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# Identification of Pharmacogenetic Markers in Smoking Cessation Therapy

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# Abstract

Pharmacogenetic clinical trials seek to identify genetic modifiers of treatment effects. When a trial has collected data on many potential genetic markers, a first step in analysis is to screen for evidence of pharmacogenetic effects by testing for treatment-by-marker interactions in a statistical model for the outcome of interest. This approach is potentially problematic because i) individual significance tests can be overly sensitive, particularly when sample sizes are large; and ii) standard significance tests fail to distinguish between markers that are likely, on biological grounds, to have an effect, and those that are not. One way to address these concerns is to perform Bayesian hypothesis tests (Berger 1985; Kass and Raftery 1995), which are typically more conservative than standard uncorrected frequentist tests, less conservative than multiplicity-corrected tests, and make explicit use of relevant biological information through specification of the prior distribution. In this article we use a Bayesian testing approach to screen a panel of genetic markers recorded in a randomized clinical trial of bupropion versus placebo for smoking cessation. From a panel of 59 single-nucleotide polymorphisms (SNPs) located on 11 candidate genes, we identify four SNPs (one each on CHRNA5 and CHRNA2 and two on CHAT) that appear to have pharmacogenetic relevance. Of these, the SNP on CHRNA5 is most robust to specification of the prior. An unadjusted frequentist test identifies seven SNPs, including these four, none of which remains significant upon correction for multiplicity. In a panel of 43 randomly selected control SNPs, none is significant by either the Bayesian or the corrected frequentist test.

# Keywords

Bayes factor; Bayesian hypothesis test; bupropion; importance sampling; pharmacogenomics; single-nucleotide polymorphism

# Introduction

The emerging field of pharmacogenomics seeks to link genetic polymorphisms in drug targets and metabolizing enzymes with efficacy and toxicity phenotypes (Eichelbaum et al. 2006). When a polymorphism is recorded on subjects in a clinical trial, a natural approach to assessing its importance is to test the treatment-by-polymorphism interaction in a statistical model for the trial outcome. Although such an approach potentially oversimplifies the complexity of the

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polygenic drug response phenotype (Need et al. 2005), nevertheless it can be valuable in identifying markers that are worthy of further study.

A potential problem with this approach is that classical significance tests are overly sensitive, especially in large samples. This is because they assess departures from the null rather than comparing the fits of the null and alternative models. The problem is compounded when one conducts many tests, as failure to correct for multiplicity can lead to an excess of false positives. One can adapt variants of the Bonferroni method to construct adjusted tests whose family-wise type I error rates are acceptably low (Hochberg 1988), but these methods are extremely conservative. Moreover, in screening large numbers of markers one should be able to use available biological information. In particular, markers that are thought likely, *a priori*, to have a pharmacogenetic effect should be held to a lower standard of evidence than those that are unlikely to have such an effect. That classical statistical tests do not permit the incorporation of prior information is often touted as an indication of their "objectivity".

A possible alternative approach is to screen the markers using Bayesian hypothesis testing (Berger 1985). This involves calculating for each marker a Bayes factor, or weight of evidence, that measures the plausibility of the null hypothesis of no interaction versus the alternative that there is an interaction (Kass and Raftery 1995). Bayesian tests are generally more conservative than classical tests and therefore potentially more suitable for screening panels of markers. Moreover Bayesian tests make explicit use of contextual biological information through specification of the prior distribution, which in this setting refers to the analyst's *a priori* degree of belief that a particular marker is pharmacogenetically active. Until fairly recently, the computation of Bayesian analyses in all but the simplest models was prohibitively expensive, but improvements in computing technology have largely eliminated this obstacle. Thus, applications of Bayesian analysis in genetics have become increasingly common (Desai and Emond 2004; Tadesse et al. 2005; Zhao et al. 2005; Gottardo et al. 2006; Kitchen et al. 2007).

In this article we conduct an explicitly Bayesian analysis of a panel of candidate genetic markers collected in a clinical trial of bupropion for smoking cessation. Pharmacotherapy for smoking cessation provides an ideal case study given the public health significance of tobacco dependence, the relatively modest effectiveness of currently available drugs, and emerging data supporting associations of genetic polymorphisms with response to nicotine replacement therapies (Johnstone et al. 2004; Lerman et al. 2006; Lerman et al. 2004; Malaiyandi et al. 2006; David et al. 2007) and bupropion (Swan et al. 2005; Berrettini et al. 2007; Lee et al. 2006; Lerman et al. 2004).

Our analysis focuses on 59 single-nucleotide polymorphisms (SNPs) on 11 genes in the nicotinic acetylcholine receptor (nAChR) family. *In vitro* binding experiments have demonstrated that bupropion is a non-competitive antagonist at the  $\alpha 3\beta 4\alpha 5\pm\beta 2$  subtype of nAChR (Fryer and Lukas 1999; Slemmer et al. 2000; Bondarev et al. 2003; Alkondon and Albuquerque 2005). Bupropion blocks the hypothermic and antinociceptive effects of nicotine (Slemmer et al. 2000; Damaj et al. 2004), as well as dopamine and norepinephrine release from striatal synaptical vesicles, most likely via antagonism at these nAChRs (Miller et al. 2002). Several human genetic studies have also nominated nAChRs in the etiology of tobacco dependence (Feng et al. 2004; Li et al. 2005; Greenbaum et al. 2006; Beirut et al. 2007; Saccone et al. 2007), although not all results have been positive (Silverman et al. 2000; Lueders et al. 2002).

In this article we apply Bayesian hypothesis testing to SNP data and clinical outcomes from the bupropion trial. Our analyses moreover compare the Bayesian approach to standard unadjusted and adjusted frequentist analyses.

## Materials and Methods

#### The bupropion trial

The data are from a placebo-controlled randomized pharmacogenetic trial of bupropion for smoking cessation; the design and main findings have been published previously (Lerman et al. 2004). Briefly, the study enrolled 599 smokers between April 1999 and October 2001 at Georgetown University and SUNY Buffalo. Participants were aged 18 or older and had smoked at least 10 cigarettes per day for the preceding 12 months. Exclusion criteria included pregnancy, a history of DSM-IV axis I psychiatric disorder, seizure disorder, substance abuse, and current use of psychotropic medications. Participants were randomized to receive either bupropion or placebo for 10 weeks, plus 7 sessions of behavioral group smoking cessation at the end of treatment (8 weeks following the target quit date), which was biochemically verified using cotinine (<15ng/ml to confirm smoking cessation). To reduce potential bias from ethnic admixture, we restrict our genetic analyses to the 436 participants of European ancestry in the intention-to-treat population.

All participants provided DNA for the pharmacogenetic evaluation. The data analysis described here focuses on a panel of 59 SNPs in seven nAChR  $\alpha$ -subunit genes (*CHRNA2–CHRNA7, CHRNA10*), three nAChR  $\beta$ -subunit genes (*CHRNB2–CHRNB4*), and choline acetyltransferase (*CHAT*). As a negative control, we included a panel of 43 SNPs, randomly selected from throughout the genome, that had been used to test for population stratification (Lerman et al. 2004). Although all subjects provided DNA, valid data were not available on all SNPs for all subjects. The number of available cases ranged from 290 to 428 among the candidate SNPs and 334 to 424 among the control SNPs, with 75% of all SNPs having at least 411 available cases.

The study was approved by the appropriate institutional review boards.

#### Statistical model

For each SNP we assume a dominant model in that a subject who has at least one copy of the rarer allele is considered positive for the polymorphism. Because the outcome is binary, our basic model is a logistic regression predicting quit success from treatment arm, SNP status, and the treatment-by-SNP interaction:

$$\Pr(Y_i=1|D_i,G_i)=h(\beta_0+\beta_T D_i+\beta_G G_i+\beta_I D_i G_i),$$

where

h(u)=	$\exp(u)/($	$1 + \exp(u));$
V	∫ 1 if s	subject <i>i</i> was abstinent at EOT,
$I_i -$	∫0 oth	nerwise;
D -	∫ 1/2	if subject i was assigned to bupropion,
$D_i =$	$\int -1/2$	if subject <i>i</i> was assigned to placebo;
C	<u>)</u> 1/2	if subject i was positive for the polymorphism,
$G_i =$	(-1/2)	<ul> <li>is ubject <i>i</i> was abstinent at EOT,</li> <li>herwise;</li> <li>if subject <i>i</i> was assigned to bupropion,</li> <li>if subject <i>i</i> was assigned to placebo;</li> <li>if subject <i>i</i> was positive for the polymorphism,</li> <li>otherwise.</li> </ul>

In this model  $\beta_0$  is the logit of the overall quit rate;  $\beta_T$  is the log odds ratio for treatment;  $\beta_G$  is the log odds ratio for the polymorphism; and  $\beta_I$  is the interaction, or the difference of treatment log odds ratios between subjects who are positive and negative for the polymorphism.

#### Priors for Bayesian hypothesis testing

In Bayesian hypothesis testing one must specify a prior, or distribution over the space of the model parameters, that attaches a point mass to the null hypothesis (in this case,  $\{\beta: \beta_I = 0\}$ ) and spreads the remainder of the prior probability over the set of alternative hypotheses. For the bupropion trial, we set the prior  $f_I(\beta_I)$  for the interaction parameter  $\beta_I$  to be a mixture of a point null and a continuous density:

 $f_{I}(\beta_{I}) = \rho I_{0}(\beta_{I}) + (1 - \rho)(1 - I_{0}(\beta_{I}))g(\beta_{I}),$ 

where  $\rho$  is the prior probability that the null is true (i.e., that the interaction is 0),  $I_0(x)$  is an indicator that x = 0, and  $g(\beta_I)$  is a prior density over the set of alternative (non-zero) values of  $\beta_I$ . We moreover assume that the other parameters  $\beta_0$ ,  $\beta_T$  and  $\beta_G$  are *a priori* independent of each other and of  $\beta_I$ .

For convenience, we take our priors for the  $\beta$  coefficients to be normal, choosing their means and variances to match information from the literature. In a previous randomized, placebocontrolled trial of bupropion in smoking cessation (Tønnesen et al. 2003), the average of abstinence fractions in the two groups on the logit scale was -0.69, which we use as the prior mean of  $\beta_0$ . Taking the variance estimates from the Tønnesen study, transforming to the logit scale, and inflating by 50% to account for between-trial variability, we arrive at a prior standard deviation (SD) for  $\beta_0$  of 0.148. Also adapting estimates from the Tønnesen study, we take the prior of  $\beta_T$  to be normal with mean 1.037 and SD 0.315. Assuming that most SNPs will have no more than a modest main effect on abstinence, we take the prior for  $\beta_G$  to be normal with mean 0 and SD equal to that of  $\beta_T$ .

The prior for  $\beta_I$  contains both a continuous and a discrete part. To compute Bayes factors it is not necessary to specify the prior probability of the null hypothesis  $\rho$ , so we allow this number to vary in the range (0, 1). We take  $g(\beta_I)$ , the density of  $\beta_I$  over the alternative space, to be normal with mean 0 and SD equal to twice that of  $\beta_T$  (i.e., 0.632). As  $g(\beta_I)$  is the component of the prior that is least well informed by data, we conducted a sensitivity analysis in which we varied its SD in the range (0, 9).

#### Posterior probabilities and Bayes factors

Given the data *x* and the model assumptions, the posterior probability that the null hypothesis is true is

$$\Pr(\beta_1 = 0|x) = \frac{\rho m_0(x)}{\rho m_0(x) + (1 - \rho)m_1(x)}$$

where

$$m_0(x) = \int L(\beta_0, \beta_T, \beta_G, 0) \pi_{0TG}(\beta_0, \beta_T, \beta_G) d(\beta_0, \beta_T, \beta_G),$$
  

$$m_1(x) = \int L(\beta_0, \beta_T, \beta_G, \beta_I) \pi_{0TG}(\beta_0, \beta_T, \beta_G) g(\beta_I) d(\beta_0, \beta_T, \beta_G, \beta_I),$$

 $\pi_{0TG}$  is the joint prior for the parameters  $\beta_0$ ,  $\beta_T$  and  $\beta_G$ , and  $L(\beta)$  is the likelihood function. One can think of  $m_0(x)$  and  $m_1(x)$  as the marginal likelihoods for the null and alternative hypotheses, respectively. The marginal likelihood reflects how well the model hypothesis explains the observed data.

We calculate  $m_0(x)$  and  $m_1(x)$  by importance sampling (Hammersley and Handscomb 1964), a simulation method that takes advantage of the fact that although the posterior density itself is generally unavailable, it is typically easy to compute a function that is proportional to the posterior density — specifically, the product of the prior and the likelihood. In importance sampling one takes a large number of draws from an approximate posterior, known as the *proposal distribution*, that one can easily simulate from and whose density is available in closed form (the asymptotic normal approximation to the sampling distribution of the MLE is a common choice). One then calculates importance weights, which are the ratios of the unscaled true posterior density to the proposal density evaluated at the sampled parameters. Averages of functions of the sampled parameters, weighted by the importance weights, approximate the posterior expectations of those functions. SPlus code for an implementation of importance sampling in the pharmacogenetic model is available from the first author.

A summary of the weight of evidence against the null is the Bayes factor (BF), defined as the ratio of the posterior odds that the null is true to the prior odds that the null is true:

$$BF = \frac{m_0(x)}{m_1(x)}.$$

Note that the BF does not depend on the prior probability of the null hypothesis,  $\rho$ , which cancels out when one takes the ratio of posterior to prior odds. BF does depend on the priors for the parameters under the null and the alternative hypotheses, however, because these functions enter into the calculation of  $m_0(x)$  and  $m_1(x)$ , respectively.

To use BF as a screening tool, we adopt the Jeffreys scale of evidence, which interprets a value of BF < 1/3 as moderate evidence for the alternative hypothesis (Kass and Raftery 1995). For example, a BF of this magnitude implies evidence strong enough to transform a prior odds of 3 (prior probability equal to 75%) to a posterior odds of 1 or less (posterior probability 50% or less).

#### Comparison with a frequentist analysis

We have also calculated p values for the hypothesis of no interaction using a likelihood-ratio test (LRT) and a multiplicity-adjusted LRT based on the permutation step-down min-P procedure of Westfall and Young (1993). This method controls the family-wise error rate in the strong sense; that is, it controls the error rate for any combination of true and false hypotheses. We have used it here because it is valid even if the individual tests are not independent, as is the case in our data.

# Results

Table 1 lists the 59 candidate SNPs, sorted by BF, with the corresponding LRT unadjusted and adjusted p values for the test of no treatment-by-SNP interaction. The criterion BF < 1/3 identifies four SNPs, on genes *CHRNA5*, *CHAT* (two SNPs) and *CHRNA2*, that have potential pharmacogenetic associations. To assess robustness we varied the alternative-hypothesis prior SD of the interaction  $\beta_I$  and found that the BF for the *CHRNA5* SNP remained less than 1/3 for prior SDs in the range (0.4, 3.6), suggesting modest sensitivity to the prior. The other SNPs have BFs under 1/3 in the ranges (0.5, 3.3), (0.5, 1.9) and (0.6, 1.4), respectively, suggesting greater sensitivity. Thus we consider the *CHRNA5* SNP to be significant in a robust Bayesian sense (Berger and Berry 1988). By comparison, the unadjusted LRT p value criterion identifies seven SNPs as potentially pharmacogenetically active (column 5 of Table 1). None of these p values remains significant in the adjusted procedure that controls the FWE rate at 0.05 (column 6).

Table 2 shows the BFs and unadjusted and adjusted p values for the treatment-by-SNP interaction tests for the 43 randomly selected SNPs. None of these is identified as significant by either the Bayesian or adjusted frequentist criteria, and only one is identified as significant by the unadjusted frequentist test. As one would expect to find two or more p values of .05 or less in a list of 43 p values, we consider it likely that this lone significant finding is a type I error.

Table 3 shows the posterior probability of the null hypothesis of no interaction as a function of its prior probability for the top four candidate and control SNPs. Note, for instance, that for the second- and third-ranked control SNPs, whose BFs are nearly 1 (Table 2), the prior and posterior probabilities are practically equal. For each SNP, the posterior probability of the null increases monotonically as  $\rho$  (the prior probability of the null) increases from 0.1 to 0.9. A potential use of the prior probabilities in screening a large number of markers (for example in a SNP array) would assign some value  $\rho \leq 0.5$  to candidate SNPs and some  $\rho \geq 0.5$  to control SNPs, in which case the top four candidate SNPs would all have posterior probabilities of the null no greater than 24%, whereas even the top four control SNPs would have posterior probabilities of the null in excess of 44%.

The last four columns of Tables 1 and 2 present the raw probabilities of 7-day abstinence at EOT, cross-classified by SNP type and treatment, for the candidate and control SNPs, respectively. Note that for the top SNP, rs871058 on *CHRNA5*, there is a modest treatment effect (24% quit on placebo vs. 26% on bupropion) for subjects who possess the rare allele but a large effect for those who do not (19% vs. 44%). The same is true for rs1917810 on *CHAT* and rs2565065 on *CHRNA2*, the third and fourth most significant SNPs. The opposite holds for the second-lowest-BF SNP, rs2269338 on *CHAT*, where the bupropion effect is large for positives and modest for negatives. Thus a potential use of rs871058, rs1917810 and rs2565065 in clinical practice would be to prescribe bupropion treatment to subjects who are heterozygous for the common allele, and some other treatment, perhaps nicotine replacement therapy or varenicline, for the others. One would use an opposite approach with rs2269338.

Note that interaction effects are generally more modest for the control SNPs (Table 2) and that in both the candidate and control SNPs the strength of the interaction declines as one progresses down the columns.

# Discussion

We have developed a Bayesian hypothesis test to screen for genetic modifiers of patient response to bupropion pharmacotherapy for smoking cessation. Our method is more conservative than a conventional frequentist test, but less so than the frequentist test adjusted for multiplicity. The method identified one strongly robust pharmacogenetic marker from a panel of candidate SNPs in nAChR genes. Neither the Bayesian test nor the adjusted frequentist test identified any of a panel of randomly selected control SNPs as likely to be pharmacogenetically informative.

The most strongly significant marker is rs871058, a SNP in the first intron of *CHRNA5*, which codes for the nAChR  $\alpha$ 5 subunit. In the human genome, *CHRNA5* lies in a three-gene cluster *CHRNA5-CHRNA3-CHRNB4* (Duga et al. 2001) that comprises a single haplotype block (HapmapDatabase 2007). The  $\alpha$ 5 subunit binds to either the  $\alpha$ 3 $\beta$ 4 or  $\alpha$ 3 $\beta$ 2 subunits to form a pentamer (Conroy et al. 1992; Conroy and Berg 1995), and inclusion of the  $\alpha$ 5 subunit increases the efficacy of nicotine's actions on these receptors (Wang et al. 1996). The  $\alpha$ 5 subunit is also a component of  $\alpha$ 4 $\beta$ 2, the most abundant nAChR in the brain, and inclusion of  $\alpha$ 5 increases conductance of these receptors and causes a higher rate of desensitization (Ramirez-Latorre et al. 1996). Moreover, pre-clinical studies have demonstrated that bupropion is a non-

competitive antagonist at the  $\alpha 3\beta 4\alpha 5$  and  $\alpha 3\beta 2\alpha 5$  subunits (Fryer and Lukas 1999; Bondarev et al. 2003), and thus it is plausible that genetic variation in *CHRNA5* influences bupropion's efficacy for treatment of tobacco dependence. Further, a non-synonymous SNP (rs16969968) on *CHRNA5* emerged as the strongest risk variant in a nicotine dependence association study of over 3,000 SNPs in over 300 candidate genes (Saccone et al. 2007). This polymorphism is located about 24kb downstream from rs871058, and these two SNPs lie in the same haplotype block. Although the functional significance of these SNPs is unknown, there is a high degree of linkage disequilibrium across *CHRNA5* (see Figure 1) that matches the Hapmap data, and the intronic SNP identified in the current analysis could be in linkage with an unknown functional variant that alters the subunit properties (Hapmap Database 2007). We obtained sufficient coverage of *CHRNA5* with the seven SNPs spanning 26kb of its total 28kb, and pairwise linkage disequilibrium between the markers was high.

On the whole the BF and p value give similar answers. When they do not, it is a matter of the data fitting poorly under the alternative-hypothesis prior. For example, candidate SNP rs2292975 on *CHRNA2*, ranked 10 in Table 1, has a significant LRT p value but a BF that does not meet the 1/3 cutoff. Under the null model, the treatment effect was moderate ( $\hat{\beta}_T = 0.585$ ), whereas under the alternative model the treatment effect was reduced substantially (away from the prior mean) to  $\hat{\beta}_T = 0.368$ , with a very large interaction term ( $\hat{\beta}_I = 1.07$ ). The net result was that although the interaction model fits better in the sense of the LRT, the estimated parameters are more remote from the prior mean because of the small treatment effect and large interaction. This is the effect of the alternative-hypothesis prior, which allows for interaction terms but at the same time discounts large interactions. Note that this situation occurs when bupropion has a positive treatment effect for SNP carriers but a negative effect for non-carriers. The same pattern occurs for the SNP with the 14th-smallest BF, rs2292974 on *CHRNA2*.

As suggested in the preceding paragraph, a potential concern with Bayesian tests is their dependence on the assumed prior distribution. Although in general one should select a prior that most faithfully reflects existing knowledge about the actions of the treatment in question, inevitably there will be aspects of the prior that existing data cannot address precisely — specifically, the size of the interaction. Our sensitivity analysis reveals a modest effect of the assumed prior SD of the interaction coefficient with the strongest BF; more elaborate sensitivity analyses are possible and may be desirable in some cases.

Other related problems that can benefit from Bayesian analysis of this type include specification of the optimal genetic model (dominant, recessive, additive or general) and identification of combinations of SNPs that best predict treatment outcome (Kitchen et al. 2007). Because such models are not generally *nested* — i.e., they do not form a sequence of sub-models — they are not amenable to comparison by classical frequentist tests but nevertheless can readily be tested using Bayes factors.

The current model allows for testing of SNPs individually but does not take account of potential correlation between SNPs. Such correlation is likely to obtain in cases, like this one, where SNPs on several related genes may together affect a complex phenotype. A more comprehensive approach would specify a model including a treatment effect, main effects of all the SNPs, their interactions with treatment, and also possibly SNP-by-SNP and other higher-order interactions. This is a potentially large and complicated model involving hundreds of parameters even in an application where, like ours, only a few dozen genetic markers are in play. A comprehensive model of this kind would allow us not only to more efficiently screen markers but to identify parsimonious models describing the simultaneous effects of treatment and genetic factors on the outcome. We are working to build such models in further research with the bupropion data.

The Bayesian approach measures the weight of evidence for an hypothesis from a single data set, unlike frequentist tests that seek to achieve target values for long-term error rates in hypothetical replications of an experiment. Bayesian tests are typically more conservative than frequentist tests, as our example illustrated. Thus Bayesian tests may to some extent mitigate the multiplicity problem that arises when one tests a large number of hypotheses with a single set of data. It does not follow, however, that the Bayesian test, considered as a screening procedure, is free of multiplicity concerns (Westfall et al. 1997). That is, one can evaluate the Bayesian test in terms of its power and type I error rate, which will, as in any frequentist test, depend on the number of markers being assessed. Thus to set the significance criterion for the BF in a screening context one should consider both the number of markers to be screened and the likely distribution of alternative-hypothesis interaction effects. For example, in screening a larger panel of markers, one may wish to use a stricter criterion for significance such as BF < 1/20. Methodology for the selection of this criterion is an object for further empirical research.

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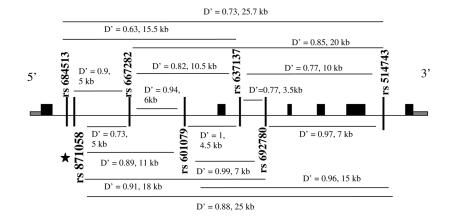
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# Figure 1.

Diagram of the *CHRNA5* gene indicating the genotyped SNPs. The darker shaded boxes represent the exons and the lighter shaded boxes represent the untranslated regions (kb = kilobases, D' = linkage disequilibrium estimate). Figure is not drawn to scale.

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Tests for treatment-by-SNP interaction effect on 7-day point prevalence of smoking cessation at end of treatment, SNPs on candidate Table 1 genes.

							đ	Percent Abstinent at EOT (# of subjects)	EOT (# of subj	ects)
							S	SNP=0	SI	SNP=1
Rank	RS Number	Gene	Bayes Factor	LRT p	Adjusted LRT p	Prevalence, SNP=1 (%)	Placebo	Bupropion	Placebo	Bupropion
1	rs871058	CHRNA5	0.200	0.019	0.699	59.2	19(88)	44(84)	24(109)	26(141)
2	rs2269338	CHAT	0.251	0.031	0.838	19.9	24(157)	29(170)	15(34)	45(47)
ŝ	rs1917810	CHAT	0.293	0.029	0.828	62.9	16(64)	39(76)	26(127)	30(144)
4	rs2565065	CHRNA2	0.313	0.027	0.812	51.2	18(102)	38(104)	26(96)	27(120)
5	rs3793798	CHAT	0.390	0.048	0.934	64.7	16(67)	39(79)	24(127)	29(141)
9	rs3743077	CHRNA3	0.396	0.058	0.963	63.7	17(75)	38(74)	26(117)	29(145)
L	rs1878399	CHRNA3	0.406	0.059	0.963	64.5	18(74)	39(76)	25(122)	29(151)
8	rs1948	CHRNB4	0.442	0.073	0.980	56.9	20(98)	41(83)	23(98)	27(141)
6	rs1878399	CHRNA3	0.468	0.077	0.982	65.7	18(72)	40(75)	23(128)	29(153)
10	rs2292975	CHRNA2	0.474	0.029	0.828	68.2	25(59)	22(76)	19(139)	37(150)
11	rs601079	CHRNA5	0.483	0.079	0.983	62.8	18(73)	39(72)	26(108)	31(137)
12	rs3743075	CHRNA3	0.547	0.106	0.995	60.8	21(86)	41(80)	23(110)	27(147)
13	rs8023462	CHRNB4	0.594	0.094	0.992	54.5	18(97)	37(86)	25(92)	30(127)
14	rs2292974	CHRNA2	0.621	0.045	0.926	68.6	25(59)	23(74)	20(139)	37(151)
15	rs692780	CHRNA5	0.713	0.161	1.000	60.8	21(86)	41(81)	22(113)	28(146)
16	rs2231532	CHRNA10	0.717	0.071	0.978	63.7	24(67)	23(86)	21(128)	38(140)
17	rs3743074	CHRNA3	0.738	0.163	1.000	60.9	20(83)	40(81)	23(114)	28(141)
18	rs3743073	CHRNA3	0.890	0.197	1.000	52.2	18(89)	39(96)	22(88)	30(114)
19	rs514743	CHRNA5	0.896	0.207	1.000	53.4	19(78)	38(78)	24(76)	30(103)
20	rs2741868	CHRNA10	0.972	0.225	1.000	47.9	22(99)	27(121)	21(99)	38(103)
21	rs3824103	CHRNA2	1.011	0.695	1.000	5.2	22(186)	32(215)	18(11)	36(11)
22	rs2377871	CHAT	1.062	0.692	1.000	6.4	22(185)	33(211)	17(12)	33(15)
23	rs4953	CHRNB3	1.063	0.755	1.000	7.3	21(175)	31(206)	25(16)	43(14)
24	rs3735757	CHRNA2	1.114	0.130	0.999	27.1	18(141)	34(163)	27(51)	29(62)
25	rs1316971	CHRNB4	1.290	0.690	1.000	26.8	21(125)	30(159)	26(50)	41(54)
26	rs2229958	CHRNA2	1.361	0.608	1.000	74.0	16(45)	27(62)	24(148)	33(157)
27	rs2072659	CHRNB2	1.361	0.626	1.000	16.5	23(172)	33(183)	15(26)	30(44)

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Number         Gene         Bayes Factor         LRT         Adjusted LRT         Province, SYM=1         <								Ğ	Percent Abstinent at EOT (# of subjects)	EOT (# of sub	jects)
Join Mathematic Mathmata Mathmata Matha Mathematic Mathematic Mathematic Mathematic Mat								SI	VP=0	S	SNP=1
38         6273305         СНВОМ         1361         0.941         1000         133           39         693862         СНВОМ         1.370         0.345         1000         26.5           30         693862         СНВОМ         1.371         0.445         1000         26.5           31         5373473         СНВОМ         1.430         0.545         1000         26.5           31         6530433         СНВОМ         1.430         0.554         1000         26.5           32         653143         СНВОМ         1.440         0.864         1000         26.5           36         6506457         СНВОМ         1.450         0.544         1000         26.5           36         6506457         СНВОМ         1.451         0.641         1000         26.5           36         6506457         СНВОМ         1.452         0.541         1000         26.5           36         6506457         СНВОМ         1.452         0.541         1000         26.5           36         6506457         СНВОМ         1.452         0.542         1000         26.5           36         650530         СНВОМ         1.542	Rank	RS Number	Gene	Bayes Factor	LRTp	Adjusted LRT p	Prevalence, SNP=1 (%)	Placebo	Bupropion	Placebo	Bupropion
se39862         CHRMJ         1.370         0.77         1.00         265           s537372         CMM         1.371         0.445         1.00         265           s537372         CMM         1.371         0.445         1.00         292           s53743078         CHRMJ         1.470         0.554         1.00         292           s53743078         CHRMJ         1.460         0.554         1.00         203           s6177514         CHRMJ         1.470         0.564         1.000         263           s68437         CHRMJ         1.470         0.640         1.000         263           s68431         CHRMJ         1.470         0.564         1.000         263           s68431         CHRMJ         1.470         0.640         1.000         263           s68431         CHRMJ         1.470         0.640         1.000         263           s68431         CHRMJ         1.470         0.640         1.000         263           s68431         CHRMJ         1.560         0.561         1.000         263           s68431         CHRMJ         1.560         0.561         1.000         264	28	rs2273505	CHRNA4	1.364	0.941	1.000	13.3	21(163)	32(195)	24(29)	35(26)
sc379372         CH/T         1371         0.445         100         92           sc3743078         CHKMA         1430         0.688         1000         917           sc3743078         CHKMA         1440         0.688         1000         913           sc3743078         CHKMA         1440         0.684         1000         917           sc3177514         CHRMA         1447         0.644         1000         913           sc400868         CHRMA         1472         0.644         1000         913           sc800371         CHRMA         1472         0.644         1000         923           sc80131         CHRMA         157         0.640         1000         923           sc80131         CHRMA         1567         0.564         1000         923           sc801314         CHRMA         1560         0.564         1000         923           <	29	rs938682	CHRNA3	1.370	0.737	1.000	26.5	21(135)	30(168)	25(56)	40(53)
$\kappa^{3743}(3)$ $CHRMA$ $I.420$ $0.688$ $1.000$ $31.7$ $\kappa^{23042}(8)$ $CHRMA$ $I.430$ $0.534$ $1.000$ $30.8$ $\kappa^{2117514}$ $CHRMA$ $I.446$ $0.803$ $1.000$ $30.8$ $\kappa^{2117514}$ $CHRMA$ $I.446$ $0.803$ $1.000$ $30.6$ $\kappa^{2117514}$ $CHRMA$ $1.472$ $0.674$ $1.000$ $20.7$ $\kappa^{280437}$ $CHRMA$ $1.472$ $0.674$ $1.000$ $20.7$ $\kappa^{2018}$ $CHRMA$ $1.472$ $0.674$ $1.000$ $20.7$ $\kappa^{2236166}$ $CHRMA$ $1.489$ $0.640$ $1.000$ $20.7$ $\kappa^{2101}$ $CHRMA$ $1.489$ $0.640$ $1.000$ $20.7$ $\kappa^{2101}$ $CHRMA$ $1.489$ $0.670$ $1.000$ $20.7$ $\kappa^{220137}$ $CHRMA$ $1.577$ $0.973$ $1.000$ $20.7$ $\kappa^{220137}$ $CHRMA$ $1.577$ $0.730$ $1.000$ $20.7$ $\kappa^{220137}$ $CHRMA$ $1.577$ $0.730$ $1.000$ $20.7$ $\kappa^{2201360}$ $CHRMA$ $1.577$ $0.730$ $1.000$ $20.7$ $\kappa^{220137}$ $CHRMA$ $1.677$ $0.730$ $1.000$ $20.7$ $\kappa^{2201380}$ $CHRMA$ $1.677$ $0.730$ $1.000$ $20.7$ $\kappa^{2201380}$ $CHRMA$ $1.677$ $0.730$ $1.000$ $20.7$ $\kappa^{2201380}$ $CHRMA$ $1.680$ $0.730$ $1.000$ $20.7$ $\kappa^{2201380}$ $CHRMA$ $1.680$ $0.790$ <	30	rs3793792	CHAT	1.371	0.445	1.000	59.2	21(78)	34(93)	23(116)	30(132)
vc304296         CHRM6         1430         0.554         1000         30.8           vc3177514         CHRM3         1.457         0.717         1.000         26.2           vc804086         CHRM3         1.457         0.717         1.000         26.3           vc804086         CHRM4         1.457         0.644         1.000         26.3           vc80413         CHRM4         1.478         0.670         1.000         26.3           vc3236196         CHRM4         1.489         0.670         1.000         26.3           vc3236137         CHRM4         1.489         0.670         1.000         26.3           vc323614         CHRM4         1.557         0.640         1.000         26.3           vc323614         CHRM4         1.560         0.541         1.000         26.3           vc323615         CHRM4         1.560         0.542         1.000         26.3           vc323616         CHRM4         1.560         0.542         1.000         26.3           vc323616         CHRM4         1.560         0.542         1.000         26.3           vc323752         CHRM4         1.570         0.792         1.000         <	31	rs3743078	CHRNA3	1.420	0.688	1.000	31.7	20(128)	30(163)	24(71)	39(64)
sc/177514         CHRM3         1446         0.803         1000         26.2           s8040868         CHRM3         1457         0.717         1000         709           s88437         CHRM4         1457         0.717         1000         709           s88437         CHRM4         1489         0.654         1000         709           s88431         CHRM4         1489         0.654         1000         709           s632314         CHRM4         1489         0.660         1000         24.1           s637137         CHRM4         1557         0.640         1000         24.2           s649530         CHRM4         1550         0.564         1000         24.2           s637137         CHRM4         1550         0.564         1000         24.2           s637137         CHRM4         1550         0.564         1000         24.2           s639140         CHRM4         1550         0.564         1000         24.2           s649530         CHRM4         1570         0.573         1000         24.2           s6495308         CHRM4         1571         0.573         1000         24.2 <t< td=""><td>32</td><td>rs2304298</td><td>CHRNA6</td><td>1.430</td><td>0.554</td><td>1.000</td><td>30.8</td><td>23(137)</td><td>33(153)</td><td>19(59)</td><td>33(70)</td></t<>	32	rs2304298	CHRNA6	1.430	0.554	1.000	30.8	23(137)	33(153)	19(59)	33(70)
18904088 $CHRMJ$ $1.457$ $0.717$ $1.000$ $709$ $18808437$ $CHRMJ$ $1.472$ $0.654$ $1.000$ $457$ $18808437$ $CHRMJ$ $1.472$ $0.654$ $1.000$ $424$ $182238196$ $CHRMJ$ $1.489$ $0.634$ $1.000$ $2.07$ $18748281$ $CHRMJ$ $1.527$ $0.973$ $1.000$ $2.19$ $18684513$ $CHRMJ$ $1.548$ $0.670$ $1.000$ $2.19$ $18684513$ $CHRMJ$ $1.548$ $0.670$ $1.000$ $2.19$ $186927814$ $CHRMJ$ $1.547$ $0.640$ $1.000$ $2.19$ $1897741$ $CHRMJ$ $1.567$ $0.544$ $1.000$ $2.67$ $1827517$ $CHRMJ$ $1.560$ $0.544$ $1.000$ $2.67$ $1827517$ $CHRMJ$ $1.560$ $0.764$ $1.000$ $2.67$ $1827517$ $CHRMJ$ $1.577$ $0.544$ $1.000$ $2.67$ $18275177$ $CHRMJ$ $1.577$ $0.732$ $1.000$ $2.67$ $1837177$ $CHRMJ$ $1.577$ $0.724$ $1.000$ $2.73$ $18471661$ $CHRMJ$ $1.677$ $0.792$ $1.000$ $2.73$ $185733722$ $CHRMJ$ $1.677$ $0.792$ $1.000$ $2.73$ $181637630CHRMJ1.6770.7921.0002.73181637630CHRMJ1.6730.7921.0002.73181637322CHRMJ1.6730.7921.0002.73$	33	rs7177514	CHRNA3	1.446	0.803	1.000	26.2	21(97)	31(117)	29(34)	38(42)
1886437 $CHRW7$ $1.472$ $0.654$ $1.000$ $457$ $15236196$ $CHRW4$ $1.489$ $0.654$ $1.000$ $4.24$ $15748281$ $CHRW4$ $1.489$ $0.670$ $1.000$ $2.07$ $15748281$ $CHRW4$ $1.527$ $0.973$ $1.000$ $2.19$ $15864513$ $CHRW4$ $1.548$ $0.670$ $1.000$ $2.19$ $15807814$ $CHRW7$ $1.557$ $0.640$ $1.000$ $2.19$ $15807137$ $CHRW7$ $1.567$ $0.564$ $1.000$ $2.15$ $15807137$ $CHRW4$ $1.567$ $0.542$ $1.000$ $2.67$ $15807137$ $CHRM2$ $1.567$ $0.542$ $1.000$ $2.67$ $15807137$ $CHRM2$ $1.567$ $0.732$ $1.000$ $2.67$ $15807161$ $CHRM1$ $1.577$ $0.732$ $1.000$ $2.67$ $15891400$ $CHRM1$ $1.677$ $0.732$ $1.000$ $2.67$ $15891400$ $CHRM2$ $1.677$ $0.732$ $1.000$ $2.73$ $15891400$ $CHRM2$ $1.677$ $0.732$ $1.000$ $2.73$ $15891750$ $CHRM2$ $1.687$ $0.732$ $1.000$ $2.73$ $15891750$ $CHAT$ $1.687$ $0.730$ $1.000$ $2.73$ $1588124$ $CHAT$ $1.687$ $0.730$ $1.000$ $2.73$ $1588234$ $CHAT$ $1.687$ $0.730$ $1.000$ $2.73$ $15892413$ $CHAT$ $1.687$ $0.730$ $1.000$ $2.73$ $158$	34	rs8040868	CHRNA3	1.457	0.717	1.000	70.9	21(56)	36(64)	21(135)	31(158)
rs236196         CHRVI4         1489         0.634         100         424           rs748281         CHRVI2         1.527         0.973         100         207           rs684513         CHRVI2         1.548         0.670         1000         219           rs684513         CHRVI2         1.547         0.640         1000         219           rs607814         CHRVI7         1.567         0.544         1000         219           rs1917814         CHRVI2         1.567         0.564         1000         215           rs1917814         CHRVI2         1.567         0.564         1000         215           rs2320571         CHRVI2         1.567         0.572         1000         255           rs234186         CHRVI2         1.569         0.572         1000         255           rs291400         CHRVI3         1.677         0.790         1000         253           rs294186         CHRVI3         1.673         0.790         1000         253           rs295058         CHRVI3         1.673         0.790         1000         253           rs2940140         CHRV14         1.673         0.790         1000         253	35	rs868437	CHRNA7	1.472	0.654	1.000	45.7	20(89)	34(96)	22(68)	32(88)
rs748.31 $CHRMA2$ $I.527$ $0.973$ $I.000$ $207$ $rs684513$ $CHRMA7$ $I.548$ $0.670$ $I.000$ $219$ $rs8027814$ $CHRMA7$ $I.557$ $0.640$ $I.000$ $216$ $rs8027814$ $CHRMA7$ $I.557$ $0.640$ $I.000$ $216$ $rs9171814$ $CHRMA7$ $I.560$ $0.564$ $I.000$ $265$ $rs637137$ $CHRMA2$ $I.567$ $0.582$ $I.000$ $265$ $rs637137$ $CHRMA2$ $I.569$ $0.532$ $I.000$ $265$ $rs637137$ $CHRMA2$ $I.569$ $0.5732$ $I.000$ $265$ $rs637137$ $CHRMA2$ $I.569$ $0.5732$ $I.000$ $265$ $rs637137$ $CHRMA2$ $I.687$ $0.739$ $I.000$ $263$ $rs6375056$ $CHRMA2$ $I.687$ $0.739$ $I.000$ $264$ $rs737222$ $CHRM2$ $I.683$ $0.739$ $I.000$ $273$ $rs733722$ $CHAT$ $I.683$ $0.980$ $I.000$ $273$ $rs733722$ $CHAT$ $I.684$ $0.984$ $I.000$ $273$ $rs733722CHATI.6840.984I.000273rs733720CHATI.6840.984I.000273rs7337$	36	rs2236196	CHRNA4	1.489	0.634	1.000	42.4	20(100)	29(128)	21(84)	36(84)
rs684513 $CHRMS$ 1548 $0.670$ $1.000$ $219$ rs8027814 $CHRMA$ $1.557$ $0.640$ $1.000$ $492$ rs917814 $CHRMA$ $1.557$ $0.640$ $1.000$ $492$ rs917814 $CHRMA$ $1.560$ $0.564$ $1.000$ $492$ rs927977 $CHRMA$ $1.567$ $0.582$ $1.000$ $267$ rs637137 $CHRMA$ $1.569$ $0.532$ $1.000$ $267$ rs537137 $CHRMA$ $1.570$ $0.532$ $1.000$ $265$ rs91400 $CHRMA$ $1.577$ $0.739$ $1.000$ $263$ rs1645308 $CHRMA$ $1.577$ $0.739$ $1.000$ $263$ rs1645308 $CHRMA$ $1.670$ $0.673$ $1.000$ $264$ rs1637530 $CHRMA$ $1.670$ $0.790$ $1.000$ $264$ rs1637530 $CHRMA$ $1.677$ $0.790$ $1.000$ $264$ rs1637530 $CHRMA$ $1.677$ $0.790$ $1.000$ $264$ rs1637530 $CHRMA$ $1.677$ $0.790$ $1.000$ $264$ rs2556555 $CHRMA$ $1.666$ $0.790$ $1.000$ $273$ rs2555055 $CHRMA$ $1.677$ $0.790$ $1.000$ $273$ rs2555055 $CHRMA$ $1.666$ $0.790$ $1.000$ $273$ rs2555055 $CHRMA$ $1.683$ $0.790$ $1.000$ $273$ rs2555055 $CHRMA$ $1.684$ $0.790$ $1.000$ $273$ rs2555055 $CHRMA$ $1.689$ <td>37</td> <td>rs748281</td> <td>CHRNA2</td> <td>1.527</td> <td>0.973</td> <td>1.000</td> <td>20.7</td> <td>20(152)</td> <td>32(177)</td> <td>23(39)</td> <td>36(47)</td>	37	rs748281	CHRNA2	1.527	0.973	1.000	20.7	20(152)	32(177)	23(39)	36(47)
rs8027814 $CHRNA7$ 1.5570.6401.000492rs1917814 $CHAT$ 1.5600.5641.0001.38rs292977 $CHRNA2$ 1.5600.5641.00026.7rs637137 $CHRNA2$ 1.5680.5321.00026.7rs637137 $CHRNA2$ 1.5690.5541.00026.7rs637137 $CHRNA2$ 1.5690.5731.00026.7rs2565061 $CHRNA2$ 1.5690.5741.00023.3rs2741864 $CHRNA2$ 1.6720.9251.00023.3rs2365053 $CHRNA3$ 1.6370.7501.00023.3rs1637630 $CHRNA3$ 1.6370.7701.00023.3rs1637630 $CHRNA3$ 1.6370.9251.00023.3rs1637630 $CHRNA3$ 1.6370.9261.00023.3rs1637630 $CHRNA3$ 1.6370.9101.00023.3rs153720 $CHAT$ 1.6830.9801.00024.3rs256555 $CHRNA3$ 1.6690.7501.00024.3rs2565053 $CHRNA3$ 1.6830.9801.00024.3rs2556555 $CHRNA3$ 1.6830.9901.00024.3rs2556555 $CHAT$ 1.6890.7501.00024.3rs2556555 $CHRNA4$ $1.689$ $0.750$ 1.00024.3rs2556555 $CHRNA4$ $1.689$ $0.750$ $1.000$ 24.3rs2556555 $CHAT$ $1.689$ $0.$	38	rs684513	CHRNA5	1.548	0.670	1.000	21.9	20(138)	28(166)	32(44)	37(41)
rs1917814 $CHAT$ 1.5600.5641.00013.8rs2292977 $CHRNA2$ 1.5670.5821.00026.7rs637137 $CHRNA2$ 1.5680.5321.00026.7rs637137 $CHRNA2$ 1.5680.5321.00026.7rs637157 $CHRNA2$ 1.5680.5321.00026.7rs2556561 $CHRNA2$ 1.5690.5741.00026.5rs2741864 $CHRNA2$ 1.6080.6731.00023.3rs891400 $CHRNA3$ 1.6220.9251.00023.3rs6495308 $CHRNA3$ 1.6370.7901.00026.4rs6495308 $CHRNA3$ 1.6370.9111.00026.4rs73723 $CHRNA3$ 1.6370.9111.00026.4rs73723 $CHRNA2$ 1.6840.8841.00027.3rs73723 $CHRNB3$ 1.6890.9901.00027.3rs733723 $CHRNB3$ 1.6890.9801.00027.3rs83834 $CHRNB3$ 1.6840.8941.00027.3rs13280604 $CHRNB3$ 1.6890.9901.00027.3rs2173581 $CHRNB3$ 1.6890.9901.00027.3rs2173581 $CHRNB3$ 1.6890.9911.00027.3rs2173581 $CHRNB4$ 1.6900.9971.00037.7rs2173581 $CHRNB4$ 1.7901.00027.3rs2173581 $CHRNA6$ 1.7990.9990.997 <td>39</td> <td>rs8027814</td> <td>CHRNA7</td> <td>1.557</td> <td>0.640</td> <td>1.000</td> <td>49.2</td> <td>22(102)</td> <td>30(114)</td> <td>22(95)</td> <td>35(114)</td>	39	rs8027814	CHRNA7	1.557	0.640	1.000	49.2	22(102)	30(114)	22(95)	35(114)
rs292977CHRMA21.567 $0.582$ $1.000$ $26.7$ rs637137CHRMA51.568 $0.532$ $1.000$ $26.5$ rs555061CHRMA21.569 $0.532$ $1.000$ $26.5$ rs2741864CHRMA2 $1.577$ $0.739$ $1.000$ $22.5$ rs2741864CHRMA2 $1.577$ $0.739$ $1.000$ $23.3$ rs91400CHRMA2 $1.608$ $0.673$ $1.000$ $23.3$ rs815363CHRMA3 $1.627$ $0.925$ $1.000$ $23.3$ rs11637630CHRMA3 $1.637$ $0.911$ $1.000$ $27.3$ rs1555055CHRMA2 $1.657$ $0.911$ $1.000$ $27.3$ rs133722CHRMA3 $1.657$ $0.911$ $1.000$ $27.3$ rs133723CHRMA6 $1.683$ $0.980$ $1.000$ $27.3$ rs133723CHRMA6 $1.683$ $0.980$ $1.000$ $27.3$ rs133723CHRMA6 $1.683$ $0.980$ $1.000$ $27.3$ rs133724CHAT $1.683$ $0.980$ $1.000$ $27.3$ rs133723CHRMA6 $1.683$ $0.980$ $1.000$ $27.3$ rs133724CHRMA6 $1.683$ $0.980$ $0.984$ $0.984$ rs13380604CHAT $1.690$ $0.990$ $1.000$ $37.7$ rs217530CHAM $1.690$ $0.997$ $1.000$ $37.7$ rs117581CHRMA6 $1.690$ $0.997$ $1.000$ $64.1$ rs1175581CHRMA6 $1.700$ $0.714$ </td <td>40</td> <td>rs1917814</td> <td>CHAT</td> <td>1.560</td> <td>0.564</td> <td>1.000</td> <td>13.8</td> <td>22(169)</td> <td>34(192)</td> <td>19(26)</td> <td>22(32)</td>	40	rs1917814	CHAT	1.560	0.564	1.000	13.8	22(169)	34(192)	19(26)	22(32)
rs631137 $CHRVA5$ 1.5680.5321.00026.5rs2565061 $CHRVA2$ 1.5690.5541.00022.5rs2741864 $CHRVA10$ 1.5770.7591.00023.3rs2741864 $CHRVA2$ 1.6080.6731.00023.3rs891400 $CHRVA2$ 1.6370.9251.00023.3rs891400 $CHRVA3$ 1.6370.9251.00023.3rs891400 $CHRVA3$ 1.6370.9251.00023.3rs89130 $CHRVA2$ 1.6570.9111.00027.3rs73722 $CHAT$ 1.6660.7501.00027.3rs88534 $CHAT$ 1.6690.7501.00027.3rs88534 $CHAT$ 1.6830.9801.00027.3rs88534 $CHAT$ 1.6890.7501.00027.3rs825413 $CHRVA6$ 1.6840.8841.00027.3rs825413 $CHRVA6$ 1.6890.9801.00027.3rs825413 $CHRVA6$ 1.6890.9801.00037.7rs825413 $CHRVA6$ 1.6990.9801.00037.7rs17370 $CHAT$ 1.6990.9911.00037.7rs2177370 $CHAT$ 1.6990.9911.00037.7rs2177370 $CHAT$ 1.6990.8201.00038.3rs2177370 $CHAT$ 1.6990.9911.00038.7rs2177370 $CHAT$ 1.6990.9971.00038.7	41	rs2292977	CHRNA2	1.567	0.582	1.000	26.7	20(142)	34(163)	22(51)	30(60)
rs2565061 $CHRNA2$ 1.569 $0.554$ $1.000$ $22.5$ rs2741864 $CHRNA10$ $1.577$ $0.759$ $1.000$ $23.3$ rs891400 $CHRNA2$ $1.608$ $0.673$ $1.000$ $23.3$ rs6495308 $CHRNA3$ $1.622$ $0.925$ $1.000$ $23.3$ rs6495308 $CHRNA3$ $1.637$ $0.790$ $1.000$ $23.3$ rs543525 $CHRNA3$ $1.637$ $0.925$ $1.000$ $23.3$ rs733722 $CHRNA2$ $1.667$ $0.750$ $1.000$ $24.4$ rs733723 $CHRNA2$ $1.667$ $0.750$ $1.000$ $27.3$ rs85834 $CHAT$ $1.684$ $0.750$ $1.000$ $27.3$ rs85834 $CHAT$ $1.684$ $0.984$ $1.000$ $34.2$ rs892413 $CHRNA6$ $1.684$ $0.984$ $1.000$ $34.2$ rs825340 $CHRNA6$ $1.689$ $0.960$ $1.000$ $34.2$ rs82717370 $CHAT$ $1.690$ $0.950$ $1.000$ $34.2$ rs2177370 $CHRNA6$ $1.790$ $0.997$ $1.000$ $34.2$ rs2177581 $CHRNA6$ $1.769$ $0.997$ $1.000$ $54.1$ rs2177582 $CHRNA6$ $1.759$ $0.714$ $1.000$ $54.1$ rs2177581 $CHRNA6$ $1.759$ $0.714$ $1.000$ $54.1$ rs2177581 $CHRNA6$ $1.759$ $0.714$ $1.000$ $58.3$ rs2177582 $CHRNA6$ $1.759$ $0.714$ $1.000$ $58.3$ rs1880676 <td>42</td> <td>rs637137</td> <td>CHRNA5</td> <td>1.568</td> <td>0.532</td> <td>1.000</td> <td>26.5</td> <td>17(126)</td> <td>30(157)</td> <td>27(56)</td> <td>35(46)</td>	42	rs637137	CHRNA5	1.568	0.532	1.000	26.5	17(126)	30(157)	27(56)	35(46)
rs2741864         CHRNA10         1.577         0.759         1.000         706           rs891400         CHRNA2         1.608         0.673         1.000         23.3           rs891400         CHRNA3         1.622         0.925         1.000         30.0           rs6495308         CHRNA3         1.637         0.790         1.000         30.0           rs11637630         CHRNA3         1.657         0.911         1.000         26.4           rs33322         CHAT         1.666         0.750         1.000         27.3           rs33372         CHAT         1.669         0.750         1.000         27.3           rs33372         CHAT         1.669         0.750         1.000         27.3           rs33372         CHAT         1.669         0.750         1.000         27.3           rs33322         CHAT         1.683         0.980         1.000         27.3           rs885834         CHAT         1.684         0.844         1.000         27.3           rs323280604         CHRNB3         1.684         0.884         1.000         54.7           rs32280604         CHANB3         1.689         0.950         1.000	43	rs2565061	CHRNA2	1.569	0.554	1.000	22.5	21(155)	34(172)	21(43)	27(52)
rs891400CHRVA21.608 $0.673$ 1.00023.3rs6495308CHRVA31.622 $0.925$ 1.00023.0rs1637630CHRVA31.637 $0.925$ 1.00026.4rs11637630CHRVA21.657 $0.911$ 1.00026.4rs2565055CHAT1.666 $0.750$ 1.00043.2rs733722CHAT1.666 $0.750$ 1.00027.3rs83534CHAT1.683 $0.980$ 1.00027.3rs892413CHRVA61.683 $0.980$ 1.00034.2rs892413CHRVB31.689 $0.960$ 1.00034.2rs892413CHRVB31.689 $0.960$ 1.00034.2rs8232064CHRVB31.689 $0.970$ 1.00034.2rs2177370CHAT1.699 $0.970$ 1.00034.2rs2177370CHRVB21.699 $0.970$ 1.00038.0rs2177370CHRVB21.699 $0.970$ 1.00038.0rs2177370CHRVB21.699 $0.970$ 1.00038.0rs2177370CHRVB21.709 $0.970$ 1.00038.0rs2177370CHAT1.699 $0.970$ $0.000$ 38.0rs2177581CHRVB21.705 $0.714$ $1.000$ 38.0rs2177581CHRVB1.705 $0.714$ $0.000$ 38.0rs2177581CHRVA1.705 $0.714$ $0.000$ 38.0rs2177581CHRVA1.705 $0.714$ <	44	rs2741864	CHRNA10	1.577	0.759	1.000	70.6	16(56)	29(65)	22(134)	35(156)
rs6495308         CHRNA3         1.622         0.925         1.000         300           rs11637630         CHRNA3         1.637         0.790         1.000         26.4           rs21655055         CHRNA2         1.657         0.911         1.000         26.4           rs2565055         CHRNA2         1.657         0.911         1.000         27.3           rs2733722         CHAT         1.666         0.750         1.000         27.3           rs885834         CHAT         1.668         0.750         1.000         27.3           rs885834         CHAT         1.683         0.980         1.000         27.3           rs892413         CHRNA6         1.684         0.884         1.000         27.3           rs82834         CHAT         1.689         0.980         1.000         27.3           rs92413         CHRNA5         1.689         0.990         1.000         34.2           rs217370         CHAT         1.689         0.990         1.000         34.2           rs2177370         CHAT         1.699         0.990         1.000         54.1           rs2177581         CHRNA5         1.699         0.997         1.000	45	rs891400	CHRNA2	1.608	0.673	1.000	23.3	22(154)	33(171)	20(45)	26(54)
rs11637630         CHRNA3         1.637         0.790         1.000         264           rs2565055         CHRNA2         1.657         0.911         1.000         43.2           rs2565055         CHAT         1.666         0.750         1.000         43.2           rs73722         CHAT         1.666         0.750         1.000         27.3           rs885834         CHAT         1.668         0.780         1.000         27.3           rs892413         CHRNA6         1.683         0.980         1.000         27.3           rs892413         CHRNA6         1.689         0.844         1.000         37.7           rs892413         CHRNA6         1.689         0.890         1.000         37.7           rs13280604         CHAT         1.689         0.959         1.000         37.7           rs2177370         CHAT         1.690         0.600         1.000         37.7           rs2177370         CHAT         1.699         0.997         1.000         37.7           rs2177370         CHAT         1.699         0.997         1.000         38.0           rs2177381         CHRNA7         1.699         0.997         1.000	46	rs6495308	CHRNA3	1.622	0.925	1.000	30.0	20(132)	31(165)	26(66)	38(61)
rs2565055CHRNA21.6570.9111.00043.2rs733722CHAT1.666 $0.750$ $1.000$ 27.3rs885834CHAT1.668 $0.750$ $1.000$ 27.3rs892413CHRNA61.684 $0.884$ $1.000$ 54.7rs13280604CHRNB31.689 $0.959$ $1.000$ 54.7rs13280604CHRNB31.689 $0.959$ $1.000$ 54.7rs2177370CHAT $1.690$ $0.959$ $1.000$ 54.1rs2177370CHAT $1.690$ $0.950$ $1.000$ 54.1rs2177370CHRNB2 $1.690$ $0.950$ $1.000$ 54.1rs2177370CHRNB2 $1.690$ $0.970$ $1.000$ 58.9rs2072661CHRNB2 $1.690$ $0.970$ $1.000$ 58.9rs2072661CHRNA7 $1.699$ $0.9714$ $1.000$ 58.9rs2072661CHRNA7 $1.705$ $0.714$ $1.000$ 58.9rs2072661CHRNA7 $1.705$ $0.714$ $1.000$ 58.9rs2072661CHRNA7 $1.705$ $0.714$ $1.000$ 58.9rs2072661CHRNA7 $1.723$ $0.648$ $1.000$ 58.9	47	rs11637630	CHRNA3	1.637	0.790	1.000	26.4	19(135)	30(164)	26(53)	37(54)
rs73372 $CHAT$ $1.666$ $0.750$ $1.000$ $27.3$ $rs88534$ $CHAT$ $1.683$ $0.980$ $1.000$ $54.7$ $rs892413$ $CHRNA6$ $1.683$ $0.980$ $1.000$ $54.7$ $rs892413$ $CHRNA6$ $1.684$ $0.884$ $1.000$ $54.7$ $rs13280604$ $CHRNB3$ $1.689$ $0.959$ $1.000$ $37.7$ $rs2177370$ $CHAT$ $1.690$ $0.600$ $1.000$ $64.1$ $rs2072661$ $CHRNB2$ $1.699$ $0.977$ $1.000$ $64.1$ $rs2717581$ $CHRNA7$ $1.699$ $0.977$ $1.000$ $68.9$ $rs2717581$ $CHRNA6$ $1.705$ $0.714$ $1.000$ $38.3$ $rs280676$ $CHAT$ $1.723$ $0.648$ $1.000$ $38.3$	48	rs2565055	CHRNA2	1.657	0.911	1.000	43.2	18(104)	28(134)	25(91)	38(90)
rs88534 $CHAT$ 1.683 $0.980$ $1.000$ $54.7$ rs892413 $CHRNA6$ $1.684$ $0.884$ $1.000$ $34.2$ rs13280604 $CHRNB3$ $1.689$ $0.959$ $1.000$ $34.7$ rs2177370 $CHAT$ $1.690$ $0.959$ $1.000$ $37.7$ rs2072661 $CHAT$ $1.690$ $0.600$ $1.000$ $64.1$ rs2072861 $CHRNB2$ $1.699$ $0.997$ $1.000$ $68.9$ rs2175781 $CHRNA7$ $1.699$ $0.820$ $1.000$ $68.9$ rs2304297 $CHRNA6$ $1.705$ $0.714$ $1.000$ $38.3$ rs1880676 $CHAT$ $1.723$ $0.648$ $1.000$ $38.3$	49	rs733722	CHAT	1.666	0.750	1.000	27.3	20(142)	32(165)	25(55)	35(60)
rs892413CHRNA61.6840.8841.00034.2rs13280604CHRNB31.6890.9591.00037.7rs2177370CHAT1.6900.6001.00064.1rs2072661CHRNB21.6990.9971.00064.1rs217581CHRNA71.6990.9971.00058.0rs2175581CHRNA61.7050.7141.00058.9rs2304297CHRNA61.7050.7141.00038.3rs1880676CHAT1.7230.6481.00039.4	50	rs885834	CHAT	1.683	0.980	1.000	54.7	22(89)	35(98)	20(102)	31(124)
rs13280604CHRNB31.689 $0.959$ $1.000$ $37.7$ rs2177370CHAT $1.690$ $0.600$ $1.000$ $64.1$ rs2072661CHRNB2 $1.699$ $0.997$ $1.000$ $38.0$ rs207281CHRNA7 $1.699$ $0.820$ $1.000$ $38.0$ rs2304297CHRNA6 $1.705$ $0.714$ $1.000$ $38.3$ rs1880676CHAT $1.723$ $0.648$ $1.000$ $38.3$	51	rs892413	CHRNA6	1.684	0.884	1.000	34.2	23(126)	32(147)	22(64)	32(78)
rs217770         CHAT         1.690         0.600         1.000         64.1           rs2072661         CHRNB2         1.699         0.997         1.000         38.0           rs217581         CHRNA7         1.699         0.997         1.000         58.9           rs2175581         CHRNA7         1.699         0.714         1.000         58.9           rs2304297         CHRNA6         1.705         0.714         1.000         38.3           rs1880676         CHAT         1.723         0.648         1.000         39.4	52	rs13280604	<b>CHRNB3</b>	1.689	0.959	1.000	37.7	20(120)	30(141)	23(73)	35(85)
rs2072661         CHRNB2         1.699         0.997         1.000         38.0           rs717581         CHRNA7         1.699         0.820         1.000         68.9           rs2304297         CHRNA6         1.705         0.714         1.000         38.3           rs1880676         CHAT         1.723         0.648         1.000         39.4	53	rs2177370	CHAT	1.690	0.600	1.000	64.1	26(72)	33(75)	20(118)	31(144)
rs7175581         CHRNA7         1.699         0.820         1.000         68.9           rs2304297         CHRNA6         1.705         0.714         1.000         38.3           rs1880676         CHAT         1.723         0.648         1.000         39.4	54	rs2072661	CHRNB2	1.699	0.997	1.000	38.0	25(118)	38(140)	15(74)	24(84)
rs2304297         CHRNA6         1.705         0.714         1.000         38.3           rs1880676         CHAT         1.723         0.648         1.000         39.4	55	rs7175581	CHRNA7	1.699	0.820	1.000	68.9	25(68)	36(64)	20(130)	32(163)
rs1880676 CHAT 1.723 0.648 1.000 39.4	56	rs2304297	CHRNA6	1.705	0.714	1.000	38.3	19(119)	31(135)	24(71)	33(87)
	57	rs1880676	CHAT	1.723	0.648	1.000	39.4	20(119)	32(130)	25(69)	33(93)

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Rank         Rs Number         Gene         Bayes Factor         LRT p         Adjusted LRT p         Prevalence, SNP=1 (%)         Placebo         Bupropion         Placebo         Bupropion         Bupropion           58         rs833473         CHRNA7         1.760         0.900         1.000         50.8         21(100)         32(108)         22(99)         33(116)           59         rs74711         CHRNA2         1.767         0.961         1.000         55.8         19(81)         28(107)         24(118)         35(119)	RS Number         Gene         Bayes Factor         LRT p         Adjusted LRT p         Prevalence, SNP=1 (%)           rs883473         CHRNA7         1.760         0.900         1.000         50.8           rs747111         CHRNA2         1.767         0.961         1.000         55.8								Ā	Percent Abstinent at EOT (# of subjects)	t EOT (# of subj	jects)
RS Number         Gene         Bayes Factor         LRT p         Adjusted LRT p         Prevalence, SNP=1 (%)         Placebo         Bupropion         Placebo         Bu           rs883473         CHRNA7         1.760         0.900         1.000         50.8         21(100)         32(108)         22(99)           rs747111         CHRNA2         1.767         0.961         1.000         55.8         19(81)         28(107)         24(118)	RS Number         Gene         Bayes Factor         LRT p         Adjusted LRT p         Prevalence, SNP=1 (%)           rs883473         CHRNA7         1.760         0.900         1.000         50.8           rs747111         CHRNA2         1.767         0.961         1.000         55.8								S	NP=0	Sr	VP=1
rs883473         CHRNA7         1.760         0.900         1.000         50.8         21(100)         32(108)         22(99)           rs747111         CHRNA2         1.767         0.961         1.000         55.8         19(81)         28(107)         24(118)	rs833473 <i>CHRNA7</i> 1.760 0.900 1.000 50.8 21(100) rs747111 <i>CHRNA2</i> 1.767 0.961 1.000 55.8 19(81)	Rank	RS Number	Gene	Bayes Factor	LRT p	Adjusted LRT p	Prevalence, SNP=1 (%)	Placebo	Bupropion	Placebo	Bupropio
rs747111 CHRNA2 1.767 0.961 1.000 55.8 19(81) 28(107) 24(118)	15747111 CHRNA2 1.767 0.961 1.000 55.8 19(81)	58	rs883473	CHRNA7	1.760	006.0	1.000	50.8	21(100)	32(108)	22(99)	33(116)
		59	rs747111	CHRNA2	1.767	0.961	1.000	55.8	19(81)	28(107)	24(118)	35(119)

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**Table 2** Tests for treatment-by-SNP interaction effect on 7-day point prevalence of smoking cessation at end of treatment, SNPs on randomly selected genes.

Model         Restand         Restand           1         6258930         DP2A         Model LFT         Parable								Pe	Percent Abstinent at EOT (# of subjects)	t EOT (# of sub	jects)
MethRS NumberGateBayes FactorI.R TAdjasted IRT pPrevalues. SNP-1 (%)Bayes Pation1 $853930$ $0724$ $0566$ $036$ $0130$ $0130$ $0130$ $0130$ 2 $863732$ $070241$ $0560$ $0130$ $0130$ $0130$ $0130$ $9030$ 3 $863732$ $070241$ $0580$ $0130$ $0130$ $0130$ $91360$ $9637$ 4 $8235930$ $070241$ $0230$ $0130$ $0130$ $0130$ $91360$ $9637$ 6 $8239091$ $0144410$ $02302$ $01302$ $01302$ $01360$ $91360$ 7 $8239810$ $07040$ $0230$ $01302$ $01302$ $91360$ $91630$ 8 $8102160$ $01401$ $0280$ $0230$ $0230$ $91630$ $91630$ 9 $8102160$ $01401$ $0280$ $0230$ $0230$ $0230$ $91630$ 9 $810210$ $01401$ $0280$ $0230$ $0230$ $0230$ $91630$ 9 $810210$ $01401$ $0230$ $0230$ $0230$ $0230$ 9 $810210$ $01401$ $0230$ $0230$ $0230$ $0230$ 9 $810210$ $01401$ $0230$ $0230$ $0230$ $0230$ 9 $810210$ $01401$ $0230$ $0230$ $0230$ $0230$ 9 $810210$ $01401$ $0230$ $0230$ $0230$ $0230$ 9 $810310$ $01020$ $0230$ $0230$ $0230$ <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>SI</th> <th>4P=0</th> <th>S</th> <th>SNP=1</th>								SI	4P=0	S	SNP=1
		RS Number	Gene	Bayes Factor	LRT p	Adjusted LRT p	Prevalence, SNP=1 (%)	Placebo	Bupropion	Placebo	Bupropion
68732         VGCVL         0.09         0.19         0.99         0.99         6.34         18/76         36/13           574141         MGC35440         0.738         0.91         0.890         173         31/58         29/663           574141         MGC35440         0.738         0.041         0.880         173         31/58         29/663           5287575         Unidentified         0.832         0.176         1000         52         71/3         31/58         29/663           5730675         Unidentified         0.832         0.176         1000         52         71/3         31/59         31/59           5730675         Unidentified         0.84         0.266         1000         53         71/39         31/59           5730675         Unidentified         0.94         0.266         1000         56         21/45         31/59           588881         UNCVA         0.94         0.266         1000         56         21/45         31/59           5809148         Unidentified         1947         100         26         31/59         31/59           5810412         Unidentified         1017         0.260         1000         56	-	rs2839290	DIP2A	0.656	0.208	1.000	22.4	22(141)	29(177)	20(51)	41(41)
5/1141         MGC3540         072         001         0.80         713         31(50)         29(50)           rs383759         Unidentified         0738         003         0930         0730         24(30)         24(9)         24(9)           rs26875         Unidentified         0785         0.244         1000         644         28(9)         24(3)           rs278091         Unidentified         0885         0.244         1000         645         28(7)         34(3)           rs278091         Unidentified         0940         0246         1000         646         34(3)         36(3)           rs90141         Unidentified         0940         0240         1000         646         36(3)         36(3)           rs90141         Unidentified         1012         0240         1000         646         36(3)         36(3)           rs90141         Unidentified         1121         043         1000         563         34(3)         36(3)           rs90141         Unidentified         1122         043         1000         564         36(3)         36(3)           rs90142         Unidentified         1123         043         1000         564 <t< td=""><td>2</td><td>rs638732</td><td>VGCNLI</td><td>0.699</td><td>0.159</td><td>6660</td><td>63.4</td><td>18(76)</td><td>36(74)</td><td>24(118)</td><td>29(142)</td></t<>	2	rs638732	VGCNLI	0.699	0.159	6660	63.4	18(76)	36(74)	24(118)	29(142)
ac283759         Undentified         0.78         0.05         0.90         54(9)         24(9)	3	rs741441	MGC35440	0.728	0.041	0.850	71.3	31(58)	29(63)	17(140)	33(160)
z23655Unidentified $0.832$ $0.176$ $1.000$ $2.21$ $2.(130)$ $3.(15)$ $z23097$ Unidentified $0.865$ $0.244$ $1.000$ $665$ $1.776$ $3.663$ $z190118$ $NTA$ $0.949$ $0.246$ $1.000$ $665$ $1.776$ $3.663$ $z102766$ $Unidentified$ $0.940$ $0.246$ $1.000$ $565$ $2.776$ $3.663$ $z102776$ $Unidentified$ $0.940$ $0.246$ $1.000$ $566$ $2.947$ $3.653$ $z107276$ $LAST$ $0.949$ $0.946$ $0.976$ $0.100$ $566$ $2.947$ $3.653$ $z147200$ $6RV7$ $1.027$ $0.366$ $1.000$ $566$ $2.7125$ $3.653$ $z147200$ $6RV7$ $1.027$ $0.366$ $1.000$ $566$ $2.7125$ $3.613$ $z147200$ $6RV7$ $1.027$ $0.246$ $1.000$ $566$ $2.7125$ $3.613$ $z147200$ $6RV7$ $1.027$ $0.247$ $1.000$ $566$ $2.7125$ $3.613$ $z147200$ $6RV7$ $1.027$ $0.247$ $1.000$ $566$ $2.7125$ $3.613$ $z16011251$ $Unidentified1.1270.2371.0005622.71253.7125z251456Didentified1.2720.2371.0005622.71252.7125z2747571.2722.7252.71252.71252.71252.7125z2747571.2722.7252.7125$	4	rs2828759	Unidentified	0.758	0.055	0.920	64.4	28(79)	29(69)	17(118)	35(150)
$a275007$ Unidentified $0.865$ $0.244$ $1.00$ $665$ $1.776$ $3.663$ $a_199118$ $NTA$ $0.908$ $0.256$ $1.000$ $2.56$ $3.045$ $3.058$ $a_1027766$ Unidentified $0.940$ $0.281$ $1.000$ $2.56$ $3.047$ $3.058$ $a_190112$ $LAX37$ $0.932$ $0.196$ $1.000$ $5.66$ $3.073$ $3.053$ $a_191012$ $LAX37$ $0.938$ $0.947$ $0.767$ $3.063$ $3.063$ $a_191012$ $LAX37$ $0.968$ $0.947$ $0.767$ $3.063$ $3.063$ $a_191012$ $LAX37$ $0.968$ $0.947$ $0.767$ $3.063$ $3.063$ $a_191012$ $LAX37$ $0.998$ $0.947$ $0.206$ $0.947$ $3.063$ $a_1691231$ $AHCTF1$ $1.072$ $0.230$ $1.000$ $5.64$ $2.073$ $3.061$ $a_169134$ $Unidentified$ $1.127$ $0.230$ $1.000$ $5.64$ $3.073$ $3.073$ $a_169161$ Unidentified $1.127$ $0.230$ $1.000$ $6.20$ $1.760$ $3.743$ $a_1691632$ $LACTB3$ $1.244$ $0.739$ $1.000$ $6.20$ $1.760$ $3.743$ $a_1691633$ $LCUB3$ $1.244$ $0.739$ $0.743$ $3.743$ $a_1691633$ $LCUB3$ $1.244$ $0.739$ $0.743$ $3.743$ $a_1691633$ $LCUB3$ $1.244$ $0.739$ $0.743$ $2.7433$ $2.7433$ $a_1691633$ $LCU232723$ $1.447$ <t< td=""><td>5</td><td>rs256875</td><td>Unidentified</td><td>0.832</td><td>0.176</td><td>1.000</td><td>23.2</td><td>25(139)</td><td>34(152)</td><td>13(38)</td><td>34(50)</td></t<>	5	rs256875	Unidentified	0.832	0.176	1.000	23.2	25(139)	34(152)	13(38)	34(50)
$\kappa [90118$ $NTA_A$ $0.908$ $0.256$ $1.000$ $2.56$ $2.4(45)$ $30(59)$ $\kappa [024766$ Unidentified $0.940$ $0.281$ $1.000$ $6.86$ $9.47$ $3.659$ $\kappa [320881]$ $LNCO3A$ $0.933$ $0.196$ $1.000$ $6.86$ $9.47$ $3.659$ $\kappa [310412]$ $LAX33$ $0.933$ $0.196$ $1.000$ $8.84$ $1.687$ $3.659$ $\kappa [310412]$ $LAX33$ $0.988$ $0.986$ $0.706$ $1.000$ $8.64$ $3.673$ $\kappa [40712]$ $LAX33$ $0.986$ $0.706$ $1.000$ $5.84$ $3.673$ $3.645$ $\kappa [4071]$ $Unidentified$ $1.102$ $0.230$ $1.000$ $3.67$ $3.673$ $3.673$ $\kappa [4071]$ $Unidentified$ $1.122$ $0.230$ $1.000$ $5.74$ $3.673$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.241$ $0.230$ $1.000$ $5.74$ $3.673$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.242$ $0.243$ $1.000$ $5.74$ $3.673$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.242$ $0.230$ $1.000$ $5.74$ $3.673$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.243$ $0.249$ $1.000$ $5.74$ $3.673$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.243$ $0.249$ $1.000$ $5.743$ $3.673$ $\kappa [408138]$ $Unidentified$ $1.243$ $0.249$ $1.000$ $5.743$ $3.673$ $\kappa [408168]$ $\kappa [40813$	9	rs2750097	Unidentified	0.865	0.244	1.000	66.5	17(76)	35(63)	24(119)	31(157)
r   024766Unidentified $0.940$ $0.281$ $1.000$ $686$ $1.947$ ) $3659$ $r S88981$ $UNC9A$ $0.953$ $0.196$ $0.196$ $0.07$ $3.067$ ) $3.063$ $r   10012$ $LASS3$ $0.953$ $0.196$ $0.076$ $3.067$ $3.061$ $r   100231$ $LASS3$ $0.968$ $0.086$ $0.976$ $2.0143$ $3.061$ $r   100231$ $LASS3$ $0.968$ $0.086$ $0.076$ $3.067$ $3.061$ $r   100231$ $LART7$ $1.022$ $0.320$ $1.000$ $3.66$ $2.0123$ $3.043$ $r   20121$ $Unidentified$ $1.127$ $0.320$ $1.000$ $3.66$ $2.013$ $3.013$ $r   20121$ $Unidentified$ $1.127$ $0.320$ $1.000$ $5.63$ $2.013$ $3.013$ $r   20131633$ $ETCAB3$ $1.244$ $0.732$ $0.070$ $2.010$ $3.063$ $3.013$ $r   2343547$ $Unidentified$ $1.127$ $0.230$ $1.000$ $6.20$ $1.000$ $3.013$ $r   23435637$ $Unidentified$ $1.127$ $0.232$ $0.072$ $3.0130$ $r   23435637$ $Unidentified$ $1.127$ $0.232$ $0.0100$ $0.0100$ $r   23435637$ $Unidentified$ $1.127$ $0.232$ $0.028$ $0.028$ $r   2363513$ $ETCH33$ $1.147$ $0.429$ $0.000$ $0.100$ $0.120$ $r   236357Unidentified1.1370.4290.0000.0200.028r   236357$	7	rs1909118	NFLA	0.908	0.256	1.000	25.6	23(145)	30(158)	14(49)	31(55)
$\kappa 53881$ $UNC94A$ $0933$ $0.106$ $1000$ $584$ $15(87)$ $2403$ $\kappa 1910412$ $LAS33$ $0.968$ $0.066$ $0.976$ $71.6$ $30.77$ ) $30.61$ $\kappa 1467200$ $GRV7$ $1.072$ $0.366$ $1.097$ $30.61$ $30.61$ $\kappa 1467200$ $GRV7$ $1.072$ $0.366$ $1.000$ $35.6$ $22(125)$ $20(143)$ $\kappa 901251$ $Undentified$ $1.024$ $0.206$ $1.000$ $35.6$ $22(125)$ $20(143)$ $\kappa 1691251$ $Undentified$ $1.127$ $0.320$ $1.000$ $35.6$ $22(125)$ $20(143)$ $\kappa 1691251$ $Undentified$ $1.127$ $0.320$ $1.000$ $35.6$ $22(125)$ $37(12)$ $\kappa 1535496$ $EFC4B3$ $1.244$ $0.579$ $1.000$ $56.3$ $20(83)$ $37(12)$ $\kappa 1535457$ $Undentified$ $1.127$ $0.329$ $1.000$ $56.3$ $20(13)$ $37(12)$ $\kappa 1536573$ $CCDC105$ $1.417$ $0.429$ $1.000$ $62.0$ $17(80)$ $37(12)$ $\kappa 1366157$ $Undentified$ $1.312$ $0.429$ $1.000$ $47.6$ $20(13)$ $37(12)$ $\kappa 1360164$ $\GammaA226$ $1.000$ $0.429$ $1.000$ $47.6$ $20(13)$ $31(12)$ $\kappa 136017$ $I.1471$ $0.429$ $1.000$ $47.6$ $20(19)$ $31(12)$ $\kappa 1360176I.2487I.486I.487I.48620(12)20(19)\kappa 13601767I.2472I.2472I.2$	8	rs1024766	Unidentified	0.940	0.281	1.000	68.6	19(47)	36(58)	25(110)	30(119)
s1910412LAS30.9680.9760.1636.536.57)30(5)s1467200 $GRK7$ 1.0720.3061.00036.62.2(1.25)2.9(1.45)s907444Unidentified1.0440.2061.00035.62.2(1.55)2.9(1.45)s1601551 $AHCTF1$ 1.1020.4371.00035.62.2(1.55)2.9(1.45)s200866 $EFCAB3$ 1.1270.3201.00056.32.0(39)3.3(27)s234596 $FMN1$ 1.2440.5791.00056.32.0(89)3.3(27)s1534596 $FMN1$ 1.2450.3791.0002.172.2(1.59)3.3(17)s1534596 $FMN1$ 1.2440.5791.0002.172.3(17)3.3(17)s1334596 $FMN1$ 1.2450.3791.0002.172.2(15)3.3(17)s1346158Unidentified1.3120.2981.0006.201.7(60)3.3(12)s236737 $CCDC105$ 1.4170.4291.0006.201.7(60)3.3(12)s236737 $CCDC105$ 1.4170.4291.0006.202.6(10)3.3(12)s236737 $CCDC105$ 1.4170.4291.0006.202.6(10)3.3(12)s2333016 $LOC73872$ 1.4320.4991.0006.262.6(10)2.6(10)2.6(10)s1333016 $LOC73872$ 1.4520.4591.0006.162.6(10)2.6(10)2.6(10)s1333016 $LOC73872$ 1.452<	6	rs588981	UNC93A	0.953	0.196	1.000	58.4	15(87)	32(85)	27(108)	35(133)
s1467200 $GRK7$ $1072$ $0.306$ $1.000$ $36.6$ $2.125$ ) $29(14)$ $s907444$ Unidentified $1.04$ $0.206$ $1.000$ $3.5$ $2.5(103)$ $35(17)$ $s1601251$ $AHCT71$ $1.102$ $0.477$ $1.000$ $3.5$ $2.083$ $37(17)$ $s261611$ Unidentified $1.127$ $0.320$ $1.000$ $5.63$ $2.083$ $37(93)$ $s200866$ $ETCMB3$ $1.244$ $0.579$ $1.000$ $5.63$ $2.083$ $37(93)$ $s153450$ $FMV1$ $1.245$ $0.320$ $1.000$ $2.17$ $2.3(13)$ $37(93)$ $s146158$ Unidentified $1.312$ $0.329$ $1.000$ $2.17$ $2.3(13)$ $33(10)$ $s148158$ Unidentified $1.312$ $0.298$ $1.000$ $4.76$ $2.3(13)$ $33(10)$ $s73577$ $CCDC105$ $1.417$ $0.429$ $1.000$ $4.76$ $2.6(19)$ $34(10)$ $s736737$ $CCDC105$ $1.417$ $0.429$ $1.000$ $4.76$ $2.6(19)$ $34(10)$ $s73737$ $CCDC105$ $1.417$ $0.429$ $1.000$ $4.76$ $2.6(19)$ $34(10)$ $s733016$ $LC728727$ $1.429$ $0.499$ $1.000$ $4.76$ $2.6(19)$ $2.8(19)$ $s1333016$ $LC728727$ $1.429$ $0.490$ $1.000$ $4.76$ $2.0(19)$ $2.8(19)$ $s1333016$ $LC728727$ $1.429$ $0.490$ $1.000$ $4.76$ $2.0(19)$ $2.8(19)$ $s1333016$ $LC728$	10	rs1910412	LASS3	0.968	0.086	0.976	71.6	30(57)	30(61)	18(137)	34(160)
rs90444Unidentified1.0940.2061.003.5825(10)35(12)35(12)rs1691251AHCTF11.1020.4371.00074.423(43)41(59)rs2611611Unidentified1.1270.3201.00056.320(8)37(9)rs201966 $EFCAB3$ 1.2440.5791.00056.320(8)37(9)rs201363 $EFCAB3$ 1.2440.5791.00056.320(8)34(17)rs148158Unidentified1.3120.23781.00067.074.423(49)34(17)rs148158Unidentified1.3120.23781.00067.074.624(9)34(17)rs136373CCDC1051.4170.4291.00067.074.624(9)34(17)rs2031633ZC3H131.4170.4291.00067.074.624(9)34(17)rs2031633ZC3H131.4320.4491.00067.626(9)34(19)rs203163ZC3H131.4520.4491.00047.626(9)34(19)rs203413SETD1A1.4520.4491.00047.626(9)34(19)rs203413SETD1A1.4520.4591.00045.521(108)28(19)rs203413SETD1A1.4520.4491.00045.521(108)28(19)rs203413SETD1A1.5290.4491.00045.521(108)34(19)rs203643Unidentified1.529 <td>11</td> <td>rs1467200</td> <td>GRK7</td> <td>1.072</td> <td>0.306</td> <td>1.000</td> <td>36.6</td> <td>22(125)</td> <td>29(143)</td> <td>20(74)</td> <td>37(81)</td>	11	rs1467200	GRK7	1.072	0.306	1.000	36.6	22(125)	29(143)	20(74)	37(81)
$\kappa   6 0   25  $ $AHCTF l$ $1.102$ $0.437$ $1000$ $74.4$ $23(43)$ $41(59)$ $\kappa 2 0   61  $ Unidentified $1.127$ $0.220$ $1000$ $56.3$ $20(83)$ $37(93)$ $\kappa 2 0 0 8 66$ $ECAB3$ $1.244$ $0.579$ $1000$ $56.3$ $20(83)$ $37(93)$ $\kappa 1 0 0   81534506$ $FMMl$ $1.245$ $0.579$ $1000$ $56.3$ $20(83)$ $37(93)$ $\kappa 1 4 8 158$ Unidentified $1.312$ $0.298$ $1000$ $62.0$ $17(80)$ $33(00)$ $\kappa 1 4 8 158$ Unidentified $1.312$ $0.298$ $1000$ $62.0$ $17(80)$ $33(00)$ $\kappa 3 20531633$ $CCDC105$ $1.417$ $0.429$ $1000$ $62.0$ $17(80)$ $33(107)$ $\kappa 3 2054213$ $SETD1A$ $1.475$ $0.499$ $1000$ $45.5$ $26(101)$ $34(107)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $45.5$ $26(103)$ $34(107)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $45.5$ $21(108)$ $28(116)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $45.5$ $21(108)$ $28(116)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $45.5$ $21(108)$ $28(116)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $45.5$ $21(108)$ $28(116)$ $\kappa 3 2054213$ $SETD1A$ $1.452$ $0.449$ $1000$ $85.4$ $20(89)$ $2$	12	rs907444	Unidentified	1.094	0.206	1.000	35.8	25(103)	35(127)	11(62)	29(66)
rs2611611Unidentified1.1270.3201.00056.320(83)37(93)rs2009866 $EFCAB3$ 1.2440.5791.000 $51.7$ 22(152)37(19)rs1534596 $FMN1$ 1.2450.3780.3781.000 $51.7$ 22(152)37(19)rs1534596 $FMN1$ 1.2450.3780.3781.000 $51.7$ 22(152)37(19)rs1534596 $FMN1$ 1.2450.3780.3781.000 $62.0$ 17(80)33(20)rs1648158Unidentified1.3120.2981.000 $47.6$ 26(101)34(107)rs73673 $ZC3H13$ 1.4330.4091.000 $47.6$ 26(108)34(20)rs7367413 $SETD1A$ 1.4520.4591.000 $45.5$ 21(108)28(116)rs1330106 $LOC728727$ 1.4520.4591.000 $45.5$ 21(108)28(16)rs1330106 $LOC728727$ 1.4520.4591.000 $45.5$ 21(108)28(16)rs1330106 $LOC728727$ 1.4880.4661.000 $45.5$ 21(108)28(16)rs1330106 $LOC728727$ 1.4880.4661.000 $45.5$ 21(108)28(16)rs1330106 $LOC728727$ 1.4880.4661.000 $45.5$ 21(108)28(16)rs1330106 $LOC728435$ 1.5020.5401.000 $45.5$ 21(6)28(16)rs1335057Unidentified1.5210.6441.000 $42.5$ 20(72)34(23) <td>13</td> <td>rs1691251</td> <td>AHCTF1</td> <td>1.102</td> <td>0.437</td> <td>1.000</td> <td>74.4</td> <td>23(43)</td> <td>41(59)</td> <td>22(146)</td> <td>30(151)</td>	13	rs1691251	AHCTF1	1.102	0.437	1.000	74.4	23(43)	41(59)	22(146)	30(151)
rs200866 $EFCAB3$ $1.244$ $0.579$ $1.000$ $21.7$ $22(152)$ $32(179)$ $rs1534506$ $FMVI$ $1.245$ $0.378$ $1.000$ $62.0$ $17(80)$ $33(80)$ $rs1536737$ $CUDclo5$ $1.312$ $0.298$ $1.000$ $62.0$ $17(80)$ $33(120)$ $rs736737$ $CCDClo5$ $1.417$ $0.429$ $1.000$ $47.6$ $26(91)$ $34(107)$ $rs736737$ $CCDClo5$ $1.417$ $0.429$ $1.000$ $47.6$ $26(99)$ $33(120)$ $rs2031633$ $ZG3H13$ $1.433$ $0.409$ $1.000$ $47.6$ $26(99)$ $34(120)$ $rs2031633$ $ZG3H13$ $1.432$ $0.449$ $1.000$ $47.6$ $26(10)$ $34(120)$ $rs1330106$ $LOC728727$ $1.452$ $0.449$ $1.000$ $45.5$ $21(108)$ $28(116)$ $rs1330106$ $LOC728727$ $1.452$ $0.449$ $1.000$ $45.5$ $21(108)$ $28(116)$ $rs1330106$ $LOC728727$ $1.452$ $0.449$ $1.000$ $45.5$ $21(108)$ $28(116)$ $rs1330106$ $LOC728726$ $1.488$ $0.466$ $1.000$ $45.5$ $21(108)$ $28(116)$ $rs1330106$ $LOC728727$ $1.488$ $0.466$ $1.000$ $45.5$ $21(108)$ $28(116)$ $rs1330106$ $LOC728726$ $1.587$ $1.000$ $50.8$ $21086$ $28(13)$ $rs1335657$ $Unidentified1.5290.6441.00050.420(89)34(93)rs233$	14	rs2611611	Unidentified	1.127	0.320	1.000	56.3	20(88)	37(93)	23(105)	30(128)
rs153456 $FMNI$ 1.2450.3781.00062.017(80)33(9)rs1468158Unidentified1.3120.2981.00049.926(101)34(107)rs736737 $CCDC105$ 1.4170.4291.00049.926(101)34(107)rs736737 $CCDC105$ 1.4170.4291.00047.626(99)33(120)rs736733 $ZC3H13$ 1.4330.4091.00047.526(108)34(120)rs2031633 $ZC3H13$ 1.4520.4591.00045.521(108)28(116)rs1330106 $LOC728727$ 1.4520.4591.00045.521(108)28(116)rs1330106 $LOC728727$ 1.4820.4661.00045.521(108)28(116)rs1330106 $LOC728727$ 1.4820.4661.00045.521(108)28(16)rs1330106 $LOC728727$ 1.4820.4661.00045.521(108)28(16)rs1330106 $LOC728727$ 1.5200.5401.00045.521(108)28(93)rs1330106 $LOC728727$ 1.5200.5401.00050.821(85)31(97)rs136507Unidentified1.5290.4491.00050.420(89)34(93)rs2036943Unidentified1.5670.6441.00050.420(70)34(93)rs2190184Unidentified1.5810.5100.59325(100)34(93)34(93)rs2190184Unidentified1.581 <td>15</td> <td>rs2009866</td> <td>EFCAB3</td> <td>1.244</td> <td>0.579</td> <td>1.000</td> <td>21.7</td> <td>22(152)</td> <td>32(179)</td> <td>20(46)</td> <td>35(46)</td>	15	rs2009866	EFCAB3	1.244	0.579	1.000	21.7	22(152)	32(179)	20(46)	35(46)
rs1468158Unidentified1.3120.2981.00049.926(101)34(107)rs736737 $CCDC105$ 1.4170.4291.00047.626(99)33(120)rs736737 $CCDC105$ 1.4170.4291.00046.226(99)33(120)rs2031633 $ZC3H13$ 1.4330.4091.00046.226(108)34(120)rs2054213 $SETDIA$ 1.4520.4591.00045.521(108)28(116)rs1330106 $LOC728727$ 1.4820.4661.00045.521(108)28(116)rs1939810 $KTAAI826$ 1.4880.4661.00045.521(108)28(93)2rs1939810 $KTAAI826$ 1.4880.4661.00045.521(108)28(93)2rs1330106 $LOC72875$ 1.5020.5401.00061.822(68)28(93)2rs133810 $KTAAI826$ 1.5020.5401.00061.820(8)34(97)rs1365057Unidentified1.5210.6441.00050.426(121)36(120)rs2036943Unidentified1.5310.6241.00059.322(76)30(93)2rs219184Unidentified1.5810.5511.00059.322(70)30(93)2rs219184Unidentified1.5810.5211.00059.322(10)30(93)2rs219184Unidentified1.5810.5211.00059.323(10)33(12) <td>16</td> <td>rs1534596</td> <td>FMNI</td> <td>1.245</td> <td>0.378</td> <td>1.000</td> <td>62.0</td> <td>17(80)</td> <td>33(80)</td> <td>25(118)</td> <td>33(143)</td>	16	rs1534596	FMNI	1.245	0.378	1.000	62.0	17(80)	33(80)	25(118)	33(143)
rs736737 $CCDC105$ $1.417$ $0.429$ $1.000$ $47.6$ $26(99)$ $33(120)$ rs2031633 $ZC3HI3$ $1.433$ $0.409$ $1.000$ $45.5$ $26(108)$ $34(120)$ rs203163 $ZC3HI3$ $1.433$ $0.409$ $1.000$ $45.5$ $21(108)$ $28(116)$ rs2054213 $SETDIA$ $1.452$ $0.459$ $1.000$ $45.5$ $21(108)$ $28(116)$ rs1330106 $LOC728727$ $1.452$ $0.459$ $1.000$ $45.5$ $21(108)$ $28(116)$ rs13330106 $LOC728727$ $1.482$ $0.466$ $1.000$ $45.5$ $21(108)$ $28(93)$ $2$ rs878451 $LOC722485$ $1.502$ $0.540$ $1.000$ $61.8$ $22(68)$ $31(97)$ rs878451 $LOC152485$ $1.502$ $0.540$ $1.000$ $42.5$ $21(108)$ $28(93)$ $2$ rs878451 $LOC152485$ $1.502$ $0.540$ $1.000$ $61.8$ $22(68)$ $31(97)$ rs1355057Unidentified $1.522$ $0.644$ $1.000$ $61.8$ $26(121)$ $36(120)$ rs2036943Unidentified $1.531$ $0.624$ $1.000$ $59.3$ $27(76)$ $30(93)$ $2$ rs20856 $C20\sigma/23$ $1.561$ $0.604$ $1.000$ $59.3$ $22(70)$ $30(93)$ $2$ rs2190184Unidentified $1.581$ $0.521$ $1.000$ $59.3$ $27(10)$ $30(93)$ $2$	17	rs1468158	Unidentified	1.312	0.298	1.000	49.9	26(101)	34(107)	16(94)	31(113)
rs2031633 $ZC3H13$ $I.433$ $0.409$ $I.000$ $46.2$ $26(108)$ $34(120)$ rs2054213 $SETDIA$ $I.452$ $0.459$ $I.000$ $45.5$ $21(108)$ $28(116)$ rs1330106 $LOC728727$ $I.452$ $0.459$ $I.000$ $45.5$ $21(108)$ $28(116)$ rs1330106 $LOC728727$ $I.482$ $0.459$ $I.000$ $45.5$ $21(108)$ $28(116)$ rs1330106 $LOC728727$ $I.482$ $0.456$ $I.000$ $61.8$ $21(08)$ $28(13)$ rs133010 $KIAA1826$ $I.488$ $0.466$ $I.000$ $61.8$ $21(85)$ $28(13)$ rs878451 $LOC152485$ $I.502$ $0.540$ $I.000$ $61.8$ $21(85)$ $31(97)$ rs136557Unidentified $I.522$ $0.540$ $I.000$ $61.8$ $21(85)$ $31(97)$ rs2036943Unidentified $I.521$ $0.644$ $I.000$ $59.3$ $2(121)$ $36(120)$ rs208056 $C20\sigma723$ $I.567$ $0.604$ $I.000$ $59.3$ $22(76)$ $3(93)$ $2(121)$ rs2190184Unidentified $I.581$ $0.521$ $I.000$ $59.3$ $22(70)$ $30(93)$ $2(121)$	18	rs736737	CCDC105	1.417	0.429	1.000	47.6	26(99)	33(120)	17(98)	30(101)
$r_22054213$ $STDIA$ $1.452$ $0.459$ $1.000$ $45.5$ $21(108)$ $28(116)$ $r_81330166$ $LOC728727$ $1.452$ $0.459$ $1.000$ $45.5$ $21(108)$ $28(116)$ $r_81939810$ $KIAAI826$ $1.488$ $0.466$ $1.000$ $61.8$ $22(68)$ $28(93)$ $28(15)$ $r_8193810$ $KIAAI826$ $1.488$ $0.466$ $1.000$ $61.8$ $22(68)$ $28(93)$ $28(76)$ $r_873451$ $LOC152485$ $1.502$ $0.540$ $1.000$ $61.8$ $22(68)$ $28(93)$ $21(97)$ $r_873657$ Unidentified $1.529$ $0.449$ $1.000$ $61.8$ $20(89)$ $34(93)$ $r_82208056$ $C20\sigma/23$ $1.567$ $0.604$ $1.000$ $59.3$ $22(76)$ $30(93)$ $2$ $r_82190184$ Unidentified $1.581$ $0.521$ $1.000$ $65.3$ $22(10)$ $30(93)$ $2$	19	rs2031633	ZC3H13	1.433	0.409	1.000	46.2	26(108)	34(120)	17(90)	30(106)
rs1330106 $LOC72877$ 1.4520.4591.00045.521(108)28(116)rs1939810 $KIAA1826$ 1.4880.4661.00061.822(68)28(93)2rs878451 $LOC152485$ 1.5020.5401.00061.821(85)31(97)rs1365057Unidentified1.5290.4491.000 $42.5$ 26(121)36(120)rs2036943Unidentified1.5310.6241.000 $50.4$ 20(89)34(93)rs208056 $C20orf23$ 1.5670.6041.000 $59.3$ 22(76)30(93)2rs2190184Unidentified1.5810.5211.000 $46.5$ 25(100)33(121)	20	rs2054213	SETDIA	1.452	0.459	1.000	45.5	21(108)	28(116)	21(87)	35(100)
rs1939810KIAA18261.4880.4661.00061.822(68)28(93)2rs878451 $LOCI52485$ 1.5020.5401.00050.821(85)31(97)rs136557Unidentified1.5290.4491.00042.526(121)36(120)rs2036943Unidentified1.5310.6241.00050.420(89)34(93)rs2208056 $C20\sigma723$ 1.5670.6041.00059.322(76)30(93)2rs2190184Unidentified1.5810.5211.00046.525(100)33(121)	21	rs1330106	LOC728727	1.452	0.459	1.000	45.5	21(108)	28(116)	21(87)	35(100)
1878451 $LOC152485$ $1.502$ $0.540$ $1.000$ $50.8$ $21(85)$ $31(97)$ $18136567$ Unidentified $1.529$ $0.449$ $1.000$ $42.5$ $26(121)$ $36(120)$ $182036943$ Unidentified $1.531$ $0.624$ $1.000$ $50.4$ $20(89)$ $34(93)$ $182208056$ $C20orf23$ $1.567$ $0.604$ $1.000$ $59.3$ $22(76)$ $30(93)$ $2$ $182190184$ Unidentified $1.581$ $0.521$ $1.000$ $46.5$ $25(100)$ $33(121)$	22	rs1939810	KIAA1826	1.488	0.466	1.000	61.8	22(68)	28(93)	22(129)	35(132)
rs136507Unidentified1.529 $0.449$ $1.000$ $42.5$ $26(121)$ $36(120)$ rs2036943Unidentified $1.531$ $0.624$ $1.000$ $50.4$ $20(89)$ $34(93)$ rs208056 $C20orf23$ $1.567$ $0.604$ $1.000$ $59.3$ $22(76)$ $30(93)$ $2$ rs2190184Unidentified $1.581$ $0.521$ $1.000$ $46.5$ $25(100)$ $33(121)$	23	rs878451	LOC152485	1.502	0.540	1.000	50.8	21(85)	31(97)	20(85)	36(103)
rs2036943Unidentified1.531 $0.624$ $1.000$ $50.4$ $20(89)$ $34(93)$ rs2208056 $C20\sigma f 23$ $1.567$ $0.604$ $1.000$ $59.3$ $22(76)$ $30(93)$ rs2190184Unidentified $1.581$ $0.521$ $1.000$ $46.5$ $25(100)$ $33(121)$	24	rs1365057	Unidentified	1.529	0.449	1.000	42.5	26(121)	36(120)	14(76)	27(102)
rs2208056         C20orf23         1.567         0.604         1.000         59.3         22(76)         30(93)         3           rs2190184         Unidentified         1.581         0.521         1.000         46.5         25(100)         33(121)	25	rs2036943	Unidentified	1.531	0.624	1.000	50.4	20(89)	34(93)	22(85)	32(100)
rs2190184 Unidentified 1.581 0.521 1.000 46.5 25(100) 33(121)	26	rs2208056	C20orf23	1.567	0.604	1.000	59.3	22(76)	30(93)	21(120)	33(126)
	27	rs2190184	Unidentified	1.581	0.521	1.000	46.5	25(100)	33(121)	17(93)	29(99)

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						Pc	Percent Abstinent at EOT (# of subjects)	EOT (# of subj	ects)
						SI	SNP=0	SN	SNP=1
RS Number	Gene	Bayes Factor	LRTp	Adjusted LRT p	Prevalence, SNP=1 (%)	Placebo	Bupropion	Placebo	Bupropion
rs2054255	NUDCDI	1.637	0.543	1.000	58.8	22(86)	30(88)	21(110)	34(138)
rs1885423	Unidentified	1.650	0.978	1.000	66.1	20(64)	30(79)	23(133)	34(146)
rs1906810	Unidentified	1.653	0.877	1.000	66.4	24(62)	35(78)	20(133)	31(144)
rs136501	Unidentified	1.670	0.667	1.000	30.2	20(142)	32(151)	24(55)	32(72)
rs2052584	TddTHd	1.686	0.787	1.000	29.7	22(140)	34(154)	22(55)	30(69)
rs829864	Unidentified	1.688	0.993	1.000	65.8	23(66)	34(77)	21(131)	32(144)
rs2294693	<b>UNC5CL</b>	1.703	0.737	1.000	42.0	19(109)	31(137)	24(89)	34(89)
rs719674	Unidentified	1.705	0.667	1.000	63.5	27(74)	37(79)	18(123)	29(143)
rs288259	DNAJC10	1.717	0.937	1.000	57.8	22(82)	31(80)	21(101)	31(121)
rs1106499	ZNF445	1.721	0.862	1.000	53.0	24(90)	35(106)	19(104)	30(117)
rs2605141	SMCR7	1.735	0.918	1.000	56.5	22(78)	34(105)	20(119)	31(119)
rs1359719	Unidentified	1.740	0.992	1.000	48.0	21(104)	31(115)	23(93)	33(109)
rs2598108	EPDRI	1.753	0.871	1.000	58.3	20(83)	31(89)	21(112)	34(128)
rs2802853	NFASC	1.758	0.976	1.000	58.9	21(85)	33(85)	22(111)	34(133)

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36(96) 36(112)

26(94) 25(106)

29(126) 28(112)

18(103) 18(88)

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0.835

1.762 1.766

ZFYVE27 CEP110

rs946778

rs1998505

0.987

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**Table 3** Posterior probability ( $\times$  100) of the null hypothesis of no interaction for the top four candidate and randomly selected SNPs, as a function of the prior probability  $\rho$ .

	RS number	Gene	$\rho = 0.1$	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.0
Candidate SNPs	rs871058	CHRNA5	2	5	8	12	16	23	31	44	64
	rs2269338	CHAT	3	9	10	14	20	28	37	50	70
	rs1917810	CHAT	3	7	11	17	23	31	41	55	73
	rs2565065	CHRNA2	3	L	12	17	24	32	42	56	74
Randomly selected SNPs	rs2839290	DIP2A	8	16	25	34	44	54	64	76	87
	rs638732	VGCNLI	10	20	31	41	51	61	71	80	06
	rs741441	MGC35440	11	21	32	42	52	62	72	81	91
	rs2828759	Unidentified	11	22	33	43	53	63	73	82	91