Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Seibold MA, Wise AL, Speer MC, et al. A common *MUC5B* promoter polymorphism and pulmonary fibrosis. N Engl J Med 2011;364:1503-12.

Supplemental Material - Methods and Results

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Study Populations

National Jewish Health, Vanderbilt University, Duke University, and Intermune [1] identified and phenotyped subjects with FIP or IPF. The diagnosis of IIP was established according to conventional criteria [2, 3]. Eligible subjects were at least 38 years of age and had IIP symptoms for at least 3 months. A high resolution computerized tomography (HRCT) scan was required to show definite or probable IIP according to predefined criteria [3, 4]. HRCT scans were independently evaluated by two study investigators and inconsistencies regarding the IIP type or certainty of the diagnosis were resolved by consensus. A surgical lung biopsy was obtained in 46% of affected subjects. FIP families were defined by the presence of two or more cases of definite or probable IIP within three degrees, with at least one case of IIP established as definite/probable IPF. Exclusion criteria included significant exposure to known fibrogenic agents or an alternative etiology for ILD. Control subjects for genetic analysis were acquired by Duke University and National Jewish Health (supplemental methods, Figure S1). All protocols were approved by local Institutional Review Boards and individuals gave written, informed consent to participate.

Control Subjects for Genetic Screen of Lung-Expressed Gel-forming Mucins

Control subjects for the mucin-wide analysis (n=322, Table S2) self-identified as white and included independent spousal controls from FIP families (not used in prior resequencing analysis) (n=47) in addition to both cases (n=158) and controls (n=117) from a COPD case-control cross-sectional study (Table S2). COPD study subjects who self-reported or had a physician-diagnosis of idiopathic pulmonary fibrosis or another interstitial lung disease were excluded. Additionally COPD study subjects received high-resolution computed tomography (HRCT) scans of the chest which were reviewed by a radiologist. Individuals with HRCT scans consistent with IPF were excluded. A study coordinator or principle investigator verifies all information entered into the database to prevent misclassification. No mucin SNPs were associated with COPD disease status and correction for multiple testing (all P values >0.03).

Linkage Analysis

A genome-wide linkage screen was completed in 82 multiplex families (Figure S2) using a DeCode linkage panel consisting of a total of 884 markers (Table S1) with an average inter-marker distance of 4.2 cM. Multipoint non-parametric linkage analysis was performed using Merlin [5]. Kong and Cox LOD scores [6] were calculated using the S_{pairs} statistic [7] under an exponential model; support intervals were determined using the one-LOD-score-down method.

Fine-mapping of Chromosome 11

To interrogate the linked region on the p-terminus of chromosome 11 (8.4 Mb bounded by rs702966 and rs1136966), we performed fine mapping by genotyping 306 tagging SNPs [8] in 145 unrelated cases of FIP, 152 cases of IPF, and 233 Caucasian controls. Tests of association comparing FIP cases and IPF cases to controls were calculated under an additive model for the minor allele.

Resequencing of MUC2 and MUC5AC

Primer pairs to generate overlapping amplicons for resequencing the proximal promoter and most exons of *MUC2* and *MUC5AC* were designed on sequences masked for repetitive elements, SNPs, and homology to other regions of the genome. PCR followed by cycle sequencing reactions at 1/64 Big Dye reaction scale were performed. Magnetic bead cleaned (Agencourt Bioscience, Beverly, MA) cycle sequencing reactions were run on ABI3730 sequencers. Sequence data files were uploaded into PolyPhred for quality analysis and polymorphism detection (http://droog.mbt.washington.edu/PolyPhred.html).

Subjects resequenced included 69 family-independent FIP cases, 96 unrelated IPF cases, and 54 spouse controls. Subjects were selected for resequencing from families based on established criteria: definite over probable diagnosis, IPF over other IIP diagnoses, and youngest age of onset. Spouse controls were checked to ensure independence. An allele-based Fisher's exact test was used to analyze resequencing data for association with both FIP and IPF. The most notable associated SNPs were rs35288961 (*MUC5AC* Intronic) (IPF; P=0.02) which tags a gene-wide *MUC5AC* haplotype, and a *MUC5AC* nonsynonymous SNP, rs28403537 (Ala497Val) (FIP; P=0.002), which is in strong linkage disequilibrium with two other *MUC5AC* nonsynonymous SNPs that are in complete LD and part of the same codon, rs34474233 and rs34815853 (Ala4729Lys).

Tagging SNP Selection for Genetic Screen of Lung-Expressed Gel-forming Mucins

We used sequencing data from three sources to select tagging SNPs for the lung-expressed gel-forming mucin screen. First, we used the publically available resequencing data of the mucin region from the NIEHS SNPs program (http://egp.gs.washington.edu/). This project reported to resequence MUC2 and MUC5AC. However, due to refinement in the gene structure of MUC5AC and MUC5B since this resequencing was conducted we determined the MUC5AC transcript resequenced actually covered the MUC5B gene, a large portion of the MUC5AC gene, and some intergenic regions. For MUC2 we selected 37 SNPs reported by the NIEHS resequencing project to tag all 140 common variants identified in the European population resequenced. The NIEHS resequencing of MUC5AC was based on an incorrect chimeric transcript that included a portion of the literature verified MUC5AC transcript, intergenic regions, and the near complete MUC5B transcript. This resequencing data covers large portions of genome sequence containing the true 5' (exons 1-15) and 3' end (exons 34-50) of MUC5AC, but not MUC5AC exons 16-31 which are located in a gap in the genome build. Based on this resequencing of MUC5AC and MUC5B, we selected 63 SNPs tagging the 313 genetic variants identified in the European population resequenced. This resequencing did not cover the majority of the large central repetitive exon located in all 3 of the mucin genes, as the repetitive nature of these sequences renders them not amenable to resequencing. Second, we selected SNPs to genotype which tag common genetic variation (allele freq > 0.01) discovered in our resequencing of the MUC5AC gene in IPF cases and controls. Third, we tagged common genetic variation (allele freq > 0.01) reported in the CEU population of Hapmap for the MUC2-MUC5AC (Chr:1094000-1142000

Hg18) and MUC5AC-MUC5B (Chr11:1178501-1201000, Hg18) intergenic regions. The Haploview program was used in all tagging analyses in a pairwise manner with an r^2 threshold of 0.8. Quality control checks were in place for HWE (P=0.001) and genotype call rates (cutoff 75%). LD Bins and tagging SNPs typed within bins are shown in Table S4. None of the MUC5AC-MUC5B Hapmap Intergenic SNPs were in LD and therefore these SNPs were genotyped individually and are not listed by bins. All SNPs successfully genotyped from the lung-expressed gel-forming mucin screen are listed in Table S3.

Genotyping for Genetic Screen of Lung-Expressed Gel-forming Mucins

Genotyping was performed using iPLEX reagents and protocols for multiplex PCR, single base primer extension (SBE) and generation of mass spectra, as per the manufacturer's instructions (for complete details see iPLEX Application Note, Sequenom, San Diego). SNP assays were optimized using Sequenom AssayDesigner software. Although the iPLEX assay can theoretically be multiplexed to 40-plex, we restrict the maximum plexity of assays to ≤ 34-plex, as we have determined, empirically, that plexities greater than 34 tend to have decreased overall performance (lower genotyping call rates). Multiplexed assays typically contained between 10-36 SNPs. DNA amplification was performed using a standard protocol, as per the manufacturer's protocol. Amplification occurs in a multiplexed fashion in the Sequenom assay, hence it is not possible to modify the amplification parameters for each SNP independently. Rather, the conditions of multiplexed amplification (low primer concentrations, 100 nM), and the design of primers (AssayDesigner software) ensure a high degree of sequence capture via PCR. Multiplexed PCR was performed in 5-µl reactions on 384-well plates containing 5 ng of genomic DNA. Reactions contained 0.5 U HotStar Taq polymerase (QIAGEN), 100 nM primers, 1.25X HotStar Taq buffer, 1.625 mM MgCl2, and 500 µM dNTPs. Following enzyme activation at 94 °C for 15 min, DNA was amplified with 45 cycles of 94 °C x 20 sec, 56 °C x 30 sec, 72 *C x 1 min, followed by a 3-min extension at 72 °C. Unincorporated dNTPs were removed using shrimp alkaline phosphatase (0.3 U, Sequenom). Single-base extension was carried out by addition of SBE primers at concentrations from 0.625 μM (low MW primers) to 1.25 μM (high MW primers) using iPLEX enzyme and buffers (Sequenom, San Diego) in 9-μl reactions. Reactions were desalted and SBE products measured using the MassARRAY Compact system. Mass spectra were analyzed and genotypes were called by an automated algorithm (Typer 3.4, Sequenom), either in direct mode (calls based directly on the mass spectra of detected peaks, corresponding to allelic extension products), or by clustering on the population of data points in polar mode (yield versus skew), as is common in other packages (e.g., GenomeStudio, Illumina). All significant SNPs were checked by hand for artifacts to ensure high-quality genotype calls.

Validation of rs35705950 genotype calls

As noted in the main text results the most strongly associated SNP (rs35705950) in the genetic screen of gel-forming mucins deviated from Hardy-Weinberg Equilibrium (HWE) in the case but not control group. Although genotyping error was unlikely due to the HWE deviation only being present in the case groups, we took several measures to ensure this was not the case. First iPLEX clusters were examined to ensure no artifacts were present. Secondly, the subjects genotyped for the genetic screen of gel-forming mucins were also typed for the significant SNP (rs35705950) by another genotyping technology, Taqman Genotyping Assays (Applied Biosystems, Foster City, CA). There was only 1 discrepancy in genotype calls between Taqman and iPLEX across the 1278 subjects typed. Additionally, a subset of subjects were sequenced across the genome region containing the rs35705950 SNP and sequencing calls matched with genotype calls.

Goodness-of-Fit tests for associated SNPs not in HWE in cases

We examined whether the genotype frequencies in cases and controls were consistent with those expected if the putative risk allele is a risk factor for disease (i.e. whether the departure from HWE in cases but not controls might be caused by a disease-related allele). Using the methods developed by Wittke-Thompson et al. [9] for SNP rs35705950, we first found the maximum likelihood estimates for the disease allele frequency and penetrances under each of the following disease models for the rare allele: general, additive, dominant and recessive. Using those maximum likelihood parameters, we then performed a chi-squared goodness-of-fit test to determine whether the genotype frequencies observed in cases and controls were consistent with that specific disease model for that SNP. We implemented the maximum likelihood estimation and chi-squared goodness-of-fit test described by Wittke-Thompson et al. using Mathematica.

Evaluating rs35705950 in the linkage families

We used the linkage and association modeling in pedigrees (LAMP) methods [10] to conduct three likelihood ratio tests for rs35705950. LAMP jointly models and estimates linkage and association parameters to quantify the degree of linkage disequilibrium between a candidate SNP and a putative disease locus. The three hypothesis tests are:

1. Test whether the SNP is linked to the disease locus (H_0: No linkage)
2. Test whether the SNP is in LD with the disease locus so that the SNP may account in part for the linkage signal (H_0: Linkage equilibrium; r^2 between SNP and disease locus =0)
3. Test for whether there are other variants that can in part explain the linkage signal (H_0: Linkage disequilibrium; r^2 between SNP and disease locus =1)

If we rejected the null hypothesis for each of the first two tests, we conclude linkage (test 1) and association (test 2) between the SNP and the disease locus. If we reject the null hypothesis for test 3, then there may be other disease variants in the region; i.e. the SNP does not fully explain the linkage signal. We assumed a 0.5 cM position the SNPs and conducted a sensitivity analysis by varying the assumed position of the SNP.

Resequencing of the MUC5B Promoter

Primer pairs were designed for PCR amplification of 9 overlapping amplicons covering the 4kb upstream of the MUC5B transcription start site (Table S10). PCR reactions were run by standard methods using Platinum Taq DNA polymerase. PCR products were cleanup by ExoSAP treatment and sequencing products generated by BigDye Terminator Cycle Sequencing using a 1/32 dilution of BigDye. Sequencing products were cleaned up by ABI BigDye Xterminator resin and sequenced by capillary sequencing using an ABI 3730 DNA Sequencer (Applied Biosystems, Foster City, CA). DNA sequence files were uploaded to Sequencher and analyzed for quality of reads and identification of genetic variants across subjects and in comparison to published reference sequence (Gene Codes Corporation, Ann Arbor, MI) (Table S11).

Gel-forming Mucin Gene Models

The gene structure of MUC5AC is reported incorrectly by both the UCSC Genome Browser and Ensembl. These sites display a 73 exon mucin gene labeled MUC5AC and display MUC5B as a splice variant of this large gene. Expression of a large chimeric MUC5AC-MUC5B protein has never been reported. Rather MUC5AC and MUC5B have been purified from airway mucus and run as distinct bands on Western blots [11]. Both message and protein expression of MUC5AC and MUC5B have distinct expression patterns in the normal lung with the former expressed primarily in airway surface epithelium goblet cells and the latter expressed to a higher degree by sub-mucosal glands and to a lesser extent by surface airway epithelium goblet cells [12, 13].

The gel-forming mucins are 4 separate genes present in the chromosomal order pter-MUC6-MUC2-MUC5AC-MUC5B-pCen, which was experimentally determined by both linkage analysis and physical mapping [14]. Our gene model for MUC5AC is based on the experimental cloning the MUC5AC cDNA and this sequence can be found in these PubMed nucleotide files, AJ298317-AJ298319, and AJ001402 [15, 16]. Our gene exon structure when translated matches the consensus MUC5AC protein sequence (P98088) [17]. The MUC2 and MUC5B gene models and therefore the consequence of variants described are based on UCSC Genome Browser gene models uc001lsx.1 and uc001tb.2, respectively. Uncertainty still exists regarding the exact size of the large repetitive central exons and some gene introns in the mucin genes. The genomic position of all variants indicated throughout the text, figures, tables, and supplement corresponds to the latest human genome build 37 – Hg19 (Feb. 2009). The exception to this is with regards to the gap in the genome build located in the middle of the MUC5AC gene (Hg19, Chr11:1162760:1212759). For genetic variants located in this gap, position given is based on the genomic clone NW_001838016.1. Most importantly, the genomic region containing the IPF associated SNP (rs35705950) has been identified by several groups as the promoter region for MUC5B. One study cloned the 4kb upstream of the MUC5B TSS we recognize in the paper (containing the rs35705950 SNP), as the promoter sequence of the MUC5B gene. They found this sequence drives gene expression as determined by a luciferase activity assay [18]. This group also performed transcription factor binding assays in situ by ChIP showing transcription factor binding sites are present in this sequence that modify MUC5B gene expression [18]. Another group cloned the region in question as the MUC5B promoter and studied the effects of genetic variation on gene expression [19]. Six SNPs in the lung-expressed gel-forming mucin screen are located in truncated portions of the gene model in which case they are plotted in adjacent to the truncation point.

Unaffected Lung Tissue for MUC5B Gene Expression Analysis

Single whole-lung samples from 47 individuals were obtained from International Institute for the Advancement of Medicine (Edison, NJ). All individuals suffered brain death and were evaluated for organ transplantation before research consent. Informed consent was obtained at the time of transplant evaluation. All specimens failed regional lung selection criteria for transplantation. For study inclusion, individuals had to demonstrate no evidence of active infection or chest radiographic abnormalities, mechanical ventilation <48 h, PaO2/FiO2 ratio > 200, and no past medical history of underlying lung disease or systemic disease that involves the lungs (e.g., rheumatoid arthritis, systemic lupus erythematosus). Patients with mild asthma not requiring the regular use of inhaled β-agonists were included. After resection, the lungs were insufflated with preservation solution and transported on ice to our laboratory. Upon receipt, each lung was dissected into upper and lower lobes and central (<5 cm from main stem bronchus) and peripheral (< 5 cm from pleura) sections.

The samples were flash frozen in liquid nitrogen and stored at -80^{o} C for further analysis. The study was approved by the National Jewish Health Institutional Review Board (IRB protocol #NJC HS-1539).

MUC5B Gene Expression and MUC5B Immunohistochemistry

Total RNA from peripheral lung tissue from IPF cases (n=33) and controls (n=47) was reverse transcribed, and pre-validated *MUC5B* (Hs00861588_m1) and *GAPDH* (Hs99999905_g1) Taqman assays were used to determine expression of *MUC5B*. Five micron sections were deparaffinized and underwent heat-antigen retrieval, incubation with DDT and then iodoacetamide. MUC5B antibody [20] was used at 1:400 dilution.

Supplemental Table 1. DeCode linkage panel consisting of 884 markers.

Marker	cM	expLOD
D1S468	4.16	0.35
D1S450	16.993	0.44
D1S434	21.802	0.48
D1S507	26.828	0.76
D1S2697	29.075	0.47
D1S2644	36.516	0.09
D1S199	38.456	0.07
D1S2864	42.192	0.08
D1S2620	43.936	0.11
D1S2749	47.417	0.2
D1S470	49.492	0.47
D1S241	54.195	0.65
D1S255	59.975	0.59
D1S186	61.476	0.52
D1S2861	68.18	0.04
D1S2713	69.428	0.02
D1S2797	70.483	0
D1S197	73.675	-0.16
D1S2652	78.87	-0.02
D1S476	83.244	-0.01
D1S220	84.842	0
D1S2846	87.952	0
D1S2788	89.078	0
D1S438	91.461	0
D1S198	94.913	0
D1S481	102.52	0.29
D1S2841	105.857	0.58
D1S500	106.401	0.52
D1S430	107.366	0.44
D1S2856	109.232	0.41
D1S2865	114.169	0.27
D1S435	117.67	0.34
D1S2776	118.568	0.33
D1S2664	121.065	0.31
D1S206	124.95	0.27
D1S495	126.349	0.35
D1S2688	129.083	0.49
D1S2695	133.385	0.25
D1S2726	134.61	0.14

D1S189	140.46	0
D1S442	144.724	-0.05
D1S1653	154.538	0
D1S2707	159.033	-0.05
D1S484	160.45	-0.07
D1S2628	168.681	-0.12
D1S196	172.571	-0.05
D1S452	176.386	0
D1S218	179.561	0.17
D1S2818	187.029	0.36
D1S238	191.997	0.15
D1S412	196.564	0
D1S2717	208.146	0.32
D1S249	210.819	0.22
D1S2685	213.635	0.25
D1S245	216.774	0.41
D1S205	217.215	0.46
D1S425	218.952	0.37
D1S237	222.179	0.37
D1S227	227.006	0.2
D1S213	232.374	0.11
D1S2833	238.23	0.05
D1S2709	239.64	0.02
D1S2850	251.419	0
D1S1594	261.768	0.04
D1S2785	262.682	0.01
D1S304	263.283	0
D1S2679	268.006	0.02
D2S2268	1.989	-0.32
D2S323	4.612	-0.26
D2S319	7.814	-0.26
D2S2211	18.385	-0.1
D2S162	23.523	0
D2S398	27.796	0.01
D2S168	29.949	0.06
D2S149	35.627	-0.01
D2S2168	49.373	0
D2S146	53.103	-0.02
D2S367	59.437	-0.04
D2S2230	61.586	-0.01
D2S2328	66.767	0
D2S2259	68.734	0.04
D2S2294	70.262	0.13

D2S2291	72.568	0.17
D2S391	74.107	0.16
D2S2156	78.417	0.82
D2S370	84.658	0.52
D2S2332	86.044	0.49
D2S2368	91.392	0.43
D2S2110	99.577	0.14
D2S286	102.428	0.09
D2S2116	103.502	0.12
D2S1777	105.04	0.2
D2S388	112.751	0.15
D2S2216	114.147	0.14
D2S2264	118.855	0.43
D2S293	122.551	0.47
D2S363	130.95	0.45
D2S2254	132.186	0.48
D2S347	138.309	0.36
D2S2271	143.62	0.1
D2S2215	145.454	0.15
D2S2196	152.91	0.19
D2S151	160.987	0.1
D2S2324	163.62	0.23
D2S2277	163.898	0.24
D2S142	168.829	0.3
D2S1353	171.626	0.19
D2S2330	174.846	0.25
D2S335	181.956	0.22
D2S2188	186.247	0.22
D2S364	192	-0.01
D2S118	195.342	-0.06
D2S117	199.069	-0.16
D2S116	202.939	-0.14
D2S2358	208.816	0
D2S2321	209.449	0
D2S2361	216.936	-0.07
D2S2382	218.524	-0.09
D2S163	226.246	0
D2S126	228.27	0.18
D2S133	232.122	0.68
D2S362	238.908	1.06
D2S2297	239.771	1.01
D2S427	242.633	0.54
D2S2344	244.51	0.34

D2S1279	245.447	0.16
D2S2202	253.232	0.08
D2S338	253.84	0.07
D2S125	264.008	-0.24
D2S395	264.167	-0.17
D2S140	265.28	-0.15
D3S4559	1.076	0.01
D3S1307	2.606	0.01
D3S1270	3.277	0
D3S1297	5.052	-0.01
D3S3630	6.223	-0.01
D3S1515	19.885	-0.43
D3S3591	23.902	-0.06
D3S1263	30.71	0.06
D3S1293	44.627	0.13
D3S1266	52.218	0.08
D3S3547	56.447	0.04
D3S1612	62.047	-0.02
D3S3521	66.396	-0.09
D3S3597	70.479	-0.09
D3S1581	72.757	-0.04
D3S3532	80.932	-0.02
D3S1600	89.04	-0.01
D3S1287	90.594	-0.02
D3S1566	97.19	-0.49
D3S3551	99.228	-0.6
D3S3614	100.828	-0.66
D3S3653	106.925	-0.98
D3S3508	110.344	-1.16
D3S2388	111.309	-1.18
D3S1276	111.553	-1.12
D3S1271	115.243	-0.56
D3S3045	120.29	-0.22
D3S3683	124.142	-0.26
D3S3585	124.633	-0.29
D3S1575	126.997	-0.1
D3S1558	128.934	-0.01
D3S3515	129.73	0
D3S1267	133.534	-0.01
D3S1292	142.175	0.12
D3S3637	146.456	0.1
D3S3694	152.297	0
D3S1569	154.11	0

D3S1593	155.856	-0.01
D3S1308	160.668	-0.02
D3S1279	163.84	-0.04
D3S1607	168.315	-0.02
D3S3668	171.185	0
D3S3725	178.272	-0.02
D3S1565	181.867	-0.03
D3S3699	189.976	-0.22
D3S1618	193.372	-0.11
D3S3592	195.053	-0.14
D3S1262	198.552	-0.1
D3S1580	206.428	0.01
D3S3669	214.298	0.04
D3S3562	216.435	0.03
D3S240	219.969	0.03
D3S1265	222.338	0.04
D3S1311	225.046	0.02
D4S3023	7.377	0
D4S431	12.909	-0.02
D4S2935	13.305	-0.03
D4S394	15.279	0
D4S2928	23.836	-0.01
D4S403	27.833	-0.05
D4S1511	30.101	-0.1
D4S419	36.334	-0.04
D4S404	40.998	0
D4S3022	43.893	0.01
D4S391	48.955	0
D4S2912	54.037	-0.06
D4S1587	55.944	-0.05
D4S405	62.104	-0.07
D4S1627	66.522	-0.11
D4S2971	68.763	-0.22
D4S428	71.03	-0.19
D4S398	77.905	-0.08
D4S3004	80.14	-0.18
D4S1519	81.583	-0.31
D4S2389	84.721	-0.17
D4S2963	90.596	-0.13
D4S2361	94.748	0
D4S2460	99.464	0.23
D4S423	102.697	0.17
D4S2986	106.89	0.01

D4S1572	110.138	-0.03
D4S406	117.484	-0.11
D4S427	125.559	-0.31
D4S1615	129.752	-0.23
D4S1579	139.994	-0.13
D4S424	142.051	-0.19
D4S1586	144.419	-0.13
D4S2962	148.056	-0.23
D4S2934	151.163	-0.21
D4S2918	157.382	-0.23
D4S2980	157.383	-0.23
D4S3046	159.326	-0.21
D4S2952	164.316	-0.3
D4S1539	173.748	-0.72
D4S3030	174.553	-0.92
D4S415	177.034	-0.93
D4S3015	187.268	-0.6
D4S3041	189.524	-0.76
D4S1540	197.042	-0.31
D4S426	207.471	-0.06
D4S2930	209.268	-0.02
D5S1981	1.212	-0.06
D5S417	9.355	-0.08
D5S2088	11.871	-0.23
D5S406	13.117	-0.29
D5S1957	22.949	-0.34
D5S1954	36.026	-0.3
D5S2096	39.436	-0.12
D5S2031	42.23	-0.07
D5S661	50.056	0
D5S1986	53.234	0.07
D5S674	56.711	0.17
D5S426	58.504	0.23
D5S2021	61.33	0.1
D5S418	66.571	0.05
D5S430	67.291	0.05
D5S427	79.196	0
D5S2072	80.82	0.02
D5S2003	90.541	0.03
D5S424	93.23	0.02
D5S428	104.446	-0.01
D5S1725	106.879	-0.02
D5S2498	108.317	-0.03

D5S1503	113.021	-0.11
D5S409	114.893	-0.09
D5S2501	119.416	-0.08
D5S2027	120.952	-0.17
D5S2065	122.492	-0.22
D5S1720	122.574	-0.22
D5S404	127.059	-0.16
D5S471	128.045	-0.07
D5S2053	138.746	-0.15
D5S414	142.23	-0.17
D5S2017	145.351	-0.19
D5S436	150.78	-0.15
D5S2090	153.72	-0.03
D5S640	159.099	0
D5S410	162.446	-0.01
D5S2066	171.447	0.01
D5S2040	173.9	0.01
D5S400	181.337	0.37
D5S2075	182.329	0.3
D5S1960	189.288	0.11
D5S498	197.374	0.14
D5S2030	205.424	0.01
D5S408	210.411	-0.02
D5S2006	211.064	-0.07
D6S942	0	-0.17
D6S1574	16.206	0.14
D6S1640	19.816	0.03
D6S470	24.914	0.08
D6S1721	31.851	0.04
D6S289	36.34	0
D6S422	44.681	-0.01
D6S1588	46.737	0
D6S1660	48.373	0
D6S1571	51.181	0.01
D6S273	53.751	0
D6S291	57.511	0
D6S1576	57.941	0
D6S1575	63.694	0.08
D6S1549	63.989	0.08
D6S282	68.355	0.13
D6S459	72.595	0.08
D6S452	74.581	0.2
D6S272	76.516	0.22

D6S1960	80.398	0.13
D6S257	82.215	0.13
D6S460	93.396	0.1
D6S1644	97.333	0.09
D6S268	115.025	-0.09
D6S416	119.653	-0.02
D6S457	134.751	-0.1
D6S1656	134.761	-0.1
D6S975	135.969	-0.06
D6S270	138.783	-0.02
D6S1569	146.769	-0.16
D6S1648	149.252	-0.04
D6S1637	154.786	-0.05
D6S419	170.827	-0.27
D6S1581	174.456	-0.11
D6S305	176.923	-0.11
D6S1599	179.13	-0.09
D6S1719	183.345	-0.43
D6S264	185.783	-0.36
D6S297	187.646	-0.55
D6S503	190.173	-0.34
D6S281	193.435	-0.66
D6S446	194.224	-0.72
D7S2474	3.71	0.06
D7S531	7.702	0.11
D7S2201	12.205	0
D7S2514	15.278	0.01
D7S641	17.854	0
D7S513	23.238	-0.02
D7S664	26.724	0
D7S2557	29.624	0.01
D7S2495	34.178	0.17
D7S1802	36.404	0.09
D7S493	37.926	0.33
D7S1795	38.947	0.28
D7S2463	40.505	0.29
D7S1808	45.142	0.3
D7S516	45.356	0.28
D7S632	51.196	0.11
D7S2252	53.389	0.17
D7S484	55.899	0.18
D7S2846	60.57	0.07
D7S510	61.944	0.08

D7S2541	63.446	0.03
D7S691	64.932	0
D7S519	70.244	0
D7S2451	76.795	0.02
D7S499	79.12	0.06
D7S502	80.864	0.09
D7S672	86.425	0.14
D7S1870	88.745	0.08
D7S669	91.309	0.12
D7S660	95.116	0.05
D7S630	102.009	0.14
D7S2410	103.208	0.15
D7S2409	104.927	0.17
D7S657	105.585	0.23
D7S2459	120.049	-0.08
D7S2418	122.151	-0.05
D7S635	131.549	-0.04
D7S530	133.201	-0.06
D7S649	136.4	-0.02
D7S509	145.559	0.04
D7S684	149.79	0.14
D7S1824	152.076	0.12
D7S2513	153.382	0.11
D7S661	155.037	0.1
D7S676	155.315	0.11
D7S2461	166.465	0.01
D7S483	170.597	0.01
D7S2462	175.859	0.01
D7S2447	179.624	0.01
D7S2423	192.273	0
D8S264	3.538	0.11
D8S1824	6.889	0.15
D8S1819	16.906	0.43
D8S1759	19.634	0.42
D8S520	21.475	0.41
D8S516	22.502	0.38
D8S552	24.4	0.31
D8S1790	26.087	0.15
D8S1827	27.058	0.02
D8S549	27.172	0.04
D8S258	36.656	0.19
D8S1734	42.099	0.03
D8S1820	49.166	-0.02

D8S1223	52.975	0
D8S505	55.976	0.01
D8S1791	58.623	0
D8S532	61.589	0
D8S531	63.93	0
D8S1737	69.341	0
D8S509	69.412	0
D8S1763	73.884	0.24
D8S260	75.632	0.29
D8S543	81.877	0.55
D8S1705	92.177	0.58
D8S1707	97.461	1.16
D8S273	97.796	1.14
D8S1699	102.988	0.64
D8S1778	106.891	0.47
D8S1762	108.054	0.61
D8S521	110.624	0.92
D8S1784	115.27	0.44
D8S1132	115.987	0.44
D8S1470	118.703	0.37
D8S1779	119.262	0.41
D8S281	119.655	0.29
D8S1823	123.3	0.19
D8S514	127.609	-0.02
D8S1799	131.797	-0.21
D8S1461	132.391	-0.23
D8S256	148.757	-1.12
D8S1746	150.111	-1.16
D8S1783	152.339	-1.32
D8S1743	160.009	-0.28
D9S1779	0.001	1.96
D9S1858	0.26	1.98
D9S288	8.716	0.65
D9S1813	9.595	0.57
D9S1686	11.931	0.55
D9S1810	12.758	0.53
D9S286	18.529	0.09
D9S168	24.283	-0.01
D9S1808	28.239	0.03
D9S1870	44.971	0.01
D9S171	47.163	-0.11
D9S259	49.852	-0.31
D9S1853	55.17	-0.34

D9S2149	55.302	-0.34
D9S1817	58.233	-0.23
D9S1777	67.339	-0.44
D9S1876	70.422	-0.73
D9S175	72.803	-0.41
D9S1674	76.609	-0.22
D9S1843	79.874	-0.18
D9S283	95.9	0.02
D9S1781	98.124	0
D9S287	101.542	0
D9S1690	106.996	0
D9S172	111.558	0
D9S261	114.649	-0.02
D9S1675	117.445	0
D9S1824	123.555	0.01
D9S1776	124.821	0.01
D9S762	127.719	0.01
D9S1682	132.086	0.01
D9S1825	136.348	0.02
D9S1821	137.485	0.04
D9S290	139.866	0
D9S1793	150.424	-0.24
D9S1826	162.103	-0.14
D9S1838	164.102	-0.12
D9S2168	164.489	-0.12
D10S249	1.19	-0.4
D10S1218	11.297	-0.12
D10S591	14.952	-0.01
D10S189	20.561	0.51
D10S1751	21.776	0.73
D10S1779	23.688	1.29
D10S1728	25.414	1.7
D10S1712	25.805	1.84
D10S465	26.441	2.06
D10S1649	26.554	2.07
D10S585	28.718	1.79
D10S1430	32.113	1.47
D10S1721	32.449	1.63
D10S570	32.732	1.6
D10S1725	34.825	1.34
D10S1707	35.11	1.3
D10S1664	36.818	0.97
D10S191	37.42	0.92

D10S1653	38.925	0.97
D10S1661	41.399	1.19
D10S548	44.682	1.38
D10S600	54.324	0.93
D10S213	56.479	1.3
D10S1169	61.256	0.82
D10S208	61.446	0.74
D10S539	74.88	0.52
D10S1647	87.205	0.42
D10S537	91.456	0.8
D10S556	96.988	0.52
D10S580	97.935	0.49
D10S607	100.269	0.86
D10S1677	100.715	0.84
D10S1686	107.614	0.62
D10S1765	110.538	0.56
D10S536	114.189	0.32
D10S185	116.043	0.17
D10S1709	120.748	0.1
D10S1726	122.52	0.06
D10S192	123.571	0.09
D10S1267	125.146	0.01
D10S597	129.567	0.05
D10S1773	139.224	0.07
D10S1693	141.504	0.14
D10S1230	147.861	0.05
D10S587	152.266	0.04
D10S1723	153.932	0.07
D10S1656	154.802	0.08
D10S575	160.194	0.25
D10S217	163.607	0.5
D10S1655	170.209	0.47
D10S169	175.52	0.11
D10S212	181.655	0.06
D10S1700	183.595	0.04
D11S4046	1.293	3.07
D11S1318	2.485	3.34
D11S4146	5.479	2.46
D11S1760	8.786	2.16
D11S4149	16.388	1.04
D11S1999	17.473	0.93
D11S4170	23.403	0.73
D11S902	26.226	0.72

D11S2368	29.323	0.56
D11S4190	35.533	0.3
D11S914	48.004	-0.53
D11S1776	49.461	-0.6
D11S907	51.978	-0.38
D11S4102	55.391	-0.56
D11S1360	58.178	-0.28
D11S1785	59.334	-0.23
D11S903	60.942	-0.38
D11S4191	66.18	-0.59
D11S4205	70.273	-0.59
D11S4162	79.309	-0.01
D11S1314	80.354	-0.01
D11S937	85.418	0
D11S1362	88.329	0
D11S1887	92.14	0
D11S4118	97.141	0
D11S917	102.674	0.2
D11S4206	110.805	0.13
D11S908	118.662	0.2
D11S4127	122.23	0.36
D11S994	124.673	0.28
D11S4094	131.312	0.32
D11S934	135.659	0.28
D11S4151	135.733	0.28
D11S912	140.628	0.3
D11S2367	148.23	0.66
D11S1320	150.173	0.66
D11S969	154.041	0.79
D11S968	155.836	0.68
D12S352	0	-0.23
D12S1656	4.232	-0.28
D12S372	8.635	-0.25
D12S1725	13.608	-0.04
D12S314	14.439	-0.01
D12S374	16.844	-0.01
D12S336	24.756	-0.02
D12S1697	26.932	-0.08
D12S364	31.966	-0.03
D12S1728	34.88	-0.1
D12S1682	40.077	-0.05
D12S1591	44.813	0.02
D12S1704	52.932	0.25

D12S1681	54.629	0.28
D12S345	56.47	0.3
D12S368	67.917	0.59
D12S83	75.48	0.18
D12S329	77.467	0.17
D12S313	85.041	0
D12S326	92.97	-0.07
D12S1708	97.672	-0.08
D12S351	103.104	-0.06
D12S95	104.424	-0.07
D12S2081	110.591	0
D12S346	113.367	0.01
D12S1727	115.045	0.01
D12S78	118.522	0
D12S1636	120.165	-0.02
D12S1613	124.076	-0.28
D12S354	133.659	-0.32
D12S366	140.324	0.01
D12S395	142.391	0.06
D12S2073	144.137	0
D12S378	145.072	0
D12S1614	148.984	0.27
D12S324	151.953	0.35
D12S1659	163.126	0.57
D12S367	165.267	0.54
D12S1723	173.293	0.6
D12S1638	175.011	0.56
D13S1243	11.572	0
D13S221	16.88	0
D13S217	22.887	0.11
D13S289	28.145	0.01
D13S171	31.986	0.02
D13S219	36.492	0.06
D13S218	40.44	0.4
D13S325	45.56	0.65
D13S326	49.152	0.65
D13S1320	60.688	0.14
D13S279	65.825	0.02
D13S156	71.452	-0.02
D13S162	73.301	0
D13S1281	75.056	0.02
D13S170	78.012	0.01
D13S271	80.33	0.03

D13S265	82.701	0.02
D13S1241	91.339	0.02
D13S779	97.86	0.01
D13S1256	100.656	0.02
D13S797	107.618	0.02
D13S796	112.167	0.06
D13S778	115.544	0.08
D13S1315	118.998	0.13
D13S285	126.858	0.28
D13S293	131.92	0.48
D14S261	4.517	-0.38
D14S1043	9.826	-0.39
D14S283	15.375	-0.39
D14S990	16.121	-0.22
D14S972	19.33	-0.05
D14S1032	21.686	0
D14S1280	23.036	0.01
D14S275	23.037	0.03
D14S1071	29.187	-0.01
D14S70	37.632	-0.14
D14S1014	39.409	-0.19
D14S75	41.356	-0.28
D14S552	44.875	-0.48
D14S748	46.8	-0.61
D14S976	46.804	-0.61
D14S978	50.46	-0.64
D14S276	56.023	-0.57
D14S980	58.402	-0.36
D14S274	59.819	-0.23
D14S1012	64.794	-0.11
D14S1069	68.32	-0.07
D14S1065	68.321	-0.05
D14S1011	69.675	-0.04
D14S258	70.399	-0.03
D14S986	74.334	-0.09
D14S1433	74.941	-0.08
D14S74	80.165	-0.02
D14S616	85.448	-0.07
D14S974	86.384	-0.16
D14S67	88.656	-0.22
D14S1044	92.856	-0.57
D14S280	96.753	-0.3
D14S617	96.807	-0.3

D14S1050	97.687	-0.25
D14S1054	102.52	-0.21
D14S987	106.216	-0.08
D14S65	109.097	-0.02
D14S1019	109.308	0
D14S985	118.781	0.29
D14S293	125.03	0.33
D14S292	126.138	0.31
D15S128	6.06	0.01
D15S97	11.147	0.01
D15S975	13.46	0
D15S156	15.596	-0.04
D15S1019	21.441	-0.15
D15S165	23.509	-0.21
D15S231	27.428	-0.07
D15S995	29.843	-0.03
D15S1040	30.953	0
D15S118	35.231	-0.02
D15S1012	39.389	-0.25
D15S146	43.142	-0.29
D15S214	43.884	-0.32
D15S1032	51.648	-0.21
D15S1016	52.712	-0.2
D15S117	58.089	-0.06
D15S1036	65.913	-0.07
D15S1507	68.151	-0.09
D15S988	70.386	-0.11
D15S216	75.088	-0.19
D15S114	82.513	-0.45
D15S1005	86.488	-0.32
D15S1047	88.194	-0.41
D15S999	91.764	-0.38
D15S979	95.738	-0.18
D15S1004	110.612	0
D15S816	114.36	0
D15S157	116.137	0.03
D15S1014	123.83	-0.01
D15S212	124.465	-0.08
D15S120	130.403	-0.21
D16S423	14.968	-0.14
D16S418	20.609	-0.3
D16S3087	25.526	-0.1
D16S404	26.041	-0.07

D16S519	29.513	-0.04
D16S3062	32.066	-0.06
D16S500	33.908	-0.06
D16S3103	39.528	0
D16S410	41.834	0.04
D16S403	47.294	0.33
D16S3068	51.268	0.45
D16S3145	54.415	0.31
D16S3136	62.362	0.74
D16S3034	68.274	0.82
D16S415	69.143	0.8
D16S3253	70.983	0.47
D16S3057	76.359	0.25
D16S514	83.448	0.11
D16S503	84.309	0.03
D16S3066	91.199	0.02
D16S515	94.692	-0.01
D16S504	101.711	-0.02
D16S505	108.071	-0.06
D16S3091	112.785	-0.2
D16S763	120.627	-0.37
D16S520	126.833	-0.3
D16S2621	131.456	-0.44
D17S1832	16.789	0
D17S960	21.088	-0.01
D17S1791	25.051	0
D17S804	28.957	-0.01
D17S1852	31.499	0
D17S969	35.154	0
D17S799	37.942	0.01
D17S922	41.551	0.23
D17S839	43.765	0.29
D17S1857	47.635	0.28
D17S1863	54.376	0.1
D17S1850	59.794	0.09
D17S1867	66.959	0.08
D17S1299	71.133	0.12
D17S1868	76.3	0.07
D17S788	80.863	0.06
D17S787	83.22	0.19
D17S957	89.636	0.92
D17S1290	90.36	1.09
D17S794	94.361	0.41

D17S944	95.11	0.47
D17S789	101.989	0.86
D17S940	102.596	0.79
D17S949	105.506	0.72
D17S1351	108.829	0.66
D17S1862	110.904	0.79
D17S1847	126.708	0.05
D17S836	128.025	0.05
D17S784	132.738	0
D18S1105	4.054	-0.07
D18S63	9.837	0
D18S452	18.348	0.11
D18S967	21.744	0.22
D18S1163	26.031	0.26
D18S464	33.37	0.14
D18S453	40.897	0
D18S1107	47.287	-0.31
D18S478	52.453	-0.39
D18S877	54.033	-0.4
D18S457	56.514	-0.45
D18S1135	57.594	-0.5
D18S1102	59.894	-0.28
D18S468	62.591	-0.22
D18S450	70.781	-0.17
D18S474	74.788	-0.16
D18S487	77.608	-0.23
D18S1152	79.594	-0.2
D18S1129	82.643	-0.07
D18S64	84.27	-0.19
D18S1134	87.196	-0.24
D18S1147	88.505	-0.23
D18S68	91.039	-0.11
D18S465	92.907	-0.11
D18S485	102.55	-0.05
D18S469	106.377	-0.06
D18S1161	111.047	-0.06
D18S462	119.147	-0.01
D19S565	8.627	0.03
D19S591	10.588	0.09
D19S424	11.835	0.07
D19S884	27.04	0.07
D19S584	33.166	0.49
D19S1165	33.782	0.52

D19S226	37.979	0.44
D19S179	38.056	0.44
D19S414	55.808	0.11
D19S225	57.355	0.24
D19S897	65.915	0.51
D19S223	68.913	0.49
D19S217	72.804	0.47
D19S903	73.474	0.47
D19S902	78.516	0.1
D19S904	84.865	0.14
D19S888	97.251	0.02
D19S572	99.842	0.02
D19S927	101.769	0
D19S605	108.448	0
D19S573	113.227	-0.1
D19S254	113.798	-0.13
D20S103	2.611	-0.04
D20S842	9.708	0
D20S193	10.955	-0.01
D20S905	20.471	0
D20S115	25.351	0
D20S879	28.289	0
D20S175	28.693	0
D20S189	34.885	-0.08
D20S852	40.502	-0.03
D20S904	42.544	-0.02
D20S112	45.361	0
D20S912	52.186	0
D20S859	60.732	0
D20S107	63.189	0
D20S108	65.635	-0.01
D20S96	68.058	-0.04
D20S481	70.965	-0.01
D20S838	71.234	0
D20S891	74.081	-0.04
D20S887	77.422	-0.08
D20S1083	83.326	0.11
D20S902	84.892	0.2
D20S100	90.847	0.22
D20S102	93.051	0.27
D20S164	98.392	0.21
D20S171	100.839	0.21
D21S1904	7.227	-0.12

D21S1899	16.2	-0.09
D21S1905	17.645	-0.21
D21S2053	18.17	-0.19
D21S1902	20.181	-0.08
D21S1884	21.471	-0.04
D21S272	24.478	0
D21S1914	25.068	0
D21S1442	30.284	-0.02
D21S1239	33.11	-0.05
D21S1908	33.346	-0.02
D21S1909	33.806	-0.02
D21S1895	42.15	0.01
D21S1252	44.036	0.06
D21S270	46.248	0.16
D21S1255	48.281	0.17
D21S1893	53.267	0.18
D22S420	3.048	-0.36
D22S427	6.002	-0.28
D22S539	15.82	-0.18
D22S257	17.977	-0.32
D22S1174	20.026	-0.39
D22S315	23.911	-0.47
D22S1154	25.726	-0.45
D22S1163	32.148	0
D22S280	38.78	0.03
D22S685	40.555	0.05
D22S283	43.881	0.06
D22S1177	45.348	0.26
D22S1156	48.112	0.53
D22S423	51.075	0.48
D22S276	51.211	0.48
D22S1179	51.967	0.4
D22S1165	52.761	0.49
D22S928	59.393	0.55
D22S1149	63.953	0.29
D22S1169	71.57	0.35
D22S420	3.048	-0.36
D22S427	6.002	-0.28
D22S539	15.82	-0.18
D22S257	17.977	-0.32
D22S1174	20.026	-0.39
D22S315	23.911	-0.47
D22S1154	25.726	-0.45

D22S1163	32.148	0
D22S280	38.78	0.03
D22S685	40.555	0.05
D22S283	43.881	0.06
D22S1177	45.348	0.26
D22S1156	48.112	0.53
D22S423	51.075	0.48
D22S276	51.211	0.48
D22S1179	51.967	0.4
D22S1165	52.761	0.49
D22S928	59.393	0.55
D22S1149	63.953	0.29
D22S1169	71.57	0.35

Supplemental Table 2. Demographic characteristics of subjects in the re-sequencing and mucin genetic screen analyses.

	Re-Sequencing Subjects			Genetic Screen of Lung-expressed Gel-forming Mucins Subjects		
	FIP	IPF	Control	FIP	IPF	Control
Number of subjects	69	96	54	83	492	322*
Male gender	41 (60%)	61 (64%)	18 (34%)	44 (53.0%)	352 (71.5%)	147 (45.7%)
Caucasian	68 (99%)	89 (93%)	53 (98%)	83 (100%)	492 (100%)	322 (100%)
Age at diagnosis	66 ± 10	65 ± 8	68 ± 8	66.3± 11.2	67.2 ± 8.1	60.3 ± 12.6
Ever smoked	44 (64%)	71 (74%)	25 (47%)	46 (56.8%)	342 (69.9%)	245 (76.6%)

∗ Note, 325 control subjects were included in allelic association analyses but only 322 in genotypic regression analyses as demographic variables needed for regression were missing for 3 subjects. Additionally, in some genotyping multiplexes for the lung-expressed gel forming mucins, 18 of the 322 controls were not screened due to lack of DNA availability.

Supplemental Table 3. SNPs successfully genotyped in the genetic screen of lung-expressed gel-forming mucins (FIP=83, IPF=492, and controls=322).

SNP Name	Hg19 Position	Gene	AA Change	Base Change	Flanking Sequence
rs35123704	1073794	MUC2 Promoter	MUC2 Promoter	C/G	CATGTTCAGGCCAAAGCCAGGAACT[C/G]AACTCAGGGCCCCTCTCTATTTTCA
rs2071175	1074401	MUC2 Promoter	MUC2 Promoter	C/T	AAGGATCCCACATCCTCCCTGCCCT[C/T]GGGGAGGCCCCTTTCTGGGGTCAGG
rs35338528	1074635	MUC2 Promoter	MUC2 Promoter	T/G	AGTAGCTGCATGTGTTCCCCGGGTG[T/G]GTGTTGGCATTCAGGCTACAGGGCT
rs72652889	1074873	MUC2 Promoter	MUC2 Promoter	C/A	TAAGGACCAGACCCCTGCCCCCGGG[C/A]GCAACCCACACCGCCCCTGCCAGCC
rs41369349	1075092	MUC2	intronic	G/A	GCTGGTCCCAGAGTGCAGCCTGCGC[G/A]GCTCTGCTGAGGCTCCTGGCCCGGG
rs2856111	1075747	MUC2	L>P	T/C	GGGGACGTCTTCCGCTTCCCCGGCC[T/C]CTGCGACTACAACTTCGCCTCCGA
rs11825977	1075920	MUC2	V>M	G/A	GCCACCTGGCTGTGCTTAACGGGGCC[G/A]TGTGAGTGTGGTCGGTGGCACCC
rs7104590	1078393	MUC2	intronic	T/C	TCCGAGCACGTGAGTCCCCTCGGTC[T/C]GGGGTGGGGGTCCTGGCGGAGCTGG
MUC2-5531*	1078456	MUC2	R>C	C/T	ATGCTCACCCTGCGTCTGTCCCCAG[C/T]GCGCCGAGTGTGAGAGGCTGCTGACCGC
rs41359951	1079746	MUC2	C>C	C/T	CACACCTGGAGGTGAGCAGCCTGTG[C/T]GAGGAGCACCGCATGGACGGCTGTT
rs10902081	1079809	MUC2	intronic	T/C	GTGCGTGTGGAGGATGGCCCCGCCC[T/C]GGCACTGCCCACCAGATGAGAGGCA
rs7127117*	1079879	MUC2	intronic	T/C	CCTGCGCTGAGGGGACGGCTCCGC[T/C]GGGTGGTGGGGGCAGCGGCGGCACAGAAG
rs76496149	1079932	MUC2	intronic	G/A	AGTGCCTCTCCCTCCACCCGATACC[G/A]GGGGAGAAGGGGCCTCGGTGTGAGG
rs11245925	1079993	MUC2	intronic	G/T	AGGGTGGCTTCAGGGAGGCCGGGAA[G/T]GGGGCTGCCTTCCTGGTTATCACCC
MUC2-7815	1080740	MUC2	intronic	G/A	GGTGCCTGTGGGCTGTCCTGGGGCA[G/A]GTGACCATGCTTCTGCTCTCTGGCT
rs41453346	1080894	MUC2	Y>Y	C/T	CACAGGGTGACCACAACGATTCCTA[C/T]GCTCTCCTGGGCGAGCTGGCCCCCT
rs41512944	1081002	MUC2	intronic	-/A	AGAAGAATGTGAGTGGTCCTGCCCC[-/A]CTCCTTCTGGAGCCCCAGGTCCCCC
rs12416873	1081577	MUC2	intronic	G/A	GTGCAGGGTAAGTGGCCCCACCGGG[G/A]TTGCCCCAACAAAGGCCCACAGGGG
rs11245930	1082520	MUC2	intronic	A/G	TTGCTGTGTGTGCGTGTGAGCTTGC[A/G]TCTGTGAGCGCCGGGCCACACTCTG
rs7952257	1082582	MUC2	intronic	G/A	CACTGCCCGTCCACCTTGCTCTGTC[G/A]CCCAGAGGTGCAAATATGACACGTG
rs41480348	1082605	MUC2	T>T	G/A	TCGCCCAGAGGTGCAAATATGACAC[G/A]TGTAACTGTCAGAACAATGAGGACT
MUC2-9943	1082866	MUC2	intronic	-/T	GGCTCCAGCTTCGTCAGCCGGTGGT[-/T]AGCAGGAAACCAGCAACTCCTATAG
rs41534047	1083509	MUC2	intronic	C/T	GGGGAAGCTGCGGGCTGTCTGTGGC[C/T]GTCCTGCATGGGCCCCGCTCATCCC
rs11245935	1083946	MUC2	intronic	C/T	GGGTCTGGGTGCCGAGTCCTGAGGA[C/T]GCAGGCCCTGTTGATGCTGTCCCTG
rs11245936	1084362	MUC2	G>S	G/A	CCATAACAACGACCTGTATTCTTCC[G/A]GCGCCAAGATCAAGGTGGACTGCA
rs41405245	1087021	MUC2	intronic	G/A	TTGTCCTCCAGCTTTGGCTCTGGCC[G/A]CTGCCTCCTTTGGTCACATGACCGT
rs41443848	1087786	MUC2	intronic	G/A	CGGGTTGGCAGAGCAAGCTTGATGC[G/A]TCTGCGTCCCAGCCCCCGACCCCAG
rs12225760	1090101	MUC2	intronic	C/T	CTACAGAGGTACCAGTCCCTCACTG[C/T]GGCGGGGGGTCTTCTGTTCTCATCC
rs41493045	1090731	MUC2	intronic	T/C	GGGGGCTCGGGCACACCTGGCCTTC[T/C]TCCTATCTTGCTCCTGATGAGGTGA
rs7934606*	1093945	MUC2	Intronic	C/T	ACGTCCCCTCCAGGTAAGCAGAGC[C/T]GCTTGGTTCCTCTGGCCTGGGATGCTTCT
rs10902089*	1094357	MUC2	Intronic	A/G	TTGGGGCCTTTTCCTGGTGGACGGC[A/G]TGCCACAGCCAGTGCCTTCTGGACGCCT
rs41376152	1094761	MUC2	Thr/Asn	C/A	ACCAGTGCCTGGACCCCCACGCCGA[C/A]CCCACTCTCCACACCCAGCATCATC
rs10902090	1097975	MUC2	intronic	C/T	CACCAATAAGCTGAGGGCCTCTGTG[C/T]CCCAGCCCCCAGCTCTTGCAAAGAG
rs34434067*	1098337	MUC2	Intronic	A/G	GTCAGCATCCTGTCCCTGGAAGTATA[A/G]GGGCCAGGTATAGGCTGGGTGTCCATC
rs7952343	1099308	MUC2	intronic	C/T	ATGTTGTTTGAGGGTCCACCAGGAC[C/T]GTGGGCTCGCCTTCTGCAGTGCGGA
rs7396585	1100905	MUC2	intronic	A/G	CTGCTCAGGGTGGCTGTTTCTCCCC[A/G]CTGACCACAGCTGCAGCTCCGGGGC
rs11245954	1101078	MUC2	S>G	A/G	ATCATCTGCCAACCCAAGAGGTGC[A/G]GCCAGAAGCCCGTTACCCACTGCGT
rs41447547	1101864	MUC2	intronic	C/A	GAGTGGGGGTCTGGCCAGGTGGCCG[C/A]CCCGGGGCAGTCTCCAACGAACGGC
rs72655352	1102090	MUC2	P>S	C/T	CTCCCTGTGCCCGAAGCCCGGTTCT[C/T]CAGTTTATTCCTCCAAGTGCCAGGA
rs11245955	1103137	MUC2	intronic	G/A	GTGTCTCCAGGGTGTCTTCCTGGCC[G/A]GGCTGGGGCTGGCCTGCTGCCCTC
rs7927765*	1104626	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	TCCTACAAGGGAATCTGACCACATTT[C/T]GACAGCCCCGTGGGGGTTTTGCCCAGG
rs3924453*	1105806	MUC2/5AC Intergenic	MUC2/5AC Intergenic	G/A	GGTGTGGCACAGCCTTGTAGTCTGG[G/A]GACAAATGTCCTCCCCTTTGACCTCAGA
rs4077759	1105976	MUC2/5AC Intergenic	MUC2/5AC Intergenic	T/C	GGTGTGATGGGTCCCCTGGGCGTGA[T/C]GGGTCCTCAGGGTGCAACAGGTCCC
MUC2-33306	1106228	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	CTCCTTCCTGGGTTCAAGTGATCCT[C/T]CCACCTCAGCCACCCAAAGTACCAG

rs6597976*	1111474	MUC2/5AC Intergenic	MUC2/5AC Intergenic	G/A	TTTTTGTTATGGATGATTTCAAACCCT[G/A]TGAAGAACAGAGTAATGGAATGGACA
rs7479605*	1120324	MUC2/5AC Intergenic	MUC2/5AC Intergenic	A/G	TGTGGATCTCAGATGAAATCTTCTTGG[A/G]CGATCTGGGTGGTGTCGTCCACCATC
rs7112954*	1137086	MUC2/5AC Intergenic	MUC2/5AC Intergenic	G/A	TTTCTCATTTCTTCAGTGGGTGGCAT[G/A]GATTACTGACTTGACTCATCCTTTTTT
rs11245979*	1139111	MUC2/5AC Intergenic	MUC2/5AC Intergenic	T/C	TGGCTGTACAGGGCACGGGGGACCT[T/C]GTGGGGTGACCGAGCGACTGTCTCTGAG
rs56199221	1142621	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	TTCTTGCACCGTTTAGCCTGGCACG[C/T]GTTGCCCTCTGTCTCTCTCCCAGGA
rs9667093	1142632	MUC2/5AC Intergenic	MUC2/5AC Intergenic	G/C	TTTAGCCTGGCACGCGTTGCCCTCT[G/C]TCTCTCTCCCAGGACCACATTCAGG
rs9667239	1143101	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	AGCCTCCCCTGGGCATTTTGGGGA[C/T]GCTGGGCCCAGCCCATGCCTCGTGGC
rs55754006	1143404	MUC2/5AC Intergenic	MUC2/5AC Intergenic	G/A	CTCAAGACGAGGGGGGCAATTTTC[G/A]CTTTACATTTTGTTCCAATTTTTTAT
rs28653725	1145109	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	TAAGTTCCTGGCTTGGTAAAAATCTGC[C/T]GCCGAAGCCTGCTCTTTCTGTCAACA
rs56330040*	1145757	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/A	GATGGTACAGGAGGGTAATGCACGGG[C/A]TCAGGGCCCCACAGCGGGAGCTGCTGG
rs28415845*	1145844	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/T	GTCTGCTCCACAGAGCCCTGGGGTC[C/T]CCTGTGGGCAGGGTGTGTGGAGCTGCCC
rs28624253*	1146678	MUC2/5AC Intergenic	MUC2/5AC Intergenic	A/G	TGTCTGCATTCACCTGTCAGATCCCG[A/G]GGAGAGAGGGGCACTGGCGGCCGCCCA
rs35369717	1146852	MUC2/5AC Intergenic	MUC2/5AC Intergenic	C/G	AGCTCCCACCTGCCCGGCACTGTC[C/G]CCGCCCTGGGGACCCTCCTGCAAACA
rs17859811*	1150353	MUC5AC Promoter	MUC5AC Promoter	A/G	CAGAACAGCCTTGAGGCACCTCTTC[A/G]ACCCTAACCCCTCTGCAGCAGGACA
rs78659385*	1150447	MUC5AC Promoter	MUC5AC Promoter	A/G	GGGAGACCTTCTGGTTGGACGCTCC[A/G]CATGGGCAGTGGAGCAGCCGACCTT
rs28469016*	1151320	MUC5AC Promoter	MUC5AC Promoter	G/A	ACTCACAGGCTGCTGGGCATGGCAC[A/G]GTGCCCAGGGAGAGTCTAGGGTGGG
rs17859812*	1151406	MUC5AC Promoter	MUC5AC Promoter	C/T	GGGGGCCCTCGGAAACTGGGCTCTA[C/T]CCGGCAGACACACCCATCTCCGCCT
rs28737416*	1151695	MUC5AC	H>H	C/T	CTCTCGCTCTGGCCTGCACCCGGCA[C/T]ACAGGTACGGCTTGGCCCCTGGCCG
rs55680540	1152019	MUC5AC	intronic	G/A	AAGCCGACAGCACCTGGCCCACA[G/A]TATCTCCAGCTGCTCATGGCCCCTGCT
rs28645549	1152677	MUC5AC	intronic	C/T	CTGGGGCTGGGGTCTGCGGGGGCT[C/T]AGAAGGTGGGGGCAGGCCTGGGCTGG
rs56339492	1154080	MUC5AC	intronic	-/C	GACAGAGGCCTCCTAGGACCCCCC[-/C]AACCCAGCACAGAGAGAGCCCTTGCC
rs55846509	1154294	MUC5AC	R>Q	G/A	CACCCTGCCCTCTCTCCTATCGCCC[G/A]GGGGCCCAGCGGTGAGTCTGAGTGT
rs74477410*	1154369	MUC5AC	Intronic	G/A	GATTCCACCCTCCACCGTGTGGCAC[G/A]GCCCCTAGGGCCACTGGTCTTAGGG
rs55861305	1155146	MUC5AC	V>F	G/T	CCTACCAGCCCCTGTCTCCGCAGGG[G/T]TCCCGCTCCGTGGGGCGACTGTCTT
rs76577728*	1155156	MUC5AC	R>H	G/A	CCTGTCTCCGCAGGGGTCCCGCTCC[G/A]TGGGGCGACTGTCTTCCCATCTCTG
rs35396393	1155265	MUC5AC	intronic	G/A	ATAGCTTTGCTGAGCTCCCCGCTCA[G/A]GCCTGGAGGTGCCGGGTGGAGAGAG
rs56375165*	1156063	MUC5AC	Intronic	G/A	CGCGACTTCACGGTCACGATGACCGT[G/A]TCACATTTGCGACCGCAGGCATCTGCC
rs35783651	1156646	MUC5AC	S>R	C/G	ACTTCAACGGGATGCCCGTGGTCAG[C/G]GAGCTCCTCTCCCACAGTAAGGCCC
rs34664315*	1156709	MUC5AC	Intronic	G/A	AGCCCCTTCCTCAGTGTCCCCTGGG[G/A]GCTCAGTGTTGTGTGCACACACACC
rs55863018*	1158092	MUC5AC	Q>E	C/G	CCCCTGTGCAGACACCTGCTCCAAC[C/G]AGGAGCACTCCCGGGCCTGTGAGGA
rs35917282	1159133	MUC5AC	intronic	A/G	ATGGGACAGACCTGCTGGGGGTTGC[A/G]ACCCAGGCCGGCAGGCACCCTCGTC
rs55913171*	1159209	MUC5AC	Intronic	G/A	GGTGAGACCCGGTCAGCCTCCTGAC[G/A]CGGAGGCTGGAGGCTGGTCTCCTGG
rs56002968*	1159210	MUC5AC	Intronic	C/T	GTGAGACCCGGTCAGCCTCCTGACG[C/T]GGAGGCTGGAGGCTGGTCTCCTGGG
rs28653550*	1161201	MUC5AC	Intronic	A/G	GGAGTGTGAGGACCCCTGGTGTGTC[A/G]TGTTCCGCAGCCCTGTGACAGCAGT
rs28403537	1161315	MUC5AC	A>V	C/T	AGCGTGACACTGAGCCTGGATGGGG[C/T]GCAGACGGTGAGTGGAGCCTGGCAG
rs34974357	1161935	MUC5AC	Intronic	C/A	CACCCCGGGGCTGCCTGGGGTCCCG[C/A]CCCACAGCCCCCAGCAAAACCCTTG
rs76498418*	1162482	MUC5AC	Intronic	C/T	TGCCTGTGAGCCGGGTGGGGTGGCT[C/T]ACGAAGGGGCCCAAGGACAGGCTCA
MUC5AC-020242	821270*	MUC5AC	intronic	A/G	CCCAGGTCAGTGTGGCCTTGGACCC[A/G]GCCGAGGAGGGGAGGGGAGGGTAGC
MUC5AC-020493*	821521*	MUC5AC	K>K	G/A	CCGTGGATGGCTGCATCTGTCCCAA[G/A]GGCACCTTCCTGGACGACACGGGCA
MUC5AC-020787	821815*	MUC5AC	intronic	T/C	CTGTGGCCCCCAGCCTCCTCATCTC[T/C]ATAAGAAATCCTGAAAAATGGCTTC
MUC5AC-022503*	823530*	MUC5AC	D>D	C/T	GGGACGGCCACTACCTCACCTTCGA[C/T]GGACAGAGCTACAGCTTCAACGGAG
MUC5AC-022562*	823589*	MUC5AC	Intronic	G/A	TACACGCTGGTGCAGGTGAGCCGGC[A/G]CGTTTGGGGTCCTCACGGCGGCCCC
MUC5AC-022675	823702*	MUC5AC	intronic	G/T	GCCTCATCCTCCTTGCGGGAAGGAG[G/T]GCAGGGCCTGCCTGGTCCTTGATGG
MUC5AC-022754	823781*	MUC5AC	F>F	C/T	GGAAAGACAGCACCCAGGACTCCTT[C/T]CGTGTTGTCACCGAGAACGTCCCCT
MUC5AC-022841	823868*	MUC5AC	intronic	C/T	AGATTTTCCTGGGGGTGAGCGAGGC[C/T]GGGTGGTCGCATGCCCTCCAGGAGG

MUC5AC-024585*	825614*	MUC5AC	P>P	G/A	AGCCCCGTCTCCCTCAGGTGGAGCC[A/G]GCCAGGTACTACGAGGCCTGCGTGA
MUC5AC-024723*	825752*	MUC5AC	P>P	G/A	GCCTGTGTGTGTCCTGGCGGACCCC[A/G]AGCATCTGCCGTGAGTGCGAGTGGG
MUC5AC-025447*	826476*	MUC5AC	Intronic	C/T	GCAGCTTTAGAACAGCCCTGGGGTG[C/T]GGGGCCTCTGCGAGTGAGTTCCTGG
MUC5AC-025482*	826511*	MUC5AC	Intronic	G/A	GCGAGTGAGTTCCTGGGACCCCACC[G/A]AGCCCTTCCTTCCTCCCTGCAGCTC
MUC5AC-025618*	826647*	MUC5AC	V>I	G/A	CCCCCGTGGAGACTGCCTGCGGGAC[G/A]TCTGGGGCCTGGAAGGTGGGCTGGG
MUC5AC-025754*	826783*	MUC5AC	Intronic	C/A	ACATTCTGGTGCTGTCGGCGAGGCC[C/A]GCTGCTTGGGGGCTGGGCGGAGCCC
MUC5AC-027958*	829947*	MUC5AC	G>R	G/A	CCCCGGAGTGCCGCTCCGAGCCCTG[G/A]GGCAGCGTGTGCAGTGCAGCCCGGA
MUC5AC-028077*	830066*	MUC5AC	S>S	C/T	AGTGCTGCACGCCCCTAGCCTGCTC[C/T]ACCTCTAGCAGTCCAGCCCAGACCA
MUC5AC-028693*	830682*	MUC5AC	A>T	G/A	CATCACCAGACCGCCAAAGACCGTC[G/A]CAACGACACGGCCGACTCCACATCC
rs1132433	1215580	MUC5AC	T>T	A/G	GCAAGCCAGTCCACGGGGTGATGAC[A/G]AACGAGGTGGGGGCGCGCCCGGTGT
rs28452143	1215698	MUC5AC	intronic	G/A	GCCTGCCTTCTGACTTCCCGTCGACC[G/A]CGCCCTGCGTCCAGATCATCTTCA
rs75971001*	1216095	MUC5AC	Intronic	C/A	CCATAGGGACTGTCCCAGGGTTGTT[C/A]TCGGGGGACAGTGAGGCACAGGCAG
rs28503875*	1218128	MUC5AC	P>P	A/G	GGTGTCTGGGGCCCCACGGAGAGCC[A/G]GTGAAGGTGAGTGGAAGGCATGGCC
rs56013970	1219626	MUC5AC	intronic	C/T	GTAGACTTTGGAGCAACTGCCAACTC[C/T]GGCCGGGGCCAGGGACTCGAGTCT
rs34666042	1219773	MUC5AC	intronic	C/T	GGGGGCTCCGGGGGACTTTGCCTCTC[C/T]TGGCACCACAGCACAGCCAGGCCT
rs35288961	1220462	MUC5AC	intronic	G/T	AAGGGCAGGGTCTGGGAGCACTGGG[G/T]CATGTGGGGACCTGTCGTTGCCAGG
rs35525357	1220520	MUC5AC	intronic	-/A	TGGCAGAGGCTGGGGACTCTCTGGA[-/A]GCCCACGGGCTGGGGTGCAGACAGA
rs1132436*	1220967	MUC5AC	L>P	T/C	GGACGGCTGCTGCCGCTTCTGCCCGC[T/C]GCCCCCGCCCCCGTACCAGAACCG
rs80262142*	1221195	MUC5AC	M>T	T/C	GGGAACTGTGGGGACAGCTCTTCCA[T/C]GTACGTGCCTGGGCAGCAGGCAGGG
rs28729516*	1224687	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	A/G	TCTGCAGGCACTGGGAGGTCAGAAG[A/G]CAAGGCCGGCCCAGTCCCTGCACCAGGA
rs35671223	1227069	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	C/T	CCTCGCCGTGTTGCAGGAGCAGTG[C/T]GCAGGGCTGTCGGCTCCTGAGCATC
rs28742153	1227846	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	T/C	ACTCTCTGCTCTCACCCGCCATCGT[T/C]GTCCGGACTGACTGTTTATCCGAAG
rs28654232	1229227	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	C/T	CTCCTGGGCGATAAAGGGTCGGTG[C/T]TGAGTGACCTTAAGTTCTGAGAAAG
rs55797134	1230071	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	T/C	GCGCCCCACTCCTGTTTGCTCTGAC[T/C]CGAGTTGTCTTAATCCTGAGCAAAT
rs34595903*	1230393	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	C/T	CACGGTGCCAGGGCCAGGACAGCC[C/T]CGACACCGGCCTCAGCACCTGGCCATGGC
rs28464598	1230582	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	T/C	GCCCCACTGGGCTACTGCAGGGGA[T/C]GCATTCTGGTGGCATCATGCCTCTG
rs56411013	1230725	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	T/C	GCTTGTGTTTTGTTCCAGGGACTTG[T/C]GCTATTTGCTGTCTGTAGCTACATA
rs4963049*	1236427	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	A/G	TAGAAATCCCCCAAAATTCCACCCCA[A/G]TACTACTGAAGCTGATTAAAGCATTCA
rs7120886*	1238828	MUC5AC/5B Intergenic	MUC5AC/5B Intergenic	T/G	CTAGAGGACCAAACTTACGGAGAGAG[T/G]TGAGGTTGGTGGATGCGTGGGGCTCGG
rs72636989*	1240485	MUC5B promoter	MUC5B Promoter	G/A	ACCCCAGGAGTTGGGGGGCCCCCGT[G/A]CCAGGGAGCAGGAGGCTGCCGAGGTGGA
rs2672794	1241005	MUC5B promoter	MUC5B Promoter	C/T	TAACCCCCCTCGGGTTCTGTGTGGTC[C/T]AGGCCGCCCCTTTGTCTCCACTGCCCC
rs35705950	1241221	MUC5B Promoter	MUC5B Promoter	G/T	TCCTTCCTTTATCTTCTGTTTTCAGC[G/T]CCTTCAACTGTGAAGAGGTGAACTC
rs11042491*	1241821	MUC5B promoter	MUC5B Promoter	G/A	CTAAGGTGGGAGACCTGGGCGGGTGC[G/A]TCGGGGGGACGTCTGCAGCAGAGGCCC
rs56254431	1242077	MUC5B Promoter	MUC5B Promoter	C/T	AGGCATCCCCGCCCACCCCTCCCAC[C/T]GTGCCGTGCTGCAGCGGGTCTACCG
rs56322669*	1242147	MUC5B promoter	MUC5B Promoter	C/A	GCTTGGAGACCCCAGAGACCTCGGAA[C/A]CTTCAGCTTTGGAAGTGACGTCGGTGG
rs11042646	1242227	MUC5B Promoter	MUC5B Promoter	C/T	GTCCCGGAAGTGAGCGGGGAGCTA[C/T]GCTGAGATCTGGGAGACCCCCTGCC
rs55974837	1242244	MUC5B Promoter	MUC5B Promoter	C/T	GGAGCTACGCTGAGATCTGGGAGA[C/T]CCCCTGCCCCCACCCAGGTACAGGG
rs35619543*	1242250	MUC5B promoter	MUC5B Promoter	G/T	CTACGCTGAGATCTGGGAGACCCCCT[G/T]CCCCCACCCAGGTACAGGGCCAGGCAG
rs12804004	1242299	MUC5B Promoter	MUC5B Promoter	T/G	GCAGAAGCCCGAGGTGTGCCCTGAG[T/G]TAAAGAAACCGTCACAAAGAACAAA
rs56031419*	1242472	MUC5B promoter	MUC5B Promoter	G/A	CTGTCTCCGCCCTCCATCTCCAGAAC[A/G]TTCTCACATTCCCAAGCTGAAACCCTG
rs868902*	1242508	MUC5B promoter	MUC5B Promoter	C/A	TCCCAAGCTGAAACCCTGTCCCCATG[C/A]AACACCAGCTCACCATCCCCTCTGCCA
rs868903*	1242690	MUC5B promoter	MUC5B Promoter	T/C	CCCCATGGAGCAGCCTGGGCCAGCC[T/C]CTCCTTTTCACGGCTGAACCGTATTCCA
1243218-Prm*	1243218	MUC5B promoter	MUC5B Promoter	G/A	GTCTGCGCCACGGAGCATTCAGGAC[G/A]CTGGTGACCAGGGAGCCAGGAGGTGGGA
rs885455	1243378	MUC5B Promoter	MUC5B Promoter	T/C	CAAGGAGGTTTACCACATAGCCCCC[T/C]GGAAGCCCACCCNACACCAGCCGGA
rs885454*	1243391	MUC5B promoter	MUC5B Promoter	G/A	CACATAGCCCCCAGGAAGCCCACCC[G/A]ACACCAGCCGGAGGTGCTAGGCTTCTGC

rs17235353*	1243637	MUC5B promoter	MUC5B Promoter	CA/-	CATGGCCAGGAGACACTCTGGGCCT[CA/-]AGTTTCCCCTTGAATGTGAACCTTGAAA
rs7115457	1244060	MUC5B Promoter	MUC5B Promoter	G/A	CCATCTAGGACGGGTGCCAGGTGG[G/A]GTAGGCCCTTCTCTCCCTTCCGATT
rs56235854	1244197	MUC5B Promoter	MUC5B Promoter	G/A	AGCCCCTCCCCGAGAGCAAACACAC[G/A]TGGCTGGAGCGGGGAAGAGCATGGT
1244438-Prm*	1244438	MUC5B	Intronic	C/T	CCGCAGGCAGGTAAGAGCCCCCCA[C/T]TCCGCCCCCTCTCGATGCTGTCTTCACGG
rs56321310*	1245298	MUC5B	Intronic	C/T	CCAGCCTGGGCCCGGGGGGAGCTG[C/T]GTCTGGCTGCAAGGTTTGGGGGCTGGTTT
rs2672785	1246941	MUC5B	E>G	T/C	GCCATCCATGGTGTGCCCTGCATTC[T/C]CCCAGCTCGGCTCCACAGGGCCCTG
rs2075853*	1247458	MUC5B	R>W	C/T	AGGTGCCCCGACGTCCTCGCCCACC[C/T]GGCGCGTGAGCTTTGTTCCACCCGT
rs56293203	1248087	MUC5B	V>I	G/A	GGTGCTGGAGGCGTCCAACGGCTCC[G/A]TCCTCATCAATGGGCAGCGGTGAGC
rs908224	1248197	MUC5B	intronic	A/C	CCTGGCTGCCTGCCCACCCAACCCC[A/C]CCCCAGCCCTGGCCCAGGTCAGACA
rs2075854*	1248731	MUC5B	Intronic	A/G	GGGGCGGAGTGGGGACCGGGCACC[A/G]GGCAGGGAGGGGCCACGAGGACTGTGCCC
rs2075855*	1248960	MUC5B	T>T	G/A	ACCTGCAGAAGTTGGATGGGCCCAC[G/A]GAGCAGTGCCCGGACCCGCTGCCCTTGC
rs55684014*	1250583	MUC5B	Intronic	C/T	GCTTTCAGGTCCCTGCTCCCAACCC[C/T]GCCCCCAGCCTCATCAGGCGTGGAAGCA
rs56286969	1257975	MUC5B	intronic	G/A	GCAGGGAAGCAGGTGCCACCCAGC[G/A]GCCCACCCAGGGACCCACTGCACAC
rs56166347	1262045	MUC5B	intronic	T/C	CCTTGTGAGGCCAGGACTGGAGGA[T/C]GCTGAGCCAGGACCCCTTTCCCATG
rs12363494	1262189	MUC5B	T>M	C/T	GCCTGGGAGGCGGAGACTTTGAGA[C/T]GTTTGAAAACCTGAGGCAGAGAGGG
rs10835639	1262312	MUC5B	R>P	G/A	TGGGCCAGCAGGTGGACTGTGACC[G/A]CATGCGGGGGCTGATGTGCGCCAAC
rs56175069	1262459	MUC5B	T>M	C/T	CCTCAGCCCTCCCTCAGTGCCAGCA[C/T]GGAGCCTGCTGTGCCTACCCCAACC
rs55669609	1262525	MUC5B	P>L	C/T	AAAAGACCACCCTATGGGTGACCC[C/T]GAGCATCCGGTCGACGGCGGCCCTC
rs1541314	1263523	MUC5B	G>S	G/A	GGACTTCCCAACCTCAGGGGTTGCA[G/A]GCGGGGACATGGAAACTTTTGAAAA
rs2943510	1263776	MUC5B	P>L	G/A	GGCGTGGCCGTGGAGCTGGTGGCT[G/A]GGGTACTGGGGCAGTGGCTGTAGTC
rs2943512	1272226	MUC5B	P>T	G/T	TGGCCGTGCTGGTCAGCACTGGGG[G/T]GATGGGTGTTGTCCCTGGAGTTGAG
rs3021155*	1272709	MUC5B	A>T	G/A	GTGCCCACCGGTTCCACGGCCACC[G/A]CCTCCTCCACTCTGGGAACAGCTCACACC
rs3021156	1272754	MUC5B	T>A	A/G	AGCTCACACCCCCAAAGTGGTGACC[A/G]CCATGGCCACTATGCCCACAGCCAC
rs56159668*	1272793	MUC5B	P>S	C/T	CCCACAGCCACTGCCTCCACGGTT[C/T]CCAGCTCGTCCACCGTGGGGACCACCCGC
rs55693520	1272800	MUC5B	S>L	C/T	CCACTGCCTCCACGGTTCCCAGCT[C/T]GTCCACCGTGGGGACCACCCGCACC
rs56353324*	1272821	MUC5B	R>H	G/A	GCTCGTCCACCGTGGGGACCACCC[G/A]CACCCCTGCAGTGCTCCCCAGCAGC
rs56217440	1273605	MUC5B	G>S	G/A	CATCTACAATAAGACCGACCGAGCC[G/A]GCTGCCATTTCTACGCAGTGTGCAA
rs2857472*	1274927	MUC5B	Intronic	A/G	TGGGGACTCCAGGTGTCCTTTGGCT[A/G]TGGCTGCATCCCTCCGATCTCTGCC
rs56172849	1275588	MUC5B	intronic	C/T	GGGAAGGAGGAGGGCCTGGTGAGT[C/T]CAGGCTGCGGGTGGCACAGTGTTGG
rs56088961	1275592	MUC5B	intronic	G/A	AGGAGGAGGGCCTGGTGAGTCCAG[G/A]CTGCGGGTGGCACAGTGTTGGCCCA
rs56352092	1275593	MUC5B	intronic	C/A	AGGAGGAGGGCCTGGTGAGTCCAGG[C/A]TGCGGGTGGCACAGTGTTGGCCCAG
rs56232219	1275988	MUC5B	L>P	T/C	AAGAACGGCGTGCTTGTGTCTGTGC[T/C]GGGGACCACCACCATGCGTGTGGAC
rs3829224	1276327	MUC5B	A>T	C/T	GTCTTGGCCATGTCCTTGCAACTGG[C/T]GGCAGTGGTTCCGTCCCGCTGGAGA
rs56123928	1276423	MUC5B	A>P	G/C	TGGCACACCCCCCACTGCCAGCCCC[G/C]CAGCCCCGGTGTCTAGCACACCCAC
rs55893724	1276432	MUC5B	V>L	G/T	CCCACTGCCAGCCCCGCAGCCCCG[G/T]TGTCTAGCACACCCACCCCCACCCC
rs56310773*	1277894	MUC5B	intronic	C/T	CTAGGTCTCAGGGCCTCTCTTGTCAT[C/T]CTGCAGGAACCAGAGCCCACAGCTG
rs55657020	1278796	MUC5B	V>M	G/A	GTGGGTCAGCAACTGCCAGTCCTGC[G/A]TGTGTGACGAGGGTTCAGTGTCGGT
rs56220864	1278912	MUC5B	E>D	G/C	TAACCGTGACCAGGCCCCGGGCCGA[G/C]AACCCCTGCTGCCCCGAGACGGTGT
rs55745110	1278961	MUC5B	intronic	G/A	TGCGGTAAGACGCTGCAGAGCAGA[G/A]GTGCCCGGCATAGGGTGAGGGGGGA
rs55856616	1280238	MUC5B	D>N	G/A	ACCTGCCTCTCTGGGGACACCCAG[G/A]ACCCAACGGTGCAATGTCAGGAGGA
rs955396	1288876	Dow nstream MUC5B	Dow nstream MUC5B	C/T	GGTGAACTGCCTTGTCTTTCTGGTGG[C/T]TTTGAGGTTTTCTCTTTCTCTTGGG

* SNPs were typed in the smaller set of controls (N=304) due to availability of DNA.

Supplemental Table 4. Coverage of LD Bins across the MUC5AC gene and MUC2-MUC5AC intergenic region. Bold red SNPs are bin tags that were genotyped in the lung-expressed gel-forming mucin screen, bold blue SNPs were also typed but are incomplete tags of the bins in which they occur.

LD Bins	SNPs in Bins
IPF LD Bin 1	**rs34664315** **rs34974357** **rs35396393** **rs35783651** **MUC5AC-020787** **MUC5AC-022754** **MUC5AC-022841** **MUC5AC-020242** **rs35288961** **rs35917282** rs36021067 rs28542750 rs28691231 rs34831688 rs35700114 rs35705491 rs35779873 rs35915689 MUC5AC-020108 MUC5AC-020659 MUC5AC-021776 MUC5AC-022025 MUC5AC-022037 MUC5AC-022052 MUC5AC-022118 MUC5AC-022467 MUC5AC-022582 MUC5AC-025581 MUC5AC-025621 MUC5AC-028300 MUC5AC-028337 MUC5AC-028341 MUC5AC-028958 MUC5AC-029387 MUC5AC-29900
IPF LD Bin 2	**rs28503875** **rs1132433** **rs1132436** rs1132434 rs28415193 rs28502687 rs28514396 rs28515631 rs28633254 rs28652890 rs28668687 rs28707071 rs28742281 MUC5AC-017163 MUC5AC-025664 MUC5AC-027924 MUC5AC-028069 MUC5AC-028679 MUC5AC-029255
IPF LD Bin 3	**rs17859812** **rs28653550** **rs28737416** rs2075841 rs2075843 rs28429550 rs28439383 rs28457780 rs28468624 rs28663568 rs72846339 MUC5AC-020635 MUC5AC-022010 MUC5AC-027765 MUC5AC-029513
IPF LD Bin 4	**rs28452143** rs28592983 rs35196910
IPF LD Bin 5	**rs28403537** rs34815853 rs34474233
IPF LD Bin 6	**MUC5AC-022503** **rs55846509**
IPF LD Bin 7	**rs55863018** rs75860061
IPF LD Bin 8	**MUC5AC-027958** rs1132435
IPF LD Bin 9	**rs55913171** rs56026134
IPF LD Bin 10	**MUC5AC-020493** **MUC5AC-025754**
IPF LD Bin 11	**rs17859811**
IPF LD Bin 12	rs55946720
IPF LD Bin 13	**MUC5AC-022675**
IPF LD Bin 14	rs72479396
IPF LD Bin 15	**rs76577728**
IPF LD Bin 16	**MUC5AC-028077**
IPF LD Bin 17	MUC5AC-020643
IPF LD Bin 18	**rs28469016**
IPF LD Bin 19	**MUC5AC-025447**
IPF LD Bin 20	**rs76498418**
IPF LD Bin 21	**rs56013970**

IPF LD Bin 22	rs80334578
IPF LD Bin 23	MUC5AC-026495
IPF LD Bin 24	**MUC5AC-028693**
IPF LD Bin 25	rs76973651
IPF LD Bin 26	MUC5AC-022177
IPF LD Bin 27	**rs35525357** MUC5AC-026581
IPF LD Bin 28	**MUC5AC-025482**
IPF LD Bin 29	**MUC5AC-024585**
IPF LD Bin 30	**MUC5AC-025618**
IPF LD Bin 31	**MUC5AC-024723**
IPF LD Bin 32	**rs78659385**
IPF LD Bin 33	MUC5AC-025433
IPF LD Bin 34	rs28534794
IPF LD Bin 35	MUC5AC-025424
Controls LD Bin 1	**rs34664315 rs34974357 rs35396393 rs35783651 MUC5AC-020787 MUC5AC-022754 MUC5AC-022841** rs36021067 rs28691231 rs34831688 rs35705491 rs35779873 rs35915689 MUC5AC-020108 MUC5AC-020659 MUC5AC-021776 MUC5AC-022025 MUC5AC-022037 MUC5AC-022052 MUC5AC-022118 MUC5AC-022467 MUC5AC-022582 MUC5AC-025581 MUC5AC-025621 MUC5AC-028958 MUC5AC-029387 MUC5AC-026581 MUC5AC-028855 MUC5AC-029323 MUC5AC-029412 MUC5AC-029900
Controls LD Bin 2	**rs28503875** **rs1132433 rs1132436** rs28668687 MUC5AC-028844 rs1132434 rs28415193 rs28502687 rs28514396 rs28515631 rs28652890 rs28707071 rs28742281 MUC5AC-017163 MUC5AC-025664 MUC5AC-027924 MUC5AC-028069 MUC5AC-029255 MUC5AC-020643
Controls LD Bin 3	**rs28653550 rs28737416 rs17859812** rs2075841 rs2075843 rs28429550 rs28439383 rs28457780 rs28468624 rs28663568 rs72846339 MUC5AC-020635 MUC5AC-022010 MUC5AC-027765 MUC5AC-029513 MUC5AC-022177
Controls LD Bin 4	**rs28452143** rs35196910 rs28592983
Controls LD Bin 5	**rs28403537** rs34474233 rs34815853
Controls LD Bin 6	**rs35288961 rs35525357**
Controls LD Bin 7	**rs55846509 MUC5AC-022503**
Controls LD Bin 8	**MUC5AC-025447** MUC5AC-025424
Controls LD Bin 9	**MUC5AC-027958** rs1132435
Controls LD Bin 10	**rs35917282** rs28542750
Controls LD Bin 11	**rs76498418**
Controls LD Bin 12	**rs74477410**
Controls LD Bin 13	rs76973651
Controls LD Bin 14	**rs56013970**
Controls LD Bin 15	**MUC5AC-022562**

Controls LD Bin 16	**MUC5AC-020242**
Controls LD Bin 17	**rs76577728**
Controls LD Bin 18	**rs28469016**
Controls LD Bin 19	**MUC5AC-020493**
Controls LD Bin 20	**MUC5AC-024585**
Controls LD Bin 21	MUC5AC-026495
Controls LD Bin 22	**rs80262142**
Controls LD Bin 23	**MUC5AC-025754**
Controls LD Bin 24	rs80334578
Controls LD Bin 25	**rs55863018**
Controls LD Bin 26	**rs56002968**
Controls LD Bin 27	**rs17859811**
Controls LD Bin 28	**MUC5AC-022675**
Controls LD Bin 29	**rs75971001**
Controls LD Bin 30	rs28534794
Controls LD Bin 31	rs72479396
Controls LD Bin 32	rs55946720
Controls LD Bin 33	MUC5AC-025433
Controls LD Bin 34	**rs55913171**
Hapmap MUC2-MUC5AC Intergenic Bin 1	**rs7112954 rs17859811** rs11602160 rs10794300 rs10902100 rs10902101 rs7130988 rs10794295 rs10902096 rs6421966
Hapmap MUC2-MUC5AC Intergenic Bin 2	**rs11245979** rs11245962
Hapmap MUC2-MUC5AC Intergenic Bin 3	**rs7927765** rs7949616
Hapmap MUC2-MUC5AC Intergenic Bin 4	**rs4077759**
Hapmap MUC2-MUC5AC Intergenic Bin 5	**rs6597976**
Hapmap MUC2-MUC5AC Intergenic Bin 6	**rs7479605**
Hapmap MUC2-MUC5AC Intergenic Bin 7	**rs3924453**

Supplemental Table 5. Oligos for Resequencing of Proximal Promoter and Exons of MUC2*.

MUC2 Region	Forward Primer 5'>3'	Reverse Primer 5'>3'	Exon Size (bp)	Amplicon Size (bp)
Promoter 1	GCCAGCAAGGGTCACACAG	AGCATCTGAGGATTCAAGGG	-	467
Promoter 2	CAGGTGTCTCCGAACCTTTG	CTGCCCACATGTCAGTCAC	-	558
Promoter 3	GTCCTCCTTGGTGTCCAGAG	CTGCCTGAAGTAATGGCCC	-	639
Promoter 4	CCAACCACATAGGGACATGG	ATGTGACCCTGGCGAAGC	-	482
Promoter 5	ATGGGCCATTACTTCAGGC	CCGTGACAAGACACTGTTGC	-	577
Promoter 6	GACTCACAAAGCCACCGTTCGAG	CAGTTGAGCCAGGAGCCCACATC	-	556
Promoter 7	CGTCACTTCAGGTGCCATGTGAC	ATCGCCACTCTGTGGCTTTC	-	483
Promoter 8	CACTGCCATCATGTTCTTGTC	CTGAGGTTACAGGCAGCCC	-	506
Promoter 9	GCCGACATTTCAGTAACCAGCAAT G	AACCAGAGCCAGCTGGGCGA	-	697
Promoter 10	GCAGCTTGTGCTCCGCTAGGAT	AACATGCCAGGGACATGCCG	-	478
Promoter 11	AGGTCAGCCAGGGAAACAG	TTACGGAATCAGGCACACAG	-	535
Promoter 12	ACCTCAGTTTACCCACTGGC	GAACACATGCAGCTACTAGAGGG	-	770
Promoter 13	TCTGACACAGCTCCATGAGCC	GGTGTGGCATCTGCCAGATGATC	-	483
Exon 1	TGAAGAAGGCTGCGTTTACC	GCTCCTTGAAAGTCAGCAGG	103	490
Exon 2	GCTTCCAGGTGCTTCTTCAG	ACCTCAAGGCTGTTCTCCTG	271	499
Exon 3	GGAGATGGACAGGTGCTCTTTGG	GTCAGAGCACTGCCCTCC	115	430
Exon 4_5	CACCTTCCTCTGGCTCAAAC	GTCAGCAGCCTCTCACACTC	91(4) 110(5)	482
Exon 5_6	TACAACGGCCTGCAGAGCTA	GAAAGCACCAGCGTGGG	110(5) 211(6)	578
Exon 7	GTGGGCTGAGAGCCCTTC	GAGGGAGAGGCACTTCTGTG	126	353
Exon 8	GAGCAGCTCGATTGTCAGG	CAGGTCTTTGCACACCCAG	118	442
Exon 9	GCACGGACACCTGTACACAC	CTCCAGCCAGAGAGCAGAAG	139	425
Exon 10	TATGTCCTGGCCAAGGTAGG	ACTTGAAGACCACCACCTGC	111	488
Exon 11	AGAATGTGAGTGGTCCTGCC	CTGGACTGTCCGAATCACTG	70	235
Exon 12	TCCGTCCTGGGTCCTCTG	GACAGGGTTGGGAAGAGTCTG	138	353
Exon 13	CAACAAAGGCCCACAGGG	AGGAGAGCCACCTCACTTCTG	165	358
Exon 14_15	GCTGCCTGGAAATTTGACTC	GTTGCTGGTTTCCTGCTACC	95(14) 127(15)	750
Exon 16	GCAGGAAACCAGCAACTCC	ATGTGAGCCTGATGCCTCTC	256	612
Exon 17_18	GTCAGGCAGGAAGAACGATG	CAGGGACAGCATCAACAGG	53(17) 101(18)	672
Exon 19	TGGGACATGACAGAGACTGC	GACATGAGAGACCACCCTGC	152	438
Exon 20	GCAGGGTGGTCTCTCATGTCAAC	CAAGTCTCAGGGTTTCTCGG	139	428
Exon 21_22	TCTCCAGATCCAAATCCCAC	TGGTCAAAGTTCCCACACAG	111(21)	745

			180(22)	
Exon 23	TCATCTGGGACAAGAGGACC	CTTGCTGTGGCAGATGCTGAAC	240	424
Exon 24	AGGACGGGTTCTAGGATGGCC	ACCTGGATGGACAAGGAGTG	157	511
Exon 25	ACTCCTTGTCCATCCAGGTG	CTCACCCTCCAGGCCAGTG	132	441
Exon 26	GTGGGAAGTTTGGGAGGAGTAT	GCATGTGCACCCATGTGGAAC	148	543
Exon 27	GCTCTGTTCCCACAGTTACAACCCA	AGGGCTGATACACATCGGAG	44	367
Exon 28	GGAATTTCCGTCACCCTCTC	AGAGGAATGCCACTGTCACC	204	561
Exon 29	GACCACAGTGGAGGATCACC	TCCATAAGCAGAGGAGTCCAG	18	389
Exon 30	TACAAGATACGTGTCAATTGTTGCT	GGTGTCACGGTTGTACTCTTTGT	885	1589
Exon 30_31	ATCACCACCACCACTACGGT	CTCCTCAGAAGGCTGTCCTATG	1589(30) 253(31)	934
Exon 32	CTGTGGTGATACTGGCCTTG	TTCTACTGCGATCTCAGCCC	198	492
Exon 33	GGGCTGAGATCGCAGTAGAAGC	ACCAGCAGGAAGTGGTGCC	224	506
Exon 34	AGGCACCACTTCCTGCTGG	CTCAGAAGTCACCCAGCCTC	175	564
Exon 35	GGCAAGTGCAGCTCAGACATCC	CCCATCCTACCTTCTAGCCC	248	556
Exon 36	GCAGTGGAGTGGAAGCAAGAAAGG	GTGTTTACACGCAGCCTCAG	184	464
Exon 37	CGGGTTCAGTCTCTGTGAGG	GACTGGAGTTCAGCAAAGGC	229	615
Exon 38	CTTGGTCTGTCCCTGAGCTG	AGGTCTAGCTTCAGGCTGGG	179	456
Exon 41	ACCTCTGATCCCTGTTGCAC	TCCATGCCAACTCAGCC	32	320
Exon 42	GATCCCTCAGCACTCTGCTC	CAGCTGTTTCCTCACTTGCC	178	408
Exon 43	CCCTGTCTTCAGAGTGCAAC	CCATCTGTGTCCCCAGAATC	105	311
Exon 44	CCATCCACTGGGTGTGC	GGCACAGGGAGAGACATGAG	41	259
Exon 44_45_46	TCTCCAACGAACGGCCTTCTC	AAGACGCCTGCTCATTTGTC	41(44) 123(45) 99(46)	832
Exon 47_48	CCTGGGCCTCACCAGGAAG	ACCCTGGTCTCATTGCGAG	129(47) 40(48)	754
Exon 49	AGCCTCCTCGAAGATGTGG	GAGTGAGGGGTGACCTTCC	127	275
Exon 50	GTCCTCATGAATCATTGCTCC	TATCTGAAGAGAGGAAGCCGAG	373	465

*** Based on UCSC gene model uc001lsx.1**

Supplemental Table 6. Oligos for Resequencing of Proximal Promoter and Exons of MUC5AC*.

MUC5AC	Forward 5'>3'	Reverse 5'>3'	Exon Size (bp)	Amplicon Size (bp)
Promoter1	TCTTTCTCTAGGCACCTGGGC	GATGGTCTCTGGCCACCAAG	-	488
Promoter2	CATAAAGAGCTTGGGACGGG	TGTGCCTTTTACTCCCCATGTC	-	758
Promoter3	GTGACTTGAACTGGCCCTGC	GTCCTCCCCACATACCCCAC	-	660
Promoter4	TAAGGAGCTTTGGATGGGGC	GCCAAGCCGTACCTGTGTG	-	650
Promoter5	CTCTACCCGGCAGACACACC	TGAGCTCCTACTTCCCTGCC	-	548
Exon 1	CTTCTGGGCACCAGGAACTC	CCTGAGGCCCACTCAGTACC	120	484
Exon 2	CCAGCACAGAGAGAGCCCTT	GCAGGTAGTGTGACCGACCA	78	403
Exon 3	CAGAATCCGGAGTTGGCTTC	CTGCCTCTGCCCTGTACCTC	60	448
Exon 4 int.	AGGAGGTACAGGGCAGAGG	ACCATCCCAGAACCCAGACT	262	365
Exon 5	GCTCCAGAGGTCAATGTCCC	GGGTGGAGTCTGACCCTG	115	376
Exon 6	CAAGAACAGGTGCCCAGACA	CTGCCTGCACTCCTGAGACA	91	462
Exon 7	CAGGACAACTCAGGCATCCA	CCCTAGGACAAAGGCCACAG	110	378
Exon 8	GAGGAACTGCTCCACTGGCT	GGTCCTTCTTCCGAGGCTTG	214	650
Exon 8 int.	CCTAGGGCATCTGTGAGGAG	AGCACAGCCCCCTAGTTGT	214	491
Exon 9	TGTGAAGACACCGACCTGCT	GGTCCTTCTTCCGAGGCTTG	126	412
Exon 10	CCGCCATGTTGTTCCCCT	CCTCCAAGCACAGAGCAGGT	118	465
Exon 11	GGGCCACCTACTCCACAGAC	GGAGCTGGAGTGCTTCCTTG	139	524
Exon 12	CTAGCACACCTCCCTCTCGG	ATGGACACAGCCAGTGTTGC	111	394
Exon 13	CAGGCACATTTCACAGCCTC	AGCTGCATGAACAGCTGCAT	70	348
Exon 14	GTGAGGGCAGTGGCTTCTTC	CTGCAGTGCCAAATGGAAGC	138	547
Exon 15	AGACCTGCGGTAAGAGGGCT	CCCTTTCTTTGACCCTGAAGC	165	474
Exon 16	ACCCTATCCCTCCTCTGTCC	AGGTTAGTCCTGCCTGCTGA	95	227
Exon 17	AAGACCTGGGATGGGAGGAC	GGGCCCTTAGAGCAACCTGT	127	329
Exon 18	AGGTCAGTGTGGCCTTGGAC	GCAGGTGCTGTGAGGAGATG	256	475
Exon 19	CTGGTAAGAGCTCCCGCTGT	GCTGCCTAGAGGGCACAAAC	53	278
Exon 21	TGTGGTGTGGGTGAGCTGTC	AGTCTGTGCCCTGCGTTTTC	152	379
Exon 22	GTAGGAAGGCTGCACCCAGT	GTGGTTCTGGGGAAGCAGAG	139	359
Exon 23	CAGGGTGCACACAGGTTGTC	GTCCCGATCACCTCCACCTT	114	465
Exon 24	TGCTTCCCCAGAACCACTGT	CACCTCCAGGTTTCCAGCC	180	481
Exon 25	GAAGGAGGAAGCAGCACCTG	ATTCCCTTCTCCCTTCTGGG	240	452
Exon 27	CTCCGTGGCACCCTGATAAT	CAGAATGTGCTGGAAGCTGG	129	418
Exon 28	CTTCCAGCACATTCTGGTGC	AGGACAGGACCCAAGCTTCA	163	333
Exon 31	AGGAAGACAGACCTGCTGGC	AGGGCTGGGAGTTGAGAAAG	7507	731
Exon 31	ACCAGATCAGGGTCCAGTGC	AGGGCATGTGTGTGGTGAAG	7507	726

Exon 31	CTGTGAAAGTCCTCGAAGCG	GTTGAAGGAGTGGTCTGGGC	7507	756
Exon 32	TCCTGGAACTTCTCTCAGCC	GCACCTCGTAGTTGAGGCAC	992	542
Exon 32	AAAGACCAGCACAAGCCATC	GGAGTAAGCCACAGAGCTGG	992	520
Exon 32	GAGATCACCAGGCTCCAGTG	CTGTGCCACAAAGAGCAGAG	992	482
Exon 33	GTGATGATGATAGGAGTCTCTGCTC	CACACACCCAGTGTCTGGAA	200	596
Exon 34	GGACTCTCGGGACTGTGACC	CCAATTCTTTTCTGCTTCAGCCAAGC	175	371
Exon 35	AGGGACAGATGTGACCTGTTG	GACCACCTTGTTGTTGAAGATG	251	491
Exon 36	GTCCATCATCCTGGAGTACCAC	CTGGTGTCTCAGGGTCACAACT	184	651
Exon 37	GACTGTCCCAGGGTTGTTCTC	GTACCAGCAGCTCTCGTTTCC	268	553
Exon 38	GAACTTGCAGAAATAAATGGATGAT	CTTCTCTCCAGGGAACTGGG	179	563
Exon 39	GCAGCTCCGGAGCAGATGTT	GGTGGCTCCAGCAGCCCAT	88	227
Exon 40	CTCCTACTGCTACGGGAATGAC	TGGAAGGAGAGAGATCTGAGGTTAC	104	436
Exon 41	ACCAACCCTATGCTCTCTACAGG	CCAATACGGACAGAGTGGGTA	32	526
Exon 42	TTGAAGCCCTACTCCTGCTG	AGGAGTGAGGCAATTAGGAGTCT	172	569
Exon 43	AACAGCCTCATCTGGAGACC	GCAGTTGCTCCAAAGTCTACCT	102	618
Exon 44	CAGAGATGAGGCTGGACAAAC	ACACTTGATAGTGGGCTGTGTCT	38	317
Exon 45	CAACTCGGCCTGGTAGGAAG	CTACTCACGTAGAAGAGGTGGG	123	452
Exon 46	ACCCAGATCTGCAACACACA	CATCCTGGTGCTTCTCACACT	99	471
Exon 47	CTCTTCTACGTGAGTAGTGGCTGC	CACTCACGGTTCTGGTACGG	120	595
Exon 48	CAGTGTGAGAAGCACCAGGAT	GATGATCAGGCTCCTATGGTACAC	70	477
Exon 49	GCTTCACCCTTAGATGGGTTT	ACCCTCAGAGCCCTTTGTCT	115	572
Exon 50	GCAGCAGCTGGTGCTGAGCA	GGCAGTGCTGGTCAGTGCATG	700	310
Exon 50	GGAGCAGGGAACACGATGAG	AGGTGACCCATAGCCCACAC	700	532
Exon 50	CCTCCCATATGTCCTCTGAGC	ATCCAAGCTCTGGCCTCTCC	700	582

*** See description in Supplementary Methods**

Supplemental Table 7. MUC2 variants identified by re-sequencing. *

Hg19 Chr11 Position	SNP Name	Base Change	AA Change	Flanking Seq
1072743	rs11604917	C/T	promoter	CTCCACCAGGGTCCCTCGAACCCCA[C/T]GGGAAAGCCACAGAGTGGCGATGGG
1072997	rs72652888	-/CT	promoter	TGGAGGCAAAGAGGCTGGGGACACT[-/CT]CGCTTTGGGGGTGCCAGTGACTCCA
1073227	rs2071172	A/G	promoter	CTGAGCCTGGGAACCACCACTGCCC[A/G]TCCAGAGGGGACACAGGGTCAGATC
1073378	rs2071173	A/G	promoter	CTGGAAAATCTCTGTCCTGAGGCCC[A/G]CCTGGGGCATGTCAGGGTCAGGGGA
1073712	rs2071174	C/T	promoter	CTTGGTGCTTTGGGCCCCGAGTCTC[C/T]ATAACTGTTGGGGTGAGTCCCTCCC
1073794	rs35123704	C/G	promoter	CATGTTCAGGCCAAAGCCAGGAACT[C/G]AACTCAGGGCCCCTCTCTATTTTCA
1074401	rs2071175	C/T	promoter	AAGGATCCCACATCCTCCCTGCCCT[C/T]GGGGAGGCCCCTTTCTGGGGTCAGG
1074742	MUC2-001817	C/T	promoter	ATAACCTGAATCAATATTTCCCCAT[C/T]GGGGCTCGGGCCCCCGCAGCTGTCT
1074873	rs72652889	A/C	promoter	TAAGGACCAGACCCCTGCCCCCGGG[A/C]GCAACCCACACCGCCCCTGCCAGCC
1075038	rs41535845	C/G	intronic	GAGTGTCCTGGGGGCAGGGCGAGGC[C/G]GGCGGGCAAGTCGCGTCTGGGAGGA
1075092	rs41369349	A/G	intronic	GCTGGTCCCAGAGTGCAGCCTGCGC[A/G]GCTCTGCTGAGGCTCCTGGCCCGGG
1075194	rs2856092	G/T	intronic	GGGGCTCCCCTGCTATTCCTTTGGG[G/T]TTGACTGCCCGACGACAGTGTGGGT
1075207	rs41443548	C/T	intronic	TATTCCTTTGGGGTTGACTGCCCGA[C/T]GACAGTGTGGGTCTTGGGGCCAGCA
1075244	rs41534944	C/T	intronic	TCTTGGGGCCAGCACCAGGTGGAAA[C/T]AGCAGGTCAGGCCCCAGTGAACTGG
1075685	rs72652890	C/T	C>C	CCCGAAACCACGGCCACAACGTCTG[C/T]AGCACCTGGGGCAACTTCCACTACA
1075712	rs72652891	A/G	K>K	GCACCTGGGGCAACTTCCACTACAA[A/G]ACCTTCGACGGGGACGTCTTCCGCT
1075747	rs2856111	C/T	P>L	GGGGACGTCTTCCGCTTCCCCGGCC[C/T]CTGCGACTACAACTTCGCCTCCGAC
1075832	rs67387045	G/T	E>D	TGAAGCGGGGTCCGGGCCAGGCTGA[G/T]GCCCCCGCCGGGGTGGAGTCCATCC
1075842	MUC2-002917	A/G	R>G	TCCGGGCCAGGCTGAGGCCCCCGCC[A/G]GGGTGGAGTCCATCCTGCTGACCAT
1075850	rs11825969	A/G	E>E	AGGCTGAGGCCCCCGCCGGGGTGGA[A/G]TCCATCCTGCTGACCATCAAGGATG
1075920	rs11825977	A/G	M>V	CCACCTGGCTGTGCTTAACGGGGCC[A/G]TGTGAGTGTGGTCGGTGGCACCCCT
1075952	MUC2-003027	A/T	intronic	TGTGGTCGGTGGCACCCCTCCCACA[A/T]CCTAGCAACGGGGGCTGATGTTTCC
1076079	rs41533552	C/T	intronic	GGGTTCAGGTCACTAATTCATTCAA[C/T]AAACACTGATGAGCCCCCACCATTC
1077446	rs34533432	C/T	intronic	CCCAGAGGCCGGCCAAGTTGGTGAC[C/T]CCAGGGCAGGAGCTGGGCCTGGCAG
1077447	MUC2-004521	C/G	intronic	CCAGAGGCCGGCCAAGTTGGTGACC[C/G]CAGGGCAGGAGCTGGGCCTGGCAGA
1077493	rs34367348	C/T	intronic	GCAGAGCCATCTCCACCACCCCAGG[C/T]GCCCAGCTTCAGTCCCCTCTGGGCG
1077595	rs72652892	C/G	intronic	AAGAGTGACCCCGATGTGCCTCCGC[C/G]AGGGTCAGCACCCCGCACTACAGCC
1077850	MUC2-004925	A/G	intronic	GGGTGGGGCAGGGCCTCGGCAGCGC[A/G]GGGCGTCGGTGCTGGACTTGGGGGG
1077944	MUC2-005019	C/T	intronic	CCTTCCCCCAAACGCACTCGGCTTC[C/T]CAGGGACCTGCCCTGCCAGGCCGCT
1078057	rs72652893	C/T	intronic	TTGGGGGTTCCTGGCGGCTGTGGGC[C/T]GGGCGGGAGGCCAGCTCACCTGCTC
1078195	rs41323748	C/T	intronic	AGAATTCCTCTCTGACGGTGAGGCC[C/T]GGAGGGCTTGGAGGGGGCAGGGTAG
1078256	rs11605271	G/T	intronic	CCCAGGAGCCCTAGCTGAAGGGCCG[G/T]GCATCCCCAGGCGTGCTCTTCAGTC
1078320	rs72652894	A/G	N>D	GAACATGCAGAAGATCAACCAGCCC[A/G]ATGTGGTGTGTGAGGATCCCGAGGA
1078393	rs7104590	T/C	intronic	TCCGAGCACGTGAGTCCCCTCGGTC[T/C]GGGGTGGGGGTCCTGGCGGAGCTGG
1078456	MUC2-005531	C/T	R>C	ATGCTCACCCTGCGTCTGTCCCCAG[C/T]GCGCCGAGTGTGAGAGGCTGCTGAC
1078518	rs72652895	G/T	P>P	TCGCGGACTGTCAGGACCTGGTGCC[G/T]CTGGAGCCGTATCTGCGCGCCTGCC
1078536	rs61732147	C/T	R>R	TGGTGCCGCTGGAGCCGTATCTGCG[C/T]GCCTGCCAGCAGGACCGCTGCCGGT

1078538	rs41501548	C/T	A>V	GTGCCGCTGGAGCCGTATCTGCGCG[C/T]CTGCCAGCAGGACCGCTGCCGGTGC
1078599	rs72652896	C/T	A>A	ACACCTGCGTCTGCAGCACCGTGGC[C/T]GAGTTCTCCCGCCAGTGCTCCCACG
1078633	rs41339051	C/T	R>W	CCGCCAGTGCTCCCACGCCGGCGGC[C/T]GGCCCGGGAACTGGAGGACCGCCAC
1078676	rs72652897	A/G	intronic	ACCGCCACGCTCTGCCGTAAGCCCC[A/G]GCGCCTTGTGGGCAGGGGACCCCAG
1079606	rs72652898	G/T	intronic	CCTTCTCGGTGCACTTCGGGGTGGA[G/T]CGGCTGCTGTGCCCCAGCCTCACCC
1079624	rs72652899	C/G	intronic	GGGTGGAGCGGCTGCTGTGCCCCAG[C/G]CTCACCCTCACTGCGTGGCCTCTGC
1079695	MUC2-006770	C/T	S>S	CCGGGAACCTGGTGTACCTGGAGAG[C/T]GGCTCGCCCTGCATGGACACCTGCT
1079696	MUC2-006771	G/A	G>S	CGGGAACCTGGTGTACCTGGAGAGC[A/G]GCTCGCCCTGCATGGACACCTGCTC
1079746	rs41359951	C/T	C>C	CACACCTGGAGGTGAGCAGCCTGTG[C/T]GAGGAGCACCGCATGGACGGCTGTT
1079757	rs72652900	A/G	H>R	GTGAGCAGCCTGTGCGAGGAGCACC[A/G]CATGGACGGCTGTTTCTGCCCAGAA
1079809	rs10902081	T/C	intronic	GTGCGTGTGGAGGATGGCCCCGCCC[T/C]GGCACTGCCCACCAGATGAGAGGCA
1079814	rs72652901	C/T	intronic	TGTGGAGGATGGCCCCGCCCCGGCA[C/T]TGCCCACCAGATGAGAGGCAGCCCT
1079854	rs7395228	A/G	intronic	GAGGCAGCCCTGGCCTGGGGTTCTC[A/G]CCTGCGCTGAGGGGACGGCTCCGCT
1079879	rs7127117	C/T	intronic	GCCTGCGCTGAGGGGACGGCTCCGC[C/T]GGGTGGTGGGGGCAGCGGCGGCACA
1079932	rs76496149	A/G	intronic	AGTGCCTCTCCCTCCACCCGATACC[A/G]GGGGAGAAGGGGCCTCGGTGTGAGG
1079936	MUC2-007011	G/T	intronic	CCTCTCCCTCCACCCGATACCGGGG[G/T]AGAAGGGGCCTCGGTGTGAGGCCCT
1079987	rs41443944	C/T	intronic	TCCCAAAGGGTGGCTTCAGGGAGGC[C/T]GGGAAGGGGGCTGCCTTCCTGGTTA
1079988	MUC2-007063	A/G	intronic	CCCAAAGGGTGGCTTCAGGGAGGCC[A/G]GGAAGGGGGCTGCCTTCCTGGTTAT
1079993	rs11245925	G/T	intronic	AGGGTGGCTTCAGGGAGGCCGGGAA[G/T]GGGGCTGCCTTCCTGGTTATCACCC
1080042	MUC2-007117	C/G	intronic	CCTGGGGACAGACCTCCTCCTGCCC[C/G]GCCCCTGGCCTGGTGCCTGAGGCCT
1080081	rs41447049	A/G	intronic	TGCCTGAGGCCTTTGGGAGCAGCTC[A/G]ATTGTCAGGGGCAGGAAGGTGGCCT
1080083	MUC2-007158	C/T	intronic	CCTGAGGCCTTTGGGAGCAGCTCGA[C/T]TGTCAGGGGCAGGAAGGTGGCCTGG
1080164	rs11245926	A/G	intronic	CAGGGACCAGGTGGGGACCGCAGGC[A/G]TCAGCACAGGGGACCAGTGGTGCCT
1080219	MUC2-007294	C/T	intronic	GTGGGAGGCCTGGCTGGCAGCCCCT[C/T]GGTGGGGATTCTGGCTCTTTCTGAG
1080223	rs41345548	G/T	intronic	GAGGCCTGGCTGGCAGCCCCTCGGT[G/T]GGGATTCTGGCTCTTTCTGAGCCAG
1080315	MUC2-007390	C/T	C>C	ATGACGACATCGGGGACAGTGGCTG[C/T]GTTCCTGTGAGCCAGTGCCACTGCA
1080391	rs41521547	A/G	K>E	GGGCCAGGAGATCACCAATGACTGC[A/G]AGCAGTGGTGAGTCCCGGGGCCAGG
1080441	rs72652902	A/G	intronic	GGCTGGGCACAGCAGAGGCTGGGGC[A/G]GCTGAGCCCTGACCCTGTGCCCCGC
1080487	MUC2-007562	A/G	T>A	CCCGCTGCCCAACAGTGTCTGTAAC[A/G]CTGGCCGCTGGGTGTGCAAAGACCT
1080522	rs41476246	C/T	P>P	GGGTGTGCAAAGACCTGCCCTGCCC[C/T]GGCACCTGTGCCCTGGAAGGCGGCT
1080576	rs41349846	A/G	T>T	ACATCACCACCTTCGATGGGAAGAC[A/G]TACACCTTCCACGGGGACTGCTACT
1080577	rs72655303	C/T	H>Y	CATCACCACCTTCGATGGGAAGACG[C/T]ACACCTTCCACGGGGACTGCTACTA
1080627	MUC2-007702	A/G	intronic	ATGTCCTGGCCAAGGTAGGCTGCCC[A/G]GGGTCTGGGGCATGGGGCAGAGCTG
1080736	rs11245927	C/G	intronic	AGAGGGTGCCTGTGGGCTGTCCTGG[C/G]GCAGGTGACCATGCTTCTGCTCTCT
1080740	MUC2-007815	A/G	intronic	GGTGCCTGTGGGCTGTCCTGGGGCA[A/G]GTGACCATGCTTCTGCTCTCTGGCT
1080846	rs11245928	A/G	intronic	GGTGCTGCCCGTCCCGGCCCTCAGC[A/G]GCTGCACTGCCTCTTGCCCCATCAC
1080894	rs41453346	C/T	Y>Y	CACAGGGTGACCACAACGATTCCTA[C/T]GCTCTCCTGGGCGAGCTGGCCCCCT
1080917	rs41442048	C/G	P>R	TACGCTCTCCTGGGCGAGCTGGCCC[C/G]CTGTGGCTCCACAGACAAGCAGACC
1080954	rs11245929	A/G	T>T	CAGACAAGCAGACCTGCCTGAAGAC[A/G]GTGGTGCTGCTGGCTGACAAGAAGA
1081002	rs41512944	-/T	intronic	AGAAGAATGTGAGTGGTCCTGCCCC[-/T]TCCTTCTGGAGCCCCAGGTCCCCCG
1081027	MUC2-008103	A/G	intronic	CTCCTTCTGGAGCCCCAGGTCCCCC[A/G]AGGGGGGCCCTTCTCAGCCCTGAGC

1081074	rs41411848	C/T	A>V	GAGCAACCTCGGCCTTCCCTGCAGG[C/T]GGTGGTCTTCAAGTCCGATGGCAGT
1081090	rs61732120	C/T	S>S	CCCTGCAGGTGGTGGTCTTCAAGTC[C/T]GATGGCAGTGTACTGCTCAACGAGC
1081112	rs41345745	C/G	Q>E	GTCCGATGGCAGTGTACTGCTCAAC[C/G]AGCTGCAGGTGAACCTGCCCCACGT
1081151	rs41464048	C/T	intronic	CCTGCCCCACGTGACCGGTGAGTTG[C/T]GCCCCAGGGAGGGGCCCGGGCCCTT
1081181	MUC2-008257	C/T	intronic	CAGGGAGGGGCCCGGGCCCTTCGAG[C/T]TCCACTGGGCCTGCAGTGATTCGGA
1081182	MUC2-008258	G/T	intronic	AGGGAGGGGCCCGGGCCCTTCGAGC[G/T]CCACTGGGCCTGCAGTGATTCGGAC
1081277	rs41352846	A/G	intronic	CGGGGGGAGGGTCCCTGCGGCACCC[A/G]GCAGGCTCCGTCCTGGGTCCTCTGC
1081287	MUC2-008363	A/G	intronic	GTCCCTGCGGCACCCAGCAGGCTCC[A/G]TCCTGGGTCCTCTGCTGGAGGGGGT
1081351	rs10902082	A/G	intronic	CACCCTCCCGCTGCTCACCTGGGCC[A/G]GGCAGGTCCCGGGAGCCCCGCCCCT
1081371	rs77049732	A/G	intronic	GGGCCAGGCAGGTCCCGGGAGCCCC[A/G]CCCCTCGCCATGCCCCTTACTGTGT
1081381	rs10902083	A/G	intronic	GGTCCCGGGAGCCCCGCCCCTCGCC[A/G]TGCCCCTTACTGTGTCCCTCATCGT
1081385	MUC2-008461	A/C	intronic	CCGGGAGCCCCGCCCCTCGCCATGC[A/C]CCTTACTGTGTCCCTCATCGTGCCC
1081392	rs10902084	C/T	intronic	CCCCGCCCCTCGCCATGCCCCTTAC[C/T]GTGTCCCTCATCGTGCCCCTGCCCA
1081467	rs72655306	C/T	S>S	CGTCTTCCTACCACATCATGGTGAG[C/T]ATGGCCATTGGCGTCCGGCTGCAGG
1081480	rs72655307	A/G	I>V	CATCATGGTGAGCATGGCCATTGGC[A/G]TCCGGCTGCAGGTGCAGCTGGCCCC
1081483	rs72655308	C/T	R>W	CATGGTGAGCATGGCCATTGGCGTC[C/T]GGCTGCAGGTGCAGCTGGCCCCAGT
1081573	rs72655309	C/T	intronic	GCAGGTGCAGGGTAAGTGGCCCCAC[C/T]GGGGTTGCCCCAACAAAGGCCCACA
1081577	rs12416873	A/G	intronic	GTGCAGGGTAAGTGGCCCCACCGGG[A/G]TTGCCCCAACAAAGGCCCACAGGGG
1081757	rs57737240	C/G	T>S	GCCAACACCTGGAAGGCACAGTCAA[C/G]CTGCCATGACAAGCTGGACTGGTTG
1081831	MUC2-008907	A/G	intronic	CGAGAGCGGTGAGGCTCGGCAACAC[A/G]GGCGCCCCCACCTAGCGTGCCTAGG
1081886	rs72655310	C/T	intronic	CCGGCCCATGGCCTGGAAGGGCAGA[C/T]GGGGCTCCCAGCAGGAAGCATGGGT
1082007	MUC2-009083	C/T	intronic	GTTTATGGCGGCCATGGTGGCAGCC[C/T]GCCAGGTGACCTGGAAGAGGGCCTG
1082315	rs58179195	C/T	L>L	ACTACGCCGAGCACTGGTGCTCCCT[C/T]CTGAAGAAGACAGAGACCCCCTTTG
1082378	rs72655311	C/T	Y>Y	CGGCTGTGGACCCTGCTGAGTATTA[C/T]AAGGTGGGTGGGACCCACACCCCCA
1082419	rs11820653	A/G	intronic	CACACCCCCAGGCCCCCATGCCATC[A/G]AGGTGGACTCAGGGCACCCCCAGCC
1082424	rs41401046	A/G	intronic	CCCCAGGCCCCCATGCCATCGAGGT[A/G]GACTCAGGGCACCCCCAGCCCCCCA
1082491	rs72655312	C/T	intronic	GACTCAGAGCACCCGGTTGGGCCCA[C/T]TGGTTGCTGTGTGTGCGTGTGAGCT
1082520	rs11245930	A/G	intronic	TTGCTGTGTGTGCGTGTGAGCTTGC[A/G]TCTGTGAGCGCCGGGCCACACTCTG
1082533	rs41343848	A/G	intronic	GTGTGAGCTTGCATCTGTGAGCGCC[A/G]GGCCACACTCTGCCTCCCTGCCTCA
1082582	rs7952257	A/G	intronic	CACTGCCCGTCCACCTTGCTCTGTC[A/G]CCCAGAGGTGCAAATATGACACGTG
1082605	rs41480348	A/G	T>T	TCGCCCAGAGGTGCAAATATGACAC[A/G]TGTAACTGTCAGAACAATGAGGACT
1082819	rs41420644	C/T	intronic	GCACGGGTGGTCCAGGGAGAGGGGT[C/T]GGCCCCCTGCAGCCACGGACCAGGC
1082857	rs11245931	A/G	intronic	CCACGGACCAGGCTCCAGCTTCGTC[A/G]GCCGGTGGTAGCAGGAAACCAGCAA
1082899	MUC2-009976	C/T	intronic	AACCAGCAACTCCTATAGCAAGGGG[C/T]GGCCACGTAGCAGGGGCAGAACCTG
1082932	MUC2-010009	C/T	intronic	TAGCAGGGGCAGAACCTGGGGTGGG[C/T]CTGGAGCTGTGGCGGCCGAGTGTGG
1082982	rs11245932	C/T	intronic	GGAGTGGGTCCCAGAGTGTGCACTC[C/T]CTGGCCCCCTGGCCACCCTGGGGAT
1082989	rs72655313	A/C	intronic	GTCCCAGAGTGTGCACTCCCTGGCC[A/C]CCTGGCCACCCTGGGGATGGGAGCT
1083293	rs7394853	C/T	D>D	GCGGTCTCTACCTGGAGGCGGGGGA[C/T]GTGGTCGTCAGGCAGGAAGAACGAT
1083323	rs72655314	G/T	intronic	TCGTCAGGCAGGAAGAACGATGGTG[G/T]GTACCTGCTCGGGGGTCAGGTGTGG
1083364	rs7396030	A/G	intronic	TCAGGTGTGGCGTGGGGGCGGGGGA[A/G]CTCCTTCTGAACCTGCCCCAAGCGG
1083495	rs11245933	G/T	intronic	AGGCTCACATCTGCGGGGAAGCTGC[G/T]GGCTGTCTGTGGCCGTCCTGCATGG
1083509	rs41534047	C/T	intronic	GGGGAAGCTGCGGGCTGTCTGTGGC[C/T]GTCCTGCATGGGCCCCGCTCATCCC

1083511	rs41400253	C/T	intronic	GGAAGCTGCGGGCTGTCTGTGGCCG[C/T]CCTGCATGGGCCCCGCTCATCCCTG
1083569	rs72655315	C/T	L>L	CCACAGTGTGTGCCGGGATGGGCGG[C/T]TGCACTGTAGGCAGATCCGGCTGAT
1083700	rs11245934	C/T	intronic	CCCCTCCCGGGCCTGCCTGAGACCC[C/T]CAGCTTCAGCTGGAGCTGAGGTGGC
1083726	MUC2-010803	C/T	intronic	CAGCTTCAGCTGGAGCTGAGGTGGC[C/T]CCTCCGTCCCACAGGCTGCACGGCC
1083733	rs72655316	C/T	intronic	AGCTGGAGCTGAGGTGGCCCCTCCG[C/T]CCCACAGGCTGCACGGCCCCAAAGA
1083946	rs11245935	C/T	intronic	GGGTCTGGGTGCCGAGTCCTGAGGA[C/T]GCAGGCCCTGTTGATGCTGTCCCTG
1084144	rs55668297	C/T	intronic	GGTCTGGGACATGACAGAGACTGCA[C/T]GGTCAGGCCTTTCCTGGTTGCACAT
1084278	rs61732128	A/G	N>D	GTGTGTCAGTGGCTGTGTGTGCCCC[A/G]ACGGGCTGATGGATGACGGCCGGGG
1084280	rs61732127	C/T	D>D	GTGTCAGTGGCTGTGTGTGCCCCGA[C/T]GGGCTGATGGATGACGGCCGGGGTG
1084362	rs11245936	A/G	S>G	CCATAACAACGACCTGTATTCTTCC[A/G]GCGCCAAGATCAAGGTGGACTGCAA
1084564	rs10794286	C/T	intronic	GGGCAGGGTGGTCTCTCATGTCAAC[C/T]GCTGGTCTTGAAGCCATGGGAGAAG
1084585	rs10794287	A/G	intronic	CAACTGCTGGTCTTGAAGCCATGGG[A/G]GAAGGGACATTTGGAGCCACTTTTG
1084821	rs10794288	C/T	D>D	GGAGTGGCCACTACATCACCTTTGA[C/T]GGGAAGTACTACGACTTTGACGGAC
1084848	MUC2-011925	C/T	H>H	GGAAGTACTACGACTTTGACGGACA[C/T]TGCTCCTACGTGGCTGTTCAGGTGT
1085798	rs72655317	A/G	I>V	CTCATTCAGCATCATCACCGAGAAC[A/G]TCCCCTGTGGCACTACGGGCGTCAC
1085879	rs41410644	A/G	intronic	GGTGAGTGCTGCTGGCCCTGGGGAC[A/G]CGTGAGCCCTGCGGGACCCTCAGAC
1086032	rs7394667	C/G	L>V	CACCACGCGGGAGGTGGGCCAGTAC[C/G]TGGTGGTGGAGTCCAGCACGGGCAT
1086051	rs72655318	C/T	T>M	CAGTACCTGGTGGTGGAGTCCAGCA[C/T]GGGCATCATCGTCATCTGGGACAAG
1086067	rs72655319	A/C	I>I	AGTCCAGCACGGGCATCATCGTCAT[A/C]TGGGACAAGAGGACCACCGTGTTCA
1086155	rs74045940	A/G	intronic	TGCCTGCCCTGCCCCCTCCTGGCCA[A/G]CCCCCCACCCCCTGCCCTGGTGTTT
1086163	rs7926689	A/C	intronic	CTGCCCCCTCCTGGCCAGCCCCCCA[A/C]CCCCTGCCCTGGTGTTTGCAGGACA
1086176	MUC2-013253	A/T	intronic	GCCAGCCCCCCACCCCCTGCCCTGG[A/T]GTTTGCAGGACAAGCCCCTGTCCTC
1086182	rs73408597	C/T	intronic	CCCCCACCCCCTGCCCTGGTGTTTG[C/T]AGGACAAGCCCCTGTCCTCCCTCCA
1086290	rs41409547	A/G	N>S	TGTGGGAACTTTGACCACCGCTCCA[A/G]CAACGACTTCACCACGCGGGACCAC
1086418	rs41414444	C/T	R>C	CGAGCCCTGCAGCCTGAACCCGCAC[C/T]GCCGCTCCTGGGCCGAGAAGCAGTG
1086993	rs41334050	C/T	intronic	CCCTGCTGCGTCACGCACCACACGG[C/T]GCTTGTCCTCCAGCTTTGGCTCTGG
1087015	MUC2-014092	C/G	intronic	CGGCGCTTGTCCTCCAGCTTTGGCT[C/G]TGGCCGCTGCCTCCTTTGGTCACAT
1087021	rs41405245	A/G	intronic	TTGTCCTCCAGCTTTGGCTCTGGCC[A/G]CTGCCTCCTTTGGTCACATGACCGT
1087045	MUC2-014122	A/G	intronic	CGCTGCCTCCTTTGGTCACATGACC[A/G]TATAATCGGCCTCCCCTCTGAGACC
1087055	rs41353244	C/T	intronic	TTTGGTCACATGACCGTATAATCGG[C/T]CTCCCCTCTGAGACCCTGGGCTGGA
1087070	rs41441953	C/G	intronic	GTATAATCGGCCTCCCCTCTGAGAC[C/G]CTGGGCTGGACCCCCGGCCTCCCTC
1087129	rs41377945	A/G	intronic	CAGGCTCAGATATTCACCCGGAGGG[A/G]GAAAGGACATGTGTCCCCCATGCCC
1087300	rs41508845	C/T	intronic	ACCCTCTCCCCAAGGTTGGCCCTGC[C/T]GGGGCCCTGGCTGGCTGGTGCTGGG
1087304	rs72655320	G/T	intronic	TCTCCCCAAGGTTGGCCCTGCCGGG[G/T]CCCTGGCTGGCTGGTGCTGGGTAAT
1087410	rs10751639	C/G	intronic	GGAAGTCCTGGCTCCATGAGGGCAG[C/G]ACGGGCCCAGGACAGACCAGGGTGT
1087412	MUC2-014489	C/T	intronic	AAGTCCTGGCTCCATGAGGGCAGGA[C/T]GGGCCCAGGACAGACCAGGGTGTTC
1087522	rs41421946	C/T	F>F	ACACGGGTGGGGACTGTGAGTGCTT[C/T]TGCTCTGCCGTGGCCTCCTACGCCC
1087615	rs72655321	C/T	intronic	CGGACCTGTGCCGTAAGAGCCTGCC[C/T]GAACTGCACTCAGGGCCGGGACGGG
1087621	rs72655322	A/G	intronic	TGTGCCGTAAGAGCCTGCCCGAACT[A/G]CACTCAGGGCCGGGACGGGGGCTGG
1087630	MUC2-014707	A/G	intronic	AGAGCCTGCCCGAACTGCACTCAGG[A/G]CCGGGACGGGGGCTGGGAGGTGCTG
1087786	rs41443848	A/G	intronic	CGGGTTGGCAGAGCAAGCTTGATGC[A/G]TCTGCGTCCCAGCCCCCGACCCCAG
1087972	rs10902088	C/T	N>N	GCTTCGAGACCTGCAGGACCATCAA[C/T]GGCATCCACTCCAACATCTCCGTGT

1088025	rs41391551	C/T	intronic	TACCTGGAGGGTGAGCAGGGTGGGG[C/T]GGGCTTCAGCGGGGGTGATGGCCGA
1088049	rs61870067	A/G	intronic	GCGGGCTTCAGCGGGGGTGATGGCC[A/G]AGGGGCCTGGAGGCTGAGTGGGGCA
1088058	rs41384645	A/G	intronic	AGCGGGGGTGATGGCCGAGGGGCCT[A/G]GAGGCTGAGTGGGGCAGCCCTCGGG
1088080	MUC2-015157	C/T	intronic	CCTGGAGGCTGAGTGGGGCAGCCCT[C/T]GGGAGAGGCAACAGTCCACTGGCCT
1088141	MUC2-015218	A/G	intronic	CCAGGCGGCCCTCGGGGGAGGCTAC[A/G]GCCGACGGGCCTGGCACTGTGGGGC
1088145	rs11245940	A/G	intronic	GCGGCCCTCGGGGGAGGCTACGGCC[A/G]ACGGGCCTGGCACTGTGGGGCTGAA
1088207	rs12222144	C/G	intronic	GGAGACCCATGGGGACACCCGGAGG[C/G]AGGCCTGACCCTCAGGGTACCCACA
1088328	rs11245941	A/G	intronic	GCAGGGGTGGGAGGTGCTGAGGTTC[A/G]TGCAGAGCAGGGCGGGTTGGGGAGC
1088508	rs72655323	C/T	intronic	GGGACTCAGGGCTGCTCGGGGGGCC[C/T]GATGAGACTGGGCAGGGCTCCTCAG
1088642	rs41400347	C/T	intronic	AGAGAAGGGCCTGCCAGGGTAGGGA[C/T]GGTGGGTGGGGTGTGGTGGACTGCG
1088815	rs7103978	A/G	A>A	AGGACACCCACTACCCACCTGGAGC[A/G]TCGGTTCCCACCGAGGAGACCTGCA
1088835	rs41389046	C/T	T>I	GGAGCATCGGTTCCCACCGAGGAGA[C/T]CTGCAAGTCCTGGTACCTAAGCCCA
1088893	MUC2-015970	C/G	intronic	GGGGGCCTGGGGGAGCTGCACATAT[C/G]GGCACATGAGTACACACACACGTGT
1088897	rs72655324	A/C	intronic	GCCTGGGGGAGCTGCACATATGGGC[A/C]CATGAGTACACACACACGTGTGAGC
1088976	rs41525349	A/G	intronic	AACCGTTCCACATGGGTGCACATGC[A/G]CACAAACGCACACAGCATACCACGT
1089005	MUC2-016082	C/T	intronic	AAACGCACACAGCATACCACGTGCA[C/T]ACACACGGTCACATGCATGCATGGT
1089007	MUC2-016084	-/CACA	intronic	ACGCACACAGCATACCACGTGCACA[-/CACA]CGGTCACATGCATGCATGGTGCACA
1089094	MUC2-016171	A/G	intronic	ACACACAGTCACACATGCACACAGC[A/G]CACACATGGACACATGCCTAGACGC
1090193	rs12222912	A/G	intronic	GCTCTGTTCCCACAGTTACAACCCA[A/G]TGGGGGGCTCTTCCGGAGCTGGCTT
1090289	rs41503748	A/G	intronic	GAAGCTGGGGGTCTGAGCAGCGTGG[A/G]CGCGTTGTCAGTGGAGTGGGACTTG
1090293	rs72655325	A/G	intronic	CTGGGGGTCTGAGCAGCGTGGGCGC[A/G]TTGTCAGTGGAGTGGGACTTGTAGC
1090343	rs12221966	C/T	C>C	CCATGTGCTTGCTTTGCAGCGTGTG[C/T]ACCAACTCCTCCCAAGTCGTCTGCA
1090470	MUC2-017547	C/T	intronic	TTGGATCGGTGGGGGGTGCTGGTCT[C/T]CTCCTGGGCTCTGCCCCTTTGGTCC
1090501	rs35179278	A/C	intronic	GGGCTCTGCCCCTTTGGTCCCCCCC[A/C]AGCTCAGACCCACCTCCGATGTGTA
1090535	MUC2-017612	A/G	intronic	CCCACCTCCGATGTGTATCAGCCCT[A/G]GGGGGCTGCTGTGACCCATTTTGTT
1090625	MUC2-017702	A/G	intronic	CCCTCTCCCGTGATCCAGCTTCTGC[A/G]TTCTGATGAGATTCCCTTTATTCAA
1090731	rs41493045	C/T	intronic	GGGGGCTCGGGCACACCTGGCCTTC[C/T]TCCTATCTTGCTCCTGATGAGGTGA
1090736	rs41458446	A/G	intronic	CTCGGGCACACCTGGCCTTCTTCCT[A/G]TCTTGCTCCTGATGAGGTGATTCTT
1090844	rs72655326	A/G	R>G	CTACTGGGAGATCTGTGGCCCCAAC[A/G]GGACGGTGGAGAAGCACTTCAACAT
1090933	rs41455844	A/C	T>T	TCACCACCATCACCCTCCCCACCAC[A/C]CCCACCACCTTCACCACTACCACCA
1090934	rs41426647	A/C	T>P	CACCACCATCACCCTCCCCACCACC[A/C]CCACCACCTTCACCACTACCACCAC
1090952	rs72655327	-/ACC	Del>T	CACCACCCCCACCACCTTCACCACT[-/ACC]ACCACCACCACCACCCCGACCTCCA
1090970	MUC2-018056	-/ACC	Del>T	CACCACTACCACCACCACCACCACC[-/ACC]CCGACCTCCAGCACAGGTAAGGCCC
1091017	rs72655329	C/T	intronic	CCCCCTGGTTCCCTCCATGCTTCCT[C/T]GGGCTCTCACCTTCCCCTGCATCCA
1091043	MUC2-018120	A/G	intronic	GGGCTCTCACCTTCCCCTGCATCCA[A/G]CATCCAGCACAGAGGGCTCTTTCGG
1091080	rs41414549	A/G	intronic	GAGGGCTCTTTCGGGGGCAGGCCCC[A/G]GCCTGGTGCAGCCAGGCTGTGACCC
1091175	rs78098804	A/G	intronic	ACTGAGGTGTGAGGGGGCCTGCCCT[A/G]GCTCCCCTGGCCTGGTGCATTGAGA
1091333	rs11821453	G/T	intronic	TTATGTTCCCCTGCGTTTGTTCTGG[G/T]TGAAATCCTAGCTACCACTGAACAA
1091365	rs72655330	A/G	intronic	CCTAGCTACCACTGAACAAGCCACC[A/G]GGGGTATGATAGCCACAGAAAAAAG
1091375	rs72655331	C/T	intronic	ACTGAACAAGCCACCAGGGGTATGA[C/T]AGCCACAGAAAAAAGAAACTTTTTT
1091387	MUC2-018464	A/C	intronic	ACCAGGGGTATGATAGCCACAGAAA[A/C]AAGAAACTTTTTTTAAAAAAGGCAA

1091395	rs72655332	A/T	intronic	TATGATAGCCACAGAAAAAAGAAAC[A/T]TTTTTTAAAAAAGGCAAGATTTTAA
1091455	rs41418747	C/T	intronic	AACTATATAATGATATCCTCTTTTC[C/T]TCCTGCTTTATTGCAGTTTTATCAA
1091656	MUC2-018733	G/T	intronic	ATGTATTTTGGCCACTTCATTCATG[G/T]TTTGCTGAGGCCAGGGGCTAAAGTG
1091713	rs41431149	A/T	intronic	GATTGGCTGTCGGTGACAATATTGC[A/T]GGTTAAGAGTGGAGACAAAGCCCCT
1091751	rs41350844	C/T	intronic	AGACAAAGCCCCTTCCGTCACACTT[C/T]CTTACTGGAATGGGAAGCTCTCTTG
1091763	rs41533851	G/T	intronic	TTCCGTCACACTTCCTTACTGGAAT[G/T]GGAAGCTCTCTTGTTATTGATTCTT
1092031	rs41401547	G/T	intronic	TCTGAATCCTGGTGGCTTCCTGGAG[G/T]TGCCTCTCCCCAGGTGTGAGAGACA
1092388	MUC2-019465	A/C	T>P	GTGTATCACCACTCCCAGCCCTCCA[A/C]CTACCACTCCCAGCCCTCCACCAAC
1092789	rs12804894	A/C	T>T	CCACCACAACCACCCCTCCACCAAC[A/C]ACCACTCCCATCACCACCACCACCA
1092795	rs12786761	A/T	T>T	CAACCACCCCTCCACCAACCACCAC[A/T]CCCATCACCACCACCACCACGGTGA
1092803	rs12804904	C/G	T>S	CCTCCACCAACCACCACTCCCATCA[C/G]CACCACCACCACGGTGACCCCAACC
1092813	rs12577898	C/T	T>T	CCACCACTCCCATCACCACCACCAC[C/T]ACGGTGACCCCAACCCCAACACCCA
1092859	rs12786542	A/T	T>S	ACCCACCGGCACACAGACCCCAACA[A/T]CGACACCCATCACCACCACCACCAC
1092882	rs12573875	C/T	T>T	CAACGACACCCATCACCACCACCAC[C/T]ACGGTGACCCCAACCCCAACACCCA
1092928	rs12791677	A/T	T>S	ACCCACCGGCACACAGACCCCAACA[A/T]CGACACCCATCACCACCACCACTAC
1093631	rs56282171	C/G	T>S	CAGACCCCAACCATGATACCCATCA[C/G]CACCACCACTACGGTGACCCCAACC
1093641	rs9735156	C/T	T>T	CCATGATACCCATCAGCACCACCAC[C/T]ACGGTGACCCCAACCCCAACACCCA
1093709	rs72655333	C/T	P>L	CCCCCCACCCACACAAGCACAGCAC[C/T]CATTGCTGAGTTGACCACATCCAAT
1093710	rs7944723	C/G	P>P	CCCCCACCCACACAAGCACAGCACC[C/G]ATTGCTGAGTTGACCACATCCAATC
1093769	rs41361144	A/G	Q>R	GAGTCCTCAACCCCTCAGACCTCTC[A/G]GTCCACCTCTTCCCCTCTCACGGAG
1093814	rs72655334	C/G	T>S	ACGGAGTCAACCACCCTTCTGAGTA[C/G]CCTACCACCTGCCATTGAGATGACC
1093865	rs41329651	C/T	T>M	AGCACGGCCCCACCCTCCACACCCA[C/T]GGCACCCACGACCACGAGCGGAGGC
1093897	rs72655335	C/G	L>V	CACGACCACGAGCGGAGGCCACACA[C/G]TGTCTCCACCGCCCAGCACCACCAC
1093921	rs41444845	A/T	T>S	ACTGTCTCCACCGCCCAGCACCACC[A/T]CGTCCCCTCCAGGTAAGCAGAGCTG
1093945	rs7934606	C/T	intronic	CACGTCCCCTCCAGGTAAGCAGAGC[C/T]GCTTGGTTCCTCTGGCCTGGGATGC
1093969	rs72655336	C/G	intronic	CTGCTTGGTTCCTCTGGCCTGGGAT[C/G]CTTCTTCCTCCCCTTGTGCCGGGCA
1094031	rs41368148	A/G	intronic	GGAAGGCTCAAGGCACGTTCTGGGC[A/G]CCTCTCTGCCCACGAAGCTTGGTCA
1094107	MUC2-021184	A/G	intronic	TGGCCAGTGCTGGGCAGTGAAGCCA[A/G]AGGCCATTCCGCTTGCCCATAGGAC
1094129	rs61547621	A/G	intronic	CCAAAGGCCATTCCGCTTGCCCATA[A/G]GACAGCCTTCTGAGGAGCTGCTGAC
1094157	rs61044527	C/T	intronic	CAGCCTTCTGAGGAGCTGCTGACAC[C/T]GGCCAGTGCTGGGCAGTGGAGCCCT
1094158	rs41443346	A/G	intronic	AGCCTTCTGAGGAGCTGCTGACACC[A/G]GCCAGTGCTGGGCAGTGGAGCCCTT
1094237	MUC2-021314	A/T	intronic	TTCTTCAGGGGCCCACTGCTATGTG[A/T]TGCGGTGCTGTGGGAGCCCATCAAG
1094241	rs41387948	A/G	intronic	TCAGGGGCCCACTGCTATGTGATGC[A/G]GTGCTGTGGGAGCCCATCAAGGCTG
1094357	rs10902089	A/G	intronic	TTGGGGCCTTTTCCTGGTGGACGGC[A/G]TGCCACAGCCAGTGCCTTCTGGACG
1094629	rs11245950	C/T	intronic	ACCCTGTGGCATCTGAGATGTGCAA[C/T]GTCTCAGCCCTCACTGGTGTCTCCT
1094663	rs72655337	A/G	intronic	CCTCACTGGTGTCTCCTGCTCTCAC[A/G]GGCACCCCCACTCGCGGTACCACGA
1094680	rs41359254	G/T	G>V	GCTCTCACAGGCACCCCCACTCGCG[G/T]TACCACGACCGGGTCATCTTCAGCC
1094690	rs10794291	C/T	T>T	GCACCCCCACTCGCGGTACCACGAC[C/T]GGGTCATCTTCAGCCCCCACCCCCA
1094753	rs10794292	A/C	P>P	CGACCACCACCAGTGCCTGGACCCC[A/C]ACGCCGACCCCACTCTCCACACCCA
1094761	rs41376152	A/C	N>T	ACCAGTGCCTGGACCCCAACGCCGA[A/C]CCCACTCTCCACACCCAGCATCATC
1094843	rs41417150	C/T	N>N	CTGTGCTTATCTGCTGTGTCCTGAA[C/T]GACACCTACTACGCACCAGGTACTC
1094868	rs35911093	C/G	intronic	CGACACCTACTACGCACCAGGTACT[C/G]AGGCTGTTCACATCCTGTGCTTGGG

1094978	rs7121670	A/G	intronic	AGAAGCGTCTCAGGAGGCAGCAGCC[A/G]TCGAGGGTGGCTGTGTCCAGGGCAC
1095079	rs41419247	C/T	intronic	GGGGTCCAGCGGCTAGCCCTGCCTC[C/T]GGATAGCCCTGCCTCTGGACGGTGT
1095082	rs6597999	A/C	intronic	GTCCAGCGGCTAGCCCTGCCTCCGG[A/C]TAGCCCTGCCTCTGGACGGTGTGAT
1095100	rs41346247	A/G	intronic	CCTCCGGATAGCCCTGCCTCTGGAC[A/G]GTGTGATCGTGGGTCTGTCTCCCTT
1095109	rs41439848	A/G	intronic	AGCCCTGCCTCTGGACGGTGTGATC[A/G]TGGGTCTGTCTCCCTTCGCAGGTGA
1096494	rs6421972	C/T	C>C	GCGATCCCAACGACAAGGTGTCCTG[C/T]CCCCGCACCCTCATCGTGCGCCACG
1096700	rs11245951	C/T	intronic	TGCCAAGGCATAGCCTCTCCTAGAG[C/T]TGGGCTAGAAGGTAGGATGGGGTGG
1096778	rs76658708	C/T	intronic	TTCCTGCAGGCCCTCCAGGTGTGTC[C/T]TGGGCCCCTCGAGCCCTGGCACCAT
1096984	rs41441551	C/T	intronic	GTCCCCAGGTGCTCCCAGGAGAGCT[C/T]CTTCACTGGCTCACCCATGGGACCA
1097145	rs72655338	C/T	intronic	CCTGGAGCTCTCACAAGGAGAGGAC[C/T]GAGGCAGCTGCAGCTCCCATGGTGT
1097358	rs72655339	C/T	G>G	ACCGGTTTGGCAACAACACCAAGGG[C/T]CAGTGTGgtgagttccgtgaccccc
1097414	rs72655340	A/G	intronic	CCCCGAGGCCCCCACGGCTCCCACC[A/G]TCCCCTGTGCCCCCATGTCCTGCCC
1097749	rs41386154	A/C	N>T	CTGCCCAGCGGGGAGATCGTCTCCA[A/C]CTGTGAGGCTGCGGCTGACCAGTGG
1097784	rs72655341	A/G	N>D	TGCGGCTGACCAGTGGCTGGTGAAC[A/G]ACCCCTCCAAGCCACACTGCCCCCA
1097975	rs10902090	C/T	intronic	CACCAATAAGCTGAGGGCCTCTGTG[C/T]CCCAGCCCCCAGCTCTTGCAAAGAG
1098069	rs72655342	C/T	intronic	ACGGAGCCGCGGAACCAGGATCAGG[C/T]GCTAGGTCGCCGTGGGGTCCAGGAC
1098173	MUC2-025250	C/T	intronic	CTGAACTCCAGTCTCTCCTGGCTCC[C/T]GGGAAGGTGCAGGGCTGGCCGAGTG
1098193	rs41417545	C/T	intronic	GCTCCCGGGAAGGTGCAGGGCTGGC[C/T]GAGTGTGAGGCCCGGAGTAAACCAG
1098337	rs34434067	A/G	intronic	TCAGCATCCTGTCCCTGGAAGTATA[A/G]GGGCCAGGTATAGGCTGGGTGTCCA
1098410	MUC2-025487	C/T	intronic	GTCCTGAAGCTGATGACCACATAGA[C/T]GTGGTTTCTATCTCTGGGAGCCGGG
1098522	rs11245952	C/T	intronic	CTGTCCCTTGACCCTCCATCAGCCA[C/T]AGGCGCCTCTCTGGCGGGTGCCGGA
1098627	rs41428246	C/T	intronic	GGTGCCACCTGAGTGTGACCTGTGC[C/T]TCTCCCTGCACAGCCTGTTTGCCCA
1098637	rs12418069	A/G	intronic	GAGTGTGACCTGTGCCTCTCCCTGC[A/G]CAGCCTGTTTGCCCAGTGCCACGCA
1098649	rs72655343	A/C	D>A	TGCCTCTCCCTGCACAGCCTGTTTG[A/C]CCAGTGCCACGCACTGGTGCCCCCG
1098846	rs41508151	C/G	intronic	TAAGTGCCCATCTGCCCCTGCCCTG[C/G]AGCTGGGGGCCTGCAGGCCAGACGT
1098939	rs10794293	C/T	intronic	GACCTAGATGGGCTGCGGCCAGGGA[C/T]GCAGAGATGGCGGGTGTGAGACCAG
1098951	rs41433544	A/G	intronic	CTGCGGCCAGGGATGCAGAGATGGC[A/G]GGTGTGAGACCAGGGCTGGGGCCAT
1099107	MUC2-026184	A/C	intronic	GGAGGTTGATGCCCAGGCAGCTGGT[A/C]ACCCTCCTCCGTGTGTGGGGCACTG
1099308	rs7952343	C/T	intronic	ATGTTGTTTGAGGGTCCACCAGGAC[C/T]GTGGGCTCGCCTTCTGCAGTGCGGA
1099316	rs41531445	C/T	intronic	TGAGGGTCCACCAGGACCGTGGGCT[C/T]GCCTTCTGCAGTGCGGAGGGTGGCA
1099339	rs72655344	G/T	intronic	CTCGCCTTCTGCAGTGCGGAGGGTG[G/T]CATCATCTGGGCATAGCAGTCCCAC
1099385	rs41362350	C/T	intronic	CCCACCTGCCAGCTCCCCAGCCCCA[C/T]CCCACCTGTCTGACAATGCCCTCCC
1099523	rs72655345	C/T	intronic	GATGTCTGCGTGAAGACCTGCGGTA[C/T]GCCACCCACTCACACTGTCCCCTCC
1099696	rs72655346	C/G	intronic	TGGAGGCTGGGACCAGGAGGCTGAC[C/G]ACCCCCACCCCTGCTCCCTGCTGCA
1099908	rs72655347	C/T	intronic	AGATTGAGGAATGAGGTCATCTAAG[C/T]CCTGGATGGCTGAGTTGGCATGGAC
1100545	rs10902091	C/T	intronic	ACCATCCACCCACCATCCACCCATT[C/T]ATCCATCCATTCTCCCTCCCTCCAT
1100640	rs11245953	G/T	intronic	ATGACATCTTGGCCACCTCTGTGCT[G/T]CCCATGCCTCCTACCTGTGGTAGCA
1100905	rs7396585	A/G	intronic	CTGCTCAGGGTGGCTGTTTCTCCCC[A/G]CTGACCACAGCTGCAGCTCCGGGGC
1100938	rs72655348	A/C	intronic	CAGCTGCAGCTCCGGGGCTGTGGTG[A/C]GGTGGGGCCTGCCTGGTGCCACCTG
1101078	rs11245954	A/G	S>G	CATCATCTGCCAACCCAAGAGGTGC[A/G]GCCAGAAGCCCGTTACCCACTGCGT
1101143	rs41501545	C/T	A>A	ACCTCGCCACGGAGGTCAACCCTGC[C/T]GACACCTGCTGCAACATTACCGTCT
1101211	MUC2-028288	-/G	intronic	TGGGGCCCATGCCACCTCTCAGGGG[-/G]TGCACACATCCCTGTAGGCTGGGCT

1101226	rs41497751	A/G	intronic	CTCTCAGGGGTGCACACATCCCTGT[A/G]GGCTGGGCTGCCTGCTGTCCCCTCC
1101263	rs41443546	A/G	intronic	CTGCTGTCCCCTCCTTGGCAAGTGA[A/G]GAAACAGCTGGCTTGGGGGCCTCTG
1101385	rs4077011	A/G	intronic	CTGGGTGGGGAGGGGACCCTTGGAG[A/G]TGCTGGAGGCCCGACCCTGTGCAGT
1101416	rs4077012	C/T	intronic	GAGGCCCGACCCTGTGCAGTGGCCC[C/T]GGGGGCTTTGCCTGGGAGGAGCCAC
1101454	rs41462448	A/G	intronic	TGGGAGGAGCCACCCTCACGGCCGC[A/G]TGCGCACCCTGTCTTCAGAGTGCAA
1101536	rs7122456	C/T	intronic	GCCTGGGAGGAGCCACCCTCACGGC[C/T]GCGTGCACACCCTGTCTTCAGAGTG
1101649	rs7480563	C/T	P>P	AGATGGTGCCTGGAAGGTGCTGTCC[C/T]TTCTACTGGTGTGGTAAGCAGGGCT
1101722	rs72655349	A/T	intronic	CTGCCGCCCGGGGTGGGGTGGCTGT[A/T]AGGGGGTTGGCTCCCTCCTGGGGGT
1101864	rs41447547	A/C	intronic	GAGTGGGGGTCTGGCCAGGTGGCCG[A/C]CCCGGGGCAGTCTCCAACGAACGGC
1101896	rs41482246	C/T	intronic	GCAGTCTCCAACGAACGGCCTTCTC[C/T]GTTCTTTCTCCCAAGAGTCCAAGGG
1102285	rs41374853	C/T	intronic	CCGGGCCCATGTCTGCATCGTGACC[C/T]TTTCTTTCCTCCTTTCAACGCCAAC
1102381	rs41392345	A/G	intronic	GGCCTCCTCCAGGTGGGGGGGTCTC[A/G]GCAGCCCTGCAGGCTTTGTGTGGTG
1102789	MUC2-029867	A/G	intronic	CTCAGGGCTGTGCTCCCTCGGAGGC[A/G]CTAGGCAAGGACCTTTCCCAGCCTC
1102906	rs7110182	A/G	intronic	CCTTTTAAGGATTTAGGCACCCCAA[A/G]CAGGATGATCTCATCTTAGGATCCT
1103010	MUC2-030088	C/T	intronic	ATTCAGAGTTAGAACACAGACAGAC[C/T]TTTGAGGGTTGTGTGGGCTCCAGGC
1103099	rs41339047	C/T	intronic	TGTGGCCCTGGGCCTCACCAGGAAG[C/T]CTCCCCGGCCAGGTGTCTCCAGGGT
1103100	rs7106709	C/T	intronic	GTGGCCCTGGGCCTCACCAGGAAGC[C/T]TCCCCGGCCAGGTGTCTCCAGGGTG
1103137	rs11245955	A/G	intronic	GTGTCTCCAGGGTGTCTTCCTGGCC[A/G]GGCTGGGGCTGGGCCTGCTGCCCTC
1103296	rs7126405	C/T	F>F	TCTCCAACATCACCTGCCCCAACTT[C/T]GATGCCAGCATTTGCATCCCGGTGA
1103313	rs41386948	G/T	S>I	CCCAACTTTGATGCCAGCATTTGCA[G/T]CCCGGTGAGTTGGCCACCTGGGGCC
1103417	MUC2-030495	C/T	intronic	GGCCCCAGTGCTGCGACAGTGACCT[C/T]GGGCCTGGTCTGAGCTGCCGCAGGA
1103477	rs11245956	C/T	intronic	TGGGGCTTTCTGCAGCAGCTACCCC[C/T]GCCCACGGCATCGTGGGAAGGTGCT
1103562	rs72655356	A/T	N>I	ATTCTCCTTTCCCTCTAGGGCTCCA[A/T]CACATTCATGCCCAATGGATGCTGC
1103620	MUC2-030698	G/T	intronic	GTGAGTACAGGGCACAGCCTGGGGG[G/T]TAGGCAGGGTGGGGGCACAAGGGCT
1103628	rs41525949	G/T	intronic	AGGGCACAGCCTGGGGGGTAGGCAG[G/T]GTGGGGGCACAAGGGCTGGTGCCCT
1103650	rs7106039	A/C	intronic	CAGGGTGGGGGCACAAGGGCTGGTG[A/C]CCTCAGCCCCGCCTGGGGTGGCTGG
1103688	rs41442154	A/G	intronic	CTGGGGTGGCTGGAGGCTGGACAAC[A/G]GCCTCTGGGTGGGCAGTGAGGGCTG
1103725	rs72655357	C/T	intronic	GGCAGTGAGGGCTGGGGGCTGAGGC[C/T]GAGCCTGGGGAGGGGACGCAGCGAG
1103747	rs72655358	A/C	intronic	GGCCGAGCCTGGGGAGGGGACGCAG[A/C]GAGGGAGAGCCTCCTCGAAGATGTG
1103786	rs9988872	A/G	intronic	CTCGAAGATGTGGAGGCCCTGCCCT[A/G]AGCCGCTGCCCGCTCTCCCCAGGCA
1103873	rs11245957	C/T	Y>Y	TCCCCGTCACCACGGAGGTTTCGTA[C/T]GCCGGCTGCACCAAGACCGTCCTCA
1103876	rs41532344	C/T	A>A	CCGTCACCACGGAGGTTTCGTACGC[C/T]GGCTGCACCAAGACCGTCCTCATGA
1103991	rs41437546	C/G	intronic	GGGGTGGTGGAGACCCCAGGGAGGC[C/G]AGAGGCCAGCGCTGGCCCCGGAAGG
1104123	rs12270802	C/T	L>L	GAAAACCAGCCAGCGTGAGGTGGTC[C/T]TGAGCTGCCCCAATGGCGGCTCGCT
1104141	rs41533645	A/G	S>G	GGTGGTCCTGAGCTGCCCCAATGGC[A/G]GCTCGCTGACACACACCTACACCCA
1104265	rs72655359	C/T	3UTR	CCTAGGCATCTGGGGAGCGGGTGAG[C/T]GGGGTGGGCACAGCCCCCTTCACTG
1104296	rs7928098	C/G	3UTR	GGGCACAGCCCCCTTCACTGCCCTC[C/G]ACAGCTTTACCTCCCCGGACCCTC
1105806	rs3924453	C/T	3Downstream	GAGGTCAAAGGGGAGGACATTTGTC[C/T]CCAGACTACAAGGCTGTGCCACACC
1105834	rs4077757	A/T	3Downstream	AGACTACAAGGCTGTGCCACACCCC[A/T]TACATGTGACGAAACCCTCAGGAGG
1105963	rs4077758	C/T	3Downstream	TGACGGATCCTCAGGTGTGATGGGT[C/T]CCCTGGGCGTGACGGGTCCTCAGGG
1105976	rs4077759	C/T	3Downstream	GGTGTGATGGGTCCCCTGGGCGTGA[C/T]GGGTCCTCAGGGTGCAACAGGTCCC
1105994	rs74525542	C/G	3Downstream	GGCGTGACGGGTCCTCAGGGTGCAA[C/G]AGGTCCCACCTCCTGCTGTCCTGCC

1106228	MUC2-033306	C/T	3Downstream	CTCCTTCCTGGGTTCAAGTGATCCT[C/T]CCACCTCAGCCACCCAAAGTACCAG

*** Nucleotide position based on genome build 37-Hg19 (Feb. 2009)**

Supplemental Table 8. MUC5AC variants identified by re-sequencing. *

Hg19 / NW_001838016. 1* Position	SNP Name	Base Change	AA Change	Flanking Sequence
1150353	rs17859811	A/G	promoter	CAGAACAGCCTTGAGGCACCTCTTC[A/G]ACCCTAACCCCTCTGCAGCAGGACA
1150447	rs78659385	A/G	promoter	GGGAGACCTTCTGGTTGGACGCTCC[A/G]CATGGGCAGTGGAGCAGCCGACCTT
1150817	rs76788432	A/G	promoter	GAGGGGTTCTATCATTTGCCTGGAG[A/G]CTGCTGCCAGGAGCCCCTCTCCAGG
1150982	rs79608778	A/G	promoter	TTTTTCCTTTCGCCACACTCCTGCC[A/G]CATGTGCTCTCTCTCTAGGCATCCG
1151175	rs78154079	C/T	promoter	GTGGAGGGTCCAACCAGGAGGTCGG[C/T]CATGGGAGGAATGGCAGGAAAGGGA
1151320	rs28469016	A/G	promoter	ACTCACAGGCTGCTGGGCATGGCAC[A/G]GTGCCCAGGGAGAGTCTAGGGTGGG
1151343	rs79057814	A/G	promoter	ACGGTGCCCAGGGAGAGTCTAGGGT[A/G]GGGTATGTGGGGAGGACCCCTGCAG
1151406	rs17859812	C/T	promoter	GGGGGCCCTCGGAAACTGGGCTCTA[C/T]CCGGCAGACACACCCATCTCCGCCT
1151690	rs77345336	A/C	R>R	CCTGGCTCTCGCTCTGGCCTGCACC[A/C]GGCACACAGGTACGGCTTGGCCCCT
1151695	rs28737416	C/T	H>H	CTCTCGCTCTGGCCTGCACCCGGCA[C/T]ACAGGTACGGCTTGGCCCCTGGCCG
1151854	rs78242076	C/T	intronic	CCCCTGACTGTGGCCTGGCCACGAA[C/T]GAGCAGTTTCCCCTTGTGGGGTTGG
1154250	rs79836765	C/T	S>S	CAGGCCATGCCCAGGATGGCTCCTC[C/T]GAATCCAGCTACAAGCACCACCCTG
1154251	rs74607779	A/G	E>K	AGGCCATGCCCAGGATGGCTCCTCC[A/G]AATCCAGCTACAAGCACCACCCTGC
1154287	rs79183168	A/T	I>F	CAAGCACCACCCTGCCCTCTCTCCT[A/T]TCGCCCGGGGGCCCAGCGGTGAGTC
1154294	rs55846509	G/A	R>Q	CACCCTGCCCTCTCTCCTATCGCCC[A/G]GGGGCCCAGCGGTGAGTCTGAGTGT
1154369	rs74477410	A/G	intronic	GATTCCACCCTCCACCGTGTGGCAC[A/G]GCCCCTAGGGCCACTGGTCTTAGGG
1155146	rs55861305	G/T	V>F	CCTACCAGCCCCTGTCTCCGCAGGG[G/T]TCCCGCTCCGTGGGGCGACTGTCTT
1155156	rs76577728	A/G	R>H	CCTGTCTCCGCAGGGGTCCCGCTCC[A/G]TGGGGCGACTGTCTTCCCATCTCTG
1155265	rs35396393	A/G	intronic	ATAGCTTTGCTGAGCTCCCCGCTCA[A/G]GCCTGGAGGTGCCGGGTGGAGAGAG
1155289	rs28468624	A/G	intronic	AGGCCTGGAGGTGCCGGGTGGAGAG[A/G]GGCCCCAGCTTTCCGGGTGAACACT
1155680	rs74557741	A/G	R>H	TACGAGGATTTTAACATCCAGCTAC[A/G]CCGCAGCCAGGAGTCAGCGGCCCCC
1155717	rs76203912	C/G	R>S	AGTCAGCGGCCCCCACGCTGAGCAG[C/G]GTCCTCATGAAGGTGGATGGCGTGG
1155941	rs80022407	C/T	intronic	GGGCCCTCCCTCGTCCCCCGAGTGG[C/T]CCACCTGCCCCTCCTGGGATCCCCA
1156646	rs35783651	C/G	S>R	ACTTCAACGGGATGCCCGTGGTCAG[C/G]GAGCTCCTCTCCCACAGTAAGGCCC
1156709	rs34664315	A/G	intronic	AGCCCCTTCCTCAGTGTCCCCTGGG[A/G]GCTCAGTGTTGTGTGCACACACACC
1156750	rs36021067	A/C	intronic	CACACACACCCTCTGACACTCCGGG[A/C]ACACACATGCACAGATACACGGATG
1156754	rs75049268	C/G	intronic	CACACCCTCTGACACTCCGGGCACA[C/G]ACATGCACAGATACACGGATGCAGC
1157475	rs79676565	A/G	intronic	GACGGGTACCGGGACCTGCAGGCAG[A/G]CCCCGCCTCTGTGCTTGCCGCAGAC
1157476	rs28707071	C/G	intronic	ACGGGTACCGGGACCTGCAGGCAGA[C/G]CCCGCCTCTGTGCTTGCCGCAGACA
1157587	rs75860061	A/G	P>P	GTCAGGACCCTGTCCCTGAACCCCC[A/G]AGGAACTGCTCCACTGGCTTTGTAA
1157787	rs78104866	A/G	G>D	GGCTGCGTGGCCCTGGTGGACGTCG[A/G]CAGCTACCTGGAGGCTTGCAGGCAA
1157858	rs78724532	A/C	N>H	CACCGACCTGCTCAGCTGCGTCTGC[A/C]ACACCCTTGCCGAGTACTCCCGGCA
1158073	rs28691231	C/T	C>C	AGTACCACGAGTGCCGCTCCCCCTG[C/T]GCAGACACCTGCTCCAACCAGGAGC
1158074	rs79652017	A/G	A>T	GTACCACGAGTGCCGCTCCCCCTGT[A/G]CAGACACCTGCTCCAACCAGGAGCA
1158092	rs55863018	C/G	Q>E	CCCCTGTGCAGACACCTGCTCCAAC[C/G]AGGAGCACTCCCGGGCCTGTGAGGA

1159133	rs35917282	A/G	intronic	ATGGGACAGACCTGCTGGGGGTTGC[A/G]ACCCAGGCCGGCAGGCACCCTCGTC
1159150	rs28542750	A/T	intronic	GGGGTTGCGACCCAGGCCGGCAGGC[A/T]CCCTCGTCTGGGCTACGGTGTAGGC
1159155	rs76590917	C/G	intronic	TGCGACCCAGGCCGGCAGGCACCCT[C/G]GTCTGGGCTACGGTGTAGGCAGGCC
1159209	rs55913171	A/G	intronic	GGTGAGACCCGGTCAGCCTCCTGAC[A/G]CGGAGGCTGGAGGCTGGTCTCCTGG
1159210	rs56002968	C/T	intronic	GTGAGACCCGGTCAGCCTCCTGACG[C/T]GGAGGCTGGAGGCTGGTCTCCTGGG
1159470	rs56026134	A/G	intronic	AGGGGGCCCATGGCCAGCCTCCCAC[A/G]GGCTCCCCCAGCTTGGCTGCATGTC
1161201	rs28653550	A/G	intronic	GGAGTGTGAGGACCCCTGGTGTGTC[A/G]TGTTCCGCAGCCCTGTGACAGCAGT
1161315	rs28403537	C/T	A>V	AGCGTGACACTGAGCCTGGATGGGG[C/T]GCAGACGGTGAGTGGAGCCTGGCAG
1161335	rs28663568	G/T	intronic	TGGGGTGCAGACGGTGAGTGGAGCC[G/T]GGCAGGGCAAACCCCGGGAAGAGGG
1161380	rs55697911	C/T	intronic	AGAGGGAAGGGGCCTGTCTCTTCTG[C/T]AAGTCACCTCTGCCCAAGCCCTTCA
1161935	rs34974357	A/C	intronic	CACCCCGGGGCTGCCTGGGGTCCCG[A/C]CCCACAGCCCCCAGCAAAACCCTTG
1162017	rs75423548	C/T	I>I	TCAGACCCTCAACCTTCTTCATCAT[C/T]GCCCAGACCAGCCTGGGCCTGCAGC
1162303	rs76524014	C/T	A>A	TCTTCAACACCTTCAAGACCCAGGC[C/T]GCCTGCCCCAACATCAGGAACAGCT
1162387	rs74521398	G/T	intronic	GTACGGGTGTCCACGGCTCGCCTCT[G/T]TGCTGGCCGCCTGGCGCTGGTTCAC
1162414	rs79430659	C/T	intronic	GCTGGCCGCCTGGCGCTGGTTCACC[C/T]GCTTCCATTTGGCACTGCAGGCAGC
1162445	rs28534794	C/T	intronic	CATTTGGCACTGCAGGCAGCGAGGC[C/T]GGCCCTGCGTGTGCCTGTGAGCCGG
1162453	rs76973651	C/T	intronic	ACTGCAGGCAGCGAGGCTGGCCCTG[C/T]GTGTGCCTGTGAGCCGGGTGGGGTG
1162482	rs76498418	C/T	intronic	TGCCTGTGAGCCGGGTGGGGTGGCT[C/T]ACGAAGGGGCCCAAGGACAGGCTCA
1162502	rs76258277	G/A	intronic	TGGCTCACGAAGGGGCCCAAGGACA[G/A]GCTCATGGTGGGCGCCCACCCCAGC
1162517	rs72846339	C/T	intronic	CCCAAGGACAGGCTCATGGTGGGCG[C/T]CCACCCCAGCTTATGTGGAGCTTCA
821136*	MUC5AC-020108	C/G	intronic	GCGTCTGCAGTGAGTGCCTGCCAAG[C/G]CCAGCCCCTTTCCCTCGCTGGGTGG
821152*	MUC5AC-020124	C/T	intronic	CCTGCCAAGCCCAGCCCCTTTCCCT[C/T]GCTGGGTGGCCGCGGGTCTTGGGGT
821270*	MUC5AC-020242	A/G	intronic	CCCAGGTCAGTGTGGCCTTGGACCC[A/G]GCCGAGGAGGGGAGGGGAGGGTAGC
821521*	MUC5AC-020493	A/G	K>K	CCGTGGATGGCTGCATCTGTCCCAA[A/G]GGCACCTTCCTGGACGACACGGGCA
821663*	MUC5AC-020635	-/G	intronic	AGAGCTCCCGCTGTGGACTGGGGGG[-/G]TCCCTCGCGTCTCCTGGCCCAGGCT
821671*	MUC5AC-020643	C/T	intronic	CGCTGTGGACTGGGGGGGTCCCTCG[C/T]GTCTCCTGGCCCAGGCTGAGGCTCT
821687*	MUC5AC-020659	C/G	intronic	GGTCCCTCGCGTCTCCTGGCCCAGG[C/G]TGAGGCTCTGACCACCATCTCCTCA
821815*	MUC5AC-020787	T/C	intronic	CTGTGGCCCCCAGCCTCCTCATCTC[T/C]ATAAGAAATCCTGAAAAATGGCTTC
822803*	MUC5AC-021776	C/T	intronic	ACTCCCCAATGACAGACCCTCCATC[C/T]GCCCCTGCCTGCTAAGGGCGCCTGT
823037*	MUC5AC-022010	A/G	Q>Q	TGCTGGCCCTGCAGTACAGCCCCCA[A/G]TGTGTGCCTGGCTGTGTGTGCCCCG
823052*	MUC5AC-022025	C/T	C>C	ACAGCCCCCAGTGTGTGCCTGGCTG[C/T]GTGTGCCCCGATGGGCTGGTGGCGG
823064*	MUC5AC-022037	C/T	D>D	GTGTGCCTGGCTGTGTGTGCCCCGA[C/T]GGGCTGGTGGCGGATGGCGAGGGCG
823079*	MUC5AC-022052	C/T	D>D	TGTGCCCCGATGGGCTGGTGGCGGA[C/T]GGCGAGGGCGGCTGCATCACTGCGG
823102*	MUC5AC-022075	C/T	A>V	GATGGCGAGGGCGGCTGCATCACTG[C/T]GGAGGACTGCCCCTGCGTGCACAAT
823145*	MUC5AC-022118	C/T	A>A	TGCACAATGAGGCCAGCTACCGGGC[C/T]GGCCAGACCATCCGGGTGGGCTGCA
823204*	MUC5AC-022177	G/T	intronic	TATGCCGGGGGCTCAAAGCCCATGG[G/T]GGGTGTCAGGCCCAGGAAACCAGAG
823249*	MUC5AC-022222	A/G	intronic	CCAGAGGCCCTCCTTAAAGACGGGC[A/G]AGCCCCCAGCACAGGGGTCCCGGGA

823494*	MUC5AC-022467	C/T	C>C	CAGATGACCCCTGCCTGGCCACCTG[C/T]GCCGTGTACGGGGACGGCCACTACC
823512*	MUC5AC-022487	-/C	frameshift	ACCTGCGCCGTGTACGGGGACGGCC[-/C]ACTACCTCACCTTCGACGGACAGAG
823530*	MUC5AC-022503	C/T	D>D	GGGACGGCCACTACCTCACCTTCGA[C/T]GGACAGAGCTACAGCTTCAACGGAG
823589*	MUC5AC-022562	A/G	intronic	TACACGCTGGTGCAGGTGAGCCGGC[A/G]CGTTTGGGGTCCTCACGGCGGCCCC
823609*	MUC5AC-022582	A/G	intronic	CCGGCGCGTTTGGGGTCCTCACGGC[A/G]GCCCCCGTGGCCCGAAGCTGCTCAC
823702*	MUC5AC-022675	G/T	intronic	GCCTCATCCTCCTTGCGGGAAGGAG[G/T]GCAGGGCCTGCCTGGTCCTTGATGG
823781*	MUC5AC-022754	C/T	F>F	GGAAAGACAGCACCCAGGACTCCTT[C/T]CGTGTTGTCACCGAGAACGTCCCCT
823868*	MUC5AC-022841	C/T	intronic	AGATTTTCCTGGGGGTGAGCGAGGC[C/T]GGGTGGTCGCATGCCCTCCAGGAGG
824883*	MUC5AC-023854	C/T	intronic	CAGGGTGGCCCTGGGTGGGAGGAGG[C/T]GGCCTAGGGGCAGGGTGGCTCTGGC
824974*	MUC5AC-023945	A/G	L>L	CTCTGCAGGGCAGGGTCTGCGGCCT[A/G]TGTGGGAACTTCGACGACATCGCCG
825223*	MUC5AC-024194	A/G	intronic	TATGCTGGCCGGGGGGCGTTTCTCT[A/G]GGCCCAAGGGGGTCATGGTGACCCA
825614*	MUC5AC-024585	A/G	P>P	AGCCCCGTCTCCCTCAGGTGGAGCC[A/G]GCCAGGTACTACGAGGCCTGCGTGA
825626*	MUC5AC-024597	C/T	Y>Y	CTCAGGTGGAGCCGGCCAGGTACTA[C/T]GAGGCCTGCGTGAACGACGCGTGCG
825752*	MUC5AC-024723	A/G	P>P	GCCTGTGTGTGTCCTGGCGGACCCC[A/G]AGCATCTGCCGTGAGTGCGAGTGGG
826453*	MUC5AC-025424	A/G	intronic	GCCGGGAGGTGCAGGGGAGGGAAGC[A/G]GCTTTAGAACAGCCCTGGGGTGTGG
826462*	MUC5AC-025433	A/T	intronic	TGCAGGGGAGGGAAGCAGCTTTAGA[A/T]CAGCCCTGGGGTGTGGGGCCTCTGC
826476*	MUC5AC-025447	C/T	intronic	GCAGCTTTAGAACAGCCCTGGGGTG[C/T]GGGGCCTCTGCGAGTGAGTTCCTGG
826511*	MUC5AC-025482	A/G	intronic	GCGAGTGAGTTCCTGGGACCCCACC[A/G]AGCCCTTCCTTCCTCCCTGCAGCTC
826610*	MUC5AC-025581	C/T	R>R	AGCCCTGCGGGGTGCCCTGCCTGCG[C/T]ACCTGCCGGAACCCCCGTGGAGACT
826647*	MUC5AC-025618	G/A	V>I	CCCCCGTGGAGACTGCCTGCGGGAC[G/A]TCTGGGGCCTGGAAGGTGGGCTGGG
826650*	MUC5AC-025621	C/T	R>W	CCGTGGAGACTGCCTGCGGGACGTC[C/T]GGGGCCTGGAAGGTGGGCTGGGGCC
826693*	MUC5AC-025664	A/T	intronic	CTGGGGCCGGTCGGGAGGGGTGGCC[A/T]GGGCTCCGCCGCCTGTGGCCTTCTC
826783*	MUC5AC-025754	A/C	intronic	ACATTCTGGTGCTGTCGGCGAGGCC[A/C]GCTGCTTGGGGGCTGGGCGGAGCCC
826935*	MUC5AC-025906	A/C	T>T	AGGACAAGATGCAGTGTGTGGCCAC[A/C]TGCCCAACCCCGCCTCTGCCACCAC
826988*	MUC5AC-025959	A/G	R>Q	TGCCACGTCCATGGGAAGTCCTACC[A/G]GCCAGGTGCAGTGGTGCCCTCGGAC
827522*	MUC5AC-026495	T/C	intronic	GGCCTCCTGTCCCCCAGTCTGGGGG[T/C]GCAATGCAGTTCCCAGGGAACTCCA
827608*	MUC5AC-026581	C/A	intronic	GCATGGGATGCCCGTGGAAGGCACA[C/A]GGCCGCCCCCACGCATCGGCCTGCC
827623*	MUC5AC-026596	A/G	intronic	GGAAGGCACAAGGCCGCCCCCACGC[A/G]TCGGCCTGCCCTTCTTCCTTGTCTC
827773*	MUC5AC-026746	C/T	intronic	CAGCCTCTGACGGGCCTGGGCCCTC[C/T]GTCCCCATAGCCTGTGTCTGCACCT
829688*	MUC5AC-027699	A/G	P>P	CAAGCAGCGCGCACACAGGCCCTCC[A/G]AGCAGCGCCTGGCCCACCACAGCAG
829754*	MUC5AC-027765	A/G	S>S	CGAGGCTGCCCACAGCCTCTGCCTC[A/G]CTGCCGCCGGTCTGTGGGGAAAAGT
829790*	MUC5AC-027801	A/G	S>S	TCTGTGGGGAAAAGTGCCTGTGGTC[A/G]CCATGGATGGATGTCAGCCGCCCTG
829861*	MUC5AC-027872	A/G	R>H	GACTTCGACACACTGGAGAACCTCC[A/G]CGCCCATGGGTACCGGGTGTGCGAA
829913*	MUC5AC-027924	C/T	A>A	CACCCAGGTCGGTGGAGTGCCGAGC[C/T]GAGGACGCCCCCGGAGTGCCGCTCC
829947*	MUC5AC-	A/G	G>R	CCCCGGAGTGCCGCTCCGAGCCCTG[A/G]GGCAGCGTGTGCAGTGCAGCCCGG

	027958			A
829953*	MUC5AC-027964	C/T	R>C	AGTGCCGCTCCGAGCCCTGGGGCAG[C/T]GTGTGCAGTGCAGCCCGGATGTGGG
830058*	MUC5AC-028069	C/G	P>A	CAGGGTCCAGTGCTGCACGCCCCTA[C/G]CCTGCTCCACCTCTAGCAGTCCAGC
830066*	MUC5AC-028077	C/T	S>S	AGTGCTGCACGCCCCTAGCCTGCTC[C/T]ACCTCTAGCAGTCCAGCCCAGACCA
830115*	MUC5AC-029245	A/G	T>A	CACTCCTCCAACTACCTCCAAGACC[A/G]CTGAAACCCGGGCCTCAGGCTCCTC
830125*	MUC5AC-029255	A/G	Q>R	ACTACCTCCAAGACCACTGAAACCC[A/G]GGCCTCAGGCTCCTCAGCTCCCAGC
830144*	MUC5AC-028155	C/T	A>A	AAACCCGGGCCTCAGGCTCCTCAGC[C/T]CCCAGCAGCACACCTGGCACCGTGT
830193*	MUC5AC-029323	A/C	P>T	GTCTCTCTCTACAGCCAGGACGACA[A/C]CTGCCCCAGGTACCGCTACCTCTGT
830257*	MUC5AC-029387	C/T	P>L	TCAACTCCCAGCCCTCCGCCAGTGC[C/T]GGCAACATCAACATCATCCATGTCG
830282*	MUC5AC-029412	A/G	S>S	CGGCAACATCAACATCATCCATGTC[A/G]ACCACGACCCCGGGGACCTCTGTGG
830289*	MUC5AC-028300	A/G	A>T	ATCAACATCATCCATGTCGACCACG[A/G]CCCCGGGGACCTCTGTGGTCTCCAG
830326*	MUC5AC-028337	C/T	P>L	TCTGTGGTCTCCAGCAAGCCCACCC[C/T]CACTGAGCCCAGCACATCCTCCTGC
830330*	MUC5AC-028341	G/T	T>T	TGGTCTCCAGCAAGCCCACCCTCAC[G/T]GAGCCCAGCACATCCTCCTGCCTGC
830367*	MUC5AC-028378	A/C	T>C	ATCCTCCTGCCTGCAGGAGCTTTGC[A/C]CCTGGACCGAGTGGATCGATGGCAG
830376*	MUC5AC-028387	A/G	E>K	CCTGCAGGAGCTTTGCACCTGGACC[A/G]AGTGGATCGATGGCAGCTACCCTGC
830384*	MUC5AC-029513	C/T	I>I	AGCTTTGCACCTGGACCGAGTGGAT[C/T]GATGGCAGCTACCCTGCTCCTGGAA
830633*	MUC5AC-028644	C/T	C>C	ACTATGAGATCCGCATCCAGTGTTG[C/T]GAGACGGTGAACGTGTGCAGAGACA
830668*	MUC5AC-028679	C/T	P>L	AACGTGTGCAGAGACATCACCAGAC[C/T]GCCAAAGACCGTCGCAACGACACGG
830682*	MUC5AC-028693	A/G	A>T	CATCACCAGACCGCCAAAGACCGTC[A/G]CAACGACACGGCCGACTCCACATCC
830833*	MUC5AC-028844	C/T	L>P	GTCACACAGGGCACCCACACCACAC[C/T]AGTCACCAGAAACTGTCATCCCCGG
830844*	MUC5AC-028855	A/G	N>D	CACCCACACCACACCAGTCACCAGA[A/G]ACTGTCATCCCCGGTGCACCTGGAC
830872*	MUC5AC-028883	A/C	K>T	TGTCATCCCCGGTGCACCTGGACAA[A/C]GTGGTTCGACGTGGACTTCCCGTCC
830947*	MUC5AC-028958	A/G	S>N	GAAACCTACAACAACATCATCAGGA[A/G]TGGGGAAAAAATCTGCCGCCGACCT
831079*	MUC5AC-029900	A/G	R>Q	AGCCGGGAAGAGGGCCTGGTGTGCC[A/G]GAACCAGGACCAGCAGGGACCCTTC
1212930	rs79206359	C/T	S>S	CTCCCAGCCCTGTTCCCACCACCAG[C/T]ACAACCTCTGCTCCTACAACCAGCA
1213204	rs72479396	C/G	L>V	TGTTTCAAAGACCAGCACAAGCCAT[C/G]TTTCTGTATCCAAGACAACCCACTC
1213665	rs72846343	A/G	V>V	CCGCCTCCGTGGCATCCACCTCTGT[A/G]GCATCCAGCTCTGTGGCATCCAGCT
1213897	rs79604368	A/T	intronic	AGAGTGGCTGCTGGCATTCTCTGAA[A/T]TTTTTTCCCATTACACAGGTGGTAG
1214349	rs35705491	A/G	intronic	GCAGCCCGGCCGTCAGGAGAGGGCC[A/G]TGCTGTAGCCCGGCGTCTCTGATCA
1214611	rs75693630	C/T	intronic	GAAACTGGGGCACAGCCACCCTCCC[C/T]TGTCCCCACACGGGACTCTCGGGAC
1214824	rs79777218	C/G	N>K	GGGTGGAGAAGCCCACTTGTGCCAA[C/G]GGCTACCCGGCTGTGAAGGTGGCTG
1214924	rs2075841	C/T	intronic	CGAGCGGGACCCAGGGCAGCCGGGG[C/T]AGCCACTCCCCACCCAGGTGGAAAT
1215580	rs1132433	A/G	T>T	GCAAGCCAGTCCACGGGGTGATGAC[A/G]AACGAGGTGGGGGCGCGCCCGGTGT
1215611	rs77159465	A/G	intronic	GGTGGGGGCGCGCCCGGTGTGCCGC[A/G]GAGGGGGTGGGGGACGCGGCTTTCC
1215698	rs28452143	G/A	intronic	CCTGCCTTCTGACTTCCCGTCGACC[G/A]CGCCCTGCGTCCAGATCATCTTCAA
1215726	rs78483847	A/G	N>S	CCCTGCGTCCAGATCATCTTCAACA[A/G]CAAGGTGGTCAGCCCCGGCTTCCGG

1216095	rs75971001	A/C	intronic	CCATAGGGACTGTCCCAGGGTTGTT[A/C]TCGGGGGACAGTGAGGCACAGGCAG
1216357	rs74406541	C/T	R>W	ATACCCTGACCAGCCAGCCTGCCAC[C/T]GGCCTCACCCGACGCCCACCACGGT
1216409	MUC5AC-034190	A/C	T>K	GGGCCCACCACAGTTGGGTCTACCA[A/C]GGTCGGGCCCACCACAGTTGGGTCT
1216410	rs28415193	C/G	T>T	GGCCCACCACAGTTGGGTCTACCAC[C/G]GTCGGGCCCACCACAGTTGGGTCTA
1216491	rs1132434	C/G	Q>H	CGTGCCTGCCATCACCCATCTGCCA[C/G]CTGATTCTGAGCAAGTGAGACTTGG
1216953	rs35196910	C/T	intronic	GCACACAGAATGTGTGGAAGGAGCC[C/T]GTCCGGGGATACAGGAGGGCGGCCA
1217084	rs28652890	C/T	intronic	GCCGGAGAGGCTGCACCCAGCACCC[C/T]GCCCATCCCTCCCACAGGGTCTTTG
1217228	rs28592983	C/T	C>C	GCCTGGAGCTGTACGCGGCACTCTG[C/T]GCGTCCCACGACATCTGCATCGATT
1217271	rs76100206	C/T	intronic	CATCGATTGGAGAGGCCGGACCGGC[C/T]ACATGTGCCGTGAGTGCCACCACTG
1217391	rs77688114	A/G	intronic	AGTCAGGGGGGGACCTGGAGGAGGA[A/G]GGGGCAGCCCCAGGGCAGAGTGCAC
1217679	rs76087555	A/G	G>R	CCCGAGCAACCCCTCCTACTGCTAC[A/G]GGAATGACAGCGCCAGCCTCGGGTA
1217934	rs79959858	A/G	T>A	CACCAGTGCCCAAGTCTGCGTGCCC[A/G]CGGGCTGCCCCAGTACGTGCCCCAG
1218128	rs28503875	A/G	P>P	GGTGTCTGGGGCCCCACGGAGAGCC[A/G]GTGAAGGTGAGTGGAAGGCATGGCC
1218143	rs28515631	A/C	intronic	ACGGAGAGCCGGTGAAGGTGAGTGG[A/C]AGGCATGGCCCAAGAGGGCACTGGG
1218204	rs74317130	C/T	intronic	CCGAGGAGGGAGGCTCTTGAAACAC[C/T]GGCCCCAGAAATGGTCAGGTGGGGC
1218282	rs79002585	A/G	intronic	CAGAGGCCCAGAGAAAGGGCTGCGG[A/G]AGGAGCCGGGCTCCCAGAAAGACTC
1218289	rs77420167	C/T	intronic	CCAGAGAAAGGGCTGCGGGAGGAGC[C/T]GGGCTCCCAGAAAGACTCGGGATCT
1218585	rs77739503	A/C	intronic	ACTCCTGCTGGGTCCTCAGTGCAGG[A/C]CACACGGCCTCCACACCTGGCTGCC
1218613	rs28668687	A/G	intronic	CACGGCCTCCACACCTGGCTGCCCC[A/G]GCACTGCATGAGCCGGGCTGGCTGC
1218631	rs28429550	C/G	intronic	CTGCCCCAGCACTGCATGAGCCGGG[C/G]TGGCTGCTGCACCCCTGGGTGGAGC
1218708	rs35779873	C/T	V>V	CTTCCTTGCAGGTGGGCCACACCGT[C/T]GGCATGGACTGCCAGGAGTGCACGT
1218799	rs78345715	A/C	L>M	CTGCCCGCTGCCCCCTGCCTGCCCC[A/C]TGCCCGGCTTCGTGCCTGTGCCTGC
1218994	rs79256384	A/G	intronic	TGCCTACGAGGGCGTCCCCTCCTCC[A/G]CTTCCGCAACAGCCTCATCTGGAGA
1219088	rs78239294	C/T	intronic	CAGGGGGTGGGCCTTCGGGTGGGGG[C/T]GGGGGACAGACTCCTAATTGCCTCA
1219094	rs35700114	A/G	intronic	GTGGGCCTTCGGGTGGGGGCGGGGG[A/G]CAGACTCCTAATTGCCTCACTCCTG
1219118	rs28742281	C/T	intronic	GACAGACTCCTAATTGCCTCACTCC[C/T]GCCCCCGCAGCCTGCAACACCAGCC
1219143	rs76464011	C/T	R>C	TGCCCCCGCAGCCTGCAACACCAGC[C/T]GCTGCCCCGCGCCCGTGGGCTGTCC
1219151	rs35915689	C/G	P>P	CAGCCTGCAACACCAGCCGCTGCCC[C/G]GCGCCCGTGGGCTGTCCTGAGGGCG
1219152	rs34474233	G/A	A>T	AGCCTGCAACACCAGCCGCTGCCCC[G/A]CGCCCGTGGGCTGTCCTGAGGGCGC
1219153	rs34815853	C/A	A>E	GCCTGCAACACCAGCCGCTGCCCCG[C/A]GCCCGTGGGCTGTCCTGAGGGCGCC
1219331	rs28482817	C/T	intronic	AGATGCCAGTGCGGCTTGTCCACTG[C/T]GGGTCTGTGGCTCTGGACTGAGCCT
1219482	rs80334578	C/T	intronic	CGGCGGGGGGTGCAGCTGCTTGTCT[C/T]CTCGTGGGCAGGCTGGACAGTGTGC
1219502	rs75338404	C/G	V>L	TGTCTTCTCGTGGGCAGGCTGGACA[C/G]TGTGCAGCATCAACGGGACCCTGTA
1219626	rs56013970	C/T	intronic	TAGACTTTGGAGCAACTGCCAACTC[C/T]GGCCGGGGCCAGGGACTCGAGTCTC
1219632	rs2075843	A/G	intronic	TTGGAGCAACTGCCAACTCCGGCCG[A/G]GGCCAGGGACTCGAGTCTCTGCAGA
1220089	rs76692682	G/T	intronic	AAGCTCATGAGTGTCTGCTGCCCTG[G/T]CTCTCCCCAGCCCGGCGCCGTGGTC
1220171	rs34831688	C/T	D>D	AGCTGCCGGGTGGCCCCCCATCGGA[C/T]GCGTTTGTGGTCAGCTGTGAGACCC
1220174	rs56047977	A/G	A>A	TGCCGGGTGGCCCCCCATCGGACGC[A/G]TTTGTGGTCAGCTGTGAGACCCAGA
1220185	rs76043948	G/C	S>T	CCCCCATCGGACGCGTTTGTGGTCA[G/C]CTGTGAGACCCAGATCTGCAACACA

1220266	rs55946720	A/G	intronic	CCCCGACCCTGCCCTGGCTCTTGGG[A/G]GGCAGCGGTCGCCTGGATTCCAGCC
1220462	rs35288961	G/T	intronic	AAGGGCAGGGTCTGGGAGCACTGGG[G/T]CATGTGGGGACCTGTCGTTGCCAGG
1220521	rs35525357	-/A	intronic	TGGCAGAGGCTGGGGACTCTCTGGA[-/A]GCCCACGGGCTGGGGTGCAGACAGA
1220549	rs78740076	A/G	intronic	CCACGGGCTGGGGTGCAGACAGAGG[A/G]ACAGACGGAGGGAGGGTCACTCAC C
1220599	rs28633254	C/T	P>P	CCCGGGGCCTGGCCTCCCTCCAGCC[C/T]GGCGAGACCTGGTCAGACGCAGGG A
1220760	rs28514396	C/T	intronic	GCTCCAGCCAAGGGGGGCTTCACCC[C/T]TAGATGGGTTTGGGGGGCTGTGATC
1220796	rs28502687	C/T	intronic	TGGGGGGCTGTGATCATCCCTGCAG[C/T]GCCAGCAGACACCCCCTCCTGCTTG
1220911	rs76838798	G/T	intronic	GCCTCGGCACTGAGGGCGCCCCTCT[G/T]TCGGCACAGGACGAGGCCCGCATGA
1220923	rs1132435	C/T	D>D	AGGGCGCCCCTCTGTCGGCACAGGA[C/T]GAGGCCCGCATGAGCAAGGACGGCT
1220967	rs1132436	C/T	P>L	GACGGCTGCTGCCGCTTCTGCCCGC[C/T]GCCCCCGCCCCCGTACCAGAACCGT
1220997	rs28457780	A/G	intronic	CCGCCCCCGTACCAGAACCGTGAGT[A/G]CCCAGCCTGCTGGGCGGGGCGGGC T
1221038	rs28439383	C/T	intronic	GGGGCGGGCTCCACCCTCAGAGGTC[C/T]AGGAGCAGCTGGGCTGGTCCTAAAC
1221195	MUC5AC-038890	T/C	M>T	GGGAACTGTGGGGACAGCTCTTCCA[T/C]GTACGTGCCTGGGCAGCAGGCAGGG
1221264	rs35968147	C/T	intronic	GGTGCAGTCAGGGCCCCCAGGGCTC[C/T]AGGTGCCAGATAGACGAGGGGCAG G

* **Nucleotide position based on genome build 37 – Hg19 (Feb. 2009) or sequence NW_001838016.1 where indicated by (*).**

Supplemental Table 9. *MUC2* Variants Significant at P ≤ 0.05 for FIP and IPF in the Re-Sequencing Cohort (Odds Ratio with 95% Confidence Interval).

			Re-Sequencing Cohort		Minor Allele Frequency		
SNP Name	**Position**	**AA Change**	**FIP**	**IPF**	**FIP**	**IPF**	**Control**
rs34533432	1077446	Intronic (C/T)	0.4(0.2-0.8)‡	0.6(0.4-1.2)	17%	25%	34%
rs34367348	1077493	Intronic (C/T)	0.5(0.3-1.0)†	0.6(0.3-1.0)†	25%	28%	39%
rs7104590	1078393	Intronic (T/C)	0.6(0.3-1.1)	0.5(0.3-0.9)†	24%	22%	35%
rs10902081	1079809	Intronic (T/C)	1.7(1.0-3.1)	1.7(1.0-2.9)†	61%	61%	47%
rs12416873	1081577	Intronic (A/G)	1.0(0.5-2.0)	0.4(0.2-0.8)‡	19%	8%	19%
rs7944723	1093710	Pro1839Pro	3.0(1.5-6.3)‡	1.8(0.9-3.5)	38%	27%	17%
rs7480563	1101649	Pro2550Pro	0.5(0.3-0.9)‡	0.9(0.6-1.5)	32%	47%	49%

Amino Acid Position: Based on position in MUC2 gene model: uc001lsx.1

† P≤0.05; Fisher's exact test (two-tailed)

‡ P≤0.01; Fisher's exact test (two-tailed)

Re-Sequencing study populations: 69 family-independent FIP cases, 96 unrelated IPF cases, and 54 spouse controls.

Supplemental Table 10. *MUC5AC* Variants Significant at P ≤ 0.05 for FIP and IPF in the Re-Sequencing Cohort (Odds Ratio with 95% Confidence Interval).

			Re-Sequencing Cohort		Minor Allele Frequency		
SNP Name	**Position**	**AA Change**	**FIP**	**IPF**	**FIP**	**IPF**	**Control**
rs28542750	1159150	Intronic (A/T)	1.9(1.0-3.6)†	1.5(0.9-2.8)	34%	29%	21%
rs28403537	1161315	Ala497Val	2.9(1.1-9.2)†	1.7(0.6-5.5)	15%	9%	5%
rs28534794	1162445	Intronic (C/T)	0.4(0.2-0.7)‡	0.7(0.4-1.2)	30%	43%	51%
MUC5AC-020643	821671*	Intronic (C/T)	0.5(0.3-0.9)†	0.7(0.4-1.1)	41%	47%	56%
MUC5AC-022675	823702*	Intronic (G/T)	4.6(1.0-44.0)†	4.6(1.0-42.6)†	8%	8%	2%
MUC5AC-026495	827522*	Intronic (T/C)	0.3(0.1-0.8)‡	0.5(0.2-1.0)†	7%	10%	19%
rs35288961	1220462	Intronic (G/T)	2.1(1.0-4.6)†	2.3(1.2-4.8)‡	26%	27%	14%

* bp position genomic contig, alternate assembly for Homo sapiens chromosome 11, NW_001838016

Amino Acid Position: from UNIProtKB/Swiss-Prot *MUC5AC*_Human (P98088).

† P≤0.05; Fisher's exact test (two-tailed)

‡ P≤0.01; Fisher's exact test (two-tailed)

Re-Sequencing study populations: 69 family-independent FIP cases, 96 unrelated IPF cases, and 54 spouse controls.

MAF: minor allele frequency for re-sequencing cohort.

Supplemental Table 11. Oligos used in resequencing of the MUC5B promoter.

MUC5B Promoter Amplicon	Forward Primer 5' > 3'	Reverse Primer 5' > 3'	Amplicon Size (bp)	Hg19 Coordinates
MUC5B-Prm-1	GGTTCTCCTTGTCTTGCAGCCCCT	ATGGGCTCTTGGTCTGCTCAGAG	616	Chr11:1239997-1240612
MUC5B-Prm-2	GGGCCTGGCTCTGAGTACACATCCT	AAGGAAAGGGACACAGCCGGTTCC	644	Chr11:1240556-1241199
MUC5B-Prm-3	GGGTCCCCATTCATGGCAGGATT	TTTCTCCATGGCAGAGCTGGGACC	601	Chr11:1240957-1241557
MUC5B-Prm-4	CTAGTGGGAGGGACGAGGGCAAAGT	CTCGTGGCTGTGACTGCACCCAG	610	Chr11:1241386-1241995
MUC5B-Prm-5	TTGGCTAAGGTGGGAGACCT	AGCTTGGGAATGTGAGAACG	700	Chr11:1241791-1242490
MUC5B-Prm-6	CATGAGGGGTGACAGGTGGCAAA	CCCGCGTTTGTCTTTCTGAAGTT	676	Chr11:1242392-1243067
MUC5B-Prm-7	GGTCAGAAGCTTTGAAGATGGGC	CTTGTCCAATGCCAGCCCTGATC	607	Chr11:1242985-1243591
MUC5B-Prm-8	CTGCCAGGGTTAATGAGGAG	GGATCAGGAAGGATTTGCAG	663	Chr11:1243491-1244153
MUC5B-Prm-9	AGGCAGGCTGGCTGACCACTGTTT	CGTGAAGACAGCATCGAGAGGGG	501	Chr11:1243966-1244466
MUC5B-Prm-5 Seq Pr.	TTGGCTAAGGTGGGAGACCT			Chr11:1241791-1241810

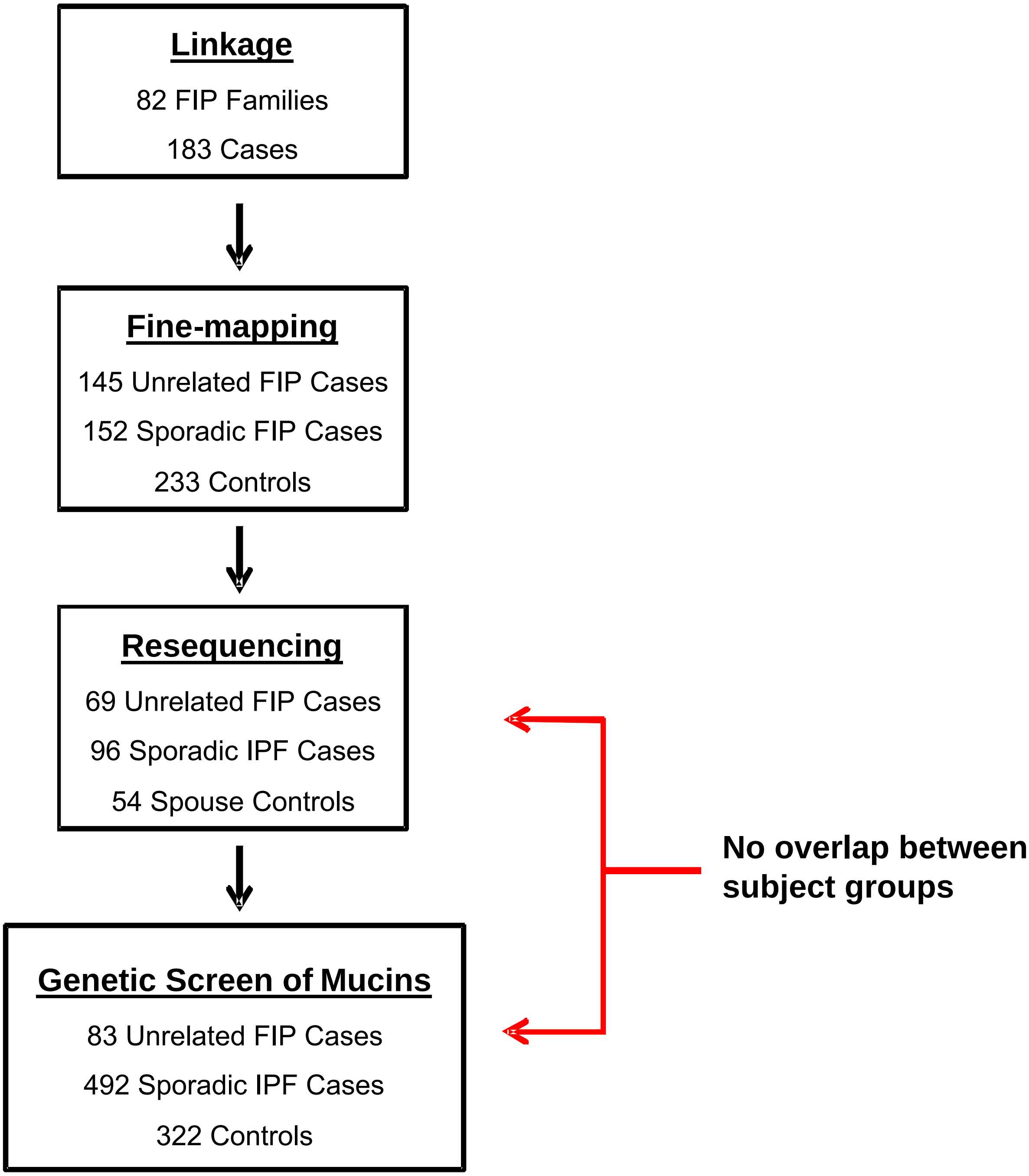
Supplemental Table 12. SNPs identified in resequencing of the MUC5B promoter

Hg19 Position	SNP Name	Base Change	Flanking Sequence
1240338	rs2672792	T/C	GTCACCTGCCCAGGTCCCCGAGGCC[T/C]GGAACACCTTCCTGCTGGGCCCACC
1240485	rs72636989	G/A	CCACCCCAGGAGTTGGGGGGCCCCCGT[G/A]CCAGGGAGCAGGAGGCTGCCGAGG
1240925	MUC5B-Prm1	C/T	GTGGCCCTGATCACTGGTGCCTGGA[C/T]GGCCTCTGAAGGGGTCTGTGGGGTC
1241005	rs2672794	C/T	AACCCCCCTCGGGTTCTGTGTGGTC[C/T]AGGCCGCCCCTTTGTCTCCACTGCC
1241221	rs35705950	G/T	TTTCTTCCTTTATCTTCTGTTTTCAGC[G/T]CCTTCAACTGTGAAGAAGTGA
1241361	MUC5B-Prm2	A/G	TGCCCCGGACCCAGCCCAGTTCCCA[A/G]TGGGCCCTCTGCCCGGGGAGGTGC
1241762	MUC5B-Prm3	C/T	GGTGGGCATCGGCTTGTGAGCTGGAGCCG[C/T]GGGCAGGGAGGGGGGATGTCACGAG
1241821	rs11042491	G/A	GGCTAAGGTGGGAGACCTGGGCGGGTGC[G/A]TCGGGGGGACGTCTGCAGCAGAGGC
1241848	rs2735726	T/C	TGCGTCGGGGGGACGTCTGCAGCAGAGGCC[T/C]GGGCAGCAGGCACACCCCTCCTGCCAG
1241993	MUC5B-Prm4	G/A	GGGGCCTGGGTGCAGTCACAGCCAC[G/A]AGCCCAGGGGTGGGGACTCTGGCC
1242092	MUC5B-Prm5	C/T	CCCCTCCCACCGTGCCGTGCTGCAG[C/T]GGGTCTACCGGCCTGGATGTGAAA
1242101	MUC5B-Prm6	C/T	CCGTGCCGTGCTGCAGCGGGTCTAC[C/T]GGCCTGGATGTGAAAGAGAGCTTG
1242227	rs11042646	C/T	AGTCCCGGAAGTGAGCGGGGAGCTA[C/T]GCTGAGATCTGGGAGACCCCCTGC
1242244	rs55974837	C/T	GGGAGCTACGCTGAGATCTGGGAGA[C/T]CCCCTGCCCCCACCCAGGTACAGG
1242250	rs35619543	G/T	TACGCTGAGATCTGGGAGACCCCCT[G/T]CCCCCACCCAGGTACAGGGCCAGG
1242299	rs12804004	T/G	GCAGAAGCCCGAGGTGTGCCCTGAG[T/G]TAAAGAAACCGTCACAAAGAACAA
1242472	rs56031419	G/A	TGTCTCCGCCCTCCATCTCCAGAAC[G/A]TTCTCACATTCCCAAGCTGAAACC
1242508	rs868902	C/A	CCCAAGCTGAAACCCTGTCCCCATG[C/A]AACACCAGCTCACCATCCCCTCTGCC
1242567	MUC5B-Prm7	C/T	GGCGCCCACCGTCCACACTCCGTCT[C/T]TGCGGGTTTCATGACTCCAGGGGCAG
1242599	MUC5B-Prm8	G/A	TTTCATGACTCCAGGGGCAGCACAC[G/A]AGTGGCCCCTCCTGCCTTTGTCCTC
1242607	MUC5B-Prm9	C/T	CTCCAGGGGCAGCACACGAGTGGCC[C/T]CTCCTGCCTTTGTCCTCTGTGTCCA
1242690	rs868903	C/T	CCCCCATGGAGCAGCCTGGGCCAGCC[C/T]CTCCTTTTCACGGCTGAACCGTAT
1242910	MUC5B-Prm10	G/A	ACCCCCACCAGCAGGGCACAGGGCTCC[G/A]GGTCCCCACGTCTCTGCCAACACTT
1242977	MUC5B-Prm11	G/A	CTTGATCCCCGCCATCCTATTGAGC[G/A]TGAGACAGGTCAGAAGCTTTGAAG
1243218	MUC5B-Prm12	G/A	GTCTGCGCCACGGAGCATTCAGGAC[G/A]CTGGTGACCAGGGAGCCAGGAGGT
1243378	rs885455	A/G	CGTCAAGGAGGTTTACCACATAGCCCCC[A/G]GGAAGCCCACCCGACACCAGCCGGA
1243391	rs885454	G/A	TTTACCACATAGCCCCCRGGAAGCCCACCC[G/A]ACACCAGCCGGAGGTGCTAGGCTTC
1243409	MUC5B-Prm13	T/C	CCCACCCGACACCAGCCGGAGGTGC[T/C]AGGCTTCTGCGGCTCCCACCTGGG
1243911	MUC5B-Prm14	G/A	GGACCCATGGTCAGTGGCTGGGGGT[G/A]CTGCCCAGAGGCTGGGATTCCCTTC
1244060	rs7115457	G/A	GCCATCTAGGACGGGTGCCAGGTGG[G/A]GTAGGCCCTTCTCTCCCTTCCGATT
1244080	rs7118568	C/G	GGTGGGGTAGGCCCTTCTCTCCCTT[C/G]CGATTCTCAGAAGCTGCTGGGGGTG
1244197	rs56235854	G/A	AGCCCCTCCCCGAGAGCAAACACAC[G/A]TGGCTGGAGCGGGGAAGAGCATGGTGC
1244219	rs2735738	T/C	CACGTGGCTGGAGCGGGGAAGAGCA[T/C]GGTGCCCTGCGTGGCCTGGCCTGGC
1244438	MUC5B-Prm15	C/T	GCCGCAGGCAGGTAAGAGCCCCCCA[C/T]TCCGCCCCCTCTCGATGCTGTCTT

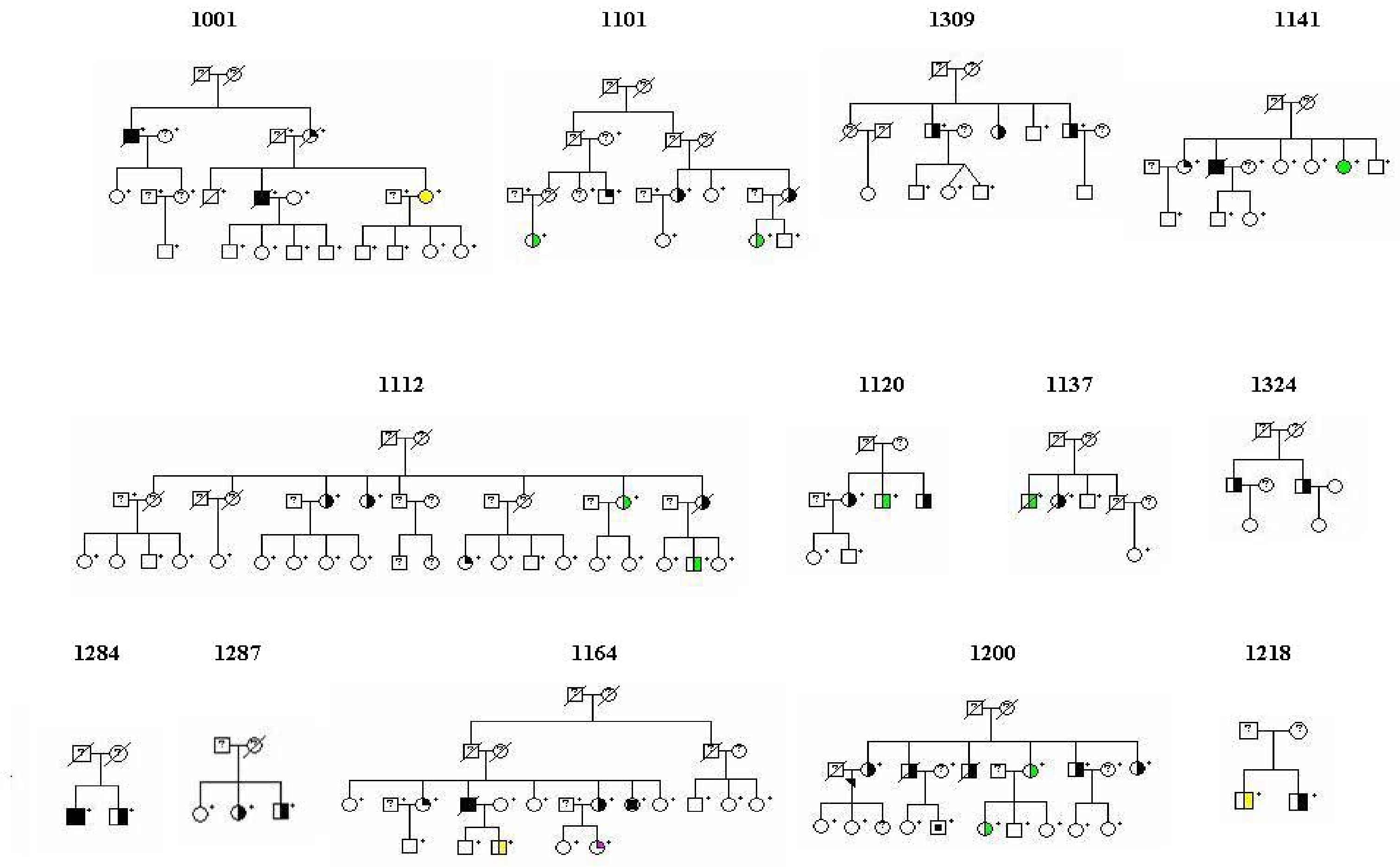
Supplemental Table 13. Genotypic logistic regression models for the 19 significant SNPs in the screen of lung-expressed gel-forming mucins adjusting for rs35705950.

Model #	SNP	IPF Single SNP Model		IPF rs35705950		FIP Single SNP Model		FIP rs35705950	
		Odds Ratio (95% C.I)	P Value	Odds Ratio (95% C.I)	P Value	Odds Ratio (95% C.I)	P Value	Odds Ratio (95% C.I)	P Value
1	rs10902081	0.7 (0.5-0.8)	4.3×10^{-4}	0.9 (0.7-1.2)	0.429	0.6 (0.4-0.9)	0.011	0.8 (0.5-1.2)	0.25
	rs35705950	x	x	8.3 (5.7-11.9)	1.5×10^{-29}	x	x	5.9 (3.5-10.1)	6.6×10^{-11}
2	rs7127117	1.6 (1.3-2.0)	6.9×10^{-5}	1.1 (0.8-1.4)	0.509	1.0 (0.7-1.5)	0.826	0.7 (0.4-1.1)	0.094
	rs35705950	x	x	7.9 (5.4-11.6)	1.3×10^{-25}	x	x	6.3 (3.5-11.4)	7.3×10^{-10}
3	rs41453346	2.8 (1.6-5.2)	0.001	1.1 (0.6-2.2)	0.72	1.9 (0.8-4.3)	0.124	1.2 (0.5-3.0)	0.653
	rs35705950	x	x	8.1 (5.6-11.8)	2.7×10^{-28}	x	x	6.1 (3.6-10.3)	1.2×10^{-11}
4	rs41480348	0.5 (0.4-0.8)	0.001	0.6 (0.4-1.0)	0.04	0.7 (0.4-1.2)	0.188	0.9 (0.5-1.7)	0.75
	rs35705950	x	x	7.9 (5.5-11.3)	2.1×10^{-29}	x	x	6.1 (3.6-10.2)	1.0×10^{-11}
5	rs7934606	1.7 (1.4-2.2)	3.8×10^{-6}	1.0 (0.7-1.3)	0.876	1.4 (1.0-2.0)	0.055	0.9 (0.6-1.3)	0.473
	rs35705950	x	x	8.7 (5.8-12.9)	1.4×10^{-26}	x	x	6.7 (3.8-11.9)	7.5×10^{-11}
6	rs10902089	1.5 (1.2-1.9)	2.9×10^{-4}	0.9 (0.7-1.2)	0.69	1.5 (1.0-2.1)	0.031	1.0 (0.7-1.6)	0.813
	rs35705950	x	x	8.3 (5.6-12.2)	1.3×10^{-26}	x	x	6.1 (3.6-10.5)	6.2×10^{-11}
7	rs9667239	1.9 (1.4-2.7)	5.6×10^{-5}	0.8 (0.5-1.2)	0.3	2.2 (1.4-3.6)	0.001	1.1 (0.6-2.0)	0.668
	rs35705950	x	x	8.9 (6.0-13.3)	8.2×10^{-27}	x	x	5.8 (3.3-10.2)	6.0×10^{-10}
8	rs55846509	3.6 (1.7-7.3)	0.001	1.0 (0.5-2.3)	0.96	1.7 (0.6-5.1)	0.32	0.8 (0.3-2.5)	0.706
	rs35705950	x	x	8.3 (5.7-12.1)	2.7×10^{-28}	x	x	6.4 (3.8-10.7)	4.8×10^{-12}
9	rs28403537	4.6 (2.8-7.6)	3.2×10^{-9}	1.5 (0.8-2.6)	0.2	2.7 (1.3-5.3)	0.006	0.8 (0.3-1.8)	0.53
	rs35705950	x	x	7.6 (5.2-11.2)	1.1×10^{-24}	x	x	6.7 (3.8-11.8)	4.7×10^{-11}
10	MUC5AC-025447	1.6 (1.2-2.2)	0.003	1.1 (0.8-1.6)	0.49	1.6 (1.0-2.5)	0.053	1.4 (0.8-2.4)	0.19
	RS35705950	x	x	7.7 (5.3-11.2)	3.1×10^{-27}	x	x	6.0 (3.5-10.3)	4.7×10^{-11}
11	rs35288961	2.0 (1.5-2.6)	3.7×10^{-6}	1.1 (0.8-1.5)	0.58	2.2 (1.4-3.5)	3.2×10^{-4}	1.3 (0.7-2.1)	0.384
	rs35705950	x	x	7.9 (5.4-11.5)	6.6×10^{-27}	x	x	5.7 (3.3-10.0)	1.3×10^{-9}
12	rs35671223	1.5 (1.2-1.9)	0.001	0.9 (0.7-1.2)	0.46	1.4 (1.0-2.0)	0.05	0.9 (0.6-1.4)	0.61
	rs35705950	x	x	8.5 (5.8-12.4)	1.1×10^{-28}	x	x	6.3 (3.6-10.9)	5.4×10^{-11}
13	rs28654232	0.6 (0.5-0.8)	1.1×10^{-4}	0.9 (0.7-1.1)	0.29	0.6 (0.4-0.9)	0.009	0.7 (0.5-1.1)	0.167
	rs35705950	x	x	8.0 (5.5-11.5)	5.7×10^{-29}	x	x	5.7 (3.4-9.6)	5.8×10^{-11}
14	rs34595903	0.5 (0.4-0.7)	2.4×10^{-6}	0.8 (0.6-1.1)	0.116	0.5 (0.3-0.7)	0.001	0.6 (0.4-1.0)	0.041
	rs35705950	x	x	7.4 (5.1-10.8)	7.0×10^{-26}	x	x	5.1 (3.0-8.6)	1.7×10^{-9}
15	rs2672794	0.5 (0.4-0.7)	1.9×10^{-7}	0.9 (0.7-1.2)	0.442	0.5 (0.3-0.8)	0.001	0.7 (0.4-1.1)	0.152
	rs35705950	x	x	8.0 (5.5-11.6)	2.5×10^{-27}	x	x	5.5 (3.2-9.3)	3.2×10^{-10}
16	rs35619543	2.1 (1.6-2.8)	1.5×10^{-8}	1.3 (0.9-1.7)	0.145	2.4 (1.6-3.6)	3.3 x10-5	1.3 (0.8-2.1)	0.296
	rs35705950	x	x	7.6 (5.2-11.2)	7.0×10^{-25}	x	x	6.1 (3.4-10.9)	6.8×10^{-10}
17	rs12804004	0.6 (0.5-0.8)	1.2×10^{-4}	0.8 (0.6-1.0)	0.07	0.6 (0.4-0.9)	0.019	0.7 (0.5-1.1)	0.159
	rs35705950	x	x	7.9 (5.5-11.3)	6.4×10^{-29}	x	x	5.9 (3.5-10.0)	3.6×10^{-11}
18	rs868903	1.6 (1.3-2.1)	2.8×10^{-5}	1.0 (0.8-1.4)	0.753	1.8 (1.3-2.6)	0.001	1.4 (0.9-2.0)	0.145
	rs35705950	x	x	7.8 (5.3-11.5)	8.6×10^{-26}	x	x	5.6 (3.2-9.6)	4.4×10^{-10}

Supplemental Figure 1. Genetic Study Design.



Supplemental Figure 2. Pedigree figures for 82 multiplex families included in linkage study. Not all individuals with possible FIP, unaffected, or unknown individuals are shown on pedigrees as a result of pedigree trimming for presentation purposes.



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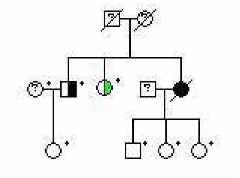

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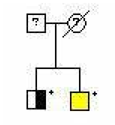

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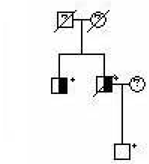

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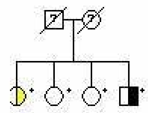

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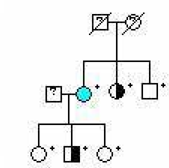

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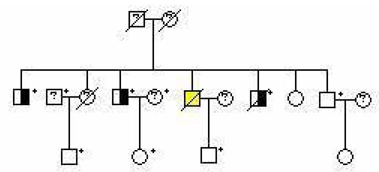

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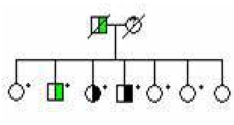

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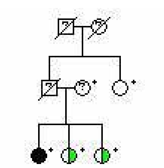

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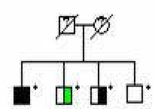

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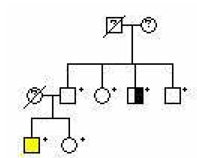

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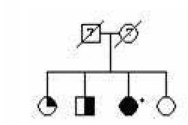

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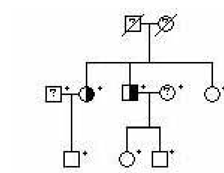

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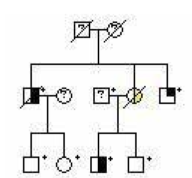

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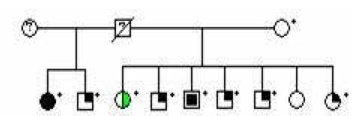

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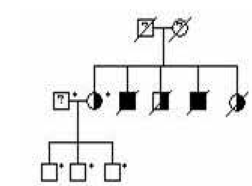

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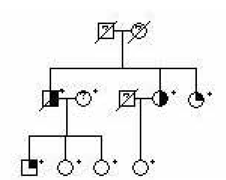

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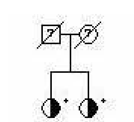

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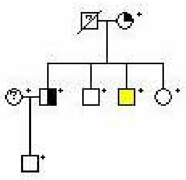

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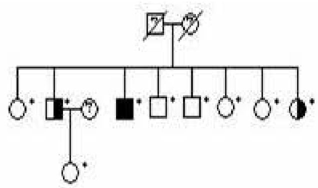

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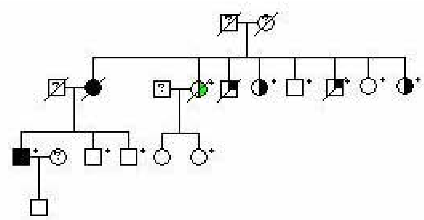

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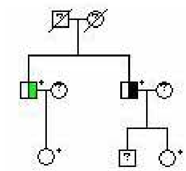

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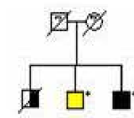

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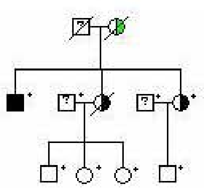

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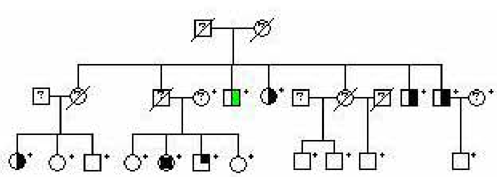

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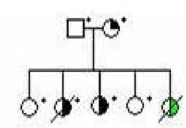

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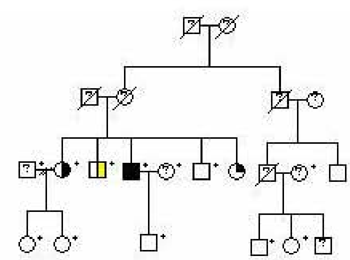

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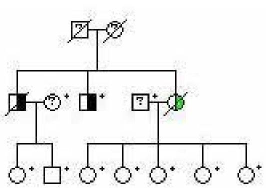

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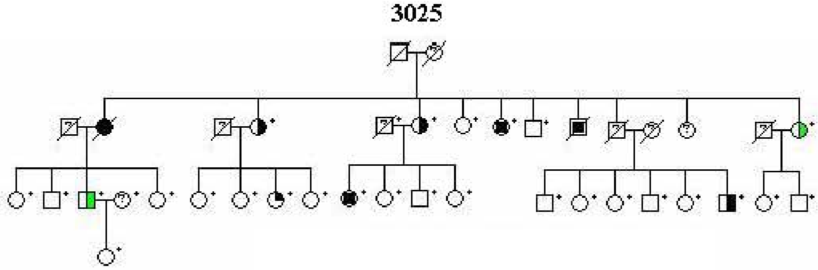

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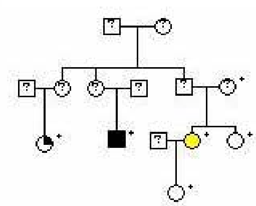

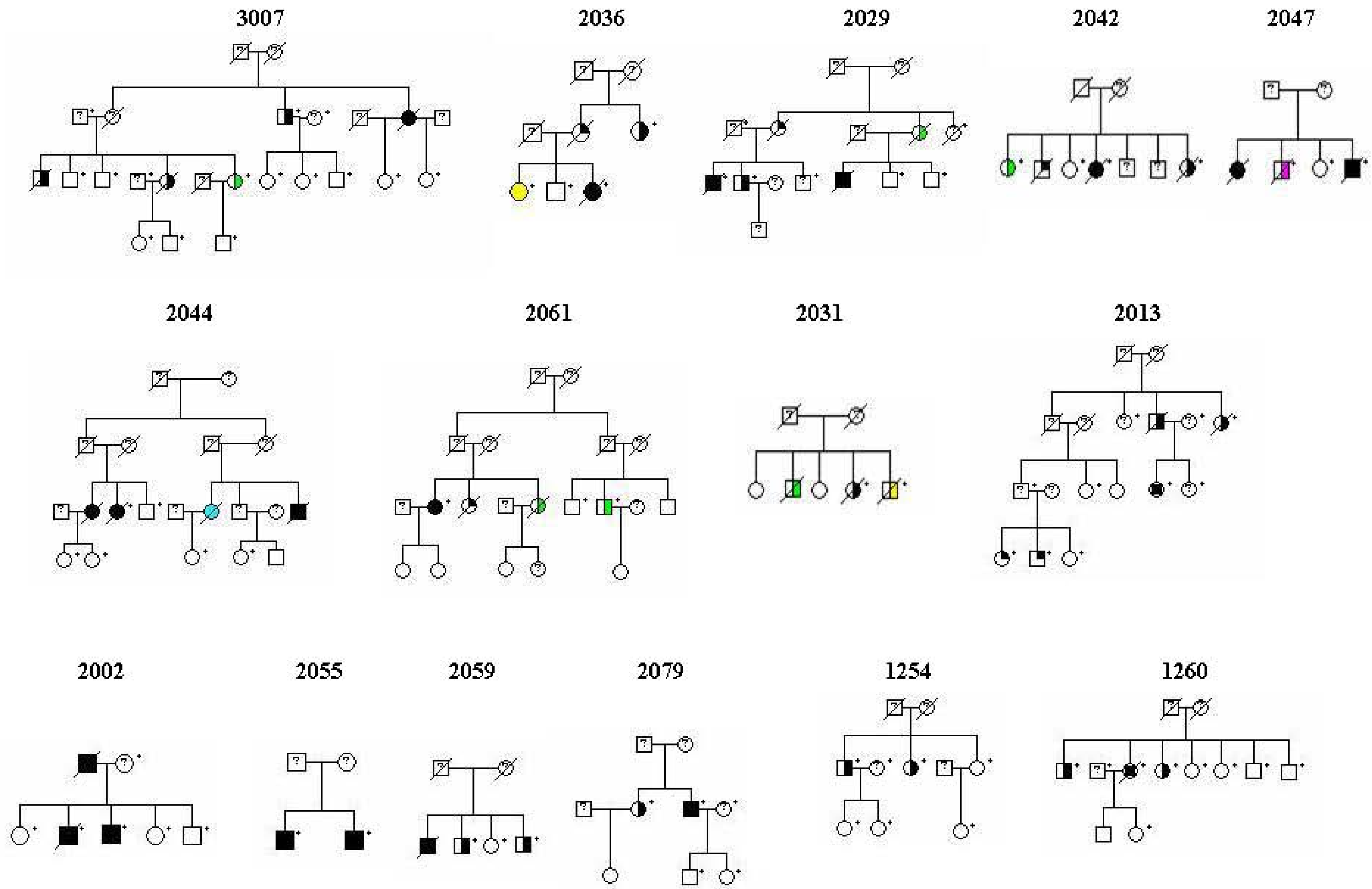
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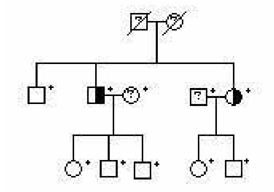

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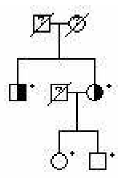

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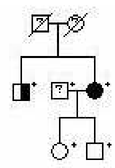

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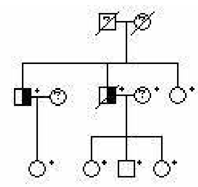

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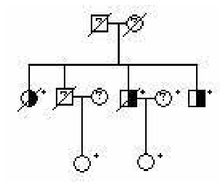

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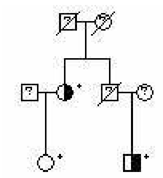

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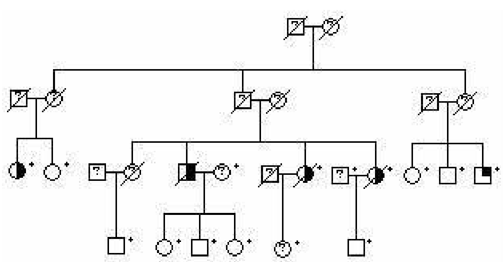

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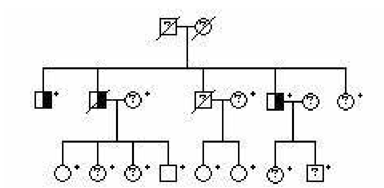

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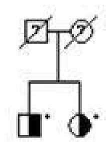

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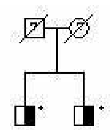

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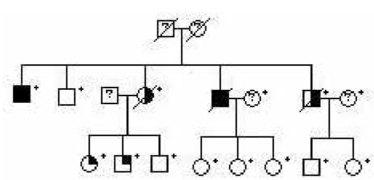

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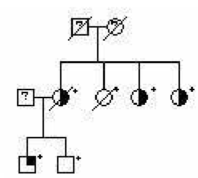

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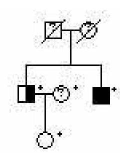

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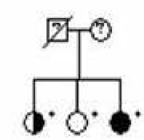

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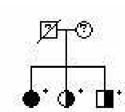

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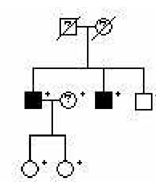

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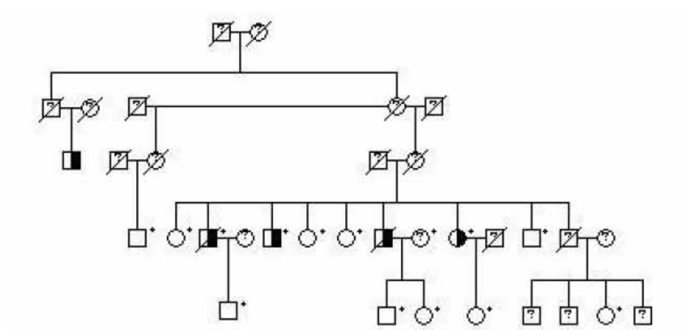

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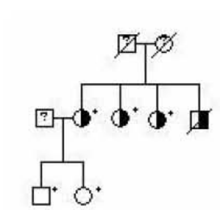

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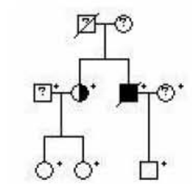

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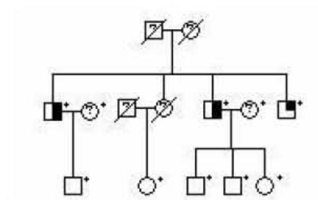

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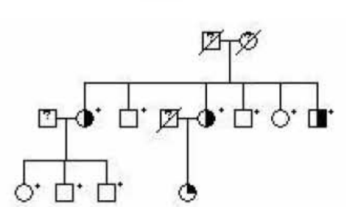

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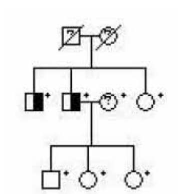

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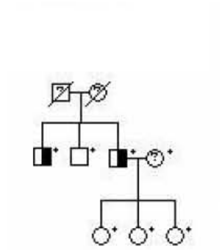

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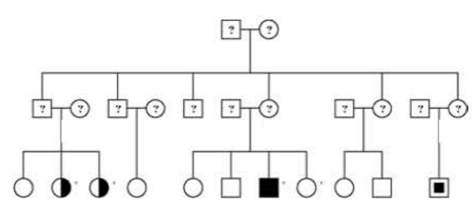

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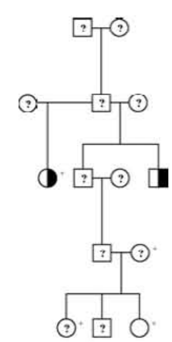


+ **Genotyped Subjects**

Pulmonary Fibrosis Definite

Pulmonary Fibrosis Probable

Pulmonary Fibrosis Possible

Pulmonary Fibrosis Reported

Respiratory Bronchiolitis–Interstitial Lung Disease Possible

Respiratory Bronchiolitis–Interstitial Lung Disease Probable

? **Not Available**

Non-specific Interstitial Pneumonia Definite

Non-specific Interstitial Pneumonia Probable

Other Idiopathic Interstitial Pneumonia Probable

Other Idiopathic Interstitial Pneumonia Possible

Cryptogenic Organizing Pneumonia Definite

Indeterminate

Unaffected

Figure S3. Multipoint LOD score graphs for whole genome screen (884 markers with an average inter-marker distance of 4.2 cM) in 82 families with two or more cases of IIP.

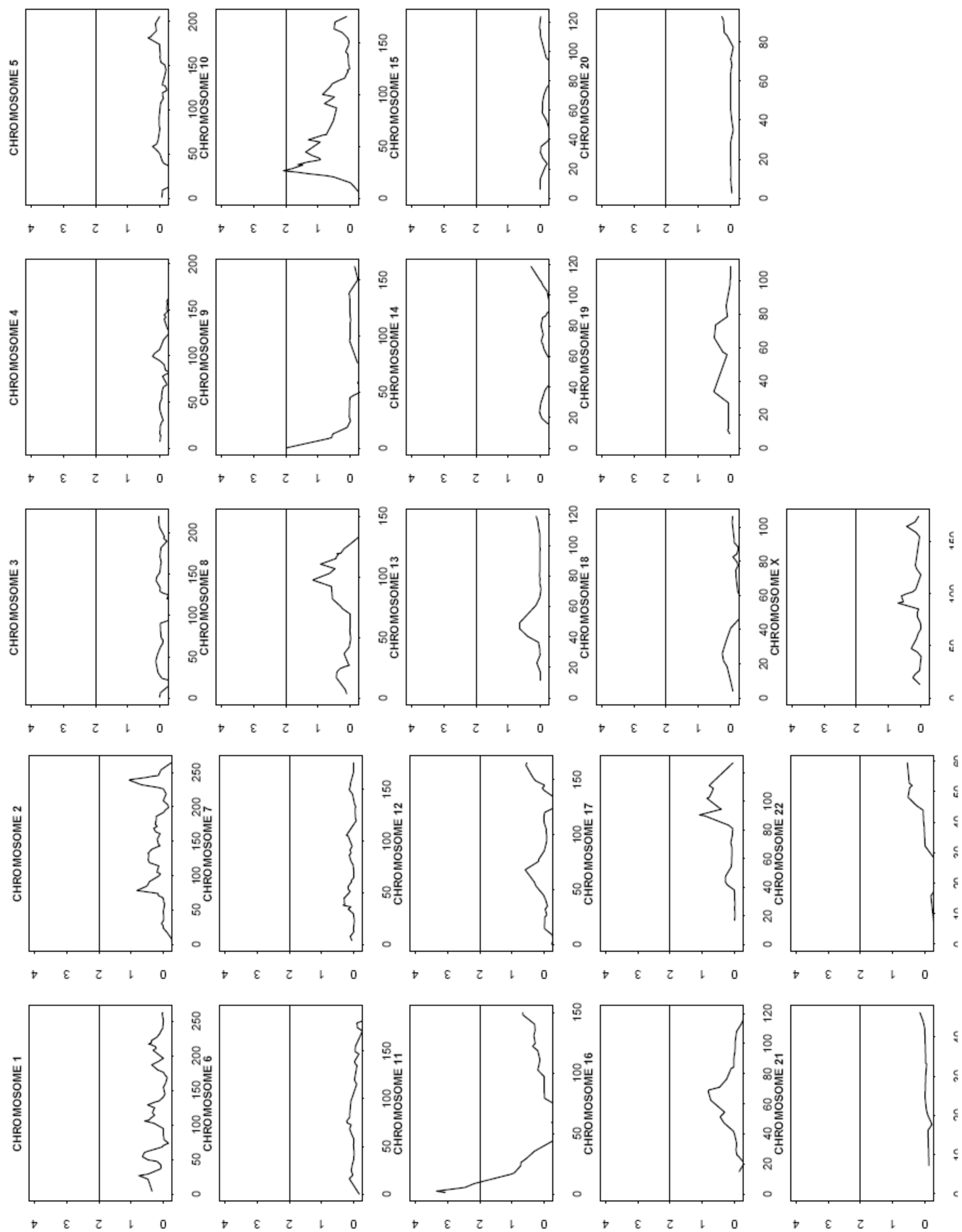


Figure S4. *MUC5B* promoter SNP (rs35705950) is at the 5' edge of sequence identified as highly conserved across vertebrate species.

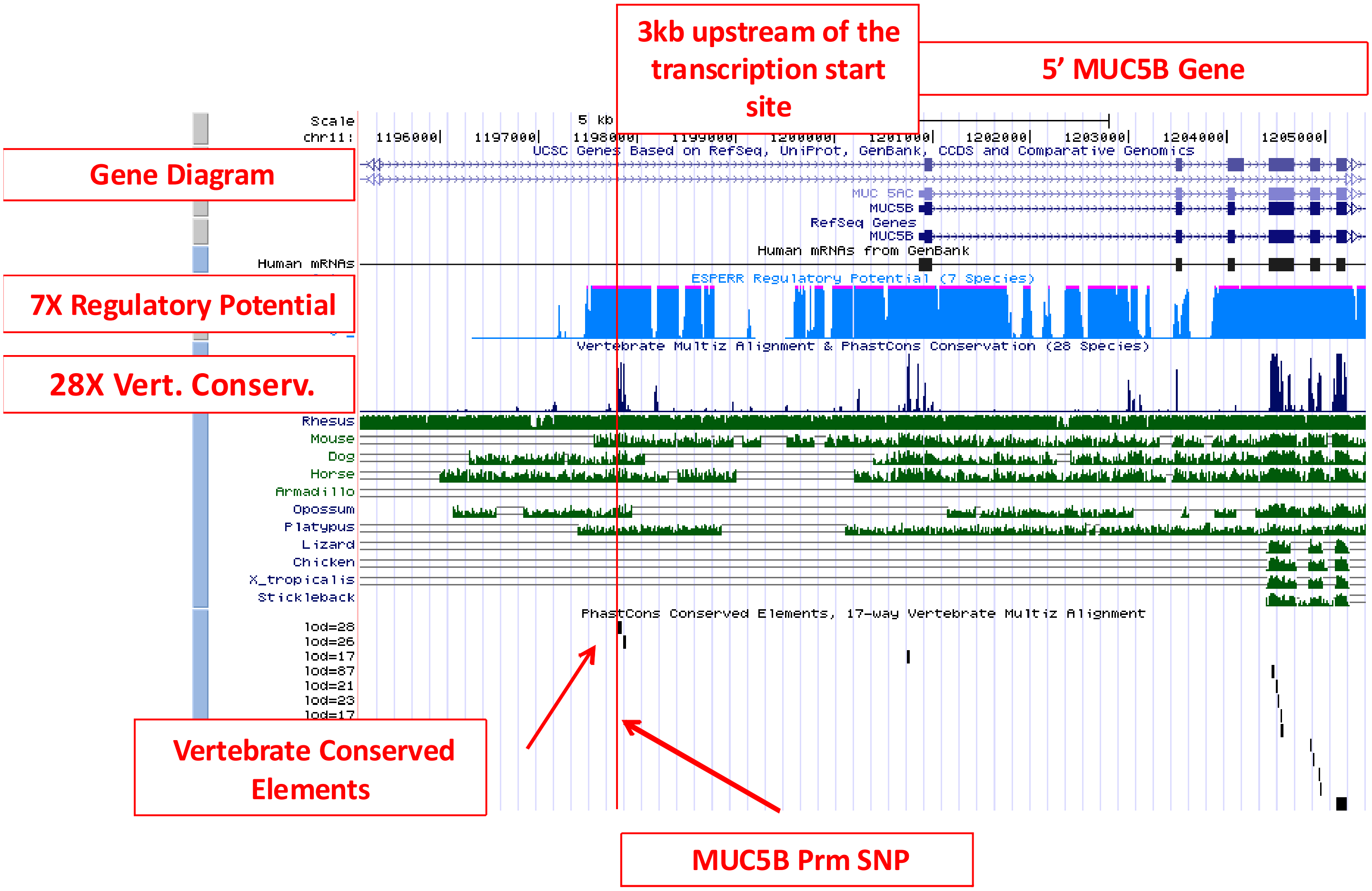
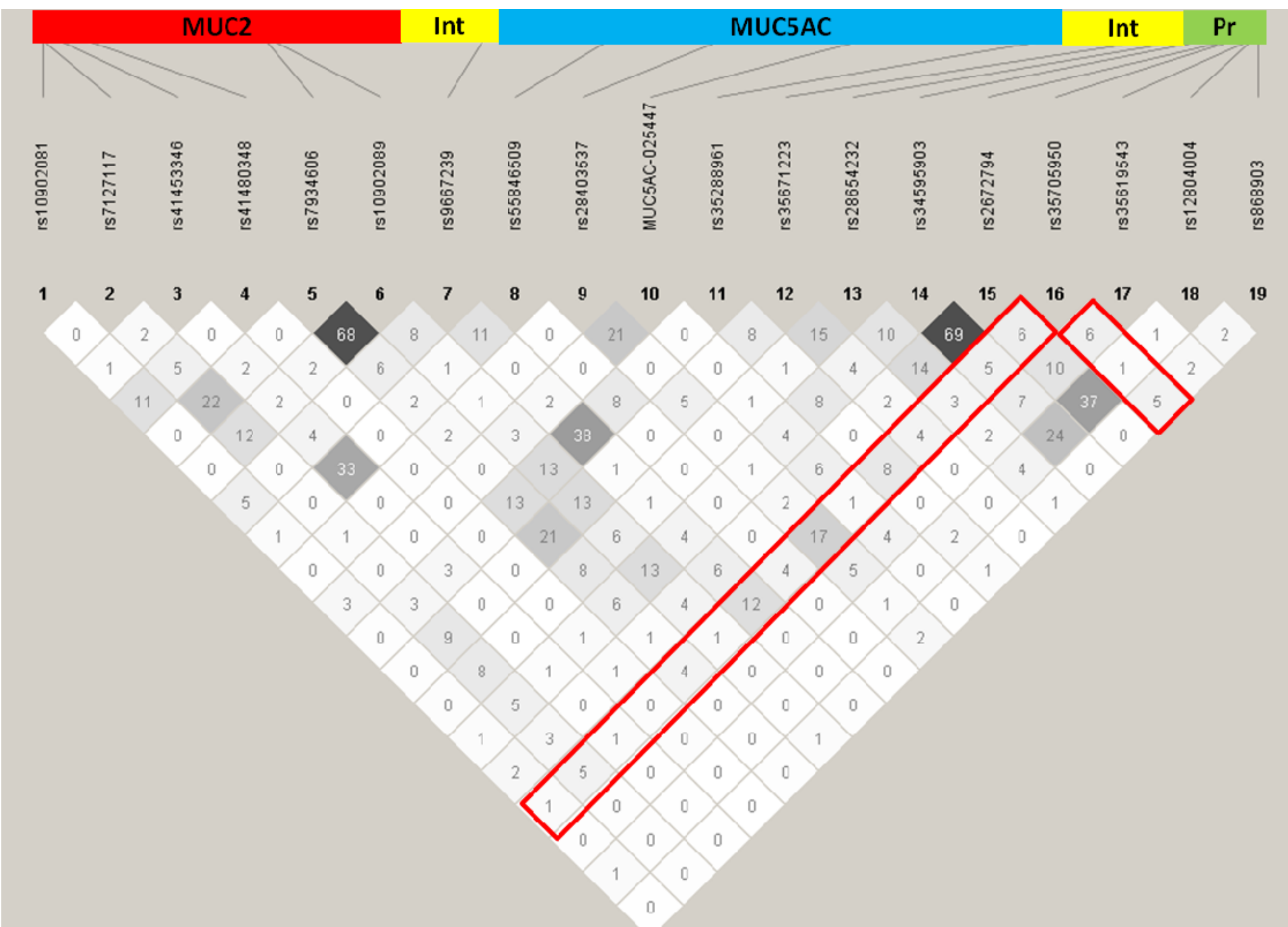


Figure S5. Pair-wise linkage disequilibrium plot for SNPs significantly associated with IPF or FIP by allelic association test in genetic screen of lung-expressed gel-forming mucins. LD values displayed are calculated by the r^2 statistic for the mucin genetic screen **in control** subjects (n=**322**). Intergenic region is abbreviated as Int, and the *MUC5B* Promoter is abbreviated as Pr.



References

1. King TE, Jr., Albera C, Bradford WZ, et al. Effect of interferon gamma-1b on survival in patients with idiopathic pulmonary fibrosis (INSPIRE): a multicentre, randomised, placebo-controlled trial. Lancet 2009;374:222-8.
2. King T, Costabel U, Cordier J, et al. Idiopathic pulmonary fibrosis: diagnosis and treatment. International consensus statement. Am J Respir Crit Care Med 2000;161:646-64.
3. Travis W, King T, Bateman E, et al. American Thoracic Society/European Respiratory Society International Multidisciplinary Consensus Classification of the Idiopathic Interstitial Pneumonias. This joint statement of the American Thoracic Society (ATS), and the European Respiratory Society (ERS) was adopted by the ATS board of directors, June 2001 and by the ERS Executive Committee, June 2001. Am J Respir Crit Care Med 2002;165:277-304.
4. King T, Costabel U, Cordier J, et al. International consensus statement idiopathic pulmonary fibrosis: diagnosis and treatment. Amer J Resp Crit Care Med 2000;161:646-64.
5. Abecasis GR, Cherny SS, Cookson WO, Cardon LR. Merlin--rapid analysis of dense genetic maps using sparse gene flow trees. Nat Genet 2002;30:97-101.
6. Kong A, Cox NJ. Allele-sharing models: LOD scores and accurate linkage tests. Am J Hum Genet 1997;61:1179-88.
7. Whittemore AS, Halpern J. A class of tests for linkage using affected pedigree members. Biometrics 1994;50:118-27.
8. Xu H, Gregory SG, Hauser ER, et al. SNPselector: a web tool for selecting SNPs for genetic association studies. Bioinformatics 2005;21:4181-6.
9. Wittke-Thompson JK, Pluzhnikov A, Cox NJ. Rational inferences about departures from Hardy-Weinberg equilibrium. Am J Hum Genet 2005;76:967-86.
10. Li M, Boehnke M, Abecasis GR. Joint modeling of linkage and association: identifying SNPs responsible for a linkage signal. Am J Hum Genet 2005;76:934-49.
11. Thornton DJ, Sheehan JK. From mucins to mucus: toward a more coherent understanding of this essential barrier. Proc Am Thorac Soc 2004;1:54-61.
12. Chen Y, Zhao YH, Di YP, Wu R. Characterization of human mucin 5B gene expression in airway epithelium and the genomic clone of the amino-terminal and 5'-flanking region. Am J Respir Cell Mol Biol 2001;25:542-53.
13. Groneberg DA, Eynott PR, Oates T, et al. Expression of MUC5AC and MUC5B mucins in normal and cystic fibrosis lung. Respir Med 2002;96:81-6.
14. Pigny P, Guyonnet-Duperat V, Hill AS, et al. Human mucin genes assigned to 11p15.5: identification and organization of a cluster of genes. Genomics 1996;38:340-52.
15. Buisine MP, Desseyn JL, Porchet N, Degand P, Laine A, Aubert JP. Genomic organization of the 3'-region of the human MUC5AC mucin gene: additional evidence for a common ancestral gene for the 11p15.5 mucin gene family. Biochem J 1998;332 (Pt 3):729-38.
16. Escande F, Aubert JP, Porchet N, Buisine MP. Human mucin gene MUC5AC: organization of its 5'-region and central repetitive region. Biochem J 2001;358:763-72.
17. Rose MC, Voynow JA. Respiratory tract mucin genes and mucin glycoproteins in health and disease. Physiol Rev 2006;86:245-78.
18. Wu DY, Wu R, Chen Y, Tarasova N, Chang MM. PMA stimulates MUC5B gene expression through an Sp1-based mechanism in airway epithelial cells. Am J Respir Cell Mol Biol 2007;37:589-97.
19. Kamio K, Matsushita I, Hijikata M, et al. Promoter analysis and aberrant expression of the MUC5B gene in diffuse panbronchiolitis. Am J Respir Crit Care Med 2005;171:949-57.

20. Rousseau K, Wickstrom C, Whitehouse DB, Carlstedt I, Swallow DM. New monoclonal antibodies to non-glycosylated domains of the secreted mucins MUC5B and MUC7. Hybrid Hybridomics 2003;22:293-9.