Ethionamide (ETH) Notes and Assumptions

 $^{^{1}}$ N = 987.

² 5-Fold Cross-Validation is used to find the best Meta-Parameters for the Random Forest and the Neural Network Classifiers.

³ Cross-Validation Criteria is ROC-AUC.

⁴ 2 Hidden Layers are included in the Neural Network Classifier.

⁵ Marginal Effects, ROC-AUC, Sensitivity and Specificity are computed 250 times (Boostraps).

⁶ 2/3 of the Sample is Randomly Selected to Train the Classifiers in each Bootstrap.

Marginal Effects, ROC-AUC, Sensitivity and Specifity are Computed on the 1/3 of the Sample left

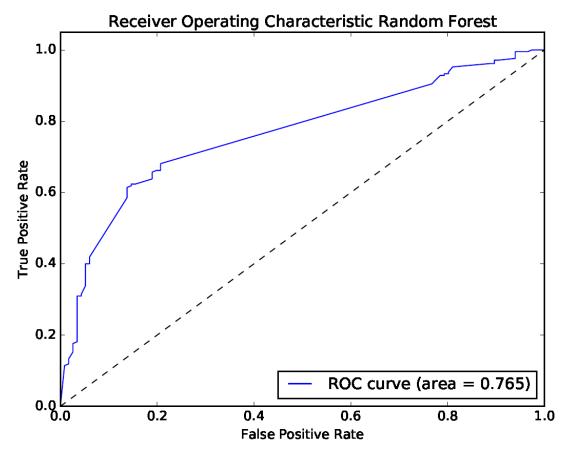
⁷ The threshold used to predict the drug resistance maximizes Sensitivity + Specificity.

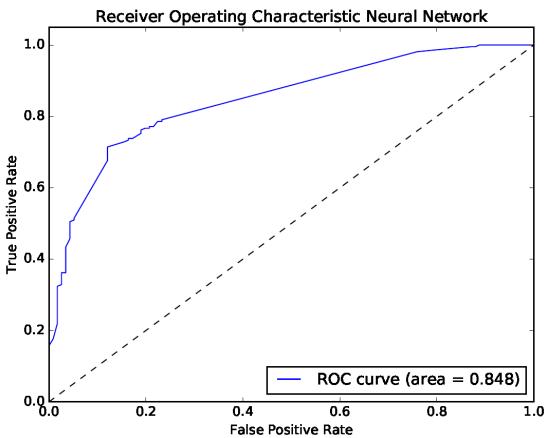
⁸ Models (1) include 20 mutations selected in "genetic determinants of drug resistance in Mycobacterium Tuberculosis and their diagnostic value".

⁹ Models (2) include all potential 127 mutations.

Ethionamide (ETH): Predictive Model Performance

	ROC-AUC	Sensitity [1]	Specificity [2]	[1] + [2]	Optimal Threshold
Original Random Forest		0.540 (0.030)	0.890 (0.030)	1.430	_
Random Forest (1)	0.736 (0.019)	0.553 (0.029)	0.887 (0.023)	1.440	0.614 (0.103)
Neural Network (1)	0.750 (0.019)	0.557 (0.029)	0.895 (0.023)	1.452	0.660 (0.105)
Random Forest (2)	0.761 (0.020)	0.619 (0.045)	0.846 (0.047)	1.464	0.614 (0.110)
Neural Network (2)	0.848 (0.015)	0.707 (0.040)	0.876 (0.036)	1.583	0.608 (0.083)





Random Forest

	Random Forest				
Mutations	Variable Importance	Random Forest (1)	Neural Network (1)	Random Forest (2)	Neural Network (2)
SNP_P_1673425_C15T_promoter_fabG1.inhA	0.144	0.295 (0.023)	0.297 (0.019)	0.307 (0.025)	0.282 (0.011)
SNP_CN_4326333_C1141G_A381P_ethA	0.046	0.302 (0.054)	0.296 (0.022)	0.314 (0.051)	0.283 (0.011)
SNP_CN_4326116_G1358A_T453I_ethA	0.022	0.267 (0.070)	0.294 (0.025)	0.331 (0.037)	0.271 (0.015)
SNP_CN_1674481_T280G_S94A_inhA	0.039	0.294 (0.038)	0.284 (0.024)	0.305 (0.037)	0.293 (0.013)
SNP_CZ_4326714_G760A_Q254ethA	0.032	0.351 (0.016)	0.385 (0.013)	0.359 (0.018)	0.380 (0.015)
SNP_CN_1674263_T62C_I21T_inhA	0.029	0.320 (0.044)	0.366 (0.018)	0.329 (0.037)	0.291 (0.013)
SNP_CN_4327416_C58A_A20S_ethA	0.015	0.339 (0.018)	0.384 (0.013)	0.312 (0.040)	0.383 (0.015)
DEL_CF_4326184_d1290G_430_ethA	0.016	0.310 (0.024)	0.320 (0.018)	0.313 (0.027)	0.294 (0.012)
SNP_CN_4327380_A94C_Y32D_ethA	0.023	0.338 (0.015)	0.385 (0.013)	0.346 (0.017)	0.380 (0.014)
SNP_CN_1674434_T233G_V78G_inhA	0.011	0.337 (0.029)	0.383 (0.013)	0.318 (0.038)	0.371 (0.014)
INS_CF_4326141_i1333C_445_ethA	0.013	0.308 (0.042)	0.383 (0.013)	0.298 (0.046)	0.371 (0.014)
SNP_CZ_4326600_G874A_R292ethA	0.015	0.153 (0.022)	0.381 (0.013)	0.184 (0.020)	0.364 (0.013)
SNP_CN_4326713_T761G_Q254P_ethA	0.005	0.281 (0.047)	0.380 (0.013)	0.266 (0.051)	0.364 (0.013)
SNP_CN_4326305_G1169A_S390F_ethA	0.017	0.310 (0.043)	0.382 (0.013)	0.311 (0.045)	0.372 (0.014)
SNP_P_1673423_G17T_promoter_fabG1.inhA	0.019	0.124 (0.060)	0.110 (0.037)	0.025 (0.077)	0.068 (0.012)
INS_CF_4326722_i752C_251_ethA	0.006	0.076 (0.118)	0.129 (0.060)	0.082 (0.111)	0.131 (0.016)
SNP_CN_1673449_A10C_T4P_fabG1	0.033	-0.093 (0.038)	-0.095 (0.031)	-0.126 (0.035)	-0.054 (0.011)
SNP_CN_4327311_A163G_S55P_ethA	0.008	0.209 (0.091)	0.379 (0.013)	0.201 (0.089)	0.361 (0.013)
SNP_CZ_4326278_G1196T_S399ethA	0.007	0.091 (0.018)	0.380 (0.013)	0.140 (0.027)	0.360 (0.013)
SNP_CZ_4327148_C326T_W109ethA	0.006	0.219 (0.082)	0.379 (0.013)	0.177 (0.079)	0.355 (0.013)
DEL_CF_4327442_d32C_11_ethA	0.023	0.1_0 (0.00_)	0.0.0 (0.020)	-0.357 (0.032)	-0.520 (0.013)
SNP_CN_4326341_G1133A_P378L_ethA	0.018			0.102 (0.039)	0.135 (0.010)
SNP_CZ_4326724_G750C_Y250ethA	0.019			-0.146 (0.074)	-0.027 (0.012)
INS_CI_4326506_i968GTC_323_ethA	0.013			-0.055 (0.117)	0.085 (0.018)
SNP_P_4327484_T11C_promoter_ethA	0.009			0.263 (0.075)	0.231 (0.014)
SNP_CN_1674782_T581C_I194T_inhA	0.012			0.149 (0.069)	0.204 (0.024)
SNP_CN_4327376_G98C_A33G_ethA	0.010			-0.208 (0.085)	-0.517 (0.016)
SNP_CZ_4326603_G871A_Q291ethA	0.008			0.269 (0.064)	0.368 (0.014)
SNP_CN_4326908_G566T_T189K_ethA	0.009			-0.239 (0.073)	-0.466 (0.016)
SNP_CZ_4326250_G1224T_Y408ethA	0.013			-0.325 (0.046)	-0.504 (0.013)
SNP_CN_4326996_G478C_P160A_ethA	0.011			-0.158 (0.106)	-0.066 (0.017)
SNP_CN_4326630_A844C_F282V_ethA	0.004			0.185 (0.095)	0.242 (0.014)
SNP_CN_4326439_G1035T_N345K_ethA	0.012			-0.149 (0.074)	-0.488 (0.022)
SNP_CN_4327350_C124T_G42S_ethA	0.009			-0.034 (0.120)	0.074 (0.017)
SNP_CN_4327367_T107C_E36G_ethA	0.009			0.175 (0.086)	0.360 (0.013)
SNP_CN_1673822_A383G_Q128R_fabG1	0.007			-0.096 (0.069)	-0.464 (0.025)
INS_CF_4326585_i889GCACC_297_ethA	0.004			0.202 (0.085)	0.363 (0.014)
INS_CF_4326719_i755GC_252_ethA	0.006			0.199 (0.090)	0.248 (0.013)
SNP_CN_4327301_T173G_D58A_ethA	0.007			0.201 (0.086)	0.361 (0.013)
DEL_CF_4326771_d703A_235_ethA	0.003			-0.202 (0.081)	-0.431 (0.027)
DEL_CD_4326366_d1108TGTAGGCCATCG_370_eth/				0.202 (0.085)	0.361 (0.013)
DEL_CF_4327334_d140A_47_ethA	0.007			0.239 (0.065)	0.364 (0.013)
SNP_CN_4327121_A353C_V118G_ethA	0.008			0.257 (0.061)	0.362 (0.014)
INS_CF_4326083_i1391T_464_ethA	0.008			0.128 (0.055)	0.362 (0.013)
SNP_CN_4326327_T1147G_T383P_ethA	0.003			-0.178 (0.078)	-0.465 (0.014)
SNP_CN_4326860_A614G_L205P_ethA	0.005			0.098 (0.109)	0.175 (0.017)
SNP_CZ_4326399_G1075A_Q359ethA	0.005			0.179 (0.081)	0.356 (0.013)
SNP_CN_4327325_T149C_Y50C_ethA	0.005			0.015 (0.110)	0.072 (0.019)
SNP_CN_4327347_C127T_G43S_ethA	0.000			0.069 (0.057)	0.349 (0.014)
SNP_CN_4326980_T494G_Q165P_ethA	0.004			0.092 (0.119)	0.162 (0.012)
SNP_CZ_4326858_G616A_Q206ethA	0.005			0.012 (0.111)	0.072 (0.015)
DEL_CF_4326187_d1287C_429_ethA	0.004			0.126 (0.094)	0.345 (0.014)
DEL_CF_4326614_d860T_287_ethA	0.004			0.133 (0.089)	0.345 (0.014)
SNP_P_1673432_T8A_promoter_fabG1.inhA	0.006			0.167 (0.115)	0.111 (0.016)
SNP_CN_4326297_G1177C_L393V_ethA	0.004			0.130 (0.092)	0.347 (0.014)
DEL_CF_4326877_d597G_199_ethA	0.004			0.095 (0.121)	0.164 (0.014)
SNP_CN_4326135_G1339A_P447S_ethA	0.003			0.021 (0.132)	0.081 (0.017)
SNP_CN_4326380_G1094A_T365M_ethA	0.006			0.191 (0.077)	0.358 (0.013)
SNP_CN_4326676_G798C_S266R_ethA	0.007			0.077 (0.117)	0.122 (0.013)
SNP_CZ_4326715_G759T_C253ethA	0.000			0.133 (0.090)	0.338 (0.016)
SNP_CN_4327065_A409G_C137R_ethA	0.005			-0.102 (0.088)	-0.052 (0.010)
INS_CF_4326370_i1104G_368_ethA	0.003			-0.110 (0.090)	-0.375 (0.033)
SNP_CN_4327445_A29C_V10G_ethA	0.007			-0.023 (0.118)	-0.265 (0.046)
SNP_CN_4327322_G152A_P51L_ethA	0.004			0.129 (0.092)	0.341 (0.015)
SNP_CN_4326800_A674G_L225P_ethA	0.004			0.203 (0.087)	0.362 (0.013)
SNP_CN_4327311_A163C_S55A_ethA	0.004			0.121 (0.030)	0.354 (0.013)

Random Forest

SPE_CM_A12881S_CRSPT_C2200_eth	Mutations	Variable Importance	Random Forest (1) Neural Network (1	Random Forest (2)	Neural Network (2)
SPE_CK_182688_6016C_2006E_eth		· · · · · · · · · · · · · · · · · · ·	Nanadii i diest (1) Nearai Network (1		
SPE_CN_432671_A7576_C253R_ethA				•	•
DEL CF 4327133 (23417 T14 ctha 0.003 -0.936 (0.046) -0.937 (0.026) -0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.937 (0.026) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.938 (0.025) 0.038 (0.025) 0.938 (0.025) 0.041 (0.012) 0.038 (0.025) 0.938 (0.025) 0.041 (0.012) 0.038 (0.025) 0.938 (0.025)				•	•
SMP_P_S127480_A7G_promoter_ethA 0.000 -0.116 [0.008) -0.307 [0.026) SMP_CC_4126705_G780F_C1257A_ethA 0.003 -0.073 [0.125] -0.080 [0.019] SMP_CC_4126705_G780F_C1257A_ethA 0.003 -0.073 [0.125] -0.028 [0.019] SMP_CC_4126705_G780F_C757CTCTACACCCC_51_ethA 0.000 -0.116 [0.089] -0.288 [0.019] SMP_CC_4126705_G780F_C757CTCTACACCCC_51_ethA 0.004 0.016 [0.102] 0.384 [0.003] SMP_CC_432729_T181C_T61A_ethA 0.004 0.039 [0.055] 0.004 [0.102] SMP_CC_412718_T61B_C161A_ethA 0.004 0.016 [0.124] 0.038 [0.003] SMP_CC_412718_T61B_C7575CTTACACCCC_51_ethA 0.005 -0.404 [0.120] -0.039 [0.003] SMP_CC_412718_T61B_C7575CTTACCCC_51C_61A 0.001 0.016 [0.012] -0.072 [0.013] SMP_CC_412718_T61B_C7575CTTACCC_51C_61A 0.001 0.016 [0.012] -0.007 [0.017] SMP_CC_41276_T61B_C7575CTTACCC_51C_61A 0.001 0.016 [0.012] -0.007 [0.017] SMP_CC_41276_T61B_C7575CTTACCC_51C_61A 0.001 0.016 [0.012] -0.007 [0.017] SMP_CC_41276_T61B_C757CTAC_61A 0.003 0.017 [0.103] 0.007				•	•
SPR_CN_4326265_C1211A_R806L_ethA				•	•
SPE_CM_4326705_C796C_P273A_ethA				•	
SMP_C4_32666_0C34P promoter_insbisLinh				•	•
SMP_P_ID73406_C34T_promoter_fabGalinhA 0.000				•	•
DEL_CF_4329722_07521CTGACAGGC_251_ethA				•	• • •
SNP_CN_432728_TIBLC_TEIA_ethA				• •	
SNP_P_1673432_T8G_promoter_fabG_linhA					• •
SNP_CR_432715_G329C_5110W_ethA					
SMP_CR_433611_A13636_W455R_ethA					• • •
SNP_P_L 1673832_T8C_promoter_fabGLinhA 0.011 0.088 (0.089) -0.07 (0.017) SNP_C L 1673818_A3796_M127Y_fabG1 0.001 -0.088 (0.089) -0.070 (0.017) SNP_C L 2432669_G8650_C8650_A269_ethA 0.003 0.006 (0.042) -0.446 (0.018) DEL_CF_4326420_d1054C_352_ethA 0.003 0.007 (0.124) 0.075 (0.020) SNP_C R_4326632_T82_ethA 0.003 0.017 (0.124) 0.075 (0.020) SNP_C R_432632_T82_ethA 0.003 0.017 (0.124) 0.075 (0.020) SNP_C R_432626_T82_T84C_REST 0.000 0.014 (0.125) 0.083 (0.015) DEL_CF_4327409_605T_32_ethA 0.001 0.095 (0.024) 0.389 (0.014) 0.389 (0.015) SNP_CR_4327211_G263_AT881_ethA 0.001 0.096 (0.024) 0.357 (0.013) 0.015 0.064 (0.028) 0.329 (0.014) 0.057 (0.013) 0.064 (0.028) 0.329 (0.013) 0.064 (0.028) 0.326 (0.013) 0.074 (0.024) 0.064 (0.028) 0.326 (0.013) 0.074 (0.012) 0.064 (0.028) 0.326 (0.013) 0.074 (0.012) 0.064 (0.028) 0.326 (0.013) 0.074 (0.012) 0.064 (0.028) 0.326 (0.013) 0.074 (0.012) <				• •	
SNP_CN_1673818_A379G_M127V_fab61 0.003 -0.039 (0.089) -0.070 (0.017) SNP_CN_432606_6090SA_0269_enhA 0.003 0.006 (0.042) -0.446 (0.018) DEL_CF_4326470_f1056_C152P_enhA 0.003 0.001 (0.012) -0.070 (0.020) SNP_CN_4326649_G1025T_1347K_enhA 0.003 0.017 (0.130) 0.079 (0.020) SNP_CN_4326649_G1025T_1347K_enhA 0.000 0.001 (0.014) (0.125) 0.093 (0.015) SNP_CN_4326632_T842C_H2811_enhA 0.001 0.006 (0.024) 0.380 (0.015) SNP_CN_4326632_T842C_H2811_enhA 0.001 0.001 (0.066 (0.024) 0.380 (0.015) SNP_CN_1674262_A616_D12V_inhA 0.001 0.004 (0.089 (0.042) 0.357 (0.013) INS_CF_4326802_I672C_224_enhA 0.005 0.004 0.005 (0.014) 0.018 (0.088) 0.320 (0.014) SNP_CN_432671_G653_T881_enhA 0.001 0.001 (0.018) 0.357 (0.013) INS_CF_4326802_I672C_224_enhA 0.001 0.001 (0.018) 0.335 (0.013) SNP_CN_432661_G662C_P888A_enhA 0.001 0.001 (0.018) 0.038 (0.012) SNP_CN_432627_A1201C_F401V_enhA 0.001 SNP_CN_432627_A1201C_F401V_enhA 0.001 SNP_CN_432627_A1201C_F401V_enhA 0.002 0.018 (0.059) 0.332 (0.012) SNP_CN_4326279_T125G_N242T_enhA 0.002 0.010 (0.008) 0.332 (0.012) SNP_CN_4326279_T125G_N242T_enhA 0.001 0.004 (0.018) 0.005 (0.038) 0.372 (0.013) SNP_CN_432789_A185T_L62Q_enhA 0.001 0.004 (0.009) 0.009 (0.003) SNP_CN_432789_A185T_L62Q_enhA 0.001 0.005 (0.008) 0.009 (0.009) SNP_CN_432769_T135G_N2461 SNP_CN_432769_T135G_N2461 SNP_CN_432769_T135G_N2461 0.000 0.001 (0.008) 0.009 (0.009) INS_CF_432641_10600ATC_T354_enhA 0.001 0.001 (0.008) 0.009 (0.009) INS_CF_4326441_10600ATC_T354_enhA 0.001 0.003 (0.001) SNP_CN_4327649_T135G_N2461 SNP_CN_432769_G135A_C0461 0.000 0.001 (0.008) 0.009 (0.009) INS_CF_43276441_10600ATC_T354_enhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_4327640_T10548_EnhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_4327640_T10548_EnhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_4327640_T10548_EnhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_432760_T10548_EnhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_432760_T10548_EnhA 0.001 0.001 (0.009) 0.009 (0.009) INS_CF_432760_T1054					• • •
SNP_CC_432669_G805_Q805_Q1529_ethA 0.003 0.006 (0.042] 0.046 (0.018) DEL_CF_4326420_d1054C_352_ethA 0.003 0.0017 (0.124) 0.075 (0.020) SNP_CN_4326409_G1052F_1342K_ethA 0.003 0.0017 (0.124) 0.075 (0.020) SNP_CN_4326632_T3442C_P413A 0.001 0.001 0.005 (0.0024) 0.038 (0.015) DEL_CF_4327409_d505T_22_ethA 0.001 0.001 0.005 (0.0024) 0.380 (0.015) SNP_CN_4326642_A616_E12V_hhA 0.001 0.001 0.005 (0.0024) 0.380 (0.015) SNP_CN_432741_G805A_T88L_ethA 0.001 0.005 (0.0124) 0.380 (0.015) SNP_CN_432741_G805A_T88L_ethA 0.001 0.005 (0.0178 (0.082) 0.337 (0.013) SNP_CN_4326512_G805C_P288A_ethA 0.001 0.005 (0.013) SNP_CN_4326512_G805C_P288A_ethA 0.001 0.005 (0.014) 0.061 (0.028) 0.342 (0.012) SNP_CN_4326573_A1200C_F401A 0.001 0.003 0.004 (0.003) 0.0064 (0.003) 0.388 (0.012) SNP_CN_4326573_A1200C_F401A 0.001 0.003 0.004 (0.003) 0.0064 (0.003) 0.388 (0.012) SNP_CN_4326573_A1200C_F401A 0.001 0.001 0.008 (0.004) 0.008 (0.004) SNP_CN_4326573_A1200C_F401A 0.001 0.001 0.008 (0.005) 0.0044 (0.003) 0.388 (0.012) SNP_CN_4326573_A1200C_F401A 0.001 0.001 0.008 (0.005) 0.0044 (0.004) 0.008 (0.005) SNP_CN_4326582_A185T_1630_ethA 0.001 0.001 0.009 (0.004) 0.108 (0.005) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.001 0.008 (0.004) 0.008 (0.004) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.001 0.008 (0.005) 0.0044 (0.004) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.008 (0.004) 0.008 (0.004) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.003 (0.004) 0.008 (0.004) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.003 (0.005) 0.008 (0.008) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.003 (0.001) SNP_CN_432748_A366_UF_LEBAD_ethA 0.001 0.003 (0.001) SNP_CN_432749_UF_LEBAD_ethA 0.001 0.003 (0.001) SNP_CN_432741_BAD6_UF_LEBAD_ethA 0.001 0.003 (0.001) SNP_CN_4326074_CASSSS_UF_LEBAD_ETHA 0.004 0.001 0.003 (0.001) SNP_CN_4326074_CASSS_UF_LEBAD_ETHA 0.004 0.001 0.003 (0.001) SNP_CN_4326074_CASSS_UF_LEBAD_ETH					
SNP_CN_4326409_TISSC_M122P_ethA					•
DEL CF. 4326420, d103C4, 352, ethA				` '	
SMP_CM_432649_G1025T_T342K_ethA					
SNP_CN_4326632_TB3C_H281R, ethA 0.000 0.014 (0.125) 0.083 (0.015) DEL_CF_4327409_d65T_2Z_ethA 0.001 0.056 (0.024) 0.380 (0.015) SNP_CN_1674862_A61G_121V_inhA 0.001 0.091 (0.018) 0.320 (0.014) SNP_CN_4327211_G65a_T881_ethA 0.005 0.178 (0.082) 0.356 (0.013) SNP_CN_4326612_G862C_P288A_ethA 0.001 0.061 (0.028) 0.324 (0.012) SNP_CN_4326612_G862C_P288A_ethA 0.001 0.061 (0.028) 0.238 (0.013) SNP_CN_4326673_A1201C_P601V_ethA 0.003 0.066 (0.030) 0.338 (0.012) SNP_CN_4326732_TA1201C_P601V_ethA 0.001 0.066 (0.038) 0.372 (0.014) SNP_CN_4326732_TA1201C_P601V_ethA 0.001 0.016 (0.058) 0.372 (0.014) SNP_CN_4327328_A185T_E62_E01E 0.001 0.016 (0.088) 0.372 (0.014) SNP_CN_432738_A185T_E62_E01E 0.001 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081) 0.016 (0.081)	DEL_CF_4326420_d1054C_352_ethA	0.003		0.017 (0.124)	0.075 (0.020)
DEL CF 4327409_d65T_22_ethA 0.001 0.056 (0.024) 0.300 (0.015) SNP_CN_167262_A616_121V_inhA 0.001 0.091 (0.048) 0.320 (0.013) SNP_CN_14327211_0263A_178B_ethA 0.004 0.089 (0.042) 0.357 (0.013) INS_CF_4326802_1672C_224_ethA 0.005 0.0178 (0.082) 0.356 (0.013) SNP_CN_4326612_6862C_P5288A_ethA 0.001 0.061 (0.028) 0.298 (0.013) SNP_CN_432673_31201C_F640V_ethA 0.001 0.061 (0.028) 0.298 (0.013) SNP_CN_432673_A1201C_F640V_ethA 0.001 0.061 (0.028) 0.298 (0.013) SNP_CN_432673_A1201C_F640V_ethA 0.001 0.018 (0.058) 0.372 (0.014) SNP_CN_4327788_A185T_L62Q_ethA 0.001 -0.073 (0.09) -0.305 (0.037) SNP_CN_4327788_A185T_L62Q_ethA 0.001 -0.061 (0.028) 0.366 (0.015) SNP_CN_4327058_C416T_G1390_ethA 0.001 -0.053 (0.031) 0.036 (0.029) 0.306 (0.015) NS_CF_4322794_1806_G6_DethA 0.001 0.083 (0.028) 0.366 (0.015) 0.36 (0.015) 0.32 (0.012) 0.32 (0.012) 0.32 (0.012) 0.32 (0.012) 0.32 (0.012) 0.02	SNP_CN_4326449_G1025T_T342K_ethA	0.003		0.017 (0.130)	0.079 (0.010)
SNP_CN_167426Z_A616_Iz1V_inhA 0.001 0.091 (0.048) 0.320 (0.014) SNP_CN_4327211_G263A_T88I_ethA 0.004 0.089 (0.042) 0.357 (0.013) INS_CR_4326802_I672C_224_ethA 0.005 0.178 (0.082) 0.356 (0.013) SNP_CN_4326612_G868C_P288A_ethA 0.001 0.061 (0.028) 0.324 (0.012) SNP_CN_432673_A1201C_Pa01V_ethA 0.001 0.061 (0.028) 0.328 (0.013) SNP_CN_432673_A1201C_Pa01V_ethA 0.003 0.064 (0.030) 0.338 (0.012) SNP_CN_432678_P1725G_N242T_ethA 0.001 -0.073 (0.09) -0.305 (0.037) SNP_CN_432748B_A26G_I9T_ethA 0.001 -0.073 (0.09) -0.305 (0.037) SNP_CN_432708B_C416G_13190_ethA 0.001 0.059 (0.043) 0.186 (0.009) SNP_CN_4327136_T338C_E113G_ethA 0.001 0.038 (0.028) 0.366 (0.015) NS_CF_4326414_I060ATCT_354_ethA 0.001 0.038 (0.028) 0.366 (0.015) NS_CF_4326404_I040AT3_34S_ethA 0.001 0.034 (0.024) 0.330 (0.012) NS_CF_432640_I036T_34S_ethA 0.004 0.034 (0.024) 0.330 (0.012) SNP_CC_43260F_9C_5T5A_CAS_E_ethA	SNP_CN_4326632_T842C_H281R_ethA	0.000		0.014 (0.125)	0.083 (0.015)
SNP_CN_4327211_G263A_T88I_ethA	DEL_CF_4327409_d65T_22_ethA	0.001		0.056 (0.024)	0.380 (0.015)
INS. CF - 432680Z_ 1672C_ 224_ ethA	SNP_CN_1674262_A61G_I21V_inhA	0.001		0.091 (0.048)	0.320 (0.014)
SNP_CN_4326612_G86ZC_P288A_ethA 0.001 0.061 (0.028) 0.324 (0.012) SNP_CN_4326673_G921T_H307O_ethA 0.001 0.064 (0.030) 0.328 (0.012) SNP_CN_432673_A1201C_F401V_ethA 0.002 0.108 (0.058) 0.372 (0.014) SNP_CN_432673_T725G_N242T_ethA 0.001 0.073 (0.019) 0.035 (0.037) SNP_CN_4327289_A185T_GED_ethA 0.004 0.166 (0.081) 0.346 (0.014) SNP_CN_4327058_C416T_G139D_ethA 0.001 0.038 (0.028) 0.366 (0.015) SNP_CN_4327136_T338C_E113G_ethA 0.001 0.038 (0.029) 0.340 (0.012) INS_CF_4326414_1060ATCT_354_ethA 0.001 0.083 (0.029) 0.340 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.000 0.034 (0.024) 0.330 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.000 0.034 (0.024) 0.330 (0.012) SNP_CN_432676_A998C_133A_ethA 0.000 0.051 (0.022) 0.0221 (0.010) SNP_CN_432675_C719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CN_432675_C729T_W240_ethA 0.004 0.136 (0.084) 0.326 (0.012) SNP_CN_432675_C328A_promoter_ethA	SNP_CN_4327211_G263A_T88I_ethA	0.004		0.089 (0.042)	0.357 (0.013)
SNP_CN_4326553_G91T_H307Q_ethA	INS_CF_4326802_i672C_224_ethA	0.005		0.178 (0.082)	0.356 (0.013)
SNP_CN_4326273_1201C_F401Y_ethA 0.003 0.064 (0.030) 0.338 (0.012) SNP_CN_432673_72726_N242T_ethA 0.002 0.108 (0.058) 0.372 (0.014) SNP_CN_4327289_A185T_L65Q_ethA 0.004 0.166 (0.081) 0.346 (0.014) SNP_CN_4327286_A261F_G139D_ethA 0.001 0.059 (0.043) 0.186 (0.099) SNP_CN_4327136_T338C_E113G_ethA 0.001 0.038 (0.028) 0.366 (0.015) INS_CF_4326141_B1060ATCT_354_ethA 0.001 0.038 (0.029) 0.340 (0.012) SNP_CN_4327736_T338C_ethA 0.001 0.038 (0.029) 0.340 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.003 0.012 (0.041) 0.342 (0.012) SNP_CN_4326746_409_d1034T_345_ethA 0.004 0.034 (0.024) 0.330 (0.012) DEL_CF_432640_d1034T_345_ethA 0.004 0.013 (0.029) 0.221 (0.010) SNP_CX_432675_C719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CX_4326099_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_CX_4327609_G1375A_Q459_ethA 0.004 0.134 (0.091) 0.325 (0.012) SNP_CX_432771_G28A016_L134P_ethA	SNP_CN_4326612_G862C_P288A_ethA	0.001		0.061 (0.028)	0.324 (0.012)
SNP_CN_4327489_A185T_L62Q_ethA 0.001 -0.073 (0.109) -0.305 (0.037) SNP_CN_4327484_A26G_19T_ethA 0.001 -0.073 (0.109) -0.305 (0.031) SNP_CN_4327484_A26G_19T_ethA 0.001 0.059 (0.043) 0.186 (0.009) SNP_CN_432713G_T338C_E113G_ethA 0.000 0.038 (0.028) 0.366 (0.015) INS_CF_4326414_10606ATCT_354_ethA 0.001 0.083 (0.029) 0.340 (0.012) SNP_CN_4326759_6715A_R239W_ethA 0.003 0.102 (0.041) 0.342 (0.012) INS_CF_432640_d1034T_345_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_432640_d1034T_345_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CX_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CX_4326099_G1375A_Q455_ethA 0.004 0.031 (0.042) 0.238 (0.014) SNP_CX_432701_G28A_promoter_ethA 0.001 0.021 (0.002) 0.221 (0.010) SNP_CX_4327073_A0161_L134P_ethA 0.001 0.031 (0.029) 0.326 (0.012) SNP_CX_432696_G1078A_Q360_ethA 0.001 0.031 (0.025) 0.326 (0.012) SNP_CX_4326113_G154A_P454L_ethA	SNP_CN_4326553_G921T_H307Q_ethA	0.001		0.061 (0.028)	0.298 (0.013)
SNP_CN_4327489_A185T_L62Q_ethA 0.001 -0.073 (0.109) -0.305 (0.037) SNP_CN_4327484_A26G_19T_ethA 0.001 -0.073 (0.109) -0.305 (0.031) SNP_CN_4327484_A26G_19T_ethA 0.001 0.059 (0.043) 0.186 (0.009) SNP_CN_432713G_T338C_E113G_ethA 0.000 0.038 (0.028) 0.366 (0.015) INS_CF_4326414_10606ATCT_354_ethA 0.001 0.083 (0.029) 0.340 (0.012) SNP_CN_4326759_6715A_R239W_ethA 0.003 0.102 (0.041) 0.342 (0.012) INS_CF_432640_d1034T_345_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_432640_d1034T_345_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CX_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CX_4326099_G1375A_Q455_ethA 0.004 0.031 (0.042) 0.238 (0.014) SNP_CX_432701_G28A_promoter_ethA 0.001 0.021 (0.002) 0.221 (0.010) SNP_CX_4327073_A0161_L134P_ethA 0.001 0.031 (0.029) 0.326 (0.012) SNP_CX_432696_G1078A_Q360_ethA 0.001 0.031 (0.025) 0.326 (0.012) SNP_CX_4326113_G154A_P454L_ethA	SNP_CN_4326273_A1201C_F401V_ethA	0.003		0.064 (0.030)	0.338 (0.012)
SNP_CN_4327289_A185T_L62Q_ethA 0.001 -0.073 (0.109) -0.305 (0.037) SNP_CN_432748A_A26G_19T_ethA 0.004 0.166 (0.081) 0.346 (0.014) SNP_CN_4327058_C416T_6139D_ethA 0.001 0.038 (0.028) 0.366 (0.015) INS_CF_432705_T338C_E113G_ethA 0.001 0.083 (0.029) 0.340 (0.012) INS_CF_4326759_G715A_R239W_ethA 0.003 0.1010 (0.041) 0.342 (0.012) INS_CF_4327294_180G_60_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_432640_d1034T_345_ethA 0.004 0.213 (0.088) 0.365 (0.013) SNP_CA_332675_C719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CA_332675_C719T_W240_ethA 0.004 0.013 (0.090) 0.314 (0.090) 0.348 (0.014) SNP_CA_3327073_A401G_L134P_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_CA_3327073_A401G_L134P_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CA_32569_G1078A_Q560_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CA_32569_G1078A_Q560_ethA 0.001 0.031 (0.025) 0.339 (0.025) SNP_CA_32561_G168A_	SNP_CN_4326749_T725G_N242T_ethA	0.002		0.108 (0.058)	0.372 (0.014)
SNP_CN_4327448_A26G_9T_ethA 0.004 0.166 (0.081) 0.346 (0.014) SNP_CN_4327058_C416T_G139D_ethA 0.001 0.099 (0.043) 0.186 (0.009) SNP_CN_4327136_T338C_E113G_ethA 0.000 0.038 (0.028) 0.360 (0.015) INS_CF_4326414_11060ATCT_354_ethA 0.001 0.083 (0.029) 0.340 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.003 0.102 (0.041) 0.342 (0.012) INS_CF_432640_d1034T_345_ethA 0.004 0.034 (0.024) 0.330 (0.012) DEL_CF_432640_d1034T_345_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CN_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CZ_4326099_G1375A_Q459_ethA 0.001 0.034 (0.024) 0.238 (0.014) SNP_CN_432701_G28A_promoter_ethA 0.003 -0.126 (0.084) -0.423 (0.016) SNP_CN_4327073_A401G_L134P_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CN_4326396_G1078A_Q360_ethA 0.004 0.136 (0.089) 0.355 (0.013) SNP_CN_4326471_G125T_M1_ethA 0.004 0.135 (0.092) 0.356 (0.012) SNP_CN_4326617_G10374_A35D_ethA		0.001		-0.073 (0.109)	-0.305 (0.037)
SNP_CN_4327058_C416T_G139D_ethA 0.001 0.059 (0.043) 0.186 (0.009) SNP_CN_4327136_T338C_E113G_ethA 0.000 0.038 (0.029) 0.340 (0.012) INS_CF_43226741_d1060ATCT_354_ethA 0.001 0.038 (0.029) 0.340 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.000 0.034 (0.024) 0.330 (0.012) ENE_CF_432644_d1031_34T_34S_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_4326440_d1034T_34S_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CN_4326476_A998C_1333R_ethA 0.001 0.023 (0.014) 0.288 (0.012) SNP_CX_4326755_C719T_W240_ethA 0.001 0.023 (0.014) 0.288 (0.012) SNP_CX_4326755_C719T_W240_ethA 0.001 0.034 (0.014) 0.288 (0.012) SNP_CX_4326755_G1375A_Q459_ethA 0.001 0.034 (0.014) 0.288 (0.012) SNP_CX_432773_A01G_L134P_ethA 0.004 -0.126 (0.084) -0.423 (0.016) SNP_CX_4326396_c1078A_Q360_ethA 0.001 0.033 (0.025) 0.325 (0.013) SNP_CX_4326374_L257G_419_etthA 0.004 0.135 (0.089) 0.355 (0.013) SNP_CX_4326476_1257A_1_301301_434_		0.004		0.166 (0.081)	
SNP_CN_4327136_T338C_E1136_ethA 0.000 0.038 (0.028) 0.366 (0.015) INS_CF_4326414_I1060ATCT_354_ethA 0.001 0.083 (0.029) 0.340 (0.012) SNP_CN_4326759_G715A_R239W_ethA 0.003 0.102 (0.041) 0.342 (0.012) INS_CF_432724_I180G_60_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_4326440_41034T_345_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CN_4326476_A998C_1333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CX_4326595_G719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CX_4326099_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_CX_4327609_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_CX_4327609_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_CX_4327609_G1375A_Q459_ethA 0.004 0.126 (0.084) -0.423 (0.016) SNP_CX_4327609_G1375A_Q459_ethA 0.004 0.126 (0.084) -0.389 (0.027) SNP_CX_4327630_G1038_ethA 0.001 0.033 (0.025) 0.396 (0.012) SNP_CX_4326366_G1078A_Q360_ethA		0.001			, ,
INS_CF_4326414_1060ATCT_354_ethA				` '	
SNP_CN_4326759_G715A_R239W_ethA 0.003 0.102 (0.041) 0.342 (0.012) INS_CF_4327294_I180G_60_ethA 0.000 0.034 (0.024) 0.330 (0.012) DEL_CF_4326440_d1034T_345_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CN_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CZ_4326699_G1375A_Q459_ethA 0.001 0.034 (0.014) 0.285 (0.012) SNP_CR_3227501_G28A_promoter_ethA 0.003 -0.126 (0.084) -0.423 (0.016) SNP_CN_4327073_A401G_L134P_ethA 0.001 0.033 (0.025) 0.336 (0.027) SNP_CN_4327073_A401G_L134P_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CN_4327424_A50G_V17A_ethA 0.001 0.033 (0.025) 0.336 (0.012) SNP_CN_432747_1_C3T_Mtl_ethA 0.004 0.136 (0.089) 0.355 (0.013) SNP_CN_4322471_C3T_MIl_ethA 0.004 0.136 (0.089) 0.355 (0.013) SNP_CN_4326470_G1004T_A335D_ethA 0.001 0.031 (0.025) 0.319 (0.013) SNP_CN_4326470_G1004T_A335D_ethA 0.004 0.134 (0.086) 0.342 (0.015) SNP_CN_4326671_G683C_P288R_ethA					
INS_CF_432729_1180G_60_ethA					
DEL_CF_432644d1034T_345_ethA 0.004 0.213 (0.088) 0.365 (0.013) SNP_CN_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CZ_4326755_C719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CZ_4326099_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_C327073_A401G_L134P_ethA 0.003 -0.126 (0.084) -0.423 (0.016) SNP_CN_4327073_A401G_L134P_ethA 0.001 0.033 (0.025) -0.398 (0.027) SNP_CN_4327474_A50G_V17A_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CN_4327471_C3T_M1_ethA 0.004 0.136 (0.089) 0.355 (0.013) SNP_CN_4326717_[12576_419_ethA 0.004 0.135 (0.091) 0.352 (0.013) SNP_CN_4327471_C3T_M1_ethA 0.001 0.031 (0.025) 0.319 (0.013) SNP_CN_4326117_[12576_419_ethA 0.002 0.031 (0.025) 0.193 (0.015) SNP_CN_4326117_[6863C_P288R_ethA 0.002 0.031 (0.025) 0.193 (0.015) SNP_CN_4326611_[6863C_P288R_ethA 0.007 0.027 (0.080) 0.357 (0.013) DNP_CN_4326611_[6863C_P28thA 0.				` ,	
SNP_CR_4326476_A998C_L333R_ethA 0.000 0.051 (0.022) 0.221 (0.010) SNP_CZ_4326755_C719T_W240_ethA 0.001 0.023 (0.014) 0.285 (0.012) SNP_CZ_4326099_G1375A_Q459_ethA 0.004 0.134 (0.090) 0.348 (0.014) SNP_P_4327501_G28A_promoter_ethA 0.003 -0.126 (0.084) -0.423 (0.016) SNP_CN_4327073_A401G_L134P_ethA 0.004 -0.129 (0.085) -0.398 (0.027) SNP_CN_432742_A50G_V17A_ethA 0.001 0.033 (0.025) 0.326 (0.012) SNP_CN_4326396_E10708A_Q360_ethA 0.000 0.136 (0.089) 0.355 (0.013) INS_CF_4326217_i1257G_419_ethA 0.004 0.135 (0.091) 0.352 (0.013) SNP_CN_4326470_G1094_ethA 0.001 0.031 (0.025) 0.319 (0.013) SNP_CN_4326113_G1361A_P454L_ethA 0.001 0.031 (0.025) 0.193 (0.015) SNP_CN_4326611_G863C_P288R_ethA 0.007 0.031 (0.025) 0.193 (0.015) SNP_CN_4326611_G863C_P288R_ethA 0.007 0.033 (0.025) 0.330 (0.012) INS_CF_4327213_1261GC_87_ethA 0.002 0.037 (0.043) 0.242 (0.025) SNP_CN_4326697_T497G_H166P_ethA					, ,
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INS_CF_4327160_i314A_105_ethA 0.004 0.128 (0.091) 0.352 (0.013)					
NULL / 1/2 ID 17 I					
3NF_CZ_43Z0Z13_01Z01A_N4Z1etiiA 0.004 0.138 (0.008) 0.348 (0.014)	SNP_CZ_4326213_G1261A_R421ethA	0.004		0.138 (0.088)	0.348 (0.014)