORCS2	G/T	0.388	0.095	0.081	1.08 (0.93-1.27)	0.3079	0.048	1.05 (0.9-1.22)	0.5295
rs1065656	16	1838836	NUBP2	G/C	0.303	0.111	-0.085	0.92 (0.78-1.08)	0.2932	0.002	1 (0.86-1.17)	0.9831

*Alleles are high allele/low allele. Low allele was used as the reference allele and high allele as effect allele. EAF: effect allele frequency; β1 estimate of SNP-IGF-1/IGFBP-3 association were from published GWAS; β2 estimates for SNP-recurrence and β3 estimates for SNP-death association were from our population. HR was adjusted by age, gender, smoking status, BMI, histology, stage, grade, and treatment. Significant *P* values (<0.05) were bolded, P<0.01 were shown in red, and SNPs with consistent significant associations with both recurrence and death were highlighted.