Deciphering the Signature of Selective Constraints on Cancerous Mitochondrial Genome

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Abstract

In accordance with the hypothesis that cancer formation is a process of somatic evolution driven by natural selection, signature of positive selection has been detected on a number of cancer-related nuclear genes. It remains, however, controversial whether a similar selective pressure has also acted on mitochondrial DNA (mtDNA), a small molecule in mitochondrion that may play an important role in tumorigenesis by altering oxidative phosphorylation. To better understand the mutational pattern on cancerous mtDNA and decipher the genetic signature left by natural selection, a total of 186 entire mitochondrial genomes of cancerous and adjacent normal tissues from 93 esophageal cancer patients were obtained and extensively studied. Our results revealed that the observed mutational pattern on the cancerous mtDNAs might be best explained as relaxation of negative selection. Taking into account an additional 1,235 cancerous (nearly) complete mtDNA sequences retrieved from the literature, our results suggested that the relaxed selective pressure was the most likely explanation for the accumulation of mtDNA variation in different types of cancer. This notion is in good agreement with the observation that aerobic glycolysis, instead of mitochondrial respiration, plays the key role in generating energy in cancer cells. Furthermore, our study provided solid evidence demonstrating that problems in some of the published cancerous mtDNA data adequately explained the previously contradictory conclusions about the selective pressure on cancer mtDNA, thus serving as a paradigm emphasizing the importance of data quality in affecting our understanding on the role of mtDNA in tumorigenesis.

Key words: cancer, mitochondrial genome, somatic mutation, selective constraints.

Introduction

The formation of cancer was recognized as a process of somatic evolution driven by natural selection (Nowell 1976), in which any genetic alterations that confer selective advantage to the fitness of the malignant cell would then be preferentially kept. In accordance with this hypothesis, signature of positive selection has been detected on a number of cancer-related genes, opening a new avenue in understanding the molecular mechanism underling carcinogenesis (Crespi and Summers 2006).

Although it is known that positive selection has played an important role in shaping the genetic landscape of nuclear genome in cancer cells, it remains controversial whether a similar selective pressure has also acted on mitochondrial DNA (mtDNA), which is located in mitochondrion but suggested to play an important role in tumorigenesis by altering mitochondrial oxidative phosphorylation (cf. Chandra and Singh 2011). In the past decade, a high frequency of somatic mtDNA mutations have been observed in a variety of cancers and were regarded as solid evidence supporting an important role of mtDNA during the neoplastic process (cf. Wallace 2005; Brandon et al. 2006; Chatterjee et al. 2006). Consistent with this notion, a recent study suggested that cancerous mitochondrial genomes were likely under positive selection (Zhidkov et al. 2009), further suggesting that mtDNA mutations likely have some functional potential in carcinogenesis. Although it has been proposed that random process can fully explain a large fraction of the observed somatic mtDNA mutations in cancer (Coller et al. 2001), a higher ratio of nonsynonymous to synonymous substitutions among these mutations indicated the existence of

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selection (Stafford and Chen-Quin 2010). Contrasting with the scenario proposed by Zhidkov et al. (2009), Stafford and Chen-Quin (2010) suggested that the mitochondrial genomes in cancer cells were most plausibly shaped by the relaxed selective constraints based on the observation that some mtDNA genes in cancer cells had a higher missense mutation rate than that in the general population. Evidence in support of the latter viewpoint came from the observation that aerobic glycolysis, instead of mitochondrial respiration, plays a key role in generating energy in cancer cells (Vander Heiden et al. 2009). Although both studies have obtained their findings by reanalyzing the mitochondrial genome data retrieved from the literature, their opinions about the selective pressure on cancerous mtDNA were surprisingly contradictory (Zhidkov et al. 2009; Stafford and Chen-Quin 2010). These conflicting conclusions were then likely introduced by problems in data quality, as had been discussed previously (Salas et al. 2005). Scrutinizing the mtDNA data from Zhou et al. (2007), which were considered by both studies, has revealed a number of suspicious somatic mutations. (supplementary table S1, Supplementary Material online). For instance, the observed "somatic mutations" in head and neck cancerous tissue of patient 1836 consist of virtually all diagnostic variants (namely 499, 1811, 4646, 5999, 6047, 7705, 11332, 11467, 12308, 12372, 14620, 15693, 16278, 16356) of haplogroup U4b (van Oven and Kayser 2009); since it is unlikely that these somatic mutational events occurred "coincidently" on all the U4b diagnostic sites, the most reasonable explanation would be that the cancerous tissue of the patient has been suffered from sample mix-up or contamination. Alternatively, it is also possible that signature of selective pressure may vary across different types of cancer and thus explains the conflicting opinions between both studies (Zhidkov et al. 2009; Stafford and Chen-Quin 2010). More mitochondrial genome data from additional cancer would then help to clarify these issues.

To better understand the mutational pattern on cancerous mtDNA and decipher the genetic signature left by natural selection, a total of 186 entire mitochondrial genomes of the cancerous and adjacent normal tissues from 93 esophageal cancer patients were obtained in this study under a stringent quality control procedure (see "Sample collection and sequencing" in Materials and Methods). Based on this new data set, supplemented by our previously reported 90 mitochondrial genomes from Chinese patients with breast cancer (Wang et al. 2007) or colorectal cancer (Wang et al. 2011), our results revealed that mtDNA in esophageal cancer is most likely driven by the relaxed negative selection, which is a common hallmark among different types of cancer. Significantly, our study provides solid evidence disclosing that problems in some of the published cancerous mtDNA data sets introduced by sample mix-up or contamination of exogenous DNA well explain the previously conflicting viewpoints about the selective pressure on cancer mtDNA, thus serving as a paradigmatic example emphasizing the importance of data quality in affecting our understanding on the role of mtDNA in tumorigenesis.

Materials and Methods

Sample Collection and Sequencing

In total, 93 surgically resected esophageal cancer specimens were obtained from Taihang area in Henan province, China, a high-incidence area for esophageal cancer. None of the patients received any radiotherapy or chemotherapy before surgery. Histopathologically, all the patients had been confirmed with esophageal squamous cell carcinoma. For each patient, both cancerous and adjacent normal tissues were collected and stored under −80 °C until DNA extraction. Genomic DNA from each issue was isolated by using the phenol/chloroform extraction method. To avoid the problems of artificial recombination and mitochondrial pseudogenes (Salas et al. 2005; Kong et al. 2008; Yao et al. 2008), the whole mtDNA genome was amplified into two overlapping polymerase chain reaction fragments, each comprising about 8,500 bp in length (Fendt et al. 2009). Sequencing was performed by BigDye Terminator v3.1 Cycle Sequencing Kit and run on 3730 DNA Analyzer (Applied Biosystems). Sequences were aligned and edited by the LaserGene v7.1 software (DNAStar, Inc., Madison, WI), and mutations were recorded by comparing with the revised Cambridge reference sequence (rCRS; Andrews et al. 1999). To further ensure the quality of the obtained sequence data, a stringent quality control procedure (Kong et al. 2003, 2006; Palanichamy et al. 2004; Sun et al. 2006) and some caveats (Kong et al. 2008; Bandelt et al. 2009; Yao et al. 2009) were adopted during the course of sample handling and data generation. Specifically, every sample was sequenced at least twice, and all the recorded mutations were confirmed by rechecking the sequencing electropherograms and/or resequencing. Moreover, for any observed somatic mutation(s) in certain tissue, the mutation(s) was further validated by reamplifying and sequencing the genomic DNA of the same tissue sample.

Evaluating the Collected Cancerous Mitochondrial Genome Data

Besides the newly generated complete mtDNAs, we also analyzed the mtDNA data studied by Zhidkov et al. (2009) and Stafford and Chen-Quin (2010). The original and "corrected" mtDNA data from Salas et al. (2005) and additional 361 cancerous mitochondrial genomes retrieved from the literature were studied as well. To this end, a total of 1,235 cancerous mtDNA sequences were considered in this study (supplementary tables S2 and S3, Supplementary Material online), which were recruited from patients in Asia, Europe, and North America and were composed of 19 types of cancer (astrocytoma, bladder, breast, colorectal, esophageal, glioblastoma, gastric, head and neck, hepatocellular, leukemia, lung, medulloblastoma, nasopharyngeal, oral, ovarian, pancreas, prostate, renal, and thyroid cancer).

Determining Germline Variation in Natural Human Population

To determine the mutational spectra of mtDNA variation in the general populations, 3,696 complete mitochondrial

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genomes from the general human populations were retrieved from GenBank (available on June 2009). The mutational spectrum of mtDNA (germline) variation in the general populations was reanalyzed and used as a baseline for comparison. After removing those sequences with poor quality, 3,639 mitochondrial genomes were used in the subsequent analyses. All mtDNA sequences were aligned by Kalign program (Lassmann et al. 2009) according to the rCRS. DNADIST program in PHYLIP 3.69 package (Felsenstein 2009) was used to calculate the distance matrix, followed by the creation of a Neighbor-Joining (NJ) phylogenetic tree using NEIGHBOR with *Pan troglodytes* (NC_001643) as an outgroup. DNAPARS was used to infer the mtDNA sequences at the inner nodes of the NJ phylogenetic tree, and we recorded the variants occurring on the terminal branches as the private ones in the general population (supplementary table S4, Supplementary Material online).

Data Analyses

To estimate the potential selective constraints, numbers of synonymous (*S*) and nonsynonymous (*N*) substitutions in the mtDNA protein-coding regions from cancerous tissue samples and the general human populations were counted, respectively. Noticeably, during the analysis of *N*/*S* ratio in each type of cancer, we only considered the cancer type with cancerous mitochondrial genomes outnumbering 30, for a smaller number of cancerous mitochondrial genomes may result in an extremely low incidence of synonymous and/or nonsynonymous mutations and thus easily bias the result. Combination of mutations (COMs, which refers to two or more mutations that recurred in two or more tumors) were calculated according to Zhidkov et al. (2009), and the reported mtDNA data considered in this study were reassessed by using the phylogenetic analysis. This approach could be achieved by extensively comparing the mutation pattern of certain mtDNA sequence under survey with the reconstructed phylogenetic tree of human mtDNAs worldwide, which has been proven to be of great help in distilling potential problems in reported mtDNA data (Bandelt et al. 2001; Yao et al. 2003, 2004, 2006, 2009; Bandelt et al. 2005; Salas et al. 2005; Kong et al. 2008). Specifically, to pinpoint the possibly artificial recombination that was likely introduced by sample contamination or mix-up, the recently proposed phylogenetic method and mutation scoring system were adopted (Kong et al. 2008). To shed more light on the potential effect of data quality on our understanding of mtDNA mutation pattern in cancer studies, ratios of the number of somatic mutations (*Ns*) to the number of the individuals with somatic mutation(s) (*Ni*) were calculated.

Results and Discussion

In the present study, a total of 186 mitochondrial genomes, representing the primary cancerous and adjacent normal tissues of 93 patients with esophageal cancer, were obtained and deposited into GenBank under accession numbers JF824812–JF824997. The new mitochondrial genome data and the cancerous somatic mutations were displayed by way of phylogenetic tree (supplementary fig. S1, Supplementary Material online). As a result, a total of 64 cancerous somatic mutations were detected here (supplementary table S5, Supplementary Material online), among which 18 are nonsynonymous and 11 are synonymous that distribute across the whole genome. Out of the 93 patients, 40 present somatic mutations in their cancerous tissues (40/93), a proportion similar with the previous study on mitochondrial genomes in esophageal cancer (11/20 [Tan et al. 2006]; 12/31 [Gochhait et al. 2008]).

By respectively calculating the ratio of the number of nonsynonymous substitution (*N*) to the number of synonymous substitution (*S*) in the 93 cancerous mitochondrial genomes and those from the general human population, our result revealed that the *N*/*S* ratio in cancerous mitochondrial genomes (1.64) was significantly higher than that in the general populations (0.50; $P = 0.002$). This ratio increased to 2.00 if we considered our previously reported mtDNA data from breast and colorectal cancer (Wang et al. 2007, 2011). The observed significantly higher *N*/*S* value in our esophageal cancerous mtDNAs suggests that the selective pressure on the cancerous mtDNAs is different from that on the mtDNAs from the general human populations. Although the observed high *N*/*S* ratio of cancerous mtDNAs could be explained as the signature of relaxed negative selection, possibility of positive selection could not be ruled out completely. Estimation of neutrality index by the McDonald and Kreitman test (McDonald and Kreitman 1991, by using 24 mitochondrial genomes of chimpanzee as outgroup) revealed that the value of cancerous mtDNAs (2.25) is similar but larger than that of mtDNAs in the matched normal tissues (2.15), indicating the mtDNAs in both tissues being driven by purifying selection, albeit with different degree. Taken together, the mutational pattern observed in the esophageal cancerous mtDNAs might be best explained as the result of the relaxation of negative selection.

Intriguingly, our result is similar to that of Stafford and Chen-Quin (2010) but at odds with the conclusion of Zhidkov et al. (2009). To shed light on the fundamental reasons underlying this discrepancy, we performed a series of analyses to test the possibility of whether the conflict was raised by the problems in data quality. By repeating the analyses performed in Zhidkov et al. (2009) based on the same data set that, however, was corrected by using the phylogenetic approach, we detected only one COMs, significantly fewer than the 15 COMs detected in the data used by Zhidkov et al. (2009; fig. 1 and supplementary table S6, Supplementary Material online). A similar pattern was obtained when the cancerous mitochondrial genome data studied in Salas et al. (2005) were considered: A total of ten COMs were obtained by analyzing the original data set, but no COMs were observed after the reassessed data set were considered (fig. 1 and supplementary table S6, Supplementary Material online). Therefore, it is most likely that most of the previously observed COMs were in fact attributed to problems of data quality, for example, sample mix-up or contamination from the exogenous DNA. Indeed, we found no COMs

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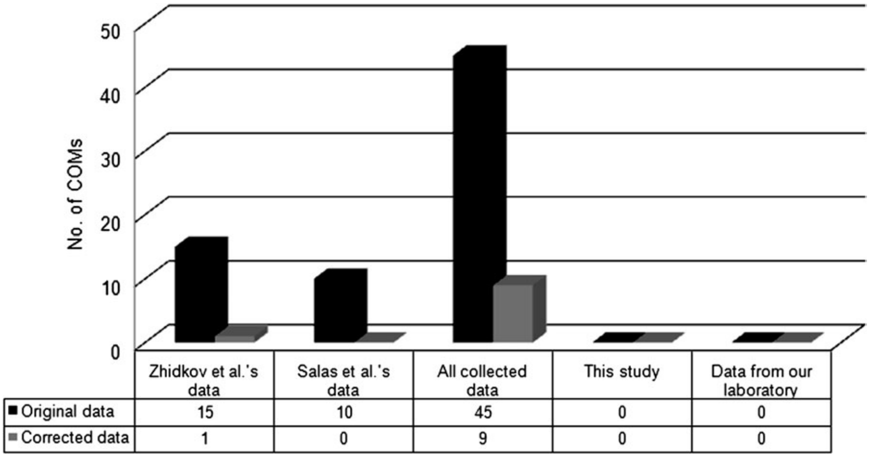

Fig. 1. Estimation of COMs based on different cancerous mtDNA data sets. "Zhidkov et al.'s data" refers to the data analyzed in Zhidkov et al. (2009); "Salas et al.'s data" means the data considered in Salas et al. (2005); "All collected data" indicates all reported cancerous mtDNA considered in the present study (supplementary tables S2 and S3, Supplementary Material online); "Data from our laboratory" represents the cancerous mitochondrial genome data generated by our laboratory, including a total of 123 cancerous mitochondrial genomes from 93 esophageal cancer patients (this study), 10 breast cancer patients (Wang et al. 2007), and 20 colorectal cancer patients (Wang et al. 2011). "Original data" means the original data retrieved from the literature, whereas "Corrected data" indicates the data corrected by using the phylogenetic approach.

in our newly generated esophageal cancerous mitochondrial genome data (fig. 1). Our reappraising results also indicated that a number of the observed somatic mutations in the mtDNA data set considered in Stafford and Chen-Quin (2010) are likely spurious and attributed to the contamination of exogenous mtDNAs (supplementary table S1, Supplementary Material online). It is then expected that taking this flawed mtDNA data set into consideration would lead to a decrease of the *N*/*S* value. Indeed, the *N*/*S* ratio turns out to be 1.32 by using the original data set considered in Stafford and Chen-Quin (2010), much lower than the value (1.64) estimated on the basis of esophageal cancer in this study. Intriguingly, this value is similar to the *N*/*S* value (1.35) based on all the originally reported cancerous mitochondrial genomes (supplementary table S4, Supplementary Material online).

To obtain a general understanding of the potential effect of poor data quality on the mutational spectrum, we have counted the number of somatic mutations (*Ns*) and the number of the individuals with somatic mutations (*Ni*; see "Data Analyses" in Materials and Methods). By comparing ratios of *Ns*/*Ni* between our own data and those retrieved from the literature, we found that the ratio value of our new data was 1.44, which remained stable (1.47; $P = 1.000$) even after we included our previously reported cancerous mtDNA data from 10 breast cancer patients (Wang et al. 2007) and 20 colorectal cancer patients (Wang et al. 2011). This result, however, is significantly lower than that (2.27) of the reported cancerous mtDNA data from the literature ($P = 0.027$; fig. 2). We corrected the seeming errors in the reported data by using the phylogenetic approach (Bandelt et al. 2005; Salas et al. 2005; Yao et al. 2009), the *Ns*/*Ni* ratio decreases to 1.70, a value similar to our data (1.70 vs. 1.44; $P = 0.45$; fig. 2). Of note is that the corrected mtDNA mutation spectrum (*Ns*/*Ni* ratio) is comparable with our own data (fig. 2), indicating the presence of authentic cancerous somatic mutations in the previous cancer studies albeit some of them most likely suffered from problems in data quality. So far, it is evident that incomplete or biased observation would be easily introduced even when only a small proportion of the cancerous mtDNA data were suffered from potential spurious variation, and this problem

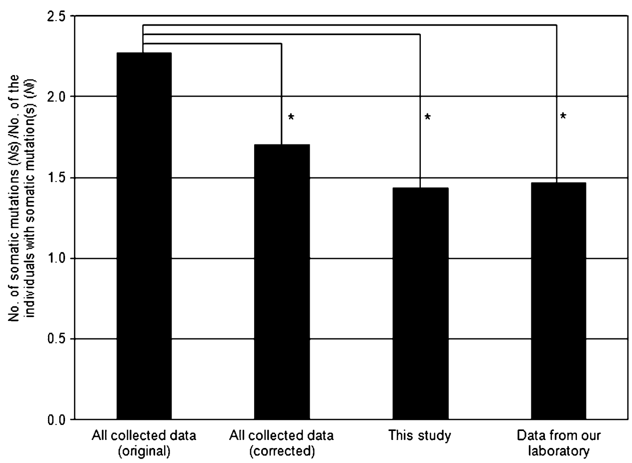

Fig. 2. Comparison of *Ns*/*Ni* ratios between our cancerous mitochondrial genome data and those retrieved from the literature. "All collected data" refers to all the cancerous mtDNA considered in the present study (available in supplementary tables S2 and S3, Supplementary Material online); "original" and "corrected" mean the original data and the data corrected by the phylogenetic approach, respectively; "This study" refers to the 93 esophageal cancerous mitochondrial genome data generated by this study; "Data from our laboratory" means the cancerous mitochondrial genome data generated by our laboratory, including a total of 123 cancerous mitochondrial genomes from 93 esophageal cancer patients (this study), 10 breast cancer patients (Wang et al. 2007), and 20 colorectal cancer patients (Wang et al. 2011). The *P* value of the comparison between B and C is 0.45. *$P < 0.05$.

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Table 1. Distribution of Synonymous and Nonsynonymous mtDNA Mutations in 1,328 mtDNAs from Cancer and 3,639 mtDNAs from the General Population.

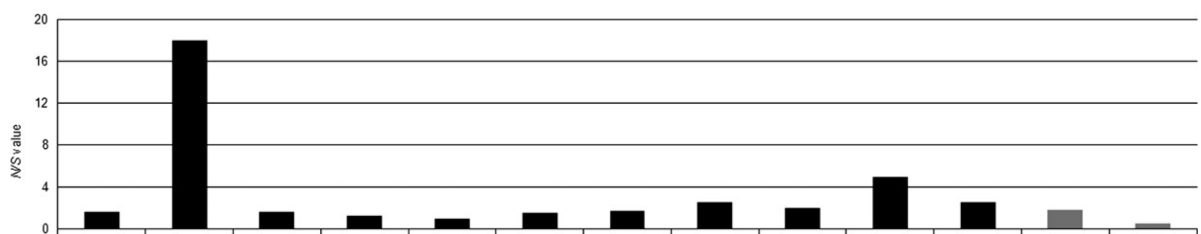
	Natural Population			Cancer				
Gene	*N*	*S*	*N/S*	No. of Mutations/bp of Gene	*N*	*S*	*N/S*	*P* Value[a]
MT-ND1	184	309	0.60	0.03	24	5	4.80	1.69×10^{-6}*
MT-ND2	145	372	0.39	0.04	27	19	1.42	3.97×10^{-5}*
MT-ND3	39	105	0.37	0.03	4	6	0.67	0.467
MT-ND4	145	483	0.30	0.03	25	18	1.39	2.23×10^{-6}*
MT-ND4L	14	84	0.17	0.03	9	1	9.00	1.82×10^{-6}*
MT-ND5	352	650	0.54	0.03	34	21	1.62	1.34×10^{-4}*
MT-ND6	91	203	0.45	0.03	9	5	1.80	1.62×10^{-2}*
MT-CYB	294	412	0.71	0.04	29	15	1.93	2.50×10^{-3}*
MT-CO1	116	475	0.24	0.03	22	17	1.29	1.23×10^{-6}*
MT-CO2	82	213	0.39	0.03	9	8	1.13	5.01×10^{-2}
MT-CO3	122	275	0.44	0.05	31	9	3.44	1.01×10^{-8}*
MT-ATP6	272	212	1.28	0.04	23	7	3.29	3.52×10^{-2}*
MT-ATP8	64	87	0.74	0.02	1	4	0.25	0.402
Complex I	970	2206	0.44	0.03	132	75	1.76	7.09×10^{-15}*
Complex III	294	412	0.71	0.04	29	15	1.93	2.50×10^{-3}*
Complex IV	320	963	0.33	0.03	62	34	1.82	1.29×10^{-14}*
Complex V	336	299	1.12	0.04	24	11	2.18	8.21×10^{-2}

NOTE.—*N*, nonsynonymous substitutions; *S*, synonymous substitutions.
[a] *P* value was calculated by Fisher's exact test.

could be largely avoided if the phylogenetic approach was fully appreciated (Yao et al. 2009).

To further determine whether the relaxed selective pressure is a common hallmark among different types of cancer, somatic mutation data of mitochondrial genomes from 1,328 cancerous tissue samples (including our new data) were analyzed and compared with that from the general human populations. Then, by respectively calculating the *N/S* ratio in the cancerous mitochondrial genomes (including the phylogenetically corrected data from the literature as well as our newly generated data) and those from the general human population, our result revealed that the *N/S* ratio of the entire coding region of cancerous mtDNA was 1.83, which was still significantly higher than that (0.50) from the general populations ($P = 3.42 \times 10^{-14}$; table 1). Further analysis revealed that, with the exception of *MT-ND3*, *MT-CO2*, and *MT-ATP8*, the *N/S* ratio of each gene in cancerous mitochondrial genome was significantly higher than that of the general populations (table 1). Intriguingly, a similar significant difference was also observed between the mtDNAs from the cancerous tissues, and the general populations after the genes were allocated into the corresponding respiratory chain complexes: Complex I ($P = 7.09 \times 10^{-15}$), Complex III ($P = 2.50 \times 10^{-3}$), and Complex IV ($P = 1.29 \times 10^{-14}$) (table 1). We classified mitochondrial genomes by cancer type and recalculated their *N/S* ratios independently; our results showed that, for virtually all types of cancer under analysis, their *N/S* ratios were consistently greater than 1 (fig. 3). These similar mutational patterns observed among different types of cancer suggested that cancerous somatic mtDNA mutations were likely accumulated under a common selective pressure, which might be best explained as the relaxation of negative selection. Further evidence in support of this viewpoint came from the observation that almost all the pinpointed cancerous somatic mutations distributed uniformly across the mitochondrial genome (fig. 4).

Since a number of somatic mutations identified in the cancerous tissues were also observed in various normal populations, suggesting them likely to be polymorphic. Excluding these potential polymorphic variants, determined by comparing with the reported variation listed in the



	Breast	Colorectal	Esophageal	Gastric	Glioblastoma	Head and neck	Hepatocellular	Leukemia	Prostate	Renal	Thyroid	All cancer	Natural population
■ *N/S*	1.58	18.00	1.64	1.20	1.00	1.48	1.67	2.50	2.00	5.00	2.52	1.83	0.49
N	41	18	23	6	1	46	5	5	16	5	58	218	1920
S	26	1	14	5	1	31	3	2	8	1	23	119	3880

FIG. 3. Assessing the *N/S* values of the cancerous mitochondrial genomes and those from the general populations. Only cancer types with cancerous mitochondrial genomes greater than 30 were considered here. "*N*" indicates nonsynonymous substitution, whereas "*S*" refers to synonymous substitution.

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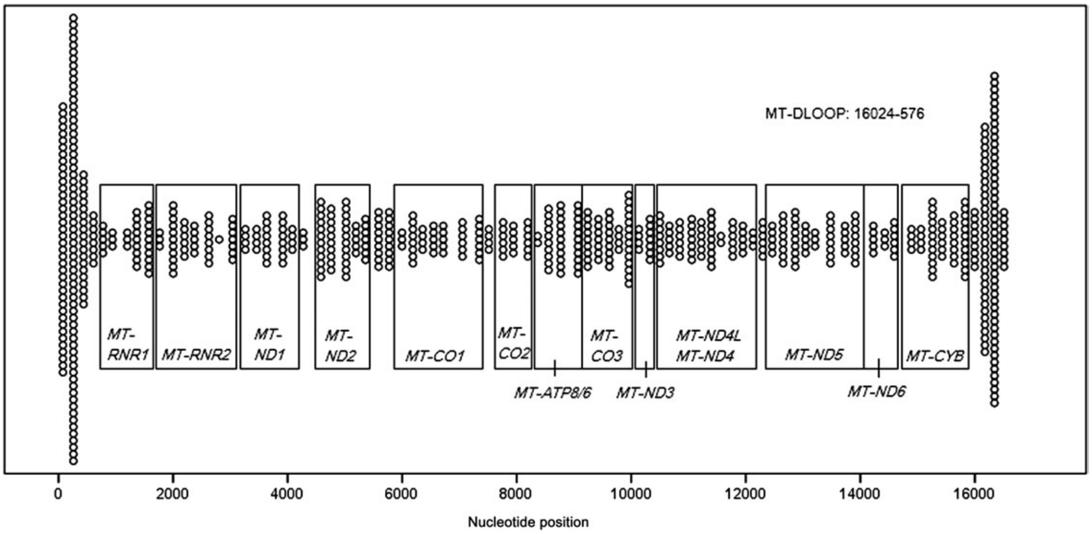

FIG. 4. Distribution of somatic mutations on mitochondrial genome of the cancerous tissue. Each circle represents one mutation in the corresponding region of mtDNA.

mtDB database (http://www.mtdb.igp.uu.se/), from the analyses revealed a similar pattern as observed above: The *N/S* ratio of our esophageal cancer mtDNA data increased from 1.64 to 4.33, whereas the total *N/S* ratio of all cancerous mtDNA data turned out to be 4.68 (supplementary tables S6 and S7, Supplementary Material online). Of note is that most of the protein-coding genes (except for *MT-ND3*, *MT-ATP6*, and *MT-ATP8*) still showed significantly greater *N/S* ratios than those in natural populations, and the previously observed uniform distribution of the cancerous somatic mutations across the mitochondrial genome remained unchanged (supplementary fig. S2, Supplementary Material online).

In conclusion, by analyzing 186 newly obtained mitochondrial genomes and 1,235 reported cancerous mtDNAs, our results suggest that the observed mutational pattern on the mtDNAs of esophageal cancer shall be best explained as the result of the relaxation of negative selection. This pattern is not restricted to esophageal cancer but observed in different types of cancer under consideration, which is in good agreement with the observation that aerobic glycolysis, instead of mitochondrial respiration, plays the key role in generating energy in cancer cells (Vander Heiden et al. 2009). Our result echoes the proposal that the switch in energy metabolism shall be treated as a seventh hallmark of cancer (Hanahan and Weinberg 2011). In retrospect, the observed high frequency of somatic mtDNA mutations in cancer once was treated as increasing evidence in support of the important role of mtDNA in tumorigenesis (cf. Wallace 2005; Brandon et al. 2006; Chatterjee et al. 2006; Hanahan and Weinberg 2011). However, our results challenge this viewpoint by showing that most of cancerous somatic mtDNA mutations were accumulated as a result of the relaxed negative selection, likely due to the impairment of mitochondrial oxidative phosphorylation with the switch of energy metabolism in cancer cells (Warburg 1956; Chandra and Singh 2011). Nonetheless, it is still possible that some specific mtDNA mutations may confer beneficial potential to cancer cells during its development or metastasis (Ishikawa et al. 2008), which plausibly consist of a limited proportion of the distilled somatic mtDNA mutations and could not be detected by the methods employed here. Remarkably, our study also provides solid evidence demonstrating that the problems in some of the published cancerous mtDNA data sets, introduced mainly by sample mix-up or contamination of exogenous mtDNA, well explain the previously conflicting viewpoints of the selective pressure on the cancerous mtDNA, with the spurious somatic mtDNA mutations either leading to the presence of COMs (Zhidkov et al. 2009) or significantly decreasing the *N/S* value (Stafford and Chen-Quin 2010), thus offering a paradigm emphasizing the importance of data quality in affecting our understanding on the role of mtDNA in tumorigenesis.

Supplementary Material

Supplementary tables S1–S7 and figures S1 and S2 are available at *Molecular Biology and Evolution* online (http://www.mbe.oxfordjournals.org/).

Acknowledgments

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References

Andrews RM, Kubacka I, Chinnery PF, Lightowlers RN, Turnbull DM, Howell N. 1999. Reanalysis and revision of the Cambridge reference sequence for human mitochondrial DNA. *Nat Genet.* 23:147.

Bandelt HJ, Achilli A, Kong QP, Salas A, Lutz-Bonengel S, Sun C, Zhang YP, Torroni A, Yao YG. 2005. Low "penetrance" of

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phylogenetic knowledge in mitochondrial disease studies. *Biochem Biophys Res Commun.* 333:122–130.
Bandelt HJ, Lahermo P, Richards M, Macaulay V. 2001. Detecting errors in mtDNA data by phylogenetic analysis. *Int J Legal Med.* 115:64–69.
Bandelt HJ, Salas A, Taylor RW, Yao YG. 2009. Exaggerated status of "novel" and "pathogenic" mtDNA sequence variants due to inadequate database searches. *Hum Mutat.* 30:191–196.
Brandon M, Baldi P, Wallace DC. 2006. Mitochondrial mutations in cancer. *Oncogene* 25:4647–4662.
Chandra D, Singh KK. 2011. Genetic insights into OXPHOS defect and its role in cancer. *Biochim Biophys Acta.* 1807:620–625.
Chatterjee A, Mambo E, Sidransky D. 2006. Mitochondrial DNA mutations in human cancer. *Oncogene* 25:4663–4674.
Coller HA, Khrapko K, Bodyak ND, Nekhaeva E, Herrero-Jimenez P, Thilly WG. 2001. High frequency of homoplasmic mitochondrial DNA mutations in human tumors can be explained without selection. *Nat Genet.* 28:147–150.
Crespi BJ, Summers K. 2006. Positive selection in the evolution of cancer. *Biol Rev Camb Philos Soc.* 81:407–424.
Felsenstein J. 2009. PHYLIP (phylogeny inference package) version 3.69. Seattle (WA): Department of Genome Sciences, University of Washington.
Fendt L, Zimmermann B, Daniaux M, Parson W. 2009. Sequencing strategy for the whole mitochondrial genome resulting in high quality sequences. *BMC Genomics* 10:139.
Gochhait S, Bhatt A, Sharma S, Singh YP, Gupta P, Bamezai RN. 2008. Concomitant presence of mutations in mitochondrial genome and p53 in cancer development—a study in north Indian sporadic breast and esophageal cancer patients. *Int J Cancer.* 123:2580–2586.
Hanahan D, Weinberg RA. 2011. Hallmarks of cancer: the next generation. *Cell* 144:646–674.
Ishikawa K, Takenaga K, Akimoto M, Koshikawa N, Yamaguchi A, Imanishi H, Nakada K, Honma Y, Hayashi J. 2008. ROS-generating mitochondrial DNA mutations can regulate tumor cell metastasis. *Science* 320:661–664.
Kong QP, Bandelt HJ, Sun C, et al. (12 co-authors). 2006. Updating the East Asian mtDNA phylogeny: a prerequisite for the identification of pathogenic mutations. *Hum Mol Genet.* 15:2076–2086.
Kong QP, Salas A, Sun C, Fuku N, Tanaka M, Zhong L, Wang CY, Yao YG, Bandelt HJ. 2008. Distilling artificial recombinants from large sets of complete mtDNA genomes. *PLoS One* 3:e3016.
Kong QP, Yao YG, Sun C, Bandelt HJ, Zhu CL, Zhang YP. 2003. Phylogeny of east Asian mitochondrial DNA lineages inferred from complete sequences. *Am J Hum Genet.* 73:671–676.
Lassmann T, Frings O, Sonnhammer EL. 2009. Kalign2: high-performance multiple alignment of protein and nucleotide sequences allowing external features. *Nucleic Acids Res.* 37:858–865.
McDonald JH, Kreitman M. 1991. Adaptive protein evolution at the Adh locus in Drosophila. *Nature* 351:652–654.
Nowell PC. 1976. The clonal evolution of tumor cell populations. *Science* 194:23–28.
Palanichamy MG, Sun C, Agrawal S, Bandelt HJ, Kong QP, Khan F, Wang CY, Chaudhuri TK, Palla V, Zhang YP. 2004. Phylogeny of mitochondrial DNA macrohaplogroup N in India, based on complete sequencing: implications for the peopling of South Asia. *Am J Hum Genet.* 75:966–978.
Salas A, Yao YG, Macaulay V, Vega A, Carracedo A, Bandelt HJ. 2005. A critical reassessment of the role of mitochondria in tumorigenesis. *PLoS Med.* 2:e296.
Stafford P, Chen-Quin EB. 2010. The pattern of natural selection in somatic cancer mutations of human mtDNA. *J Hum Genet.* 55:605–612.
Sun C, Kong QP, Palanichamy MG, Agrawal S, Bandelt HJ, Yao YG, Khan F, Zhu CL, Chaudhuri TK, Zhang YP. 2006. The dazzling array of basal branches in the mtDNA macrohaplogroup M from India as inferred from complete genomes. *Mol Biol Evol.* 23:683–690.
Tan DJ, Chang J, Liu LL, Bai RK, Wang YF, Yeh KT, Wong LJ. 2006. Significance of somatic mutations and content alteration of mitochondrial DNA in esophageal cancer. *BMC Cancer* 6:93.
van Oven M, Kayser M. 2009. Updated comprehensive phylogenetic tree of global human mitochondrial DNA variation. *Hum Mutat.* 30:E386–E394.
Vander Heiden MG, Cantley LC, Thompson CB. 2009. Understanding the Warburg effect: the metabolic requirements of cell proliferation. *Science* 324:1029–1033.
Wallace DC. 2005. Mitochondria and cancer: Warburg addressed. *Cold Spring Harb Symp Quant Biol.* 70:363–374.
Wang CY, Li H, Hao XD, Liu J, Wang JX, Wang WZ, Kong QP, Zhang YP. 2011. Uncovering the profile of somatic mtDNA mutations in Chinese colorectal cancer patients. *PLoS One* 6:e21613.
Wang CY, Wang HW, Yao YG, Kong QP, Zhang YP. 2007. Somatic mutations of mitochondrial genome in early stage breast cancer. *Int J Cancer.* 121:1253–1256.
Warburg O. 1956. On respiratory impairment in cancer cells. *Science* 124:269–270.
Yao YG, Bravi CM, Bandelt HJ. 2004. A call for mtDNA data quality control in forensic science. *Forensic Sci Int.* 141:1–6.
Yao YG, Kong QP, Salas A, Bandelt HJ. 2008. Pseudomitochondrial genome haunts disease studies. *J Med Genet.* 45:769–772.
Yao YG, Macauley V, Kivisild T, Zhang YP, Bandelt HJ. 2003. To trust or not to trust an idiosyncratic mitochondrial data set. *Am J Hum Genet.* 72:1341–1346.
Yao YG, Salas A, Bravi CM, Bandelt HJ. 2006. A reappraisal of complete mtDNA variation in East Asian families with hearing impairment. *Hum Genet.* 119:505–515.
Yao YG, Salas A, Logan I, Bandelt HJ. 2009. mtDNA data mining in GenBank needs surveying. *Am J Hum Genet.* 85:929–933.
Zhidkov I, Livneh EA, Rubin E, Mishmar D. 2009. MtDNA mutation pattern in tumors and human evolution are shaped by similar selective constraints. *Genome Res.* 19:576–580.
Zhou S, Kachhap S, Sun W, et al. (18 co-authors). 2007. Frequency and phenotypic implications of mitochondrial DNA mutations in human squamous cell cancers of the head and neck. *Proc Natl Acad Sci U S A.* 104:7540–7545.

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Deciphering the signature of selective constraints on cancerous mitochondrial genome

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Supplementary Material

Supplementary Table S1. Potential spurious variation distilled in the published cancerous mtDNA data.

Cancer type	Sample ID	Original data	Potential spurious variation	Score of the potential spurious variation[a]	Corrected data	Reference
Breast	BRCA10	9903	-	-	9903	(Gasparre et al. 2007)
Breast	BRCA14	15843	-	-	15843	(Gasparre et al. 2007)
Breast	BRCA17	15813G	-	-	15813G	(Gasparre et al. 2007)
Breast	BRCA3	12601	-	-	12601	(Gasparre et al. 2007)
Breast	BRCA5	9119	-	-	9119	(Gasparre et al. 2007)
Breast	BRCA9	13973T	-	-	13973T	(Gasparre et al. 2007)
Astrocytoma	G15	11204	-	-	11204	(Gasparre et al. 2007)
Astrocytoma	G5	4016G	-	-	4016G	(Gasparre et al. 2007)
Thyroid	HCT1	13271, 13414	-	-	13271, 13414	(Gasparre et al. 2007)
Thyroid	HCT18	4975	-	-	4975	(Gasparre et al. 2007)
Thyroid	HCT23	10537	-	-	10537	(Gasparre et al. 2007)
Thyroid	HCT25	12056	-	-	12056	(Gasparre et al. 2007)
Thyroid	HCT26	8836	-	-	8836	(Gasparre et al. 2007)
Thyroid	HCT28	4831	-	-	4831	(Gasparre et al. 2007)
Thyroid	HCT30	15209	-	-	15209	(Gasparre et al. 2007)
Thyroid	HCT31	8839	-	-	8839	(Gasparre et al. 2007)
Thyroid	HCT33	4720	-	-	4720	(Gasparre et al. 2007)
Thyroid	HCT36	11475	-	-	11475	(Gasparre et al. 2007)
Thyroid	HCT37	3949	-	-	3949	(Gasparre et al. 2007)
Thyroid	HCT38	11403	-	-	11403	(Gasparre et al. 2007)
Thyroid	HCT39	3392	-	-	3392	(Gasparre et al. 2007)

Thyroid	HCT4	5185	-	-	5185	(Gasparre et al. 2007)
Thyroid	HCT40	13042	-	-	13042	(Gasparre et al. 2007)
Thyroid	HCT43	4222	-	-	4222	(Gasparre et al. 2007)
Thyroid	HCT44	8836, 12797	-	-	8836, 12797	(Gasparre et al. 2007)
Thyroid	HCT5	4148	-	-	4148	(Gasparre et al. 2007)
Thyroid	HCT6	15674	-	-	15674	(Gasparre et al. 2007)
Thyroid	HCT7	13870T	-	-	13870T	(Gasparre et al. 2007)
Thyroid	HCT9	11613	-	-	11613	(Gasparre et al. 2007)
Thyroid	TC12	11736	-	-	11736	(Gasparre et al. 2007)
Thyroid	TC16	8725	-	-	8725	(Gasparre et al. 2007)
Thyroid	TC18	7441A	-	-	7441A	(Gasparre et al. 2007)
Thyroid	TC4	8572	-	-	8572	(Gasparre et al. 2007)
Thyroid	TC6	12961	-	-	12961	(Gasparre et al. 2007)
Thyroid	TC7	11204	-	-	11204	(Gasparre et al. 2007)
Thyroid	TC8	3842	-	-	3842	(Gasparre et al. 2007)
Prostate	1	72	-	-	72	(Gomez-Zaera et al. 2006)
Prostate	11	16284	-	-	16284	(Gomez-Zaera et al. 2006)
Prostate	2	310	-	-	310	(Gomez-Zaera et al. 2006)
Prostate	8	16069A	-	-	16069A	(Gomez-Zaera et al. 2006)
Prostate	9	1792	-	-	1792	(Gomez-Zaera et al. 2006)
Colorectal	507C	13393	-	-	13393	(Habano et al. 1999)
Colorectal	70C	3380	-	-	3380	(Habano et al. 1999)
Leukemia	1	14569	-	-	14569	(He et al. 2003)
Leukemia	11	16129	-	-	16129	(He et al. 2003)
Leukemia	13	1380	-	-	1380	(He et al. 2003)

Leukemia	14	4145	-	-	4145	(He et al. 2003)
Leukemia	2	15296	-	-	15296	(He et al. 2003)
Leukemia	24	15618	-	-	15618	(He et al. 2003)
Leukemia	4	11046	-	-	11046	(He et al. 2003)
Leukemia	6	4	-	-	4	(He et al. 2003)
Leukemia	7	13848	-	-	13848	(He et al. 2003)
Pancreas	PX16	14603	-	-	14603	(Jones et al. 2001)
Pancreas	PX17	2805T	-	-	2805T	(Jones et al. 2001)
Pancreas	PX19	15983	-	-	15983	(Jones et al. 2001)
Pancreas	PX27	3670	-	-	3670	(Jones et al. 2001)
Pancreas	1	16129	-	-	16129	(Kassauei et al. 2006)
Pancreas	10	2698, 3032, 5999, 7075C, 13241, 15017	-	-	2698, 3032, 5999, 7075C, 13241, 15017	(Kassauei et al. 2006)
Pancreas	11	1811, 3326G, 8163, 14884, 15693, 16134	16134-15693-1811 (U4a1)	5	3326G, 8163, 14884	(Kassauei et al. 2006)
Pancreas	12	94, 630, 5940, 11947, 12414, 15884, 16311, 16519	16519-15884C-12414-11947 (W)	4.5	94, 630, 5940, 16311	(Kassauei et al. 2006)
Pancreas	13	10301C, 10417, 10450, 10885, 10901, 11083, 11377, 11471, 11827	-	-	10301C, 10417, 10450, 10885, 10901, 11083, 11377, 11471, 11827	(Kassauei et al. 2006)
Pancreas	14	195, 1811, 4646, 10572, 12308, 12372, 12937, 14620	16356-16134-15693-14620-12937-12372-12308-4646-1811-19	16	10572	(Kassauei et al. 2006)

		, 15693, 16134, 16356	5 (U4a1)			
Pancreas	15	195, 228, 477, 482, 7175, 7256, 7274, 7521, 7771, 8206, 9221, 9540, 10115, 14766	14766-10115-9540-9221-8206-7771-7274-7175-195 (L2a); 14766-9540-7521-7256-195 (L3'4)	16.5 (L2a); 8.5 (L3'4)	228, 477, 482	(Kassauei et al. 2006)
Pancreas	2	841	-	-	841	(Kassauei et al. 2006)
Pancreas	3	1323	-	-	1323	(Kassauei et al. 2006)
Pancreas	4	841, 5368G	-	-	841, 5368G	(Kassauei et al. 2006)
Pancreas	5	10895, 14543	-	-	10895, 14543	(Kassauei et al. 2006)
Pancreas	6	2234, 9972	-	-	2234, 9972	(Kassauei et al. 2006)
Pancreas	7	678, 16153	-	-	678, 16153	(Kassauei et al. 2006)
Pancreas	8	841, 14543, 15409G	-	-	841, 14543, 15409G	(Kassauei et al. 2006)
Pancreas	9	94, 630, 12612	-	-	94, 630, 12612	(Kassauei et al. 2006)
Colorectal	A7B7	9906, 16390	-	-	9906, 16390	(Lievre et al. 2005)
Colorectal	A9B9	6163	-	-	6163	(Lievre et al. 2005)
Leukemia	1	1721, 8617, 12196	-	-	1721, 8617, 12196	(Linnartz, Anglmayer and Zanssen 2004)
Leukemia	2	2056, 4216, 13708	13708-4216 (J)	3	2056	(Linnartz, Anglmayer and Zanssen 2004)
Leukemia	3	5843	-	-	5843	(Linnartz, Anglmayer and Zanssen 2004)
Leukemia	4	3394, 4216, 13708	13708-4216-3394 (J1c1)	4	-	(Linnartz, Anglmayer and Zanssen 2004)
Leukemia	5	4216, 13708	13708-4216 (J)	3	-	(Linnartz, Anglmayer and Zanssen 2004)

Thyroid	1	15280	-	-	15280	(Maximo et al. 2002)
Thyroid	10A	4940, 7785	-	-	4940, 7785	(Maximo et al. 2002)
Thyroid	10B	195, 9137	-	-	195, 9137	(Maximo et al. 2002)
Thyroid	11	6473, 12918	-	-	6473, 12918	(Maximo et al. 2002)
Thyroid	12A	481	-	-	481	(Maximo et al. 2002)
Thyroid	12B	9030, 9575C	-	-	9030, 9575C	(Maximo et al. 2002)
Thyroid	14	12236	-	-	12236	(Maximo et al. 2002)
Thyroid	15	7873, 8697, 8706	-	-	7873, 8697, 8706	(Maximo et al. 2002)
Thyroid	16A	456, 7873	-	-	456, 7873	(Maximo et al. 2002)
Thyroid	17	462, 4985, 15182	-	-	462, 4985, 15182	(Maximo et al. 2002)
Thyroid	18	207, 8716	-	-	207, 8716	(Maximo et al. 2002)
Thyroid	19	115	-	-	115	(Maximo et al. 2002)
Thyroid	2	497, 499	-	-	497, 499	(Maximo et al. 2002)
Thyroid	20	7775, 11332	-	-	7775, 11332	(Maximo et al. 2002)
Thyroid	21	185	-	-	185	(Maximo et al. 2002)
Thyroid	22	9655	-	-	9655	(Maximo et al. 2002)
Thyroid	23	10269, 14560T	-	-	10269, 14560T	(Maximo et al. 2002)
Thyroid	25	4613, 9477	-	-	4613, 9477	(Maximo et al. 2002)
Thyroid	27	3992, 13943	-	-	3992, 13943	(Maximo et al. 2002)
Thyroid	28	10793	-	-	10793	(Maximo et al. 2002)
Thyroid	3	325	-	-	325	(Maximo et al. 2002)
Thyroid	30	5633, 7819A	-	-	5633, 7819A	(Maximo et al. 2002)
Thyroid	31	7103, 9691	-	-	7103, 9691	(Maximo et al. 2002)
Thyroid	35	10197C	-	-	10197C	(Maximo et al. 2002)
Thyroid	39	549	-	-	549	(Maximo et al. 2002)

Thyroid	4	6650C, 9477T	-	-	6650C, 9477T	(Maximo et al. 2002)
Thyroid	40	10639, 11016	-	-	10639, 11016	(Maximo et al. 2002)
Thyroid	41	150, 4312, 10691G	-	-	150, 4312, 10691G	(Maximo et al. 2002)
Thyroid	44	3910	-	-	3910	(Maximo et al. 2002)
Thyroid	46	15312G	-	-	15312G	(Maximo et al. 2002)
Thyroid	5	460, 14498A	-	-	460, 14498A	(Maximo et al. 2002)
Thyroid	51	325, 3594, 10320, 11840	3594-325 (L4a1)	3	10320, 11840	(Maximo et al. 2002)
Thyroid	56	9296, 10181	-	-	9296, 10181	(Maximo et al. 2002)
Thyroid	57	73	-	-	73	(Maximo et al. 2002)
Thyroid	59	3526, 13943	-	-	3526, 13943	(Maximo et al. 2002)
Thyroid	6	8697, 8701, 10272	8701-8697 (L4a1a)	4	10272	(Maximo et al. 2002)
Thyroid	60	150	-	-	150	(Maximo et al. 2002)
Thyroid	62	12967C	-	-	12967C	(Maximo et al. 2002)
Thyroid	7	9746	-	-	9746	(Maximo et al. 2002)
Thyroid	8	9477	-	-	9477	(Maximo et al. 2002)
Thyroid	9	8701	-	-	8701	(Maximo et al. 2002)
Renal	1	338, 1578, 12007	-	-	338, 1578, 12007	(Meierhofer et al. 2006)
Renal	2	4584	-	-	4584	(Meierhofer et al. 2006)
Renal	3	94, 7423	-	-	94, 7423	(Meierhofer et al. 2006)
Renal	4	204, 1169, 3243, 12510A	-	-	204, 1169, 3243, 12510A	(Meierhofer et al. 2006)
Renal	5	2222	-	-	2222	(Meierhofer et al. 2006)
Renal	6	1566, 10579	-	-	1566, 10579	(Meierhofer et al. 2006)
Renal	7	16174	-	-	16174	(Meierhofer et al. 2006)
Head and neck	1	70	-	-	70	(Mithani et al. 2007)

Head and neck	10	4752, 8701	-	-	4752, 8701	(Mithani et al. 2007)
Head and neck	11	15693	-	-	15693	(Mithani et al. 2007)
Head and neck	12	189, 5390, 9910	-	-	189, 5390, 9910	(Mithani et al. 2007)
Head and neck	2	3700	-	-	3700	(Mithani et al. 2007)
Head and neck	3	3079, 10695	-	-	3079, 10695	(Mithani et al. 2007)
Head and neck	4	3664	-	-	3664	(Mithani et al. 2007)
Head and neck	5	8618, 8701	8618-8701 (L3d)	4	-	(Mithani et al. 2007)
Head and neck	6	9003	-	-	9003	(Mithani et al. 2007)
Head and neck	7	2004, 9210	-	-	2004, 9210	(Mithani et al. 2007)
Head and neck	8	3308, 8701, 10398	10398-8701-3308 (L1b)	5	-	(Mithani et al. 2007)
Head and neck	9	4689, 5198, 9100, 14798	14798 -5198 (J1c5)	4	4689, 9100	(Mithani et al. 2007)
Renal	1177	1923	-	-	1923	(Nagy, Wilhelm and Kovacs 2003)
Renal	1282	1389	-	-	1389	(Nagy, Wilhelm and Kovacs 2003)
Renal	1627	16316T	-	-	16316T	(Nagy, Wilhelm and Kovacs 2003)
Renal	105T	5623	-	-	5623	(Nagy et al. 2002)
Renal	123A	540	-	-	540	(Nagy et al. 2002)
Renal	123B	16129	-	-	16129	(Nagy et al. 2002)
Renal	192T	94	-	-	94	(Nagy et al. 2002)
Renal	195T	4659	-	-	4659	(Nagy et al. 2002)
Renal	94B	16304	-	-	16304	(Nagy et al. 2002)
Nasopharyngeal	12	16273	-	-	16273	(Pang et al. 2008)
Nasopharyngeal	13	183	-	-	183	(Pang et al. 2008)

Nasopharyngeal	17	16309	-	-	16309	(Pang et al. 2008)
Nasopharyngeal	18	151, 479, 489, 709, 15970, 16093, 16111, 16157, 16223, 16304, 16362	16093-709-489-16223 (M10a)	2.5 (M10a)	151, 479, 15970, 16111, 16157, 16304, 16362	(Pang et al. 2008)
Nasopharyngeal	23	16273	-	-	16273	(Pang et al. 2008)
Nasopharyngeal	3	310	-	-	310	(Pang et al. 2008)
Nasopharyngeal	4	195, 360A	-	-	195, 360A	(Pang et al. 2008)
Nasopharyngeal	5	150, 199, 301C, 302C, 489, 15769, 16192, 16223, 16297, 16299, 16355, 16390	16297-16223-16192-489-199-150 (M7b1)	4	301C, 302C, 15769, 16299, 16355, 16390	(Pang et al. 2008)
Nasopharyngeal	7	150, 199, 489, 16129, 16192, 16223, 16278, 16297, 16304	16297-16223-16192-16129-489-199-150 (M7b1)	4.5	16278, 16304	(Pang et al. 2008)
Breast	B24	13708	-	-	13708	(Parrella et al. 2001)
Breast	B27T_L	3918	-	-	3918	(Parrella et al. 2001)
Breast	B32	12344A	-	-	12344A	(Parrella et al. 2001)
Breast	B33	16292	-	-	16292	(Parrella et al. 2001)
Breast	B35	11900	-	-	11900	(Parrella et al. 2001)
Breast	B38	16093	-	-	16093	(Parrella et al. 2001)
Breast	B44	14869	-	-	14869	(Parrella et al. 2001)
Colorectal	C1	6718, 14288A, 15332	-	-	6718, 14288A, 15332	(Wang et al. 2011)
Colorectal	C12	4532	-	-	4532	(Wang et al. 2011)
Colorectal	C14	16093, 14288A	-	-	16093, 14288A	(Wang et al. 2011)
Colorectal	C16	215, 15276, 16158	-	-	215, 15276, 16158	(Wang et al. 2011)

Colorectal	C3	16365	-	-	16365	(Wang et al. 2011)
Colorectal	C4	16390	-	-	16390	(Wang et al. 2011)
Colorectal	C8	14288A, 15447	-	-	14288A, 15447	(Wang et al. 2011)
Colorectal	C20	9275	-	-	9275	(Wang et al. 2011)
Breast	102	152, 204, 207, 16189	-	-	152, 204, 207, 16189	(Tan, Bai and Wong 2002)
Breast	104	73, 16325, 16519	-	-	73, 16325, 16519	(Tan, Bai and Wong 2002)
Breast	106	195, 16519	-	-	195, 16519	(Tan, Bai and Wong 2002)
Breast	108	16147	-	-	16147	(Tan, Bai and Wong 2002)
Breast	110	16293	-	-	16293	(Tan, Bai and Wong 2002)
Breast	112	9131	-	-	9131	(Tan, Bai and Wong 2002)
Breast	114	150, 185, 189	-	-	150, 185, 189	(Tan, Bai and Wong 2002)
Breast	146	16182C	-	-	16182C	(Tan, Bai and Wong 2002)
Breast	152	16362, 16365	-	-	16362, 16365	(Tan, Bai and Wong 2002)
Breast	176	1811	-	-	1811	(Tan, Bai and Wong 2002)
Breast	180	16172	-	-	16172	(Tan, Bai and Wong 2002)
Breast	182	4973	-	-	4973	(Tan, Bai and Wong 2002)
Breast	184	4973, 5285	-	-	4973, 5285	(Tan, Bai and Wong 2002)
Oral	10	204, 207, 313A, 10245	-	-	204, 207, 313A, 10245	(Tan et al. 2004)
Oral	14	222, 11794, 16320	-	-	222, 11794, 16320	(Tan et al. 2004)
Oral	18	4986C	-	-	4986C	(Tan et al. 2004)
Oral	19	5026	-	-	5026	(Tan et al. 2004)
Oral	3	318, 4510T	-	-	318, 4510T	(Tan et al. 2004)
Oral	4	204, 207, 246, 489	-	-	204, 207, 246, 489	(Tan et al. 2004)
Esophageal	E02	310	-	-	310	(Tan et al. 2006)

Esophageal	E05	1544T	-	-	1544T	(Tan et al. 2006)
Esophageal	E12	10500	-	-	10500	(Tan et al. 2006)
Esophageal	E14	9377	-	-	9377	(Tan et al. 2006)
Esophageal	E15	9182	-	-	9182	(Tan et al. 2006)
Breast	B3	8601	-	-	8601	(Wang et al. 2007)
Breast	B6	2275	-	-	2275	(Wang et al. 2007)
Thyroid	1	9553	-	-	9553	(Witte et al. 2007)
Thyroid	11	13617, 13637	13637-13617 (U5b2)	4	-	(Witte et al. 2007)
Thyroid	2	2681	-	-	2681	(Witte et al. 2007)
Thyroid	4	372	-	-	372	(Witte et al. 2007)
Thyroid	6	2259	-	-	2259	(Witte et al. 2007)
Thyroid	9	9682	-	-	9682	(Witte et al. 2007)
Hepatocellular	0012	94	-	-	94	(Yin et al. 2010)
Hepatocellular	0020	72, 9263, 9267	-	-	72, 9263, 9267	(Yin et al. 2010)
Hepatocellular	0024	6787, 16300	-	-	6787, 16300	(Yin et al. 2010)
Hepatocellular	0030	70, 9545	-	-	70, 9545	(Yin et al. 2010)
Hepatocellular	0069	189	-	-	189	(Yin et al. 2010)
Hepatocellular	0072	5650	-	-	5650	(Yin et al. 2010)
Hepatocellular	0074	72	-	-	72	(Yin et al. 2010)
Hepatocellular	0075	1659	-	-	1659	(Yin et al. 2010)
Hepatocellular	0081	72, 11708	-	-	72, 11708	(Yin et al. 2010)
Hepatocellular	0083	7976	-	-	7976	(Yin et al. 2010)
Hepatocellular	0097	72	-	-	72	(Yin et al. 2010)
Hepatocellular	0098	3842	-	-	3842	(Yin et al. 2010)
Hepatocellular	0100	152, 16298	-	-	152, 16298	(Yin et al. 2010)

Head and neck	1017	490, 924T, 3570A, 4605, 5305G, 5615, 7468, 7791, 8419, 9050, 15433	-	-	490, 924T, 3570A, 4605, 5305G, 5615, 7468, 7791, 8419, 9050, 15433	(Zhou et al. 2007)
Head and neck	1063	10410	-	-	10410	(Zhou et al. 2007)
Head and neck	1164	20C	-	-	20C	(Zhou et al. 2007)
Head and neck	1280	11324G	-	-	11324G	(Zhou et al. 2007)
Head and neck	1356	25A, 64, 5002, 13970	-	-	25A, 64, 5002, 13970	(Zhou et al. 2007)
Head and neck	1493	4024, 5004, 5276, 8269, 9123, 10044, 11889, 12406, 12633A, 13368, 14969, 15452A, 15607, 15928, 16126, 16519	10044-9123-8269-5004-4024 (H4a1a); 16519-16126-15928-15607-15452A-13368-12633A (T1)	10 (H4a1a); 12 (T1)	5276, 11889, 12406, 14969	(Zhou et al. 2007)
Head and neck	1535	16261	-	-	16261	(Zhou et al. 2007)
Head and neck	1565	15257, 16319, 16320	16319-15257 (K1b1a)	2.5	16320	(Zhou et al. 2007)
Head and neck	1680	195, 912A, 1323, 2069G, 2083G, 2352, 2706, 3360, 5570, 5799, 5848G, 7028, 8701, 10398	10398-8701-7028-2706 (non-N)	7	195, 912A, 1323, 2069G, 2083G, 2352, 3360, 5570, 5799, 5848G	(Zhou et al. 2007)
Head and neck	1691	185, 215, 228, 251, 295, 462, 489, 2706, 4216, 4580, 4689, 5198, 7028, 7702, 9100, 10398, 11251, 12612, 13708, 14798, 15904, 16069, 16126	16126-16069-14798-13708-12612-11251-10398-7028-5198-4216-2706-489-462-295-228-185(J1c5)	21.5	215, 251, 4580, 4689, 7702, 9100, 15904	(Zhou et al. 2007)

Head and neck	1736	25, 150, 2352, 2483, 3277, 4752, 8701, 9377, 9540, 10398, 10819, 10873, 12406, 12705, 14905, 15301, 16172, 16223, 16311, 16320	16320-16311-16223-16172-15301-14905-12705-10873-10819-10398-9540-9377-8701-2483-2352-150 (L3e2b1)	23.5	25, 3277, 4752, 12406	(Zhou et al. 2007)
Head and neck	1809	9003, 13789G, 14815A, 15369A	-	-	9003, 13789G, 14815A, 15369A	(Zhou et al. 2007)
Head and neck	1817	5252, 15937	-	-	5252, 15937	(Zhou et al. 2007)
Head and neck	1836	499, 1811, 4646, 5021, 5999, 6047, 7705, 11332, 11467, 12308, 12361, 12372, 13563, 14353, 14620, 15693, 16278, 16356	16356-16278-15693-14620-12372-12308-11467-11332-7705-6047-5999-4646-1811-499 (U4b2a)	23.5	5021,12361, 13563, 14353	(Zhou et al. 2007)
Head and neck	1858	16147	-	-	16147	(Zhou et al. 2007)
Head and neck	2008	3700	-	-	3700	(Zhou et al. 2007)
Head and neck	2018	4776	-	-	4776	(Zhou et al. 2007)
Head and neck	2039	16093	-	-	16093	(Zhou et al. 2007)
Head and neck	2043	30, 3197, 7956A, 9477, 9591, 9668G, 11466G, 12308, 12372, 13414, 13617, 14793, 15218, 16270, 16428	16428-16270-15218-14793-13617-12372-12308-9477-3197 (U5a1b3)	15.5	30, 7956A, 9591, 9668G, 11466G, 13414	(Zhou et al. 2007)
Head and neck	2051	7424, 12705, 16311	16311-7424 (R1a)	2.5	16311	(Zhou et al. 2007)
Head and neck	2075	189, 5390, 9910A	-	-	189, 5390, 9910A	(Zhou et al. 2007)
Head and neck	2105	11299T	-	-	11299T	(Zhou et al. 2007)
Head and neck	2126	70	-	-	70	(Zhou et al. 2007)

Head and neck	2195	489	-	-	489	(Zhou et al. 2007)
Head and neck	2232	3079, 10695	-	-	3079, 10695	(Zhou et al. 2007)
Head and neck	2382	4037	-	-	4037	(Zhou et al. 2007)
Head and neck	2444	1495	-	-	1495	(Zhou et al. 2007)
Head and neck	2455	72, 2706, 4580, 4639, 5263, 7002, 7028, 8869, 9378, 9629, 15904, 16298	16298-15904-8869-7028-5263-4639-4580-2706-72 (V1a)	15.5	7002, 9378, 9629	(Zhou et al. 2007)
Head and neck	2550	558, 6128	-	-	558, 6128	(Zhou et al. 2007)
Head and neck	2553	215, 4831, 11324G	-	-	215, 4831, 11324G	(Zhou et al. 2007)
Head and neck	2555	131, 2581, 4639, 4793, 7028, 8251, 12603, 16519	-	-	131, 2581, 4639, 4793, 7028, 8251, 12603, 16519	(Zhou et al. 2007)
Head and neck	2702	25A	-	-	25A	(Zhou et al. 2007)
Head and neck	2704	2618	-	-	2618	(Zhou et al. 2007)
Head and neck	2714	1593, 4715, 8584, 8701, 9540, 10398, 12705, 13263, 14318, 14524, 15043, 15301, 15487T, 16086, 16223, 16278, 16298, 16325	16325-16298-16278-16223-16086-15487T-15043-15301-14524-14318-13263-12705-10398-9540-8701-8584-4715 (C1b4)	26.5	1593	(Zhou et al. 2007)
Head and neck	2717	3664	-	-	3664	(Zhou et al. 2007)
Head and neck	2760	10361, 15307	-	-	10361, 15307	(Zhou et al. 2007)
Head and neck	2778	3010	-	-	3010	(Zhou et al. 2007)
Head and neck	2818	2004, 9210	-	-	2004, 9210	(Zhou et al. 2007)
Head and neck	2828	39, 2706, 5147, 5580, 6680, 7028, 7424, 8618,	16223-16124-15301-14284-13886-13105-	28	39, 5580, 15058, 15766, 16153	(Zhou et al. 2007)

		8701, 9540, 10398, 10873, 12705, 13105, 13886, 14284, 15058, 15301, 15766, 16124, 16153, 16223	12705-10873-10398-9540-8701-8618-7424-7028-6680-5147-2706 (L3d1)			
Head and neck	2907	9247	-	-	9247	(Zhou et al. 2007)
Head and neck	3538	1990, 4776, 16488	-	-	1990, 4776, 16488	(Zhou et al. 2007)
Breast	1026	9885A	-	-	9885A	(Zhu et al. 2005)
Breast	697	8498, 16293	-	-	8498, 16293	(Zhu et al. 2005)
Breast	738	15824	-	-	15824	(Zhu et al. 2005)
Breast	833	85, 310, 3849	-	-	85, 310, 3849	(Zhu et al. 2005)
Breast	844	4665	-	-	4665	(Zhu et al. 2005)
Breast	845	12642	-	-	12642	(Zhu et al. 2005)
Breast	885	4499	-	-	4499	(Zhu et al. 2005)
Breast	898	2706	-	-	2706	(Zhu et al. 2005)
Breast	906	12636, 15924	-	-	12636, 15924	(Zhu et al. 2005)
Breast	911	11768, 12636	-	-	11768, 12636	(Zhu et al. 2005)
Breast	944	310, 4323, 12642, 15700, 16145	-	-	310, 4323, 12642, 15700, 16145	(Zhu et al. 2005)
Breast	954	15700	-	-	15700	(Zhu et al. 2005)
Breast	983	194, 195, 199, 204, 207, 295, 709, 1243, 5240T, 9885A, 12852, 13263, 15655, 15755T, 15783, 16114	13263-1243-709-207-204-195-194 (W3a1)	6.5	199, 295, 5240T, 9885A, 12852, 15655, 15755T, 15783, 16114	(Zhu et al. 2005)
Breast	988	13397A, 13398A, 13674G	-	-	13397A, 13398A, 13674G	(Zhu et al. 2005)

Prostate	PCA001	8269, 11921, 12316	-	-	8269, 11921, 12316	(Kloss-Brandstatter et al. 2010)
Prostate	PCA002	13488G	-	-	13488G	(Kloss-Brandstatter et al. 2010)
Prostate	PCA003	2007, 2545	-	-	2007, 2545	(Kloss-Brandstatter et al. 2010)
Prostate	PCA005	2150, 2151, 8313,16047	-	-	2150, 2151, 8313,16047	(Kloss-Brandstatter et al. 2010)
Prostate	PCA006	965	-	-	965	(Kloss-Brandstatter et al. 2010)
Prostate	PCA007	6384	-	-	6384	(Kloss-Brandstatter et al. 2010)
Prostate	PCA008	11139	-	-	11139	(Kloss-Brandstatter et al. 2010)
Prostate	PCA009	10115	-	-	10115	(Kloss-Brandstatter et al. 2010)
Prostate	PCA012	879, 2119,4522	-	-	879, 2119,4522	(Kloss-Brandstatter et al. 2010)
Prostate	PCA013	3394	-	-	3394	(Kloss-Brandstatter et al. 2010)
Prostate	PCA014	5393	-	-	5393	(Kloss-Brandstatter et al. 2010)
Prostate	PCA015	513, 7471, 8184, 16390	-	-	513, 7471, 8184, 16390	(Kloss-Brandstatter et al. 2010)
Prostate	PCA017	1623, 10436, 15313	-	-	1623, 10436, 15313	(Kloss-Brandstatter et al. 2010)
Prostate	PCA018	9438	-	-	9438	(Kloss-Brandstatter et al. 2010)
Prostate	PCA019	11391, 15243	-	-	11391, 15243	(Kloss-Brandstatter et al. 2010)
Prostate	PCA020	709	-	-	709	(Kloss-Brandstatter et al. 2010)
Prostate	PCA022	5031	-	-	5031	(Kloss-Brandstatter et al. 2010)
Prostate	PCA023	13718	-	-	13718	(Kloss-Brandstatter et al. 2010)
Prostate	PCA024	8705	-	-	8705	(Kloss-Brandstatter et al. 2010)
Prostate	PCA025	8736, 9930, 14463	-	-	8736, 9930, 14463	(Kloss-Brandstatter et al. 2010)
Prostate	PCA027	9116	-	-	9116	(Kloss-Brandstatter et al. 2010)
Prostate	PCA030	14221	-	-	14221	(Kloss-Brandstatter et al. 2010)

Gastric	GC2	8572, 15777	-	-	8572, 15777	(Bi et al. 2011)
Gastric	GC3	15597	-	-	15597	(Bi et al. 2011)
Gastric	GC4	3200	-	-	3200	(Bi et al. 2011)
Gastric	GC6	4632, 9770	-	-	4632, 9770	(Bi et al. 2011)
Breast	5	16391	-	-	16391	(Fendt et al. 2011)
Breast	9	16390	-	-	16390	(Fendt et al. 2011)
Breast	12	215	-	-	215	(Fendt et al. 2011)
Breast	13	16106C, 16304	-	-	16106C, 16304	(Fendt et al. 2011)
Breast	14	152	-	-	152	(Fendt et al. 2011)
Breast	1	12875	-	-	12875	(Fendt et al. 2011)
Breast	2	7379	-	-	7379	(Fendt et al. 2011)
Breast	3	5703	-	-	5703	(Fendt et al. 2011)
Breast	6	9966	-	-	9966	(Fendt et al. 2011)
Breast	7	15341	-	-	15341	(Fendt et al. 2011)
Breast	8	2145, 2998	-	-	2145, 2998	(Fendt et al. 2011)
Breast	11	12131	-	-	12131	(Fendt et al. 2011)
Breast	12	12803	-	-	12803	(Fendt et al. 2011)
Breast	13	1632, 5102, 5390	-	-	1632, 5102, 5390	(Fendt et al. 2011)
Breast	14	1132, 1578	-	-	1132, 1578	(Fendt et al. 2011)
Breast	B1	6620, 7269, 16169	-	-	6620, 7269, 16169	(Gochhait et al. 2008)
Breast	B2	333A	-	-	333A	(Gochhait et al. 2008)
Breast	B3	15968	-	-	15968	(Gochhait et al. 2008)
Breast	B4	6055	-	-	6055	(Gochhait et al. 2008)
Breast	B6	13130A, 16189	-	-	13130A, 16189	(Gochhait et al. 2008)
Breast	B7	15930	-	-	15930	(Gochhait et al. 2008)
Breast	B14	2680	-	-	2680	(Gochhait et al. 2008)
Breast	B15	215, 7383	-	-	215, 7383	(Gochhait et al. 2008)
Breast	B16	15001	-	-	15001	(Gochhait et al. 2008)
Breast	B17	1267A, 6182, 6246	-	-	1267A, 6182, 6246	(Gochhait et al. 2008)

Breast	B19	16292	-	-	16292	(Gochhait et al. 2008)
Breast	B22	5703	-	-	5703	(Gochhait et al. 2008)
Breast	B24	9715, 13523A	-	-	9715, 13523A	(Gochhait et al. 2008)
Esophageal	E1	6493A	-	-	6493A	(Gochhait et al. 2008)
Esophageal	E2	6286A	-	-	6286A	(Gochhait et al. 2008)
Esophageal	E3	12892	-	-	12892	(Gochhait et al. 2008)
Esophageal	E7	13523A	-	-	13523A	(Gochhait et al. 2008)
Esophageal	E13	1345	-	-	1345	(Gochhait et al. 2008)
Esophageal	E15	182	-	-	182	(Gochhait et al. 2008)
Esophageal	E16	6116, 16182C, 16183C	-	-	6116, 16182C, 16183C	(Gochhait et al. 2008)
Esophageal	E18	1313C, 5821	-	-	1313C, 5821	(Gochhait et al. 2008)
Esophageal	E19	334, 16239	-	-	334, 16239	(Gochhait et al. 2008)
Esophageal	E20	749	-	-	749	(Gochhait et al. 2008)
Esophageal	E21	16093	-	-	16093	(Gochhait et al. 2008)
Gastric	907	16438, 4996, 16519	-	-	16438, 4996, 16519	(Hung et al. 2010)
Gastric	909	189, 9986	-	-	189, 9986	(Hung et al. 2010)
Gastric	919	12405	-	-	12405	(Hung et al. 2010)
Gastric	938	16399	-	-	16399	(Hung et al. 2010)
Gastric	1132	3697	-	-	3697	(Hung et al. 2010)
Gastric	1133	204	-	-	204	(Hung et al. 2010)
Gastric	1147	16260	-	-	16260	(Hung et al. 2010)
Gastric	1151	205, 13015	-	-	205, 13015	(Hung et al. 2010)
Breast	257	5112, 13878	-	-	5112, 13878	(Tseng et al. 2011)
Breast	349	9774	-	-	9774	(Tseng et al. 2011)
Breast	425	16390, 5809	-	-	16390, 5809	(Tseng et al. 2011)
Breast	446	15416	-	-	15416	(Tseng et al. 2011)
Breast	447	203	-	-	203	(Tseng et al. 2011)

Breast	451	10599	-	-	10599	(Tseng et al. 2011)
Breast	498	6768	-	-	6768	(Tseng et al. 2011)
Breast	510	188	-	-	188	(Tseng et al. 2011)
Breast	546	13980C	-	-	13980C	(Tseng et al. 2011)
Breast	621	16290	-	-	16290	(Tseng et al. 2011)
Breast	739	188	-	-	188	(Tseng et al. 2011)
Breast	779	6384	-	-	6384	(Tseng et al. 2011)
Breast	797	1499	-	-	1499	(Tseng et al. 2011)
Breast	801	5522	-	-	5522	(Tseng et al. 2011)
Breast	806	152	-	-	152	(Tseng et al. 2011)
Breast	807	9901	-	-	9901	(Tseng et al. 2011)
Breast	958	310, 7293, 9412	-	-	310, 7293, 9412	(Tseng et al. 2011)
Breast	961	16304	-	-	16304	(Tseng et al. 2011)

Notes: These potential spurious variations were pinpointed by using the phylogenetic analysis as fully described in Bandelt et al. (2001) and Salas et al. (2005). [a] mtDNA variation is weighted and scored according to Kong et al. (2008).

Supplementary Table S2. Sources of the cancerous mtDNA data considered in the present study.

Loci of Sampling	Cancer type	Total No. patients	No. Samples reported with somatic mutation	Sequencing region	Reference
US	Head and Neck	83	41	Mt Genome	(Zhou et al. 2007)[a,b]
US	Pancreas	15	15	Mt Genome	(Kassauei et al. 2006)[a]
China	Esophageal	21	7	*MT-DLOOP*	(Abnet et al. 2004)[c]
US	Prostate	16	11	*MT-DLOOP*	(Chen et al. 2002)[c]
US	Bladder	14	12	Mt Genome	(Fliss et al. 2000)[b,c]
US	Head and Neck	13	6	Mt Genome	(Fliss et al. 2000)[b,c]
US	Lung	14	6	Mt Genome	(Fliss et al. 2000)[b,c]
Italia	Breast	20	17	Mt Genome	(Gasparre et al. 2007)[b]
Italia	Astrocytoma	16	7	Mt Genome	(Gasparre et al. 2007)[b]
Italia	Thyroid	66	44	Mt Genome	(Gasparre et al. 2007)[b]
Spain	Prostate	17	5	*MT-DLOOP*, *MT-RNR1*, *MT-RNR2*, *MT-ND3*, *MT-ND4L*, *MT-ND4*	(Gomez-Zaera et al. 2006)[b]
Japan	Colorectal	45	7	*MT-ND1*, *MT-ND5*	(Habano et al. 1999)
UK	Leukemia	24	9	Mt Genome	(He et al. 2003)
Japan	Esophageal	37	2	*MT-DLOOP*	(Hibi et al. 2001b)[c]
Japan	Colorectal	77	7	*MT-DLOOP*	(Hibi et al. 2001a)[c]
Portugal	Prostate	16	3	*MT-DLOOP*, *MT-RNR2*, complex I	(Jeronimo et al. 2001)[b,c]
US	Pancreas	5	4	Mt Genome	(Jones et al. 2001)[b]
Germany	Glioblastoma	55	7	Mt Genome	(Kirches et al. 2001)[c]
France	Colorectal	11	7	Mt Genome	(Lievre et al. 2005)
Germany	Leukemia	10	5	Mt Genome	(Linnartz, Anglmayer

					and Zanssen 2004)
China	Ovarian	10	6	Mt Genome	(Liu et al. 2001)[b,c]
Portugal, Spain	Thyroid	79	45	Mt Genome	(Maximo et al. 2002)[b]
Austria	Renal	15	7	Mt Genome	(Meierhofer et al. 2006)[b]
US	Head and Neck	83	12	Mt Genome	(Mithani et al. 2007)[b]
Germany	Renal	9	7	Mt Genome	(Nagy, Wilhelm and Kovacs 2003)[b]
Germany	Renal	8	3	Mt Genome	(Nagy et al. 2002)
China	Nasopharyngeal	23	10	Mt Genome	(Pang et al. 2008)
Italy	Breast	18	11	Mt Genome	(Parrella et al. 2001)[b]
China	Colorectal	20	8	Mt Genome	(Wang et al. 2011)
----	Colorectal	10	7	Mt Genome	(Polyak et al. 1998)[b,c]
US	Breast	19	14	Mt Genome	(Tan, Bai and Wong 2002)[b]
Taiwan	Oral	17	14	Mt Genome	(Tan et al. 2004)[b]
Taiwan	Esophageal	20	11	Mt Genome	(Tan et al. 2006)[b]
China	Breast	10	2	Mt Genome	(Wang et al. 2007)
Germany	Thyroid	14	6	Mt Genome	(Witte et al. 2007)[b]
US	Medulloblastoma	15	6	Mt Genome	(Wong et al. 2003)[c]
Taiwan	Hepatocellular	20	10	Mt Genome	(Wong et al. 2004)[c]
Taiwan	Hepatocellular	44	23	Mt Genome	(Yin et al. 2010)
US	Breast	15	14	Mt Genome	(Zhu et al. 2005)[b]
Austria	Prostate	30	22	Mt Genome	(Kloss-Brandstatter et al. 2010)
Taiwan	Breast	58	27	Mt Genome	(Tseng et al. 2011)
India	Breast	36	15	Mt Genome	(Gochhait et al. 2008)
India	Esophageal	31	12	Mt Genome	(Gochhait et al. 2008)
Austria	Breast	15	12	Mt Genome	(Fendt et al. 2011)

China	Gastric	10	4	Mt Genome	(Bi et al. 2011)
Taiwan	Gastric	31	20	Mt Genome	(Hung et al. 2010)
Total	**-**	**1235**	**550**	**-**	**-**

Notes: [a] Data cited by Zhidkov et al. (2009); [b] Data cited by Stafford et al. (2010); [c] Data cited by Salas et al. (2005).

Supplementary Table S3. List of the originally observed cancerous somatic mtDNA mutations from the literature.

Position	Sample ID	Cancer type	mtDNA locus	From	To	Reference
16184	16	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16289	18	Esophageal	*MT-DLOOP*	C	A	(Abnet et al. 2004)
16293	19	Esophageal	*MT-DLOOP*	A	G	(Abnet et al. 2004)
16319	19	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16185	20	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16223	20	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16256	20	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16260	20	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16266	20	Esophageal	*MT-DLOOP*	C	G	(Abnet et al. 2004)
16270	20	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16298	20	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16399	20	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
150	21	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16067	21	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16164	21	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16171	21	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16172	21	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16182	21	Esophageal	*MT-DLOOP*	C	A	(Abnet et al. 2004)
16183	21	Esophageal	*MT-DLOOP*	C	A	(Abnet et al. 2004)
16184	21	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16298	21	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16362	21	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)

16443	21	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
16470	21	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16471	21	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16473	21	Esophageal	*MT-DLOOP*	G	A	(Abnet et al. 2004)
16519	21	Esophageal	*MT-DLOOP*	C	T	(Abnet et al. 2004)
16182	1	Prostate	*MT-DLOOP*	A	C	(Chen et al. 2002)
16183	1	Prostate	*MT-DLOOP*	A	C	(Chen et al. 2002)
16189	1	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16232	1	Prostate	*MT-DLOOP*	C	A	(Chen et al. 2002)
16249	1	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16274	1	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
16304	1	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16311	1	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
313	10	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
235	11	Prostate	*MT-DLOOP*	G	C	(Chen et al. 2002)
315	11	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16403	11	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16459	12	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
174	13	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
195	13	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16474	13	Prostate	*MT-DLOOP*	G	C	(Chen et al. 2002)
16093	14	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
1	16	Prostate	*MT-DLOOP*	G	C	(Chen et al. 2002)
16218	2	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
73	4	Prostate	*MT-DLOOP*	A	G	(Chen et al. 2002)

94	4	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
106	4	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
207	4	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
499	4	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
16111	4	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16182	4	Prostate	*MT-DLOOP*	A	C	(Chen et al. 2002)
16183	4	Prostate	*MT-DLOOP*	A	C	(Chen et al. 2002)
16189	4	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16217	4	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
73	5	Prostate	*MT-DLOOP*	A	G	(Chen et al. 2002)
489	5	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16298	5	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16519	5	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
73	6	Prostate	*MT-DLOOP*	A	G	(Chen et al. 2002)
150	6	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
195	6	Prostate	*MT-DLOOP*	T	C	(Chen et al. 2002)
16519	1113	Lung	*MT-DLOOP*	T	C	(Fliss et al. 2000)
114	1124	Bladder	*MT-DLOOP*	T	C	(Fliss et al. 2000)
16265	1124	Bladder	*MT-DLOOP*	A	C	(Fliss et al. 2000)
3054	1127	Bladder	*MT-RNR2*	G	A	(Fliss et al. 2000)
16532	1127	Bladder	*MT-DLOOP*	A	T	(Fliss et al. 2000)
16380	1140	Lung	*MT-DLOOP*	G	A	(Fliss et al. 2000)
150	1174	Lung	*MT-DLOOP*	C	T	(Fliss et al. 2000)
195	1174	Lung	*MT-DLOOP*	T	C	(Fliss et al. 2000)
75	1637	Head and neck	*MT-DLOOP*	G	A	(Fliss et al. 2000)

11150	1678	Head and neck	*MT-ND4*	G	A	(Fliss et al. 2000)
16172	1680	Head and neck	*MT-DLOOP*	C	T	(Fliss et al. 2000)
16292	1680	Head and neck	*MT-DLOOP*	C	T	(Fliss et al. 2000)
16300	1680	Head and neck	*MT-DLOOP*	A	G	(Fliss et al. 2000)
1811	1684	Head and neck	*MT-RNR2*	A	G	(Fliss et al. 2000)
10822	1708	Head and neck	*MT-ND4*	C	T	(Fliss et al. 2000)
386	580	Bladder	*MT-DLOOP*	C	A	(Fliss et al. 2000)
2445	716	Bladder	*MT-RNR2*	T	C	(Fliss et al. 2000)
10978	716	Bladder	*MT-ND4*	A	G	(Fliss et al. 2000)
2056	799	Bladder	*MT-RNR2*	G	A	(Fliss et al. 2000)
11065	870	Bladder	*MT-ND4*	A	G	(Fliss et al. 2000)
11518	870	Bladder	*MT-ND4*	G	A	(Fliss et al. 2000)
12519	874	Bladder	*MT-ND5*	T	C	(Fliss et al. 2000)
10071	884	Bladder	*MT-ND3*	T	C	(Fliss et al. 2000)
10321	884	Bladder	*MT-ND3*	T	C	(Fliss et al. 2000)
10792	884	Bladder	*MT-ND4*	A	G	(Fliss et al. 2000)
10793	884	Bladder	*MT-ND4*	C	T	(Fliss et al. 2000)
12049	884	Bladder	*MT-ND4*	C	T	(Fliss et al. 2000)
2664	898	Lung	*MT-RNR2*	T	C	(Fliss et al. 2000)
10822	899	Bladder	*MT-ND4*	C	T	(Fliss et al. 2000)
5521	915	Lung	*MT-TW*	G	A	(Fliss et al. 2000)
12345	915	Lung	*MT-ND5*	G	A	(Fliss et al. 2000)
16183	915	Lung	*MT-DLOOP*	C	A	(Fliss et al. 2000)
16187	915	Lung	*MT-DLOOP*	C	T	(Fliss et al. 2000)
9903	BRCA10	Breast	*MT-CO3*	T	C	(Gasparre et al. 2007)

15843	BRCA14	Breast	*MT-CYB*	T	C	(Gasparre et al. 2007)
15813	BRCA17	Breast	*MT-CYB*	T	G	(Gasparre et al. 2007)
12601	BRCA3	Breast	*MT-ND5*	T	C	(Gasparre et al. 2007)
9119	BRCA5	Breast	*MT-ATP6*	T	C	(Gasparre et al. 2007)
13973	BRCA9	Breast	*MT-ND5*	A	T	(Gasparre et al. 2007)
11204	G15	Astrocytoma	*MT-ND4*	T	C	(Gasparre et al. 2007)
4016	G5	Astrocytoma	*MT-ND1*	T	G	(Gasparre et al. 2007)
13271	HCT1	Thyroid	*MT-ND5*	T	C	(Gasparre et al. 2007)
13414	HCT1	Thyroid	*MT-ND5*	G	A	(Gasparre et al. 2007)
4975	HCT18	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
10537	HCT23	Thyroid	*MT-ND4L*	G	A	(Gasparre et al. 2007)
12056	HCT25	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
8836	HCT26	Thyroid	*MT-ATP6*	A	G	(Gasparre et al. 2007)
4831	HCT28	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
15209	HCT30	Thyroid	*MT-CYB*	T	C	(Gasparre et al. 2007)
8839	HCT31	Thyroid	*MT-ATP6*	G	A	(Gasparre et al. 2007)
4720	HCT33	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
11475	HCT36	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
3949	HCT37	Thyroid	*MT-ND1*	T	C	(Gasparre et al. 2007)
11403	HCT38	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
3392	HCT39	Thyroid	*MT-ND1*	G	A	(Gasparre et al. 2007)
5185	HCT4	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
13042	HCT40	Thyroid	*MT-ND5*	G	A	(Gasparre et al. 2007)
4222	HCT43	Thyroid	*MT-ND1*	T	C	(Gasparre et al. 2007)
8836	HCT44	Thyroid	*MT-ATP6*	A	G	(Gasparre et al. 2007)

12797	HCT44	Thyroid	*MT-ND5*	T	C	(Gasparre et al. 2007)
4148	HCT5	Thyroid	*MT-ND1*	G	A	(Gasparre et al. 2007)
15674	HCT6	Thyroid	*MT-CYB*	T	C	(Gasparre et al. 2007)
13870	HCT7	Thyroid	*MT-ND5*	A	T	(Gasparre et al. 2007)
11613	HCT9	Thyroid	*MT-ND4*	T	C	(Gasparre et al. 2007)
11736	TC12	Thyroid	*MT-ND4*	T	C	(Gasparre et al. 2007)
8725	TC16	Thyroid	*MT-ATP6*	A	G	(Gasparre et al. 2007)
7441	TC18	Thyroid	*MT-CO1*	C	A	(Gasparre et al. 2007)
8572	TC4	Thyroid	*MT-ATP6*	G	A	(Gasparre et al. 2007)
12961	TC6	Thyroid	*MT-ND5*	A	G	(Gasparre et al. 2007)
11204	TC7	Thyroid	*MT-ND4*	T	C	(Gasparre et al. 2007)
3842	TC8	Thyroid	*MT-ND1*	G	A	(Gasparre et al. 2007)
72	1	Prostate	*MT-DLOOP*	C	T	(Gomez-Zaera et al. 2006)
16284	11	Prostate	*MT-DLOOP*	A	G	(Gomez-Zaera et al. 2006)
310	2	Prostate	*MT-DLOOP*	T	C	(Gomez-Zaera et al. 2006)
16069	8	Prostate	*MT-DLOOP*	C	A	(Gomez-Zaera et al. 2006)
1792	9	Prostate	*MT-RNR2*	G	A	(Gomez-Zaera et al. 2006)
13393	507C	Colorectal	*MT-ND5*	G	A	(Habano et al. 1999)
3380	70C	Colorectal	*MT-ND1*	G	A	(Habano et al. 1999)
14569	1	Leukemia	*MT-ND6*	G	A	(He et al. 2003)
16129	11	Leukemia	*MT-DLOOP*	G	A	(He et al. 2003)
1380	13	Leukemia	*MT-RNR1*	G	A	(He et al. 2003)
4145	14	Leukemia	*MT-ND1*	T	C	(He et al. 2003)
15296	2	Leukemia	*MT-CYB*	A	G	(He et al. 2003)
15618	24	Leukemia	*MT-CYB*	T	C	(He et al. 2003)

11046	4	Leukemia	*MT-ND4*	T	C	(He et al. 2003)
4	6	Leukemia	*MT-DLOOP*	C	T	(He et al. 2003)
13848	7	Leukemia	*MT-ND5*	C	T	(He et al. 2003)
41	18	Esophageal	*MT-DLOOP*	C	T	(Hibi et al. 2001b)
16294	2	Colorectal	*MT-DLOOP*	C	T	(Hibi et al. 2001a)
16222	20	Colorectal	*MT-DLOOP*	C	G	(Hibi et al. 2001a)
60	79	Colorectal	*MT-DLOOP*	T	G	(Hibi et al. 2001a)
16108	92	Colorectal	*MT-DLOOP*	C	T	(Hibi et al. 2001a)
146	1	Prostate	*MT-DLOOP*	T	C	(Jeronimo et al. 2001)
189	1	Prostate	*MT-DLOOP*	A	G	(Jeronimo et al. 2001)
204	1	Prostate	*MT-DLOOP*	T	C	(Jeronimo et al. 2001)
207	1	Prostate	*MT-DLOOP*	G	A	(Jeronimo et al. 2001)
235	1	Prostate	*MT-DLOOP*	A	G	(Jeronimo et al. 2001)
3357	1	Prostate	*MT-ND1*	A	G	(Jeronimo et al. 2001)
3434	1	Prostate	*MT-ND1*	G	A	(Jeronimo et al. 2001)
3480	1	Prostate	*MT-ND1*	G	A	(Jeronimo et al. 2001)
3505	1	Prostate	*MT-ND1*	A	G	(Jeronimo et al. 2001)
11674	1	Prostate	*MT-ND4*	C	T	(Jeronimo et al. 2001)
11947	1	Prostate	*MT-ND4*	A	G	(Jeronimo et al. 2001)
12308	1	Prostate	*MT-TL2*	A	G	(Jeronimo et al. 2001)
12372	1	Prostate	*MT-ND5*	A	G	(Jeronimo et al. 2001)
12414	1	Prostate	*MT-ND5*	T	C	(Jeronimo et al. 2001)
12705	1	Prostate	*MT-ND5*	C	T	(Jeronimo et al. 2001)
14053	1	Prostate	*MT-ND5*	G	A	(Jeronimo et al. 2001)
16183	1	Prostate	*MT-DLOOP*	A	G	(Jeronimo et al. 2001)

16189	1	Prostate	*MT-DLOOP*	T	C	(Jeronimo et al. 2001)
2923	32	Prostate	*MT-RNR2*	G	A	(Jeronimo et al. 2001)
14603	PX16	Pancreas	*MT-ND6*	G	A	(Jones et al. 2001)
2805	PX17	Pancreas	*MT-RNR2*	A	T	(Jones et al. 2001)
15983	PX19	Pancreas	*MT-TP*	T	C	(Jones et al. 2001)
3670	PX27	Pancreas	*MT-ND1*	G	A	(Jones et al. 2001)
16129	1	Pancreas	*MT-DLOOP*	G	A	(Kassauei et al. 2006)
2698	10	Pancreas	*MT-RNR2*	G	A	(Kassauei et al. 2006)
3032	10	Pancreas	*MT-RNR2*	G	A	(Kassauei et al. 2006)
5999	10	Pancreas	*MT-CO1*	T	C	(Kassauei et al. 2006)
7075	10	Pancreas	*MT-CO1*	G	C	(Kassauei et al. 2006)
13241	10	Pancreas	*MT-ND5*	T	C	(Kassauei et al. 2006)
15017	10	Pancreas	*MT-CYB*	T	C	(Kassauei et al. 2006)
1811	11	Pancreas	*MT-RNR2*	A	G	(Kassauei et al. 2006)
3326	11	Pancreas	*MT-ND1*	T	G	(Kassauei et al. 2006)
8163	11	Pancreas	*MT-CO2*	A	G	(Kassauei et al. 2006)
14884	11	Pancreas	*MT-CYB*	C	T	(Kassauei et al. 2006)
15693	11	Pancreas	*MT-CYB*	T	C	(Kassauei et al. 2006)
16134	11	Pancreas	*MT-DLOOP*	C	T	(Kassauei et al. 2006)
94	12	Pancreas	*MT-DLOOP*	G	A	(Kassauei et al. 2006)
630	12	Pancreas	*MT-TF*	C	T	(Kassauei et al. 2006)
5940	12	Pancreas	*MT-CO1*	A	G	(Kassauei et al. 2006)
11947	12	Pancreas	*MT-ND4*	A	G	(Kassauei et al. 2006)
12414	12	Pancreas	*MT-ND5*	T	C	(Kassauei et al. 2006)
15884	12	Pancreas	*MT-CYB*	G	A	(Kassauei et al. 2006)

16311	12	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)
16519	12	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)
10301	13	Pancreas	*MT-ND3*	A	C	(Kassauei et al. 2006)
10417	13	Pancreas	*MT-TR*	T	C	(Kassauei et al. 2006)
10450	13	Pancreas	*MT-TR*	A	G	(Kassauei et al. 2006)
10885	13	Pancreas	*MT-ND4*	T	C	(Kassauei et al. 2006)
10901	13	Pancreas	*MT-ND4*	A	G	(Kassauei et al. 2006)
11083	13	Pancreas	*MT-ND4*	A	G	(Kassauei et al. 2006)
11377	13	Pancreas	*MT-ND4*	G	A	(Kassauei et al. 2006)
11471	13	Pancreas	*MT-ND4*	C	T	(Kassauei et al. 2006)
11827	13	Pancreas	*MT-ND4*	T	C	(Kassauei et al. 2006)
195	14	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)
1811	14	Pancreas	*MT-RNR2*	A	G	(Kassauei et al. 2006)
4646	14	Pancreas	*MT-ND2*	T	C	(Kassauei et al. 2006)
10572	14	Pancreas	*MT-ND4L*	G	A	(Kassauei et al. 2006)
12308	14	Pancreas	*MT-TL2*	A	G	(Kassauei et al. 2006)
12372	14	Pancreas	*MT-ND5*	G	A	(Kassauei et al. 2006)
12937	14	Pancreas	*MT-ND5*	A	G	(Kassauei et al. 2006)
14620	14	Pancreas	*MT-ND6*	C	T	(Kassauei et al. 2006)
15693	14	Pancreas	*MT-CYB*	T	C	(Kassauei et al. 2006)
16134	14	Pancreas	*MT-DLOOP*	C	T	(Kassauei et al. 2006)
16356	14	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)
195	15	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)
228	15	Pancreas	*MT-DLOOP*	A	G	(Kassauei et al. 2006)
477	15	Pancreas	*MT-DLOOP*	T	C	(Kassauei et al. 2006)

482	15	Pancreas	*MT-DLOOP*	C	T	(Kassauei et al. 2006)
7175	15	Pancreas	*MT-CO1*	T	C	(Kassauei et al. 2006)
7256	15	Pancreas	*MT-CO1*	C	T	(Kassauei et al. 2006)
7274	15	Pancreas	*MT-CO1*	C	T	(Kassauei et al. 2006)
7521	15	Pancreas	*MT-TD*	G	A	(Kassauei et al. 2006)
7771	15	Pancreas	*MT-CO2*	A	G	(Kassauei et al. 2006)
8206	15	Pancreas	*MT-CO2*	G	A	(Kassauei et al. 2006)
9221	15	Pancreas	*MT-CO3*	A	G	(Kassauei et al. 2006)
9540	15	Pancreas	*MT-CO3*	T	C	(Kassauei et al. 2006)
10115	15	Pancreas	*MT-ND3*	T	C	(Kassauei et al. 2006)
14766	15	Pancreas	*MT-CYB*	T	C	(Kassauei et al. 2006)
841	2	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
1323	3	Pancreas	*MT-RNR1*	G	A	(Kassauei et al. 2006)
841	4	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
5368	4	Pancreas	*MT-ND2*	C	G	(Kassauei et al. 2006)
10895	5	Pancreas	*MT-ND4*	A	G	(Kassauei et al. 2006)
14543	5	Pancreas	*MT-ND6*	A	G	(Kassauei et al. 2006)
2234	6	Pancreas	*MT-RNR2*	C	T	(Kassauei et al. 2006)
9972	6	Pancreas	*MT-CO3*	A	G	(Kassauei et al. 2006)
678	7	Pancreas	*MT-RNR1*	T	C	(Kassauei et al. 2006)
16153	7	Pancreas	*MT-DLOOP*	G	A	(Kassauei et al. 2006)
841	8	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
14543	8	Pancreas	*MT-ND6*	A	G	(Kassauei et al. 2006)
15409	8	Pancreas	*MT-CYB*	C	G	(Kassauei et al. 2006)
94	9	Pancreas	*MT-DLOOP*	G	A	(Kassauei et al. 2006)

630	9	Pancreas	*MT-TF*	C	T	(Kassauei et al. 2006)
12612	9	Pancreas	*MT-ND5*	A	G	(Kassauei et al. 2006)
185	2	Glioblastoma	*MT-DLOOP*	A	G	(Kirches et al. 2001)
195	2	Glioblastoma	*MT-DLOOP*	T	C	(Kirches et al. 2001)
204	2	Glioblastoma	*MT-DLOOP*	C	T	(Kirches et al. 2001)
295	2	Glioblastoma	*MT-DLOOP*	T	C	(Kirches et al. 2001)
4646	2	Glioblastoma	*MT-ND2*	T	C	(Kirches et al. 2001)
5198	2	Glioblastoma	*MT-ND2*	A	G	(Kirches et al. 2001)
5999	2	Glioblastoma	*MT-CO1*	T	C	(Kirches et al. 2001)
6047	2	Glioblastoma	*MT-CO1*	A	G	(Kirches et al. 2001)
12936	2	Glioblastoma	*MT-ND5*	A	G	(Kirches et al. 2001)
13124	2	Glioblastoma	*MT-ND5*	T	C	(Kirches et al. 2001)
14620	2	Glioblastoma	*MT-ND6*	C	T	(Kirches et al. 2001)
14798	2	Glioblastoma	*MT-CYB*	C	T	(Kirches et al. 2001)
16126	2	Glioblastoma	*MT-DLOOP*	C	T	(Kirches et al. 2001)
16134	2	Glioblastoma	*MT-DLOOP*	C	T	(Kirches et al. 2001)
16293	2	Glioblastoma	*MT-DLOOP*	A	G	(Kirches et al. 2001)
16356	2	Glioblastoma	*MT-DLOOP*	T	C	(Kirches et al. 2001)
16519	2	Glioblastoma	*MT-DLOOP*	T	C	(Kirches et al. 2001)
72	7	Glioblastoma	*MT-DLOOP*	T	C	(Kirches et al. 2001)
9906	A7B7	Colorectal	*MT-CO3*	G	A	(Lievre et al. 2005)
16390	A7B7	Colorectal	*MT-DLOOP*	G	A	(Lievre et al. 2005)
6163	A9B9	Colorectal	*MT-CO1*	T	C	(Lievre et al. 2005)
1721	1	Leukemia	*MT-RNR2*	C	T	(Linnartz, Anglmayer and Zanssen 2004)
8617	1	Leukemia	*MT-ATP6*	A	G	(Linnartz, Anglmayer and Zanssen 2004)

12196	1	Leukemia	*MT-TH*	C	T	(Linnartz, Anglmayer and Zanssen 2004)
2056	2	Leukemia	*MT-RNR2*	G	A	(Linnartz, Anglmayer and Zanssen 2004)
4216	2	Leukemia	*MT-ND1*	T	C	(Linnartz, Anglmayer and Zanssen 2004)
13708	2	Leukemia	*MT-ND5*	G	A	(Linnartz, Anglmayer and Zanssen 2004)
5843	3	Leukemia	*MT-TY*	A	G	(Linnartz, Anglmayer and Zanssen 2004)
3394	4	Leukemia	*MT-ND1*	T	C	(Linnartz, Anglmayer and Zanssen 2004)
4216	4	Leukemia	*MT-ND1*	T	C	(Linnartz, Anglmayer and Zanssen 2004)
13708	4	Leukemia	*MT-ND5*	G	A	(Linnartz, Anglmayer and Zanssen 2004)
4216	5	Leukemia	*MT-ND1*	T	C	(Linnartz, Anglmayer and Zanssen 2004)
13708	5	Leukemia	*MT-ND5*	G	A	(Linnartz, Anglmayer and Zanssen 2004)
16365	OV12	Ovarian	*MT-DLOOP*	C	T	(Liu et al. 2001)
664	OV28	Ovarian	*MT-RNR1*	G	A	(Liu et al. 2001)
1952	OV30	Ovarian	*MT-RNR2*	T	C	(Liu et al. 2001)
16278	OV32	Ovarian	*MT-DLOOP*	T	C	(Liu et al. 2001)
15761	OV34	Ovarian	*MT-CYB*	G	A	(Liu et al. 2001)
1401	OV8	Ovarian	*MT-RNR1*	G	A	(Liu et al. 2001)
146	OV88	Ovarian	*MT-DLOOP*	T	C	(Liu et al. 2001)
152	OV88	Ovarian	*MT-DLOOP*	T	C	(Liu et al. 2001)
199	OV88	Ovarian	*MT-DLOOP*	T	C	(Liu et al. 2001)
489	OV88	Ovarian	*MT-DLOOP*	T	C	(Liu et al. 2001)
15280	1	Thyroid	*MT-CYB*	C	T	(Maximo et al. 2002)
4940	10A	Thyroid	*MT-ND2*	C	T	(Maximo et al. 2002)
7785	10A	Thyroid	*MT-CO2*	T	C	(Maximo et al. 2002)
195	10B	Thyroid	*MT-DLOOP*	T	C	(Maximo et al. 2002)
9137	10B	Thyroid	*MT-ATP6*	T	C	(Maximo et al. 2002)

6473	11	Thyroid	*MT-CO1*	C	T	(Maximo et al. 2002)
12918	11	Thyroid	*MT-ND5*	C	T	(Maximo et al. 2002)
481	12A	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
9030	12B	Thyroid	*MT-ATP6*	C	T	(Maximo et al. 2002)
9575	12B	Thyroid	*MT-CO3*	G	C	(Maximo et al. 2002)
12236	14	Thyroid	*MT-TS2*	G	A	(Maximo et al. 2002)
7873	15	Thyroid	*MT-CO2*	C	T	(Maximo et al. 2002)
8697	15	Thyroid	*MT-ATP6*	G	A	(Maximo et al. 2002)
8706	15	Thyroid	*MT-ATP6*	A	G	(Maximo et al. 2002)
456	16A	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
7873	16A	Thyroid	*MT-CO2*	C	T	(Maximo et al. 2002)
462	17	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
4985	17	Thyroid	*MT-ND2*	A	G	(Maximo et al. 2002)
15182	17	Thyroid	*MT-CYB*	A	G	(Maximo et al. 2002)
207	18	Thyroid	*MT-DLOOP*	G	A	(Maximo et al. 2002)
8716	18	Thyroid	*MT-ATP6*	A	G	(Maximo et al. 2002)
115	19	Thyroid	*MT-DLOOP*	T	C	(Maximo et al. 2002)
497	2	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
499	2	Thyroid	*MT-DLOOP*	G	A	(Maximo et al. 2002)
7775	20	Thyroid	*MT-CO2*	G	A	(Maximo et al. 2002)
11332	20	Thyroid	*MT-ND4*	C	T	(Maximo et al. 2002)
185	21	Thyroid	*MT-DLOOP*	G	A	(Maximo et al. 2002)
9655	22	Thyroid	*MT-CO3*	G	A	(Maximo et al. 2002)
10269	23	Thyroid	*MT-ND3*	C	T	(Maximo et al. 2002)
14560	23	Thyroid	*MT-ND6*	G	T	(Maximo et al. 2002)

4613	25	Thyroid	*MT-ND2*	A	G	(Maximo et al. 2002)
9477	25	Thyroid	*MT-CO3*	G	A	(Maximo et al. 2002)
3992	27	Thyroid	*MT-ND1*	C	T	(Maximo et al. 2002)
13943	27	Thyroid	*MT-ND5*	C	T	(Maximo et al. 2002)
10793	28	Thyroid	*MT-ND4*	C	T	(Maximo et al. 2002)
325	3	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
5633	30	Thyroid	*MT-TA*	C	T	(Maximo et al. 2002)
7819	30	Thyroid	*MT-CO2*	C	A	(Maximo et al. 2002)
7103	31	Thyroid	*MT-CO1*	C	T	(Maximo et al. 2002)
9691	31	Thyroid	*MT-CO3*	C	T	(Maximo et al. 2002)
10197	35	Thyroid	*MT-ND3*	G	C	(Maximo et al. 2002)
549	39	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
6650	4	Thyroid	*MT-CO1*	A	C	(Maximo et al. 2002)
9477	4	Thyroid	*MT-CO3*	G	T	(Maximo et al. 2002)
10639	40	Thyroid	*MT-ND4L*	A	G	(Maximo et al. 2002)
11016	40	Thyroid	*MT-ND4*	G	A	(Maximo et al. 2002)
150	41	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
4312	41	Thyroid	*MT-TI*	C	T	(Maximo et al. 2002)
10691	41	Thyroid	*MT-ND4L*	C	G	(Maximo et al. 2002)
3910	44	Thyroid	*MT-ND1*	G	A	(Maximo et al. 2002)
15312	46	Thyroid	*MT-CYB*	T	G	(Maximo et al. 2002)
460	5	Thyroid	*MT-DLOOP*	T	C	(Maximo et al. 2002)
14498	5	Thyroid	*MT-ND6*	T	A	(Maximo et al. 2002)
325	51	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
3594	51	Thyroid	*MT-ND1*	C	T	(Maximo et al. 2002)

10320	51	Thyroid	*MT-ND3*	G	A	(Maximo et al. 2002)
11840	51	Thyroid	*MT-ND4*	C	T	(Maximo et al. 2002)
9296	56	Thyroid	*MT-CO3*	C	T	(Maximo et al. 2002)
10181	56	Thyroid	*MT-ND3*	C	T	(Maximo et al. 2002)
73	57	Thyroid	*MT-DLOOP*	A	G	(Maximo et al. 2002)
3526	59	Thyroid	*MT-ND1*	G	A	(Maximo et al. 2002)
13943	59	Thyroid	*MT-ND5*	C	T	(Maximo et al. 2002)
8697	6	Thyroid	*MT-ATP6*	G	A	(Maximo et al. 2002)
8701	6	Thyroid	*MT-ATP6*	A	G	(Maximo et al. 2002)
10272	6	Thyroid	*MT-ND3*	C	T	(Maximo et al. 2002)
150	60	Thyroid	*MT-DLOOP*	C	T	(Maximo et al. 2002)
12967	62	Thyroid	*MT-ND5*	A	C	(Maximo et al. 2002)
9746	7	Thyroid	*MT-CO3*	G	A	(Maximo et al. 2002)
9477	8	Thyroid	*MT-CO3*	G	A	(Maximo et al. 2002)
8701	9	Thyroid	*MT-ATP6*	A	G	(Maximo et al. 2002)
338	1	Renal	*MT-DLOOP*	C	T	(Meierhofer et al. 2006)
1578	1	Renal	*MT-RNR1*	A	G	(Meierhofer et al. 2006)
12007	1	Renal	*MT-ND4*	G	A	(Meierhofer et al. 2006)
4584	2	Renal	*MT-ND2*	G	A	(Meierhofer et al. 2006)
94	3	Renal	*MT-DLOOP*	G	A	(Meierhofer et al. 2006)
7423	3	Renal	*MT-CO1*	A	G	(Meierhofer et al. 2006)
204	4	Renal	*MT-DLOOP*	T	C	(Meierhofer et al. 2006)
1169	4	Renal	*MT-RNR1*	G	A	(Meierhofer et al. 2006)
3243	4	Renal	*MT-TL1*	A	G	(Meierhofer et al. 2006)
12510	4	Renal	*MT-ND5*	C	A	(Meierhofer et al. 2006)

2222	5	Renal	*MT-RNR2*	T	C	(Meierhofer et al. 2006)
1566	6	Renal	*MT-RNR1*	C	T	(Meierhofer et al. 2006)
10579	6	Renal	*MT-ND4L*	T	C	(Meierhofer et al. 2006)
16174	7	Renal	*MT-DLOOP*	C	T	(Meierhofer et al. 2006)
70	1	Head and neck	*MT-DLOOP*	A	G	(Mithani et al. 2007)
4752	10	Head and neck	*MT-ND2*	T	C	(Mithani et al. 2007)
8701	10	Head and neck	*MT-ATP6*	A	G	(Mithani et al. 2007)
15693	11	Head and neck	*MT-CYB*	T	C	(Mithani et al. 2007)
189	12	Head and neck	*MT-DLOOP*	A	G	(Mithani et al. 2007)
5390	12	Head and neck	*MT-ND2*	A	G	(Mithani et al. 2007)
9910	12	Head and neck	*MT-CO3*	T	A	(Mithani et al. 2007)
3700	2	Head and neck	*MT-ND1*	G	A	(Mithani et al. 2007)
3079	3	Head and neck	*MT-RNR2*	G	A	(Mithani et al. 2007)
10695	3	Head and neck	*MT-ND4L*	G	A	(Mithani et al. 2007)
3664	4	Head and neck	*MT-ND1*	G	A	(Mithani et al. 2007)
8618	5	Head and neck	*MT-ATP6*	T	C	(Mithani et al. 2007)
8701	5	Head and neck	*MT-ATP6*	A	G	(Mithani et al. 2007)
9003	6	Head and neck	*MT-ATP6*	C	T	(Mithani et al. 2007)
2004	7	Head and neck	*MT-RNR2*	G	A	(Mithani et al. 2007)
9210	7	Head and neck	*MT-CO3*	A	G	(Mithani et al. 2007)
3308	8	Head and neck	*MT-ND1*	C	T	(Mithani et al. 2007)
8701	8	Head and neck	*MT-ATP6*	A	G	(Mithani et al. 2007)
10398	8	Head and neck	*MT-ND3*	A	G	(Mithani et al. 2007)
4689	9	Head and neck	*MT-ND2*	A	G	(Mithani et al. 2007)
5198	9	Head and neck	*MT-ND2*	A	G	(Mithani et al. 2007)

9100	9	Head and neck	*MT-ATP6*	A	G	(Mithani et al. 2007)
14798	9	Head and neck	*MT-CYB*	T	C	(Mithani et al. 2007)
1923	1177	Renal	*MT-RNR2*	C	T	(Nagy et al. 2002)
1389	1282	Renal	*MT-RNR1*	G	A	(Nagy et al. 2002)
16316	1627	Renal	*MT-DLOOP*	A	T	(Nagy et al. 2002)
5623	105T	Renal	*MT-TA*	G	A	(Nagy, Wilhelm and Kovacs 2003)
540	123A	Renal	*MT-DLOOP*	A	G	(Nagy, Wilhelm and Kovacs 2003)
16129	123B	Renal	*MT-DLOOP*	G	A	(Nagy, Wilhelm and Kovacs 2003)
94	192T	Renal	*MT-DLOOP*	G	A	(Nagy, Wilhelm and Kovacs 2003)
4659	195T	Renal	*MT-ND2*	G	A	(Nagy, Wilhelm and Kovacs 2003)
16304	94B	Renal	*MT-DLOOP*	T	C	(Nagy, Wilhelm and Kovacs 2003)
16273	12	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
183	13	Nasopharyngeal	*MT-DLOOP*	A	G	(Pang et al. 2008)
16309	17	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
151	18	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
479	18	Nasopharyngeal	*MT-DLOOP*	A	G	(Pang et al. 2008)
489	18	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
709	18	Nasopharyngeal	*MT-RNR1*	G	A	(Pang et al. 2008)
15970	18	Nasopharyngeal	*MT-TP*	C	T	(Pang et al. 2008)
16093	18	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16111	18	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16157	18	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16223	18	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16304	18	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16362	18	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)

16273	23	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
310	3	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
195	4	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
360	4	Nasopharyngeal	*MT-DLOOP*	T	A	(Pang et al. 2008)
150	5	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
199	5	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
301	5	Nasopharyngeal	*MT-DLOOP*	A	C	(Pang et al. 2008)
302	5	Nasopharyngeal	*MT-DLOOP*	A	C	(Pang et al. 2008)
489	5	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
15769	5	Nasopharyngeal	*MT-CYB*	A	G	(Pang et al. 2008)
16192	5	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16223	5	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16297	5	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
16299	5	Nasopharyngeal	*MT-DLOOP*	A	G	(Pang et al. 2008)
16355	5	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
16390	5	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
150	7	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
199	7	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
489	7	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16129	7	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
16192	7	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
16223	7	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
16278	7	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)
16297	7	Nasopharyngeal	*MT-DLOOP*	T	C	(Pang et al. 2008)
16304	7	Nasopharyngeal	*MT-DLOOP*	C	T	(Pang et al. 2008)

13708	B24	Breast	*MT-ND5*	G	A	(Parrella et al. 2001)
3918	B27T_L	Breast	*MT-ND1*	G	A	(Parrella et al. 2001)
12344	B32	Breast	*MT-ND5*	T	A	(Parrella et al. 2001)
16292	B33	Breast	*MT-DLOOP*	C	T	(Parrella et al. 2001)
11900	B35	Breast	*MT-ND4*	G	A	(Parrella et al. 2001)
16093	B38	Breast	*MT-DLOOP*	C	T	(Parrella et al. 2001)
14869	B44	Breast	*MT-CYB*	G	A	(Parrella et al. 2001)
6718	C1	Colorectal	*MT-CO1*	T	C	(Wang et al. 2011)
14288	C1	Colorectal	*MT-ND6*	T	C	(Wang et al. 2011)
15332	C1	Colorectal	*MT-CYB*	A	G	(Wang et al. 2011)
4532	C12	Colorectal	*MT-ND2*	G	A	(Wang et al. 2011)
14288	C14	Colorectal	*MT-ND6*	A	C	(Wang et al. 2011)
16093	C14	Colorectal	*MT-DLOOP*	C	T	(Wang et al. 2011)
215	C16	Colorectal	*MT-DLOOP*	G	A	(Wang et al. 2011)
15276	C16	Colorectal	*MT-CYB*	A	C	(Wang et al. 2011)
16158	C16	Colorectal	*MT-DLOOP*	C	T	(Wang et al. 2011)
9275	C20	Colorectal	*MT-CO1*	A	G	(Wang et al. 2011)
16365	C3	Colorectal	*MT-DLOOP*	G	A	(Wang et al. 2011)
16390	C4	Colorectal	*MT-DLOOP*	A	G	(Wang et al. 2011)
14288	C8	Colorectal	*MT-ND6*	G	A	(Wang et al. 2011)
15447	C8	Colorectal	*MT-CYB*	C	T	(Wang et al. 2011)
2299	V410	Colorectal	*MT-RNR2*	T	A	(Polyak et al. 1998)
6264	V425	Colorectal	*MT-CO1*	G	A	(Polyak et al. 1998)
8009	V429	Colorectal	*MT-CO2*	G	A	(Polyak et al. 1998)
14985	V429	Colorectal	*MT-CYB*	G	A	(Polyak et al. 1998)

15572	V429	Colorectal	*MT-CYB*	T	C	(Polyak et al. 1998)
9949	V441	Colorectal	*MT-CO3*	G	A	(Polyak et al. 1998)
1967	V451	Colorectal	*MT-RNR2*	T	C	(Polyak et al. 1998)
10563	V456	Colorectal	*MT-ND4L*	T	C	(Polyak et al. 1998)
710	V478	Colorectal	*MT-RNR1*	T	C	(Polyak et al. 1998)
1738	V478	Colorectal	*MT-RNR2*	T	C	(Polyak et al. 1998)
3308	V478	Colorectal	*MT-ND1*	T	C	(Polyak et al. 1998)
152	102	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
204	102	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
207	102	Breast	*MT-DLOOP*	A	G	(Tan, Bai and Wong 2002)
16189	102	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
73	104	Breast	*MT-DLOOP*	G	A	(Tan, Bai and Wong 2002)
16325	104	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
16519	104	Breast	*MT-DLOOP*	T	C	(Tan, Bai and Wong 2002)
195	106	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
16519	106	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
16147	108	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
16293	110	Breast	*MT-DLOOP*	A	G	(Tan, Bai and Wong 2002)
9131	112	Breast	*MT-ATP6*	T	C	(Tan, Bai and Wong 2002)
150	114	Breast	*MT-DLOOP*	T	C	(Tan, Bai and Wong 2002)
185	114	Breast	*MT-DLOOP*	A	G	(Tan, Bai and Wong 2002)
189	114	Breast	*MT-DLOOP*	G	A	(Tan, Bai and Wong 2002)
16182	146	Breast	*MT-DLOOP*	A	C	(Tan, Bai and Wong 2002)
16362	152	Breast	*MT-DLOOP*	T	C	(Tan, Bai and Wong 2002)
16365	152	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)

1811	176	Breast	*MT-RNR2*	A	G	(Tan, Bai and Wong 2002)
16172	180	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
4973	182	Breast	*MT-ND2*	T	C	(Tan, Bai and Wong 2002)
4973	184	Breast	*MT-ND2*	C	T	(Tan, Bai and Wong 2002)
5285	184	Breast	*MT-ND2*	G	A	(Tan, Bai and Wong 2002)
204	10	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
207	10	Oral	*MT-DLOOP*	A	G	(Tan et al. 2004)
313	10	Oral	*MT-DLOOP*	C	A	(Tan et al. 2004)
10245	10	Oral	*MT-ND3*	C	T	(Tan et al. 2004)
222	14	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
11794	14	Oral	*MT-ND4*	T	C	(Tan et al. 2004)
16320	14	Oral	*MT-DLOOP*	T	C	(Tan et al. 2004)
4986	18	Oral	*MT-ND2*	A	C	(Tan et al. 2004)
5026	19	Oral	*MT-ND2*	A	G	(Tan et al. 2004)
318	3	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
4510	3	Oral	*MT-ND2*	G	T	(Tan et al. 2004)
204	4	Oral	*MT-DLOOP*	T	C	(Tan et al. 2004)
207	4	Oral	*MT-DLOOP*	G	A	(Tan et al. 2004)
246	4	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
489	4	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
310	E02	Esophageal	*MT-DLOOP*	T	C	(Tan et al. 2006)
1544	E05	Esophageal	*MT-RNR1*	A	T	(Tan et al. 2006)
10500	E12	Esophageal	*MT-ND4L*	G	A	(Tan et al. 2006)
9377	E14	Esophageal	*MT-CO3*	G	A	(Tan et al. 2006)
9182	E15	Esophageal	*MT-ATP6*	A	G	(Tan et al. 2006)

8601	B3	Breast	*MT-ATP6*	A	G	(Wang et al. 2007)
2275	B6	Breast	*MT-RNR2*	T	C	(Wang et al. 2007)
9553	1	Thyroid	*MT-CO3*	G	A	(Witte et al. 2007)
13617	11	Thyroid	*MT-ND5*	A	G	(Witte et al. 2007)
13637	11	Thyroid	*MT-ND5*	T	C	(Witte et al. 2007)
2681	2	Thyroid	*MT-RNR2*	G	A	(Witte et al. 2007)
372	4	Thyroid	*MT-DLOOP*	A	G	(Witte et al. 2007)
2259	6	Thyroid	*MT-RNR2*	C	T	(Witte et al. 2007)
9682	9	Thyroid	*MT-CO3*	C	T	(Witte et al. 2007)
152	122	Medulloblastoma	*MT-DLOOP*	T	C	(Wong et al. 2003)
151	124	Medulloblastoma	*MT-DLOOP*	C	T	(Wong et al. 2003)
182	124	Medulloblastoma	*MT-DLOOP*	C	T	(Wong et al. 2003)
246	124	Medulloblastoma	*MT-DLOOP*	G	A	(Wong et al. 2003)
297	124	Medulloblastoma	*MT-DLOOP*	A	G	(Wong et al. 2003)
317	124	Medulloblastoma	*MT-DLOOP*	G	A	(Wong et al. 2003)
7337	124	Medulloblastoma	*MT-CO1*	G	A	(Wong et al. 2003)
7389	124	Medulloblastoma	*MT-CO1*	T	C	(Wong et al. 2003)
7521	124	Medulloblastoma	*MT-TD*	G	A	(Wong et al. 2003)
15904	124	Medulloblastoma	*MT-TT*	T	C	(Wong et al. 2003)
15937	124	Medulloblastoma	*MT-TT*	A	G	(Wong et al. 2003)
11046	126	Medulloblastoma	*MT-ND4*	T	C	(Wong et al. 2003)
247	135	Medulloblastoma	*MT-DLOOP*	G	A	(Wong et al. 2003)
295	140	Medulloblastoma	*MT-DLOOP*	T	C	(Wong et al. 2003)
7028	149	Medulloblastoma	*MT-CO1*	T	C	(Wong et al. 2003)
6293	HE01	Hepatocellular	*MT-CO1*	T	C	(Wong et al. 2004)

16180	HE02	Hepatocellular	*MT-DLOOP*	A	G	(Wong et al. 2004)
194	HE12	Hepatocellular	*MT-DLOOP*	C	T	(Wong et al. 2004)
195	HE12	Hepatocellular	*MT-DLOOP*	T	C	(Wong et al. 2004)
199	HE12	Hepatocellular	*MT-DLOOP*	C	T	(Wong et al. 2004)
263	HE12	Hepatocellular	*MT-DLOOP*	G	A	(Wong et al. 2004)
556	HE18	Hepatocellular	*MT-DLOOP*	A	G	(Wong et al. 2004)
189	HE19	Hepatocellular	*MT-DLOOP*	A	G	(Wong et al. 2004)
194	HE19	Hepatocellular	*MT-DLOOP*	C	T	(Wong et al. 2004)
195	HE19	Hepatocellular	*MT-DLOOP*	T	C	(Wong et al. 2004)
199	HE19	Hepatocellular	*MT-DLOOP*	T	C	(Wong et al. 2004)
204	HE19	Hepatocellular	*MT-DLOOP*	T	C	(Wong et al. 2004)
207	HE19	Hepatocellular	*MT-DLOOP*	G	A	(Wong et al. 2004)
456	HE19	Hepatocellular	*MT-DLOOP*	T	C	(Wong et al. 2004)
489	HE19	Hepatocellular	*MT-DLOOP*	C	T	(Wong et al. 2004)
94	0012	Hepatocellular	*MT-DLOOP*	G	A	(Yin et al. 2010)
72	0020	Hepatocellular	*MT-DLOOP*	T	C	(Yin et al. 2010)
9263	0020	Hepatocellular	*MT-CO3*	A	G	(Yin et al. 2010)
9267	0020	Hepatocellular	*MT-CO3*	G	A	(Yin et al. 2010)
6787	0024	Hepatocellular	*MT-CO1*	T	C	(Yin et al. 2010)
16300	0024	Hepatocellular	*MT-DLOOP*	A	G/T	(Yin et al. 2010)
70	0030	Hepatocellular	*MT-DLOOP*	G	A	(Yin et al. 2010)
9545	0030	Hepatocellular	*MT-CO3*	A	G	(Yin et al. 2010)
189	0069	Hepatocellular	*MT-DLOOP*	A	G	(Yin et al. 2010)
5650	0072	Hepatocellular	*MT-TA*	G	A	(Yin et al. 2010)
72	0074	Hepatocellular	*MT-DLOOP*	T	C	(Yin et al. 2010)

1659	0075	Hepatocellular	*MT-TV*	T	C	(Yin et al. 2010)
72	0081	Hepatocellular	*MT-DLOOP*	T	C	(Yin et al. 2010)
11708	0081	Hepatocellular	*MT-ND4*	A	G	(Yin et al. 2010)
7976	0083	Hepatocellular	*MT-CO2*	G	A	(Yin et al. 2010)
72	0097	Hepatocellular	*MT-DLOOP*	T	C	(Yin et al. 2010)
3842	0098	Hepatocellular	*MT-ND1*	G	A	(Yin et al. 2010)
152	0100	Hepatocellular	*MT-DLOOP*	T	C	(Yin et al. 2010)
16298	0100	Hepatocellular	*MT-DLOOP*	C	T	(Yin et al. 2010)
490	1017	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
924	1017	Head and neck	*MT-RNR1*	A	T	(Zhou et al. 2007)
3570	1017	Head and neck	*MT-ND1*	C	A	(Zhou et al. 2007)
4605	1017	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
5305	1017	Head and neck	*MT-ND2*	C	G	(Zhou et al. 2007)
5615	1017	Head and neck	*MT-TA*	A	G	(Zhou et al. 2007)
7468	1017	Head and neck	*MT-TS1*	C	T	(Zhou et al. 2007)
7791	1017	Head and neck	*MT-CO2*	C	T	(Zhou et al. 2007)
8419	1017	Head and neck	*MT-ATP8*	T	C	(Zhou et al. 2007)
9050	1017	Head and neck	*MT-ATP6*	G	A	(Zhou et al. 2007)
15433	1017	Head and neck	*MT-CYB*	C	T	(Zhou et al. 2007)
10410	1063	Head and neck	*MT-TR*	T	C	(Zhou et al. 2007)
20	1164	Head and neck	*MT-DLOOP*	A	C	(Zhou et al. 2007)
11324	1280	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
25	1356	Head and neck	*MT-DLOOP*	T	A	(Zhou et al. 2007)
64	1356	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
5002	1356	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)

13970	1356	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
4024	1493	Head and neck	*MT-ND1*	A	G	(Zhou et al. 2007)
5004	1493	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
5276	1493	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
8269	1493	Head and neck	*MT-CO2*	G	A	(Zhou et al. 2007)
9123	1493	Head and neck	*MT-ATP6*	G	A	(Zhou et al. 2007)
10044	1493	Head and neck	*MT-TG*	A	G	(Zhou et al. 2007)
11889	1493	Head and neck	*MT-ND4*	G	A	(Zhou et al. 2007)
12406	1493	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
12633	1493	Head and neck	*MT-ND5*	C	A	(Zhou et al. 2007)
13368	1493	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
14969	1493	Head and neck	*MT-CYB*	T	C	(Zhou et al. 2007)
15452	1493	Head and neck	*MT-CYB*	C	A	(Zhou et al. 2007)
15607	1493	Head and neck	*MT-CYB*	A	G	(Zhou et al. 2007)
15928	1493	Head and neck	*MT-TT*	G	A	(Zhou et al. 2007)
16126	1493	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16519	1493	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16261	1535	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
15257	1565	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
16319	1565	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
16320	1565	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
195	1680	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
912	1680	Head and neck	*MT-RNR1*	T	A	(Zhou et al. 2007)
1323	1680	Head and neck	*MT-RNR1*	G	A	(Zhou et al. 2007)
2069	1680	Head and neck	*MT-RNR2*	T	G	(Zhou et al. 2007)

2083	1680	Head and neck	*MT-RNR2*	T	G	(Zhou et al. 2007)
2352	1680	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
2706	1680	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
3360	1680	Head and neck	*MT-ND1*	A	G	(Zhou et al. 2007)
5570	1680	Head and neck	*MT-TW*	T	C	(Zhou et al. 2007)
5799	1680	Head and neck	*MT-TC*	A	G	(Zhou et al. 2007)
5848	1680	Head and neck	*MT-TY*	T	G	(Zhou et al. 2007)
7028	1680	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
8701	1680	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)
10398	1680	Head and neck	*MT-ND3*	A	G	(Zhou et al. 2007)
185	1691	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
215	1691	Head and neck	*MT-DLOOP*	A	G	(Zhou et al. 2007)
228	1691	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
251	1691	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
295	1691	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
462	1691	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
489	1691	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
2706	1691	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
4216	1691	Head and neck	*MT-ND1*	T	C	(Zhou et al. 2007)
4580	1691	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
4689	1691	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
5198	1691	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
7028	1691	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
7702	1691	Head and neck	*MT-CO2*	G	A	(Zhou et al. 2007)
9100	1691	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)

10398	1691	Head and neck	*MT-ND3*	A	G	(Zhou et al. 2007)
11251	1691	Head and neck	*MT-ND4*	A	G	(Zhou et al. 2007)
12612	1691	Head and neck	*MT-ND5*	A	G	(Zhou et al. 2007)
13708	1691	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
14798	1691	Head and neck	*MT-CYB*	T	C	(Zhou et al. 2007)
15904	1691	Head and neck	*MT-TT*	C	T	(Zhou et al. 2007)
16069	1691	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16126	1691	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
25	1736	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
150	1736	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
2352	1736	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
2483	1736	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
3277	1736	Head and neck	*MT-TL1*	G	A	(Zhou et al. 2007)
4752	1736	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
8701	1736	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)
9377	1736	Head and neck	*MT-CO3*	A	G	(Zhou et al. 2007)
9540	1736	Head and neck	*MT-CO3*	T	C	(Zhou et al. 2007)
10398	1736	Head and neck	*MT-ND3*	A	G	(Zhou et al. 2007)
10819	1736	Head and neck	*MT-ND4*	A	G	(Zhou et al. 2007)
10873	1736	Head and neck	*MT-ND4*	T	C	(Zhou et al. 2007)
12406	1736	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
12705	1736	Head and neck	*MT-ND5*	C	T	(Zhou et al. 2007)
14905	1736	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
15301	1736	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
16172	1736	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)

16223	1736	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16311	1736	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16320	1736	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
9003	1809	Head and neck	*MT-ATP6*	C	T	(Zhou et al. 2007)
13789	1809	Head and neck	*MT-ND5*	T	G	(Zhou et al. 2007)
14815	1809	Head and neck	*MT-CYB*	C	A	(Zhou et al. 2007)
15369	1809	Head and neck	*MT-CYB*	C	A	(Zhou et al. 2007)
5252	1817	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
15937	1817	Head and neck	*MT-TT*	A	G	(Zhou et al. 2007)
499	1836	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
1811	1836	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
4646	1836	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
5021	1836	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
5999	1836	Head and neck	*MT-CO1*	T	C	(Zhou et al. 2007)
6047	1836	Head and neck	*MT-CO1*	A	G	(Zhou et al. 2007)
7705	1836	Head and neck	*MT-CO2*	T	C	(Zhou et al. 2007)
11332	1836	Head and neck	*MT-ND4*	C	T	(Zhou et al. 2007)
11467	1836	Head and neck	*MT-ND4*	A	G	(Zhou et al. 2007)
12308	1836	Head and neck	*MT-TL2*	A	G	(Zhou et al. 2007)
12361	1836	Head and neck	*MT-ND5*	A	G	(Zhou et al. 2007)
12372	1836	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
13563	1836	Head and neck	*MT-ND5*	A	G	(Zhou et al. 2007)
14353	1836	Head and neck	*MT-ND6*	T	C	(Zhou et al. 2007)
14620	1836	Head and neck	*MT-ND6*	C	T	(Zhou et al. 2007)
15693	1836	Head and neck	*MT-CYB*	T	C	(Zhou et al. 2007)

16278	1836	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16356	1836	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16147	1858	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
3700	2008	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
4776	2018	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
16093	2039	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
30	2043	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
3197	2043	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
7956	2043	Head and neck	*MT-CO2*	C	A	(Zhou et al. 2007)
9477	2043	Head and neck	*MT-CO3*	G	A	(Zhou et al. 2007)
9591	2043	Head and neck	*MT-CO3*	G	A	(Zhou et al. 2007)
9668	2043	Head and neck	*MT-CO3*	C	G	(Zhou et al. 2007)
11466	2043	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
12308	2043	Head and neck	*MT-TL2*	A	G	(Zhou et al. 2007)
12372	2043	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
13414	2043	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
13617	2043	Head and neck	*MT-ND5*	T	C	(Zhou et al. 2007)
14793	2043	Head and neck	*MT-CYB*	A	G	(Zhou et al. 2007)
15218	2043	Head and neck	*MT-CYB*	A	G	(Zhou et al. 2007)
16270	2043	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16428	2043	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
7424	2051	Head and neck	*MT-CO1*	A	G	(Zhou et al. 2007)
12705	2051	Head and neck	*MT-ND5*	T	C	(Zhou et al. 2007)
16311	2051	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
189	2075	Head and neck	*MT-DLOOP*	A	G	(Zhou et al. 2007)

5390	2075	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
9910	2075	Head and neck	*MT-CO3*	T	A	(Zhou et al. 2007)
11299	2105	Head and neck	*MT-ND4*	G	T	(Zhou et al. 2007)
70	2126	Head and neck	*MT-DLOOP*	A	G	(Zhou et al. 2007)
489	2195	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
3079	2232	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
10695	2232	Head and neck	*MT-ND4L*	G	A	(Zhou et al. 2007)
4037	2382	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
1495	2444	Head and neck	*MT-RNR1*	C	T	(Zhou et al. 2007)
72	2455	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
2706	2455	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
4580	2455	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
4639	2455	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
5263	2455	Head and neck	*MT-ND2*	C	T	(Zhou et al. 2007)
7002	2455	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
7028	2455	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
8869	2455	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)
9378	2455	Head and neck	*MT-CO3*	T	C	(Zhou et al. 2007)
9629	2455	Head and neck	*MT-CO3*	C	T	(Zhou et al. 2007)
15904	2455	Head and neck	*MT-TT*	C	T	(Zhou et al. 2007)
16298	2455	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
558	2550	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
6128	2550	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
215	2553	Head and neck	*MT-DLOOP*	A	G	(Zhou et al. 2007)
4831	2553	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)

11324	2553	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
131	2555	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
2581	2555	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
4639	2555	Head and neck	*MT-ND2*	C	T	(Zhou et al. 2007)
4793	2555	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
7028	2555	Head and neck	*MT-CO1*	T	C	(Zhou et al. 2007)
8251	2555	Head and neck	*MT-CO2*	G	A	(Zhou et al. 2007)
12603	2555	Head and neck	*MT-ND5*	C	T	(Zhou et al. 2007)
16519	2555	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
25	2702	Head and neck	*MT-DLOOP*	T	A	(Zhou et al. 2007)
2618	2704	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
1593	2714	Head and neck	*MT-RNR1*	T	C	(Zhou et al. 2007)
4715	2714	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
8584	2714	Head and neck	*MT-ATP6*	G	A	(Zhou et al. 2007)
8701	2714	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)
9540	2714	Head and neck	*MT-CO3*	T	C	(Zhou et al. 2007)
10398	2714	Head and neck	*MT-ND3*	A	G	(Zhou et al. 2007)
12705	2714	Head and neck	*MT-ND5*	C	T	(Zhou et al. 2007)
13263	2714	Head and neck	*MT-ND5*	A	G	(Zhou et al. 2007)
14318	2714	Head and neck	*MT-ND6*	T	C	(Zhou et al. 2007)
14524	2714	Head and neck	*MT-ND6*	A	G	(Zhou et al. 2007)
15043	2714	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
15301	2714	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
15487	2714	Head and neck	*MT-CYB*	A	T	(Zhou et al. 2007)
16086	2714	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)

16223	2714	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16278	2714	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
16298	2714	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16325	2714	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
3664	2717	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
10361	2760	Head and neck	*MT-ND3*	T	C	(Zhou et al. 2007)
15307	2760	Head and neck	*MT-CYB*	C	T	(Zhou et al. 2007)
3010	2778	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
2004	2818	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
9210	2818	Head and neck	*MT-CO3*	A	G	(Zhou et al. 2007)
39	2828	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
2706	2828	Head and neck	*MT-RNR2*	A	G	(Zhou et al. 2007)
5147	2828	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
5580	2828	Head and neck	*MT-NC3*	T	C	(Zhou et al. 2007)
6680	2828	Head and neck	*MT-CO1*	T	C	(Zhou et al. 2007)
7028	2828	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
7424	2828	Head and neck	*MT-CO1*	A	G	(Zhou et al. 2007)
8618	2828	Head and neck	*MT-ATP6*	T	C	(Zhou et al. 2007)
8701	2828	Head and neck	*MT-ATP6*	A	G	(Zhou et al. 2007)
9540	2828	Head and neck	*MT-CO3*	T	C	(Zhou et al. 2007)
10398	2828	Head and neck	*MT-ND3*	A	G	(Zhou et al. 2007)
10873	2828	Head and neck	*MT-ND4*	T	C	(Zhou et al. 2007)
12705	2828	Head and neck	*MT-ND5*	C	T	(Zhou et al. 2007)
13105	2828	Head and neck	*MT-ND5*	A	G	(Zhou et al. 2007)
13886	2828	Head and neck	*MT-ND5*	T	C	(Zhou et al. 2007)

14284	2828	Head and neck	*MT-ND6*	C	T	(Zhou et al. 2007)
15058	2828	Head and neck	*MT-CYB*	C	T	(Zhou et al. 2007)
15301	2828	Head and neck	*MT-CYB*	G	A	(Zhou et al. 2007)
15766	2828	Head and neck	*MT-CYB*	A	G	(Zhou et al. 2007)
16124	2828	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
16153	2828	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
16223	2828	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
9247	2907	Head and neck	*MT-CO3*	G	A	(Zhou et al. 2007)
1990	3538	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
4776	3538	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
16488	3538	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
9885	1026	Breast	*MT-CO3*	T	A	(Zhu et al. 2005)
8498	697	Breast	*MT-ATP8*	A	G	(Zhu et al. 2005)
16293	697	Breast	*MT-DLOOP*	A	G	(Zhu et al. 2005)
15824	738	Breast	*MT-CYB*	A	G	(Zhu et al. 2005)
85	833	Breast	*MT-DLOOP*	G	A	(Zhu et al. 2005)
310	833	Breast	*MT-DLOOP*	T	C	(Zhu et al. 2005)
3849	833	Breast	*MT-ND1*	G	A	(Zhu et al. 2005)
4665	844	Breast	*MT-ND2*	G	A	(Zhu et al. 2005)
12642	845	Breast	*MT-ND5*	G	A	(Zhu et al. 2005)
4499	885	Breast	*MT-ND2*	C	T	(Zhu et al. 2005)
2706	898	Breast	*MT-RNR2*	G	A	(Zhu et al. 2005)
12636	906	Breast	*MT-ND5*	T	C	(Zhu et al. 2005)
15924	906	Breast	*MT-TT*	A	G	(Zhu et al. 2005)
11768	911	Breast	*MT-ND4*	A	G	(Zhu et al. 2005)

12636	911	Breast	*MT-ND5*	C	T	(Zhu et al. 2005)
310	944	Breast	*MT-DLOOP*	T	C	(Zhu et al. 2005)
4323	944	Breast	*MT-TI*	T	C	(Zhu et al. 2005)
12642	944	Breast	*MT-ND5*	A	G	(Zhu et al. 2005)
15700	944	Breast	*MT-CYB*	C	T	(Zhu et al. 2005)
16145	944	Breast	*MT-DLOOP*	G	A	(Zhu et al. 2005)
15700	954	Breast	*MT-CYB*	T	C	(Zhu et al. 2005)
194	983	Breast	*MT-DLOOP*	T	C	(Zhu et al. 2005)
195	983	Breast	*MT-DLOOP*	C	T	(Zhu et al. 2005)
199	983	Breast	*MT-DLOOP*	C	T	(Zhu et al. 2005)
204	983	Breast	*MT-DLOOP*	C	T	(Zhu et al. 2005)
207	983	Breast	*MT-DLOOP*	A	G	(Zhu et al. 2005)
295	983	Breast	*MT-DLOOP*	C	T	(Zhu et al. 2005)
709	983	Breast	*MT-RNR1*	G	A	(Zhu et al. 2005)
1243	983	Breast	*MT-RNR1*	C	T	(Zhu et al. 2005)
5240	983	Breast	*MT-ND2*	A	T	(Zhu et al. 2005)
9885	983	Breast	*MT-CO3*	T	A	(Zhu et al. 2005)
12852	983	Breast	*MT-ND5*	C	T	(Zhu et al. 2005)
13263	983	Breast	*MT-ND5*	G	A	(Zhu et al. 2005)
15655	983	Breast	*MT-CYB*	A	G	(Zhu et al. 2005)
15755	983	Breast	*MT-CYB*	G	T	(Zhu et al. 2005)
15783	983	Breast	*MT-CYB*	T	C	(Zhu et al. 2005)
16114	983	Breast	*MT-DLOOP*	C	T	(Zhu et al. 2005)
13397	988	Breast	*MT-ND5*	T	A	(Zhu et al. 2005)
13398	988	Breast	*MT-ND5*	T	A	(Zhu et al. 2005)

13674	988	Breast	*MT-ND5*	T	G	(Zhu et al. 2005)
8269	PCA001	Prostate	*MT-CO2*	G	A	(Kloss-Brandstatter et al. 2010)
11921	PCA001	Prostate	*MT-ND4*	T	C	(Kloss-Brandstatter et al. 2010)
12316	PCA001	Prostate	*MT-TL2*	G	A	(Kloss-Brandstatter et al. 2010)
13488	PCA002	Prostate	*MT-ND5*	T	G	(Kloss-Brandstatter et al. 2010)
2007	PCA003	Prostate	*MT-RNR2*	T	C	(Kloss-Brandstatter et al. 2010)
2545	PCA003	Prostate	*MT-RNR2*	T	C	(Kloss-Brandstatter et al. 2010)
8313	PCA005	Prostate	*MT-TK*	G	A	(Kloss-Brandstatter et al. 2010)
16047	PCA005	Prostate	*MT-HV1*	G	A	(Kloss-Brandstatter et al. 2010)
6384	PCA007	Prostate	*MT-COI*	G	A	(Kloss-Brandstatter et al. 2010)
11139	PCA008	Prostate	*MT-ND4*	T	C	(Kloss-Brandstatter et al. 2010)
10115	PCA009	Prostate	*MT-ND3*	T	C	(Kloss-Brandstatter et al. 2010)
879	PCA012	Prostate	*MT-RNR*	T	C	(Kloss-Brandstatter et al. 2010)
4522	PCA012	Prostate	*MT-ND2*	T	C	(Kloss-Brandstatter et al. 2010)
3394	PCA013	Prostate	*MT-ND1*	T	C	(Kloss-Brandstatter et al. 2010)
5393	PCA014	Prostate	*MT-ND2*	T	C	(Kloss-Brandstatter et al. 2010)
513	PCA015	Prostate	*MT-HV*	G	A	(Kloss-Brandstatter et al. 2010)
8184	PCA015	Prostate	*MT-CO2*	G	A	(Kloss-Brandstatter et al. 2010)
16390	PCA015	Prostate	*MT-HV1*	G	A	(Kloss-Brandstatter et al. 2010)
1623	PCA017	Prostate	*MT-TV*	G	A	(Kloss-Brandstatter et al. 2010)
10436	PCA017	Prostate	*MT-TR*	T	C	(Kloss-Brandstatter et al. 2010)
15313	PCA017	Prostate	*MT-CYB*	C	T	(Kloss-Brandstatter et al. 2010)
9438	PCA018	Prostate	*MT-CO3*	G	A	(Kloss-Brandstatter et al. 2010)
11391	PCA019	Prostate	*MT-ND4*	G	A	(Kloss-Brandstatter et al. 2010)
15243	PCA019	Prostate	*MT-CYB*	G	A	(Kloss-Brandstatter et al. 2010)
709	PCA020	Prostate	*MT-RNR*	G	A	(Kloss-Brandstatter et al. 2010)
5031	PCA022	Prostate	*MT-ND2*	G	A	(Kloss-Brandstatter et al. 2010)
13718	PCA023	Prostate	*MT-ND5*	G	A	(Kloss-Brandstatter et al. 2010)
8705	PCA024	Prostate	*MT-ATP6*	T	C	(Kloss-Brandstatter et al. 2010)

8736	PCA025	Prostate	*MT-ATP6*	T	C	(Kloss-Brandstatter et al. 2010)
9930	PCA025	Prostate	*MT-CO3*	T	C	(Kloss-Brandstatter et al. 2010)
14463	PCA025	Prostate	*MT-ND6*	T	C	(Kloss-Brandstatter et al. 2010)
9116	PCA027	Prostate	*MT-ATP6*	T	C	(Kloss-Brandstatter et al. 2010)
14221	PCA030	Prostate	*MT-ND6*	T	C	(Kloss-Brandstatter et al. 2010)
8572	GC2	Gastric	*MT-ATP8*	G	A	(Bi et al. 2011)
8572	GC2	Gastric	*MT-ATP6*	G	A	(Bi et al. 2011)
15777	GC2	Gastric	*MT-CYB*	G	A	(Bi et al. 2011)
15597	GC3	Gastric	*MT-CYB*	T	C	(Bi et al. 2011)
3200	GC4	Gastric	*MT-RNR2*	T	C	(Bi et al. 2011)
4632	GC6	Gastric	*MT-ND2*	G	A	(Bi et al. 2011)
9770	GC6	Gastric	*MT-CO3*	T	C	(Bi et al. 2011)
16391	5	Breast	*MT-DLOOP*	A	G	(Fendt et al. 2011)
16390	9	Breast	*MT-DLOOP*	G	A	(Fendt et al. 2011)
215	12	Breast	*MT-DLOOP*	G	A	(Fendt et al. 2011)
16106	13	Breast	*MT-DLOOP*	G	C	(Fendt et al. 2011)
16304	13	Breast	*MT-DLOOP*	C	T	(Fendt et al. 2011)
152	14	Breast	*MT-DLOOP*	C	T	(Fendt et al. 2011)
12875	1	Breast	*MT-ND5*	T	C	(Fendt et al. 2011)
7379	2	Breast	*MT-CO1*	G	A	(Fendt et al. 2011)
5703	3	Breast	*MT-TN*	G	A	(Fendt et al. 2011)
9966	6	Breast	*MT-CO3*	G	A	(Fendt et al. 2011)
15341	7	Breast	*MT-CYB*	T	C	(Fendt et al. 2011)
2998	8	Breast	*MT-RNR2*	T	C	(Fendt et al. 2011)
2145	8	Breast	*MT-RNR2*	G	A	(Fendt et al. 2011)
12131	11	Breast	*MT-ND4*	T	C	(Fendt et al. 2011)
12803	12	Breast	*MT-ND5*	G	A	(Fendt et al. 2011)
1632	13	Breast	*MT-TV*	T	C	(Fendt et al. 2011)
5102	13	Breast	*MT-ND2*	G	A	(Fendt et al. 2011)

5390	13	Breast	*MT-ND2*	G	A	(Fendt et al. 2011)
1132	14	Breast	*MT-RNR1*	T	C	(Fendt et al. 2011)
1578	14	Breast	*MT-RNR1*	G	A	(Fendt et al. 2011)
6620	B1	Breast	*MT-CO1*	T	C	(Gochhait et al. 2008)
7269	B1	Breast	*MT-CO1*	G	A	(Gochhait et al. 2008)
16169	B1	Breast	*MT-DLOOP*	C	T	(Gochhait et al. 2008)
333	B2	Breast	*MT-DLOOP*	T	A	(Gochhait et al. 2008)
15968	B3	Breast	*MT-TP*	T	C	(Gochhait et al. 2008)
6055	B4	Breast	*MT-CO1*	A	G	(Gochhait et al. 2008)
13130	B6	Breast	*MT-ND5*	C	A	(Gochhait et al. 2008)
16189	B6	Breast	*MT-DLOOP*	T	C	(Gochhait et al. 2008)
15930	B7	Breast	*MT-TT*	G	A	(Gochhait et al. 2008)
2680	B14	Breast	*MT-RNR2*	C	T	(Gochhait et al. 2008)
215	B15	Breast	*MT-DLOOP*	A	G	(Gochhait et al. 2008)
7383	B15	Breast	*MT-CO1*	T	C	(Gochhait et al. 2008)
15001	B16	Breast	*MT-CYB*	T	C	(Gochhait et al. 2008)
1267	B17	Breast	*MT-RNR1*	T	A	(Gochhait et al. 2008)
6182	B17	Breast	*MT-CO1*	G	A	(Gochhait et al. 2008)
6246	B17	Breast	*MT-CO1*	T	C	(Gochhait et al. 2008)
16292	B19	Breast	*MT-DLOOP*	C	T	(Gochhait et al. 2008)
5703	B22	Breast	*MT-TN*	G	A	(Gochhait et al. 2008)
9715	B24	Breast	*MT-CO3*	G	A	(Gochhait et al. 2008)
13523	B24	Breast	*MT-ND5*	T	A	(Gochhait et al. 2008)
6493	E1	Esophageal	*MT-CO1*	T	A	(Gochhait et al. 2008)
6286	E2	Esophageal	*MT-CO1*	T	A	(Gochhait et al. 2008)
12892	E3	Esophageal	*MT-ND5*	T	C	(Gochhait et al. 2008)
13523	E7	Esophageal	*MT-ND5*	T	A	(Gochhait et al. 2008)
1345	E13	Esophageal	*MT-RNR1*	G	A	(Gochhait et al. 2008)
182	E15	Esophageal	*MT-DLOOP*	C	T	(Gochhait et al. 2008)

6116	E16	Esophageal	*MT-CO1*	A	G	(Gochhait et al. 2008)
16182	E16	Esophageal	*MT-DLOOP*	A	C	(Gochhait et al. 2008)
16183	E16	Esophageal	*MT-DLOOP*	A	C	(Gochhait et al. 2008)
1313	E18	Esophageal	*MT-RNR1*	A	C	(Gochhait et al. 2008)
5821	E18	Esophageal	*MT-TC*	A	G	(Gochhait et al. 2008)
334	E19	Esophageal	*MT-DLOOP*	T	C	(Gochhait et al. 2008)
16239	E19	Esophageal	*MT-DLOOP*	C	T	(Gochhait et al. 2008)
749	E20	Esophageal	*MT-RNR1*	G	A	(Gochhait et al. 2008)
16093	E21	Esophageal	*MT-DLOOP*	T	C	(Gochhait et al. 2008)
16438	907	Gastric	*MT-DLOOP*	G	A	(Hung et al. 2010)
4996	907	Gastric	*MT-ND2*	G	A	(Hung et al. 2010)
16519	907	Gastric	*MT-DLOOP*	C	T	(Hung et al. 2010)
189	909	Gastric	*MT-DLOOP*	A	G	(Hung et al. 2010)
9986	909	Gastric	*MT-CO3*	G	A	(Hung et al. 2010)
12405	919	Gastric	*MT-ND5*	C	T	(Hung et al. 2010)
16399	938	Gastric	*MT-DLOOP*	A	G	(Hung et al. 2010)
3697	1132	Gastric	*MT-ND1*	G	A	(Hung et al. 2010)
204	1133	Gastric	*MT-DLOOP*	T	C	(Hung et al. 2010)
16260	1147	Gastric	*MT-DLOOP*	C	T	(Hung et al. 2010)
205	1151	Gastric	*MT-DLOOP*	G	A	(Hung et al. 2010)
13015	1151	Gastric	*MT-ND5*	T	C	(Hung et al. 2010)
5112	257	Breast	*MT-ND2*	G	A	(Tseng et al. 2011)
13878	257	Breast	*MT-ND5*	A	G	(Tseng et al. 2011)
9774	349	Breast	*MT-CO3*	G	A	(Tseng et al. 2011)
16390	425	Breast	*MT-DLOOP*	G	A	(Tseng et al. 2011)
5809	425	Breast	*MT-TC*	G	A	(Tseng et al. 2011)
15416	446	Breast	*MT-CYB*	T	C	(Tseng et al. 2011)
203	447	Breast	*MT-DLOOP*	G	A	(Tseng et al. 2011)
10599	451	Breast	*MT-ND4L*	G	A	(Tseng et al. 2011)

6768	498	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
188	510	Breast	*MT-DLOOP*	A	G	(Tseng et al. 2011)
13980	546	Breast	*MT-ND5*	G	C	(Tseng et al. 2011)
16290	621	Breast	*MT-DLOOP*	C	T	(Tseng et al. 2011)
188	739	Breast	*MT-DLOOP*	A	G	(Tseng et al. 2011)
6384	779	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
1499	797	Breast	*MT-RNR1*	T	C	(Tseng et al. 2011)
5522	801	Breast	*MT-TW*	G	A	(Tseng et al. 2011)
152	806	Breast	*MT-DLOOP*	C	T	(Tseng et al. 2011)
9901	807	Breast	*MT-CO3*	A	G	(Tseng et al. 2011)
310	958	Breast	*MT-DLOOP*	C	T	(Tseng et al. 2011)
7293	958	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
9412	958	Breast	*MT-CO3*	G	A	(Tseng et al. 2011)
16304	961	Breast	*MT-DLOOP*	C	T	(Tseng et al. 2011)

Supplementary Table S4. mtDNA *de novo* mutations detected in the general human populations[a].

Sample ID[b]	Private mutations
AF346963	A10358G, A12358G, A13594G, A16235G, A16318T, A1811G, A2792G, G16438A, G709A, T152C, T16209C, T252C
AF346964	A11023G, C10736T, C14455T, C16184T, C16256T, C2263A, G13135A, G13708A, G7521A, T14182C, T2416C, T471C, T9174C, Y16519C
AF346965	A13660G, A16399G, A215G, A8805G, C7675T, G10688A, G11016A, G11150A, G13145A, G13980A, G16390A, G8838A, R9156G, T11701C, T152C, T16311C, Y6104T
AF346966	A14605G, C150T, C9599T, G10427A, G13194A, G13477A, G15927A, T195C, T5063C
AF346967	A515N, C16527T, C514N
AF346968	A2395N, A4454T, A515N, C514N, G3843A, T16187C, T16271C
AF346969	A2395N, A515N, C514N
AF346970	A248N, C9248T, T16249C
AF346971	A515N, C514N, G15731A
AF346972	A11893G, C16527T, T15784C, T7319C
AF346973	C317A, G15110A, G15803A, G3316A, G4512A, T12134C, T16126C, T7561C
AF346974	A10313G, C150T, G13708A, T195A, T593C
AF346975	A12397G, A515N, C16184T, C16223T, C514N, T721C
AF346976	C10920T, C16193T, C6164T, T14311C
AF346977	C6875A
AF346978	A16326G, C10894T, G709A, T12635C, T16519C
AF346979	A248N
AF346980	C3204T, G1719A
AF346981	C9356T, T678C
AF346982	T16140C
AF346984	A10816T, C114T, C13059T, G11914A, G14016A, G5821A, T10505C, T14094C, T15514C
AF346985	A515N, C150T, Y16362C, Y16519C, Y514N
AF346986	A515N, C514N, T16264C
AF346987	A10804G, A16284G, A2395N, A515N, C514N, T13965C, T15470C, T15940N, T4688C, Y8657C

AF346988	G16145A
AF346989	A16175G, A515N, A9355G, C16111T, C514N
AF346990	G8292A
AF346991	A248N, G8764A
AF346992	A2395N
AF346993	A515N, A8271N, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T4695C, T8277N, T8279N
AF346994	A15113G, A15358G, A515N, C456T, C514N, T16311C
AF346995	A11909G, A14118G, A515N, C16187T, C514N, C5255T, G513A, T8733C
AF346996	A2395N, A515N, A7571G, C514N
AF346997	A2395N, A515N, C514N, T5826C
AF346998	A8271N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, G7146A, T8277N, T8279N
AF346999	A8271N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T8277N, T8279N
AF347000	A12999G, A291G, C7858T, G10197A, G11377A, T5004C, T7058A
AF347001	A11884G, A13221G, A16182C, A189G, A8271N, C16217T, C16278T, C5987T, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T8279N, W8277N
AF347002	A13927T, A16235G, C14097T, C16439A, G11611A, G1719A, G6324A, G6366A, G8764A, T10253C, T7645C
AF347003	A14070T, A8577G, C10142T, G16255A, T12477C, T16172C, Y16223T, Y208C
AF347004	A12850G, A13722G, C16111A, C16169T, C5330A, T10790C, T14470C, T14971C, T152C, Y16176C, Y16294T
AF347005	A15924G, A16183C, A16235G, A4994G, C16223T, T13641C, T14374C, T16189C, T480C
AF347006	A515N, A95C, C14097T, C14766T, C514N
AF347007	A515N, A8271N, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T152C, T16324C, T593C, T8277N, T8279N
AF347008	A515N, A7673G, C2650T, C514N, T16187C
AF347009	A2060G, A515N, C514N, G7347A, G8292A
AF347011	A8271N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T14319C, T8277N, T8279N
AF347012	A248N, A286N, A287N, A515N, C514N
AF347013	A248N, A286N, A287N, A515N, A6770G, C514N
AF347014	A13611G, A515N, C465T, C514N
AF381981	A12026G, A15236G, A515N, A6437G, C14061A, C146T, C514N, C5988T, G513A, Y16519C, Y5201C
AF381982	G15734A, G3010A, T10724C, T16356C

AF381983	A10352G, A515N, C514N, C867T
AF381984	A16182C
AF381985	A2308G, C736T, G11812A, T14180C, T16189C, Y16296C
AF381986	A11908G, A227G, A4722G, A515N, C514N, C7400A, G13966A, G16129A
AF381987	A8269G, T14180C
AF381988	A515N, C1539A, C514N, T5628C, T7258C
AF381990	C12237N, C14629T, T2387C, T4928C, T8277C, T8279C, T9656C
AF381991	A10424T, A3492G, A4164G, A515N, C514N, C8393T, G15314A, G9305A
AF381992	A11719G, A2395N, A515N, A9370G, A9377G, C11396T, C13293T, C514N, R15226A, T12616C, T15622C
AF381993	A14233G, C7669T
AF381994	A515N, C13293T, C14812T, C16519T, C514N, R13485G, T1406C, Y16264T
AF381995	C150T, G3849A, G6917A, T16368C
AF381996	A14645G, A16129G, T15670C
AF381997	A73G, A9667G, C16278T, G11719A, T9137C
AF381998	A515N, C16256T, C458T, C514N, C921T, T13752C, T7389C
AF381999	A16180G, A515N, C514N, G12372A, T8472C
AF382000	A10398G, A11893G, A14926G, A9545T, C16294T, C4025T, G5147A, G5460A, G6962A, T13789C, T1700C, T471C, Y16234T
AF382001	A15924G, A248N, A8633G, G9380A
AF382002	A2706G, A5189G, R3010A, T12245C
AF382003	T12574C, Y11674C, Y16292T
AF382004	C12346T, C7151T, G11176A, G16319A, G709A, T7759C, Y13734T
AF382005	A10154G, G15301A, G16145A, G3480A
AF382007	A8271N, C15452A, C199T, C204T, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T13602C, T8277N, T8279N
AF382008	G2706A, T14034C, T16278C, Y152C
AF382009	A248N, A286N, A287N, A515N, C514N, T12574C
AF382010	A515N, A5480G, C13448T, C15205T, C437T, C514N, T16209C, Y146T, Y16519C
AF382011	A10382G, A515N, C16248T, C514N, T14798C, T15601C
AF382012	A11719G, A515N, C11946T, C514N, C8059T, R3606A, T11152G, T11665C
AF382013	A515N, C11946T, C514N, T152C, T204C, T8870C

AJ842744	A14449G, A14954G, A515N, A8271N, A8525G, C16223T, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T14290C, T16093C, T195C, T8277N, T8279N
AJ842745	A515N, A8271N, C14272G, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T309C, T8277N, T8279N
AJ842746	A515N, A8271N, C514N, C6878T, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, G16129A, T8277N, T8279N
AJ842747	A515N, A8271N, C16360A, C315N, C4025T, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, G4769A, T8277N, T8279N
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AP008915	A16183C, G16194N, T16195N
AP008916	A9355G, G16129A, G16526A, R10427A
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AP010828	A5192G, T12285C, Y146T
AP010829	A15034G, A15525G, C16260T, C16527T, G13590A, G15930A, G16390A, T12678C, T12892C, T15852C, T16093C, T16189C
AP010831	A10376G, A515N, C514N, T10667Y
AP010832	A14062G, A515N, A8348G, A8459G, C14067T, C3408T, C514N, C8409T, G263A, Y16234T
AP010833	A515N, C514N, T16209C, T16356C
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AY195753	A248N, C5606T, T3644C, Y16093T
AY195754	G16213A, T14484C
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AY195769	A9456G, C16366T, C965N, T3847C
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AY195779	G2706T
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AY195783	A515N, C514N, T146C
AY195784	A515N, C16261T, C514N, T195C
AY195785	A3221G, A515N, C514N, G4596A, T14374C
AY195786	A515N, C315N, C514N, C6491A, C8285N, G15172A, H16239T
AY195787	C10659T, T400G

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AY195789	A2395N, A515N, C2885T, C514N
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AY255175	A248N, A515N, C514N, G930A, T12732C, T195C, T8167C
AY255176	A248N, C7982T, G15930A, G1719A, T16217C, T16311C
AY255177	A13105G, A14587G, A248N, A515N, C16111T, C16266T, C514N, T10790C, T2746C

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AY275537	A515N, C16294T, C514N, T16086C
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AY289072	A11928G, A385G, A515N, C16360T, C514N
AY289073	A12372G, A515N, A8701G, A9288G, C12403T, C12879T, C16400T, C514N, G12308A, T1005C, T12957C, T199C
AY289074	A12425G, C571T, G13928C, G16319A, G4991A, T146C
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AY289082	A4674G, C16187T, C16222T, C8910T, G8152A, G9266A, T3398C, T9770C, Y16223C
AY289083	A13479G, A515N, A8271N, C514N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T16093C, T8277N, T8279N
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AY289086	A11473G, A11807G, A13105G, A13269G, A339G, C12603T, C16287T, C2359T, C4017T, G8865A, T125C, T12842C, T15479C, T195C, Y127C, Y16176T, Y16294T
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AY339412	A14564G, C14482T, G11914A
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AY339418	C16193N, C456N
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AY339420	C10343T, C16193N
AY339421	A5390G, C16301T
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AY339426	C16291T, T4080C
AY339427	C16291T, G10172A, G10310A
AY339428	C6173T, T152C, T16178C
AY339429	C2259T, G1462A, T824C
AY339430	A11807G, G11969A
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AY339432	A15880G, C315N
AY339433	A84C, C315N, G12684A, T195C
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AY339436	C315N
AY339437	C317G, R709G
AY339438	T16519C
AY339439	R709G
AY339441	C315N
AY339443	C462T, R709A
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AY339445	G9145A
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AY339512	C315N
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AY339557	T497N
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AY339559	T497N
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AY339564	G66N, Y195T
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AY615361	A248N, T4216C
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AY738941	A11252G, C10356T, C16168T, C6317T, G2758A, G3834A
AY738942	A5134G, C150T, C6263T, C9585T, T3290C
AY738943	A13535G, A7569G, G750A, G9755A, T8376C, Y16519C
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AY738955	G16129A, T16249C
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AY738959	A16399G, C12633T, T16209C, T2392C, T6719C, Y9530C
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AY738961	C16266T, G13928A, T13281C, T319C, Y199T
AY738963	A1842G, C16291T, G13708A, G14323A, T11233C
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AY738965	G1598A
AY738966	A13266C
AY738967	A9368G
AY738968	T152C, T6908C, T7711C
AY738969	A4310G, C16168T, G3591A, T13020C, T9148C
AY738970	A14548G, A5378G, C16114T
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AY738982	G15047A, Y16189C
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AY738986	A14152G, C16239G, T12879C, T13404C, T4679C, Y152C
AY738988	A183G, C5911T, G709A, R16129G, T3387G
AY738989	C16234T
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AY738992	C16290T
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AY738994	A14552G, C16287T, C3936T
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AY882385	A16119G, A4562G, C4654T, C8778T, C9054T, G16343A, H3546T, T152C, T5465C
AY882386	A1555G, A4562G
AY882387	T16359C
AY882388	A8642G, C15789T, T12297C, T16362C, T2083C

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AY882402	A13308G, A5441G, G11778A
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AY882408	C4345T, G8839A, T2387C
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AY882413	G4655A, G9804A
AY882415	C3212T, G16398A, T12136C, T16189C, T9682C, Y15511T, Y16270T
AY882416	A16235G, A337G, C956N, G13359A, T146C
AY882417	A16164T, G6734A, Y16519C
AY922253	A8179G, C16301T, G930A, T961C
AY922254	A16227G, A515N, A5805G, C514N, T152C
AY922255	C10160T, T16093C, T3504C, Y15259T

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AY922257	A16162N, A515N, C514N, T12945C, T9653C
AY922258	A16399G, A515N, C514N, T16093C, T16311C, T16362C, Y16234T
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AY922263	A2065G, A515N, C514N, C7756T, G15323A, T146C, T204C, T4703C
AY922264	A16293C, G3391A
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AY922268	A16162N, A515N, C514N, C9992T, G13368A, G16145A, T13143C, T14550C, T16311C
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AY963573	A13722G, A515N, A9260G, C16291T, C514N, G16319A, T16224C, T4695C
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FJ168721	C16527T
FJ168724	A8271N, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T8277N, T8279N
FJ168725	A8271N, C16183A, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T8277N, T8279N
FJ168726	C11782T, T146C, Y16519C
FJ168727	A12673G, Y16519T
FJ168728	A2260G, C10616T, C11407A, C15556A, C16234T, C16256G, C16342G, G16526A, G66N, T57C, T59C
FJ168729	A11002G, A178G, A547G, G66N, T7278C
FJ168730	A153G, G66N, T16092C
FJ168731	G66N
FJ168732	G66N
FJ168733	G66N, T8496C
FJ168734	A4778G, G66N
FJ168735	G8998A, Y16519C
FJ168737	C4413T
FJ168738	A2065G, A8271N, A9956G, C568N, C7990T, C8272N, C8273N, C8274N, C8275N, C8276N, C8278N, T11482C, T15383C, T16311C, T16445C, T8277N, T8279N
FJ168740	A3434G, C7802T

FJ168742	A16162G, C12393G, C14335T, G7269A, T11569A, T14218C, T195C, Y152T
FJ168743	C16192T, T16311C, T6293C, T7348C
FJ168744	G15930A, G16129A
FJ168745	A3927G, A515N, A5480G, A8713G, C514N, G15734A, G4092A, T16263C
FJ168746	A14233G, C13065T, C16234G, G2706A, T11809C, T16093C
FJ168747	A13986G, A14065G, A1971G, C13851T, T146C, T16311C
FJ168748	A16293C, A7879G, T15944N, T16249C, T16519C
FJ168749	A11890G, A1309G, A13748G, A8296G, C16111T, C16278T, G16129A, T12338C
FJ168750	A16235G, C12906A, G7805A, T10652C, T12188C, T16092C, T742C
FJ168751	A5192G, A8718G, G12771A, G16255A, G16390A, G5745A
FJ168752	A15791G, C12717T, T11465C
FJ168753	C16256T, G185A
FJ168754	A515N, C514N, T10256C
FJ168755	T14287C
FJ168756	A15924G, C5111T, G13368A, G15650A, G769A, T9722C
FJ168757	T146C
FJ168758	T12738C
FJ168760	C11932T, T15001C
FJ168762	G12372A
FJ168764	T15039C
FJ168765	A515N, C514N, T2117Y
FJ168766	A143G, A515N, C514N, G8152A
FJ230891	C3637A, T16189C
FJ348197	A14758G
FJ348198	T7674C
FJ348201	A16233G, A515N, C16256T, C514N, C7849T, T15944N, T16311C
FJ348202	A13933G, G10685A, G8865A, T13281C, T146C, T15449C
FJ348203	A9100G, C5459T, C6467T, R16482A, T16325C
FJ348204	A200G

FJ348205	A3547G
FJ348206	A16181G
FJ348207	T13143C
FJ348209	C3792T
FJ348210	C3204T
FJ348212	G9064A, T4313C, Y152C
FJ348213	G513A
FJ348214	A10679G, C5530T, T10335C
FJ348215	A12810G, A14145G, C15790T, C4111T, G9438A, T14221C, T16249C, T16519C, T9088C
FJ348216	A7735G, T16311C, T8848C
FJ348218	A390G, C5583T, G12007A
FJ348219	A515N, C12705T, C514N
FJ348220	A384G, A5558G, C16261T, C16270T, G14544A, G4959A, G7853A, G9300A, G9755A
FJ348221	A235G, T7270C
FJ348222	A189G, C16261T, G10586A, T789C
FJ348224	A512G, C6428T, T13191C
FJ348225	A341G, T16249C, T9950C
FJ656215	A1842G, C16169Y, G6257A
rCRS	G15326A, G263A, G8860A, T309C

Notes: [a]The mutations were identified by recording the private variants on the terminal branches leading to a specific individual mtDNA sequence in the reconstructed phylogenetic tree; [b] Sample ID refers to the accession number of the mtDNA sequence in GenBank.

Supplementary Table S5. Cancerous somatic mtDNA mutations observed in our 93 esophageal cancer patients.

Cancer type	Sample	mtDNA locus	Position	Form	To	rCRS	Pattern	AA change	Gender	Age (Yrs)	Matched normal tissue
Esophageal	C085	*MT-RNR2*	2121	G	A	G	Hm->Ht[a]	-	M[b]	56	Adjacent normal tissue
Esophageal	C089	*MT-ND1*	3496	G	A	G	Hm->Ht	A->T	F[c]	51	Adjacent normal tissue
Esophageal	C089	*MT-ND4*	11965	C	T	C	Hm->Ht	V->V	F	51	Adjacent normal tissue
Esophageal	C089	*MT-DLOOP*	16293	A	G	A	Hm->Ht	-	F	51	Adjacent normal tissue
Esophageal	C090	*MT-CO1*	6264	G	A	G	Hm->Ht	G->STOP	F	51	Adjacent normal tissue
Esophageal	C090	*MT-CO2*	8119	T	C	T	Ht->Ht	R->R	F	51	Adjacent normal tissue
Esophageal	C091	*MT-DLOOP*	225	G	T	G	Ht->Ht	-	F	62	Adjacent normal tissue
Esophageal	C092	*MT-ND5*	12794	T	C	T	Hm->Ht	L->S	M	47	Adjacent normal tissue
Esophageal	C094	*MT-DLOOP*	310	T	C	T	Hm->Hm	-	M	58	Adjacent normal tissue
Esophageal	C095	*MT-DLOOP*	71	G	del	G	Hm->Ht	-	F	61	Adjacent normal tissue
Esophageal	C095	*MT-RNR1*	1389	G	A	G	Hm->Ht	-	F	61	Adjacent normal tissue
Esophageal	C095	*MT-RNR2*	2383	T	C	T	Hm->Ht	-	F	61	Adjacent normal tissue
Esophageal	C101	*MT-TV*	1643	A	G	A	Hm->Ht	-	F	56	Adjacent normal tissue
Esophageal	C101	*MT-DLOOP*	16042	G	A	G	Hm->Ht	-	F	56	Adjacent normal tissue
Esophageal	C102	*MT-CO1*	6255	G	A	G	Hm->Hm	V->M	M	66	Adjacent normal tissue
Esophageal	C103	*MT-DLOOP*	16093	C	T	T	Ht->Ht	-	F	65	Adjacent normal tissue
Esophageal	C108	*MT-DLOOP*	197	G	A	A	Hm->Ht	-	F	47	Adjacent normal tissue
Esophageal	C110	*MT-RNR1*	1348	G	A	G	Hm->Ht	-	M	61	Adjacent normal tissue
Esophageal	C110	*MT-DLOOP*	16164	A	G	A	Hm->Ht	-	M	61	Adjacent normal tissue
Esophageal	C112	*MT-TC*	5809	G	A	G	Hm->Ht	-	M	62	Adjacent normal tissue
Esophageal	C117	*MT-ATP6*	9089	T	C	C	Hm->Ht	F ->S	F	55	Adjacent normal tissue
Esophageal	C119	*MT-CO1*	6755	G	A	G	Hm->Ht	G->G	F	58	Adjacent normal tissue

Esophageal	C120	*MT-RNR2*	3082	G	C	G	Hm->Ht	-	M	59	Adjacent normal tissue
Esophageal	C121	*MT-CO2*	8188	G	A	A	Ht->Hm	G->G	M	50	Adjacent normal tissue
Esophageal	C121	*MT-ATP6*	8573	G	A	G	Hm->Ht	G->D	M	50	Adjacent normal tissue
Esophageal	C122	*MT-DLOOP*	16390	G	A	G	Hm->Ht	-	F	50	Adjacent normal tissue
Esophageal	C127	*MT-ND1*	3608	G	A	G	Hm->Ht	G->D	F	55	Adjacent normal tissue
Esophageal	C127	*MT-ATP8/ MT-ATP6*	8551	T	C	T	Hm->Ht	H->H(ATP8)/ F->L(ATP6)	F	55	Adjacent normal tissue
Esophageal	C134	*MT-CO1*	6513	G	A	G	Hm->Ht	A->T	M	69	Adjacent normal tissue
Esophageal	C134	*MT-ND1*	3571+C	-	C	-	Hm->Ht	-	M	69	Adjacent normal tissue
Esophageal	C138	*MT-CO1*	6626	T	C	T	Hm->Ht	P->P	F	55	Adjacent normal tissue
Esophageal	C138	*MT-TG*	10034	T	C	C	Ht->Hm	-	F	55	Adjacent normal tissue
Esophageal	C138	*MT-NC5*	5899+C	-	C	-	Hm->Ht	-	F	55	Adjacent normal tissue
Esophageal	C142	*MT-TD*	7581	T	C	T	Hm->Ht	-	NA[d]	NA	Adjacent normal tissue
Esophageal	C143	*MT-CO2*	7823	T	C	T	Hm->Ht	S->P	F	50	Adjacent normal tissue
Esophageal	C143	*MT-CYB*	15799	A	G	A	Hm->Ht	G->G	F	50	Adjacent normal tissue
Esophageal	C146	*MT-DLOOP*	71	G	del	G	Hm->Ht	-	NA	NA	Adjacent normal tissue
Esophageal	C146	*MT-DLOOP*	16258	A	G	A	Hm->Ht	-	NA	NA	Adjacent normal tissue
Esophageal	C149	*MT-DLOOP*	225	G	T	G	Hm->Ht	-	F	61	Adjacent normal tissue
Esophageal	C150	*MT-DLOOP*	458	C	A	C	Hm->Hm	-	F	65	Adjacent normal tissue
Esophageal	C150	*MT-TN*	5698	G	A	G	Hm->Hm	-	F	65	Adjacent normal tissue
Esophageal	C150	*MT-ND5*	13708	A	G	G	Ht->Hm	T->A	F	65	Adjacent normal tissue
Esophageal	C151	*MT-ATP6*	9187	T	C	T	Hm->Hm	Y->H	F	67	Adjacent normal tissue
Esophageal	C151	*MT-TS2*	12232	T	C	T	Hm->Ht	-	F	67	Adjacent normal tissue
Esophageal	C151	*MT-DLOOP*	16291	C	T	C	Hm->Hm	-	F	67	Adjacent normal tissue
Esophageal	C155	*MT-ND1*	3918	G	A	G	Hm->Ht	E->E	F	65	Adjacent normal tissue

Esophageal	C157	*MT-DLOOP*	369	C	T	C	Hm->Ht	-	M	60	Adjacent normal tissue
Esophageal	C158	*MT-ND4*	11226	G	A	G	Hm->Ht	G->D	M	62	Adjacent normal tissue
Esophageal	C158	*MT-ND6*	14545	A	G	A	Ht->Hm	I->I	M	62	Adjacent normal tissue
Esophageal	C159	*MT-DLOOP*	16093	C	T	T	Ht->Ht	-	M	65	Adjacent normal tissue
Esophageal	C163	*MT-CYB*	15482	T	C	T	Hm->Hm	S->P	F	52	Adjacent normal tissue
Esophageal	C170	*MT-RNR2*	2363	A	G	A	Hm->Ht	-	M	51	Adjacent normal tissue
Esophageal	C172	*MT-DLOOP*	16086	C	T	T	Hm->Ht	-	M	55	Adjacent normal tissue
Esophageal	C174	*MT-ND1*	3571+C	-	C	-	Hm->Ht	-	M	43	Adjacent normal tissue
Esophageal	C174	*MT-ND5*	12882	C	T	C	Hm->Ht	F->F	M	43	Adjacent normal tissue
Esophageal	C177	*MT-NC4*	5656	A	G	A	Hm->Ht	-	M	43	Adjacent normal tissue
Esophageal	C178	*MT-DLOOP*	71	G	del	G	Hm->Ht	-	M	64	Adjacent normal tissue
Esophageal	C178	*MT-CO3*	9910	T	C	T	Hm->Ht	F->S	M	64	Adjacent normal tissue
Esophageal	C178	*MT-DLOOP*	16327	C	T	C	Hm->Ht	-	M	64	Adjacent normal tissue
Esophageal	C179	*MT-CYB*	15213	T	C	T	Hm->Ht	I->T	F	61	Adjacent normal tissue
Esophageal	C181	*MT-ND4*	11176	G	A	G	Hm->Ht	Q->Q	M	64	Adjacent normal tissue
Esophageal	C183	*MT-CO1*	7428	G	A	G	Hm->Ht	V->M	M	64	Adjacent normal tissue
Esophageal	C183	*MT-ND6*	14168	T	C	T	Hm->Ht	E->G	M	64	Adjacent normal tissue

Notes: [a] Hm: homogeneity; Ht: heterogeneity; [b] M: male; [c] F: female; [d] NA: not available.

Supplementary Table S6. Cancerous somatic mtDNA mutations in the cancer mtDNA data under study, with the potential polymorphic variation excluded.

Position	Sample ID	Cancer type	mtDNA locus	From	To	Reference
16289	18	Esophageal	*MT-DLOOP*	C	A	(Abnet et al. 2004)
16443	21	Esophageal	*MT-DLOOP*	T	C	(Abnet et al. 2004)
15597	GC3	Gastric	*MT-CYB*	T	C	(Bi et al. 2011)
4632	GC6	Gastric	*MT-ND2*	G	A	(Bi et al. 2011)
106	4	Prostate	*MT-DLOOP*	G	A	(Chen et al. 2002)
313	10	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16403	11	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16459	12	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
174	13	Prostate	*MT-DLOOP*	C	T	(Chen et al. 2002)
16474	13	Prostate	*MT-DLOOP*	G	C	(Chen et al. 2002)
1	16	Prostate	*MT-DLOOP*	G	C	(Chen et al. 2002)
12875	1	Breast	*MT-ND5*	T	C	(Fendt et al. 2011)
7379	2	Breast	*MT-CO1*	G	A	(Fendt et al. 2011)
5703	3	Breast	*MT-TN*	G	A	(Fendt et al. 2011)
2998	8	Breast	*MT-RNR2*	T	C	(Fendt et al. 2011)
12131	11	Breast	*MT-ND4*	T	C	(Fendt et al. 2011)
12803	12	Breast	*MT-ND5*	G	A	(Fendt et al. 2011)
1632	13	Breast	*MT-TV*	T	C	(Fendt et al. 2011)
16106	13	Breast	*MT-DLOOP*	G	C	(Fendt et al. 2011)
1132	14	Breast	*MT-RNR1*	T	C	(Fendt et al. 2011)
1578	14	Breast	*MT-RNR1*	G	A	(Fendt et al. 2011)
386	580	Bladder	*MT-DLOOP*	C	A	(Fliss et al. 2000)
2664	898	Lung	*MT-RNR2*	T	C	(Fliss et al. 2000)
5521	915	Lung	*MT-TW*	G	A	(Fliss et al. 2000)

12345	915	Lung	*MT-ND5*	G	A	(Fliss et al. 2000)
3054	1127	Bladder	*MT-RNR2*	G	A	(Fliss et al. 2000)
16532	1127	Bladder	*MT-DLOOP*	A	T	(Fliss et al. 2000)
15843	BRCA14	Breast	*MT-CYB*	T	C	(Gasparre et al. 2007)
12601	BRCA3	Breast	*MT-ND5*	T	C	(Gasparre et al. 2007)
9119	BRCA5	Breast	*MT-ATP6*	T	C	(Gasparre et al. 2007)
4016	G5	Astrocytoma	*MT-ND1*	T	G	(Gasparre et al. 2007)
13271	HCT1	Thyroid	*MT-ND5*	T	C	(Gasparre et al. 2007)
13414	HCT1	Thyroid	*MT-ND5*	G	A	(Gasparre et al. 2007)
4975	HCT18	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
10537	HCT23	Thyroid	*MT-ND4L*	G	A	(Gasparre et al. 2007)
12056	HCT25	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
4831	HCT28	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
4720	HCT33	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
11475	HCT36	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
3949	HCT37	Thyroid	*MT-ND1*	T	C	(Gasparre et al. 2007)
11403	HCT38	Thyroid	*MT-ND4*	G	A	(Gasparre et al. 2007)
5185	HCT4	Thyroid	*MT-ND2*	G	A	(Gasparre et al. 2007)
12797	HCT44	Thyroid	*MT-ND5*	T	C	(Gasparre et al. 2007)
4148	HCT5	Thyroid	*MT-ND1*	G	A	(Gasparre et al. 2007)
13870	HCT7	Thyroid	*MT-ND5*	A	T	(Gasparre et al. 2007)
11613	HCT9	Thyroid	*MT-ND4*	T	C	(Gasparre et al. 2007)
11736	TC12	Thyroid	*MT-ND4*	T	C	(Gasparre et al. 2007)
7441	TC18	Thyroid	*MT-CO1*	C	A	(Gasparre et al. 2007)
3842	TC8	Thyroid	*MT-ND1*	G	A	(Gasparre et al. 2007)
2680	B14	Breast	*MT-RNR2*	C	T	(Gochhait et al. 2008)
7383	B15	Breast	*MT-CO1*	T	C	(Gochhait et al. 2008)
1267	B17	Breast	*MT-RNR1*	T	A	(Gochhait et al. 2008)
6246	B17	Breast	*MT-CO1*	T	C	(Gochhait et al. 2008)

333	B2	Breast	*MT-DLOOP*	T	A	(Gochhait et al. 2008)
5703	B22	Breast	*MT-TN*	G	A	(Gochhait et al. 2008)
9715	B24	Breast	*MT-CO3*	G	A	(Gochhait et al. 2008)
13523	B24	Breast	*MT-ND5*	T	A	(Gochhait et al. 2008)
6055	B4	Breast	*MT-CO1*	A	G	(Gochhait et al. 2008)
13130	B6	Breast	*MT-ND5*	C	A	(Gochhait et al. 2008)
6493	E1	Esophageal	*MT-CO1*	T	A	(Gochhait et al. 2008)
1345	E13	Esophageal	*MT-RNR1*	G	A	(Gochhait et al. 2008)
749	E20	Esophageal	*MT-RNR1*	G	A	(Gochhait et al. 2008)
12892	E3	Esophageal	*MT-ND5*	T	C	(Gochhait et al. 2008)
13523	E7	Esophageal	*MT-ND5*	T	A	(Gochhait et al. 2008)
1792	9	Prostate	*MT-RNR2*	G	A	(Gomez-Zaera et al. 2006)
13393	507C	Colorectal	*MT-ND5*	G	A	(Habano et al. 1999)
11046	4	Leukemia	*MT-ND4*	T	C	(He et al. 2003)
4	6	Leukemia	*MT-DLOOP*	C	T	(He et al. 2003)
1380	13	Leukemia	*MT-RNR1*	G	A	(He et al. 2003)
4145	14	Leukemia	*MT-ND1*	T	C	(He et al. 2003)
60	79	Colorectal	*MT-DLOOP*	T	G	(Hibi et al. 2001a)
4996	907	Gastric	*MT-ND2*	G	A	(Hung et al. 2010)
3697	1132	Gastric	*MT-ND1*	G	A	(Hung et al. 2010)
2923	32	Prostate	*MT-RNR2*	G	A	(Jeronimo et al. 2001)
14603	PX16	Pancreas	*MT-ND6*	G	A	(Jones et al. 2001)
2805	PX17	Pancreas	*MT-RNR2*	A	T	(Jones et al. 2001)
3670	PX27	Pancreas	*MT-ND1*	G	A	(Jones et al. 2001)
841	2	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
1323	3	Pancreas	*MT-RNR1*	G	A	(Kassauei et al. 2006)
841	4	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
5368	4	Pancreas	*MT-ND2*	C	G	(Kassauei et al. 2006)
2234	6	Pancreas	*MT-RNR2*	C	T	(Kassauei et al. 2006)

841	8	Pancreas	*MT-RNR1*	A	G	(Kassauei et al. 2006)
630	9	Pancreas	*MT-TF*	C	T	(Kassauei et al. 2006)
2698	10	Pancreas	*MT-RNR2*	G	A	(Kassauei et al. 2006)
3032	10	Pancreas	*MT-RNR2*	G	A	(Kassauei et al. 2006)
7075	10	Pancreas	*MT-CO1*	G	C	(Kassauei et al. 2006)
13241	10	Pancreas	*MT-ND5*	T	C	(Kassauei et al. 2006)
15017	10	Pancreas	*MT-CYB*	T	C	(Kassauei et al. 2006)
3326	11	Pancreas	*MT-ND1*	T	G	(Kassauei et al. 2006)
8163	11	Pancreas	*MT-CO2*	A	G	(Kassauei et al. 2006)
14884	11	Pancreas	*MT-CYB*	C	T	(Kassauei et al. 2006)
630	12	Pancreas	*MT-TF*	C	T	(Kassauei et al. 2006)
5940	12	Pancreas	*MT-CO1*	A	G	(Kassauei et al. 2006)
10301	13	Pancreas	*MT-ND3*	A	C	(Kassauei et al. 2006)
10417	13	Pancreas	*MT-TR*	T	C	(Kassauei et al. 2006)
10450	13	Pancreas	*MT-TR*	A	G	(Kassauei et al. 2006)
10901	13	Pancreas	*MT-ND4*	A	G	(Kassauei et al. 2006)
11471	13	Pancreas	*MT-ND4*	C	T	(Kassauei et al. 2006)
10572	14	Pancreas	*MT-ND4L*	G	A	(Kassauei et al. 2006)
12936	2	Glioblastoma	*MT-ND5*	A	G	(Kassauei et al. 2006)
13124	2	Glioblastoma	*MT-ND5*	T	C	(Kassauei et al. 2006)
11921	PCA001	Prostate	*MT-ND4*	T	C	(Kloss-Brandstatter et al. 2010)
12316	PCA001	Prostate	*MT-TL2*	G	A	(Kloss-Brandstatter et al. 2010)
2007	PCA003	Prostate	*MT-RNR2*	T	C	(Kloss-Brandstatter et al. 2010)
2545	PCA003	Prostate	*MT-RNR2*	T	C	(Kloss-Brandstatter et al. 2010)
8313	PCA005	Prostate	*MT-TK*	G	A	(Kloss-Brandstatter et al. 2010)
16047	PCA005	Prostate	*MT-HV1*	G	A	(Kloss-Brandstatter et al. 2010)
6384	PCA007	Prostate	*MT-CO1*	G	A	(Kloss-Brandstatter et al. 2010)
11139	PCA008	Prostate	*MT-ND4*	T	C	(Kloss-Brandstatter et al. 2010)
879	PCA012	Prostate	*MT-RNR*	T	C	(Kloss-Brandstatter et al. 2010)

4522	PCA012	Prostate	*MT-ND2*	T	C	(Kloss-Brandstatter et al. 2010)
8184	PCA015	Prostate	*MT-CO2*	G	A	(Kloss-Brandstatter et al. 2010)
1623	PCA017	Prostate	*MT-TV*	G	A	(Kloss-Brandstatter et al. 2010)
10436	PCA017	Prostate	*MT-TR*	T	C	(Kloss-Brandstatter et al. 2010)
11391	PCA019	Prostate	*MT-ND4*	G	A	(Kloss-Brandstatter et al. 2010)
15243	PCA019	Prostate	*MT-CYB*	G	A	(Kloss-Brandstatter et al. 2010)
5031	PCA022	Prostate	*MT-ND2*	G	A	(Kloss-Brandstatter et al. 2010)
13718	PCA023	Prostate	*MT-ND5*	G	A	(Kloss-Brandstatter et al. 2010)
8736	PCA025	Prostate	*MT-ATP6*	T	C	(Kloss-Brandstatter et al. 2010)
9930	PCA025	Prostate	*MT-CO3*	T	C	(Kloss-Brandstatter et al. 2010)
9906	A7B7	Colorectal	*MT-CO3*	G	A	(Lievre et al. 2005)
6163	A9B9	Colorectal	*MT-CO1*	T	C	(Lievre et al. 2005)
8617	1	Leukemia	*MT-ATP6*	A	G	(Linnartz, Anglmayer and Zanssen 2004)
12196	1	Leukemia	*MT-TH*	C	T	(Linnartz, Anglmayer and Zanssen 2004)
16365	OV12	Ovarian	*MT-DLOOP*	C	T	(Liu et al. 2001)
664	OV28	Ovarian	*MT-RNR1*	G	A	(Liu et al. 2001)
1952	OV30	Ovarian	*MT-RNR2*	T	C	(Liu et al. 2001)
15761	OV34	Ovarian	*MT-CYB*	G	A	(Liu et al. 2001)
1401	OV8	Ovarian	*MT-RNR1*	G	A	(Liu et al. 2001)
15280	1	Thyroid	*MT-CYB*	C	T	(Maximo et al. 2002)
6650	4	Thyroid	*MT-CO1*	A	C	(Maximo et al. 2002)
14498	5	Thyroid	*MT-ND6*	T	A	(Maximo et al. 2002)
10272	6	Thyroid	*MT-ND3*	C	T	(Maximo et al. 2002)
12918	11	Thyroid	*MT-ND5*	C	T	(Maximo et al. 2002)
15182	17	Thyroid	*MT-CYB*	A	G	(Maximo et al. 2002)
8716	18	Thyroid	*MT-ATP6*	A	G	(Maximo et al. 2002)
115	19	Thyroid	*MT-DLOOP*	T	C	(Maximo et al. 2002)
7775	20	Thyroid	*MT-CO2*	G	A	(Maximo et al. 2002)
9655	22	Thyroid	*MT-CO3*	G	A	(Maximo et al. 2002)

10269	23	Thyroid	*MT-ND3*	C	T	(Maximo et al. 2002)
4613	25	Thyroid	*MT-ND2*	A	G	(Maximo et al. 2002)
7103	31	Thyroid	*MT-CO1*	C	T	(Maximo et al. 2002)
9691	31	Thyroid	*MT-CO3*	C	T	(Maximo et al. 2002)
10639	40	Thyroid	*MT-ND4L*	A	G	(Maximo et al. 2002)
10691	41	Thyroid	*MT-ND4L*	C	G	(Maximo et al. 2002)
3910	44	Thyroid	*MT-ND1*	G	A	(Maximo et al. 2002)
15312	46	Thyroid	*MT-CYB*	T	G	(Maximo et al. 2002)
3526	59	Thyroid	*MT-ND1*	G	A	(Maximo et al. 2002)
12967	62	Thyroid	*MT-ND5*	A	C	(Maximo et al. 2002)
4940	10A	Thyroid	*MT-ND2*	C	T	(Maximo et al. 2002)
9030	12B	Thyroid	*MT-ATP6*	C	T	(Maximo et al. 2002)
1578	1	Renal	*MT-RNR1*	A	G	(Meierhofer et al. 2006)
4584	2	Renal	*MT-ND2*	G	A	(Meierhofer et al. 2006)
7423	3	Renal	*MT-CO1*	A	G	(Meierhofer et al. 2006)
1169	4	Renal	*MT-RNR1*	G	A	(Meierhofer et al. 2006)
3243	4	Renal	*MT-TL1*	A	G	(Meierhofer et al. 2006)
1566	6	Renal	*MT-RNR1*	C	T	(Meierhofer et al. 2006)
10579	6	Renal	*MT-ND4L*	T	C	(Meierhofer et al. 2006)
3700	2	Head and neck	*MT-ND1*	G	A	(Mithani et al. 2007)
3079	3	Head and neck	*MT-RNR2*	G	A	(Mithani et al. 2007)
10695	3	Head and neck	*MT-ND4L*	G	A	(Mithani et al. 2007)
3664	4	Head and neck	*MT-ND1*	G	A	(Mithani et al. 2007)
9003	6	Head and neck	*MT-ATP6*	C	T	(Mithani et al. 2007)
2004	7	Head and neck	*MT-RNR2*	G	A	(Mithani et al. 2007)
4689	9	Head and neck	*MT-ND2*	A	G	(Mithani et al. 2007)
4752	10	Head and neck	*MT-ND2*	T	C	(Mithani et al. 2007)
9910	12	Head and neck	*MT-CO3*	T	A	(Mithani et al. 2007)
1923	1177	Renal	*MT-RNR2*	C	T	(Nagy et al. 2002)

1389	1282	Renal	*MT-RNR1*	G	A	(Nagy et al. 2002)
5623	105T	Renal	*MT-TA*	G	A	(Nagy, Wilhelm and Kovacs 2003)
540	123A	Renal	*MT-DLOOP*	A	G	(Nagy, Wilhelm and Kovacs 2003)
360	4	Nasopharyngeal	*MT-DLOOP*	T	A	(Pang et al. 2008)
301	5	Nasopharyngeal	*MT-DLOOP*	A	C	(Pang et al. 2008)
16273	12	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
16273	23	Nasopharyngeal	*MT-DLOOP*	G	A	(Pang et al. 2008)
12344	B32	Breast	*MT-ND5*	T	A	(Parrella et al. 2001)
11900	B35	Breast	*MT-ND4*	G	A	(Parrella et al. 2001)
2299	V410	Colorectal	*MT-RNR2*	T	A	(Polyak et al. 1998)
6264	V425	Colorectal	*MT-CO1*	G	A	(Polyak et al. 1998)
8009	V429	Colorectal	*MT-CO2*	G	A	(Polyak et al. 1998)
14985	V429	Colorectal	*MT-CYB*	G	A	(Polyak et al. 1998)
15572	V429	Colorectal	*MT-CYB*	T	C	(Polyak et al. 1998)
9949	V441	Colorectal	*MT-CO3*	G	A	(Polyak et al. 1998)
1967	V451	Colorectal	*MT-RNR2*	T	C	(Polyak et al. 1998)
10563	V456	Colorectal	*MT-ND4L*	T	C	(Polyak et al. 1998)
9131	112	Breast	*MT-ATP6*	T	C	(Tan, Bai and Wong 2002)
16365	152	Breast	*MT-DLOOP*	C	T	(Tan, Bai and Wong 2002)
4510	3	Oral	*MT-ND2*	G	T	(Tan et al. 2004)
313	10	Oral	*MT-DLOOP*	C	A	(Tan et al. 2004)
222	14	Oral	*MT-DLOOP*	C	T	(Tan et al. 2004)
4986	18	Oral	*MT-ND2*	A	C	(Tan et al. 2004)
5026	19	Oral	*MT-ND2*	A	G	(Tan et al. 2004)
1544	E05	Esophageal	*MT-RNR1*	A	T	(Tan et al. 2006)
10500	E12	Esophageal	*MT-ND4L*	G	A	(Tan et al. 2006)
2121	C085	Esophageal	*MT-RNR2*	G	A	This study
11965	C089	Esophageal	*MT-ND4*	C	T	This study
6264	C090	Esophageal	*MT-CO1*	G	A	This study

12794	C092	Esophageal	*MT-ND5*	T	C	This study
1389	C095	Esophageal	*MT-RNR1*	G	A	This study
2383	C095	Esophageal	*MT-RNR2*	T	C	This study
1643	C101	Esophageal	*MT-TV*	A	G	This study
16042	C101	Esophageal	*MT-DLOOP*	G	A	This study
6255	C102	Esophageal	*MT-CO1*	G	A	This study
1348	C110	Esophageal	*MT-RNR1*	G	A	This study
9089	C117	Esophageal	*MT-ATP6*	T	C	This study
3082	C120	Esophageal	*MT-RNR2*	G	C	This study
3608	C127	Esophageal	*MT-ND1*	G	A	This study
6513	C134	Esophageal	*MT-CO1*	G	A	This study
6626	C138	Esophageal	*MT-CO1*	T	C	This study
7823	C143	Esophageal	*MT-CO2*	T	C	This study
5698	C150	Esophageal	*MT-TN*	G	A	This study
9187	C151	Esophageal	*MT-ATP6*	T	C	This study
12232	C151	Esophageal	*MT-TS2*	T	C	This study
369	C157	Esophageal	*MT-DLOOP*	C	T	This study
11226	C158	Esophageal	*MT-ND4*	G	A	This study
14545	C158	Esophageal	*MT-ND6*	A	G	This study
15482	C163	Esophageal	*MT-CYB*	T	C	This study
2362	C170	Esophageal	*MT-RNR2*	A	G	This study
9910	C178	Esophageal	*MT-CO3*	T	C	This study
7428	C183	Esophageal	*MT-CO1*	G	A	This study
14168	C183	Esophageal	*MT-ND6*	T	C	This study
5112	257	Breast	*MT-ND2*	G	A	(Tseng et al. 2011)
13878	257	Breast	*MT-ND5*	A	G	(Tseng et al. 2011)
9774	349	Breast	*MT-CO3*	G	A	(Tseng et al. 2011)
15416	446	Breast	*MT-CYB*	T	C	(Tseng et al. 2011)
10599	451	Breast	*MT-ND4L*	G	A	(Tseng et al. 2011)

6768	498	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
6384	779	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
1499	797	Breast	*MT-RNR1*	T	C	(Tseng et al. 2011)
5522	801	Breast	*MT-TW*	G	A	(Tseng et al. 2011)
9901	807	Breast	*MT-CO3*	A	G	(Tseng et al. 2011)
7293	958	Breast	*MT-CO1*	G	A	(Tseng et al. 2011)
9412	958	Breast	*MT-CO3*	G	A	(Tseng et al. 2011)
6718	C1	Colorectal	*MT-CO1*	G	A	(Wang et al. 2011)
14288	C1	Colorectal	*MT-ND6*	A	C	(Wang et al. 2011)
15332	C1	Colorectal	*MT-CYB*	C	T	(Wang et al. 2011)
4532	C12	Colorectal	*MT-ND2*	G	A	(Wang et al. 2011)
14288	C14	Colorectal	*MT-ND6*	A	C	(Wang et al. 2011)
15276	C16	Colorectal	*MT-CYB*	G	A	(Wang et al. 2011)
9275	C20	Colorectal	*MT-CO3*	G	A	(Wang et al. 2011)
16365	C3	Colorectal	*MT-DLOOP*	C	T	(Wang et al. 2011)
14288	C8	Colorectal	*MT-ND6*	A	C	(Wang et al. 2011)
15447	C8	Colorectal	*MT-CYB*	C	T	(Wang et al. 2011)
8601	B3	Breast	*MT-ATP6*	A	G	(Wang et al. 2007)
2275	B6	Breast	*MT-RNR2*	T	C	(Wang et al. 2007)
9553	1	Thyroid	*MT-CO3*	G	A	(Witte et al. 2007)
2681	2	Thyroid	*MT-RNR2*	G	A	(Witte et al. 2007)
372	4	Thyroid	*MT-DLOOP*	A	G	(Witte et al. 2007)
11046	126	Medulloblastoma	*MT-ND4*	T	C	(Wong et al. 2003)
556	HE18	Hepatocellular	*MT-DLOOP*	A	G	(Wong et al. 2004)
9267	20	Hepatocellular	*MT-CO3*	G	A	(Yin et al. 2010)
6787	24	Hepatocellular	*MT-CO1*	T	C	(Yin et al. 2010)
5650	72	Hepatocellular	*MT-TA*	G	A	(Yin et al. 2010)
1659	75	Hepatocellular	*MT-TV*	T	C	(Yin et al. 2010)
11708	81	Hepatocellular	*MT-ND4*	A	G	(Yin et al. 2010)

7976	83	Hepatocellular	*MT-CO2*	G	A	(Yin et al. 2010)
3842	98	Hepatocellular	*MT-ND1*	G	A	(Yin et al. 2010)
490	1017	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
924	1017	Head and neck	*MT-RNR1*	A	T	(Zhou et al. 2007)
3570	1017	Head and neck	*MT-ND1*	C	A	(Zhou et al. 2007)
4605	1017	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
5305	1017	Head and neck	*MT-ND2*	C	G	(Zhou et al. 2007)
5615	1017	Head and neck	*MT-TA*	A	G	(Zhou et al. 2007)
7468	1017	Head and neck	*MT-TS1*	C	T	(Zhou et al. 2007)
7791	1017	Head and neck	*MT-CO2*	C	T	(Zhou et al. 2007)
9050	1017	Head and neck	*MT-ATP6*	G	A	(Zhou et al. 2007)
15433	1017	Head and neck	*MT-CYB*	C	T	(Zhou et al. 2007)
20	1164	Head and neck	*MT-DLOOP*	A	C	(Zhou et al. 2007)
11324	1280	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
25	1356	Head and neck	*MT-DLOOP*	T	A	(Zhou et al. 2007)
5002	1356	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)
13970	1356	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
11889	1493	Head and neck	*MT-ND4*	G	A	(Zhou et al. 2007)
14969	1493	Head and neck	*MT-CYB*	T	C	(Zhou et al. 2007)
912	1680	Head and neck	*MT-RNR1*	T	A	(Zhou et al. 2007)
1323	1680	Head and neck	*MT-RNR1*	G	A	(Zhou et al. 2007)
2069	1680	Head and neck	*MT-RNR2*	T	G	(Zhou et al. 2007)
5570	1680	Head and neck	*MT-TW*	T	C	(Zhou et al. 2007)
5799	1680	Head and neck	*MT-TC*	A	G	(Zhou et al. 2007)
5848	1680	Head and neck	*MT-TY*	T	G	(Zhou et al. 2007)
251	1691	Head and neck	*MT-DLOOP*	G	A	(Zhou et al. 2007)
4689	1691	Head and neck	*MT-ND2*	A	G	(Zhou et al. 2007)
25	1736	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
4752	1736	Head and neck	*MT-ND2*	T	C	(Zhou et al. 2007)

9003	1809	Head and neck	*MT-ATP6*	C	T	(Zhou et al. 2007)
14815	1809	Head and neck	*MT-CYB*	C	A	(Zhou et al. 2007)
15369	1809	Head and neck	*MT-CYB*	C	A	(Zhou et al. 2007)
14353	1836	Head and neck	*MT-ND6*	T	C	(Zhou et al. 2007)
3700	2008	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
4776	2018	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
30	2043	Head and neck	*MT-DLOOP*	T	C	(Zhou et al. 2007)
7956	2043	Head and neck	*MT-CO2*	C	A	(Zhou et al. 2007)
9668	2043	Head and neck	*MT-CO3*	C	G	(Zhou et al. 2007)
11466	2043	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
13414	2043	Head and neck	*MT-ND5*	G	A	(Zhou et al. 2007)
9910	2075	Head and neck	*MT-CO3*	T	A	(Zhou et al. 2007)
3079	2232	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
10695	2232	Head and neck	*MT-ND4L*	G	A	(Zhou et al. 2007)
4037	2382	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
7002	2455	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
9378	2455	Head and neck	*MT-CO3*	T	C	(Zhou et al. 2007)
558	2550	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
6128	2550	Head and neck	*MT-CO1*	C	T	(Zhou et al. 2007)
4831	2553	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
11324	2553	Head and neck	*MT-ND4*	T	G	(Zhou et al. 2007)
25	2702	Head and neck	*MT-DLOOP*	T	A	(Zhou et al. 2007)
2618	2704	Head and neck	*MT-RNR2*	T	C	(Zhou et al. 2007)
1593	2714	Head and neck	*MT-RNR1*	T	C	(Zhou et al. 2007)
3664	2717	Head and neck	*MT-ND1*	G	A	(Zhou et al. 2007)
2004	2818	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)
39	2828	Head and neck	*MT-DLOOP*	C	T	(Zhou et al. 2007)
9247	2907	Head and neck	*MT-CO3*	G	A	(Zhou et al. 2007)
1990	3538	Head and neck	*MT-RNR2*	G	A	(Zhou et al. 2007)

4776	3538	Head and neck	*MT-ND2*	G	A	(Zhou et al. 2007)
8498	697	Breast	*MT-ATP8*	A	G	(Zhu et al. 2005)
85	833	Breast	*MT-DLOOP*	G	A	(Zhu et al. 2005)
4665	844	Breast	*MT-ND2*	G	A	(Zhu et al. 2005)
4499	885	Breast	*MT-ND2*	C	T	(Zhu et al. 2005)
12636	906	Breast	*MT-ND5*	T	C	(Zhu et al. 2005)
11768	911	Breast	*MT-ND4*	A	G	(Zhu et al. 2005)
12636	911	Breast	*MT-ND5*	C	T	(Zhu et al. 2005)
4323	944	Breast	*MT-TI*	T	C	(Zhu et al. 2005)
15700	944	Breast	*MT-CYB*	C	T	(Zhu et al. 2005)
15700	954	Breast	*MT-CYB*	T	C	(Zhu et al. 2005)
9885	983	Breast	*MT-CO3*	T	A	(Zhu et al. 2005)
15655	983	Breast	*MT-CYB*	A	G	(Zhu et al. 2005)
15755	983	Breast	*MT-CYB*	G	T	(Zhu et al. 2005)
15783	983	Breast	*MT-CYB*	T	C	(Zhu et al. 2005)
13397	988	Breast	*MT-ND5*	T	A	(Zhu et al. 2005)
13398	988	Breast	*MT-ND5*	T	A	(Zhu et al. 2005)
9885	1026	Breast	*MT-CO3*	T	A	(Zhu et al. 2005)

Supplementary Table S7. Distribution of synonymous and non-synonymous mutations in mtDNAs from cancer tissues (with potential polymorphic variation excluded) and the general human populations.

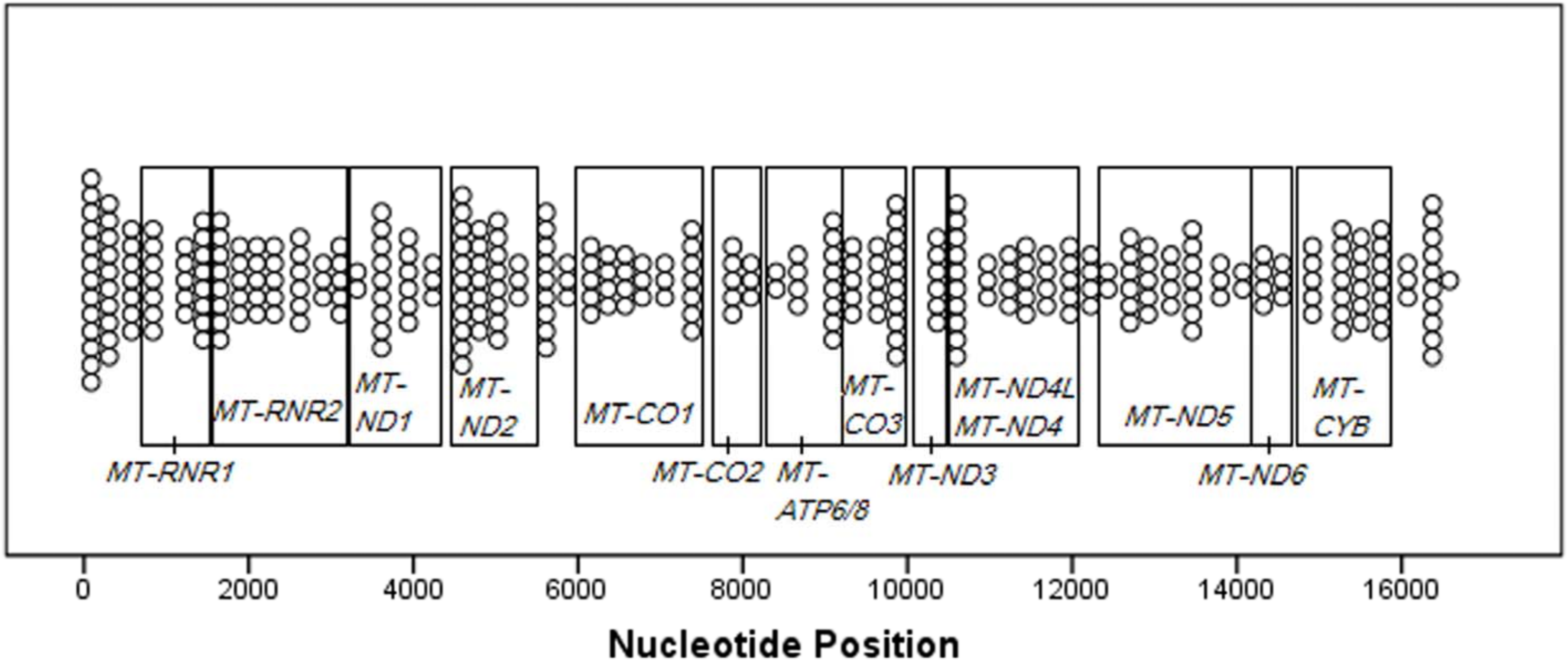
	Cancer			Natural population			
Gene	***N***	***S***	***N/S***	***N***	***S***	***N/S***	***P* value**
MT-ND1	17	1	17.00	184	309	0.60	9.84×10^{-7}*
MT-ND2	25	4	6.25	145	372	0.39	3.99×10^{-10}*
MT-ND3	2	1	2.00	39	105	0.37	0.19
MT-ND4	20	2	10.00	145	483	0.30	7.03×10^{-11}*
MT-ND4L	9	1	9.00	14	84	0.17	1.82×10^{-6}*
MT-ND5	21	7	3.00	352	650	0.54	2.90×10^{-5}*
MT-ND6	6	2	3.00	91	203	0.45	1.50×10^{-2}*
MT-CYB	18	7	2.57	294	412	0.71	3.38×10^{-3}*
MT-CO1	20	6	3.33	116	475	0.24	8.50×10^{-15}*
MT-CO2	8	0	-	82	213	0.39	4.83×10^{-5}*
MT-CO3	19	1	19.00	122	275	0.44	6.82×10^{-9}*
MT-ATP6	7	5	1.40	272	212	1.28	1.00
MT-ATP8	1	0	-	64	87	0.74	0.43
Total	173	37	4.68	1920	3880	0.50	1.30×10^{-14}*
Complex I	100	18	5.56	970	2206	0.44	1.67×10^{-14}*
Complex III	18	7	2.57	294	412	0.71	3.38×10^{-3}*
Complex IV	47	7	6.71	320	963	0.33	1.07×10^{-20}*
Complex V	8	5	1.60	336	299	1.12	0.59

Supplementary Fig. S1

Phylogenetic tree of the 186 mitochondrial genomes from esophageal cancerous and adjacent normal tissues of 93 patients generated in this study. The A/C stretch length polymorphism(s) in region 303–315 was disregarded during the tree reconstruction. Suffixes A, C, G and T indicate transversions, ‘d’ means deletion, ‘ins’ refers to an insertion event (the exact number of the inserted nucleotide(s) was disregarded), @ means reverse mutation, and recurrent mutations are underlined.

Supplementary Fig. S2 Distribution of somatic mutations (disregarding the likely polymorphic variation) on mitochondrial genome.

Each circle represents one mutation in the corresponding region on the genome.



References

Abnet CC, Huppi K, Carrera A, Armistead D, McKenney K, Hu N, Tang ZZ, Taylor PR, Dawsey SM. 2004. Control region mutations and the 'common deletion' are frequent in the mitochondrial DNA of patients with esophageal squamous cell carcinoma. *BMC cancer* 4:30.

Bi R, Li WL, Chen MQ, Zhu Z, Yao YG. 2011. Rapid identification of mtDNA somatic mutations in gastric cancer tissues based on the mtDNA phylogeny. *Mutat Res* 709-710:15-20.

Chen JZ, Gokden N, Greene GF, Mukunyadzi P, Kadlubar FF. 2002. Extensive somatic mitochondrial mutations in primary prostate cancer using laser capture microdissection. *Cancer Res* 62:6470-6474.

Fendt L, Niederstatter H, Huber G, Zelger B, Dunser M, Seifarth C, Rock A, Schafer G, Klocker H, Parson W. 2011. Accumulation of mutations over the entire mitochondrial genome of breast cancer cells obtained by tissue microdissection. *Breast Cancer Res Treat* 128:327-336.

Fliss MS, Usadel H, Caballero OL, Wu L, Buta MR, Eleff SM, Jen J, Sidransky D. 2000. Facile detection of mitochondrial DNA mutations in tumors and bodily fluids. Science 287:2017-2019.

Gasparre G, Porcelli AM, Bonora E, et al. 2007. Disruptive mitochondrial DNA mutations in complex I subunits are markers of oncocytic phenotype in thyroid tumors. *Proc Natl Acad Sci U S A* 104:9001-9006.

Gochhait S, Bhatt A, Sharma S, Singh YP, Gupta P, Bamezai RN. 2008. Concomitant presence of mutations in mitochondrial genome and p53 in cancer development - a study in north Indian sporadic breast and esophageal cancer patients. *Int J Cancer* 123:2580-2586.

Gomez-Zaera M, Abril J, Gonzalez L, Aguilo F, Condom E, Nadal M, Nunes V. 2006. Identification of somatic and germline mitochondrial DNA sequence variants in prostate cancer patients. *Mutat Res* 595:42-51.

Habano W, Sugai T, Yoshida T, Nakamura S. 1999. Mitochondrial gene mutation, but not large-scale deletion, is a feature of colorectal carcinomas with mitochondrial microsatellite instability. *Int J Cancer* 83:625-629.

He L, Luo L, Proctor SJ, Middleton PG, Blakely EL, Taylor RW, Turnbull DM. 2003. Somatic mitochondrial DNA mutations in adult-onset leukaemia. *Leukemia* 17:2487-2491.

Hibi K, Nakayama H, Yamazaki T, Takase T, Taguchi M, Kasai Y, Ito K, Akiyama S, Nakao A. 2001a. Detection of mitochondrial DNA alterations in primary tumors and corresponding serum of colorectal cancer patients. *Int J Cancer* 94:429-431.

Hibi K, Nakayama H, Yamazaki T, Takase T, Taguchi M, Kasai Y, Ito K, Akiyama S, Nakao A. 2001b. Mitochondrial DNA alteration in esophageal cancer. *Int J Cancer* 92:319-321.

Hung WY, Wu CW, Yin PH, Chang CJ, Li AF, Chi CW, Wei YH, Lee HC. 2010. Somatic mutations in mitochondrial genome and their potential roles in the progression of human gastric cancer. *Biochim Biophys Acta* 1800:264-270.

Jeronimo C, Nomoto S, Caballero OL, Usadel H, Henrique R, Varzim G, Oliveira J, Lopes, C Fliss MS, Sidransky D. 2001. Mitochondrial mutations in early stage prostate cancer and bodily fluids. *Oncogene* 20:5195-5198.

Jones JB, Song JJ, Hempen PM, Parmigiani G, Hruban RH, Kern SE. 2001. Detection of mitochondrial DNA mutations in pancreatic cancer offers a "mass"-ive advantage over detection of nuclear DNA mutations. *Cancer Res* 61:1299-1304.

Kassauei K, Habbe N, Mullendore ME, Karikari CA, Maitra A, Feldmann G. 2006.

Mitochondrial DNA mutations in pancreatic cancer. *Int J Gastrointest Cancer* 37:57-64.

Kirches E, Krause G, Warich-Kirches M, Weis S, Schneider T, Meyer-Puttlitz B, Mawrin C, Dietzmann K. 2001. High frequency of mitochondrial DNA mutations in glioblastoma multiforme identified by direct sequence comparison to blood samples. *Int J Cancer* 93:534-538.

Kloss-Brandstatter A, Schafer G, Erhart G, Huttenhofer A, Coassin S, Seifarth C, Summerer M, Bektic J, Klocker H, Kronenberg F. 2010. Somatic Mutations throughout the Entire Mitochondrial Genome Are Associated with Elevated PSA Levels in Prostate Cancer Patients. *Am J Hum Genet* 87:802-812.

Kong QP, Salas A, Sun C, Fuku N, Tanaka M, Zhong L, Wang CY, Yao YG, Bandelt HJ. 2008. Distilling artificial recombinants from large sets of complete mtDNA genomes. *PLoS ONE* 3:e3016.

Lievre A, Chapusot C, Bouvier AM, Zinzindohoue F, Piard F, Roignot P, Arnould L, Beaune P, Faivre J, Laurent-Puig P. 2005. Clinical value of mitochondrial mutations in colorectal cancer. *J Clin Oncol* 23:3517-3525.

Linnartz B, Anglmayer R, Zanssen S. 2004. Comprehensive scanning of somatic mitochondrial DNA alterations in acute leukemia developing from myelodysplastic syndromes. *Cancer Res* 64:1966-1971.

Liu VW, Shi HH, Cheung AN, Chiu PM, Leung, TW Nagley P, Wong LC, Ngan HY. 2001. High incidence of somatic mitochondrial DNA mutations in human ovarian carcinomas. *Cancer Res* 61:5998-6001.

Maximo V, Soares P, Lima J, Cameselle-Teijeiro J, Sobrinho-Simoes M. 2002. Mitochondrial DNA somatic mutations (point mutations and large deletions) and mitochondrial DNA variants in human thyroid pathology: a study with emphasis on Hurthle cell tumors. *Am J Pathol* 160:1857-1865.

Meierhofer D, Mayr JA, Fink K, Schmeller N, Kofler B, Sperl W. 2006. Mitochondrial DNA mutations in renal cell carcinomas revealed no general impact on energy metabolism. *Br J Cancer* 94:268-274.

Mithani SK, Taube JM, Zhou S, Smith IM, W KochM, Westra WH, Califano JA. 2007. Mitochondrial mutations are a late event in the progression of head and neck squamous cell cancer. *Clin Cancer Res* 13:4331-4335.

Nagy A, Wilhelm M, Kovacs G. 2003. Mutations of mtDNA in renal cell tumours arising in end-stage renal disease. *J Pathol* 199:237-242.

Nagy A, Wilhelm M, Sukosd F, Ljungberg B, Kovacs G. 2002. Somatic mitochondrial DNA mutations in human chromophobe renal cell carcinomas. *Genes Chromosomes Cancer* 35:256-260.

Pang LJ, Shao JY, Liang XM, Xia YF, Zeng YX. 2008. Mitochondrial DNA somatic mutations are frequent in nasopharyngeal carcinoma. *Cancer Biol Ther* 7:198-207.

Parrella P, Xiao Y, Fliss M, et al. 2001. Detection of mitochondrial DNA mutations in primary breast cancer and fine-needle aspirates. *Cancer Res* 61:7623-7626.

Polyak K, Li Y, Zhu H, Lengauer C, Willson JK, Markowitz SD, Trush MA, Kinzler KW, Vogelstein B. 1998. Somatic mutations of the mitochondrial genome in human colorectal tumours. *Nat Genet* 20:291-293.

Salas A, Yao YG, Macaulay V, Vega A, Carracedo A, Bandelt HJ. 2005. A critical reassessment of the role of mitochondria in tumorigenesis. *PLoS Med* 2:e296.

Stafford P, Chen-Quin EB. 2010. The pattern of natural selection in somatic cancer mutations of human mtDNA. *J Hum Genet* 55:605-612

Tan DJ, Bai RK, Wong LJ. 2002. Comprehensive scanning of somatic mitochondrial DNA mutations in breast cancer. *Cancer Res* 62:972-976.

Tan DJ, Chang J, Chen WL, Agress LJ, Yeh KT, Wang B, Wong LJ. 2004. Somatic mitochondrial DNA mutations in oral cancer of betel quid chewers. *Ann N Y Acad Sci* 1011:310-316.

Tan DJ, Chang J, Liu LL, Bai RK, Wang YF, Yeh KT, Wong LJ. 2006. Significance of somatic mutations and content alteration of mitochondrial DNA in esophageal cancer. *BMC cancer* 6:93.

Tseng LM, Yin PH, Yang CW, Tsai YF, Hsu CY, Chi CW, Lee HC. 2011. Somatic mutations of the mitochondrial genome in human breast cancers. *Genes Chromosomes Cancer* 50:800-811.

Wang CY, Li H, Hao XD, Liu J, Wang JX, Wang WZ, Kong QP, Zhang YP. 2011. Uncovering the Profile of Somatic mtDNA Mutations in Chinese Colorectal Cancer Patients. *PLoS ONE* 6:e21613.

Wang CY, Wang HW, Yao YG, Kong QP, Zhang YP. 2007. Somatic mutations of mitochondrial genome in early stage breast cancer. *Int J Cancer* 121:1253-1256.

Witte J, Lehmann S, Wulfert M, Yang Q, Roher HD. 2007. Mitochondrial DNA mutations in differentiated thyroid cancer with respect to the age factor. *World J Surg* 31:51-59.

Wong LJ, Lueth M, Li XN, Lau CC, Vogel H. 2003. Detection of mitochondrial DNA mutations in the tumor and cerebrospinal fluid of medulloblastoma patients. *Cancer Res* 63:3866-3871.

Wong LJ, Tan DJ, Bai RK, Yeh KT, Chang J. 2004. Molecular alterations in mitochondrial DNA of hepatocellular carcinomas: is there a correlation with clinicopathological profile? *J Med Genet* 41:e65.

Yin PH, Wu CC, Lin JC, Chi CW, Wei YH, Lee HC. 2010. Somatic mutations of mitochondrial genome in hepatocellular carcinoma. *Mitochondrion* 10:174-182.

Zhidkov I, Livneh EA, Rubin E, Mishmar D. 2009. MtDNA mutation pattern in tumors and human evolution are shaped by similar selective constraints. *Genome Res* 19:576-580.

Zhou S, Kachhap S, Sun W, et al. 2007. Frequency and phenotypic implications of mitochondrial DNA mutations in human squamous cell cancers of the head and neck. *Proc Natl Acad Sci U S A* 104:7540-7545.

Zhu W, Qin W, Bradley P, Wessel A, Puckett CL, Sauter ER. 2005. Mitochondrial DNA mutations in breast cancer tissue and in matched nipple aspirate fluid. *Carcinogenesis* 26:145-152.

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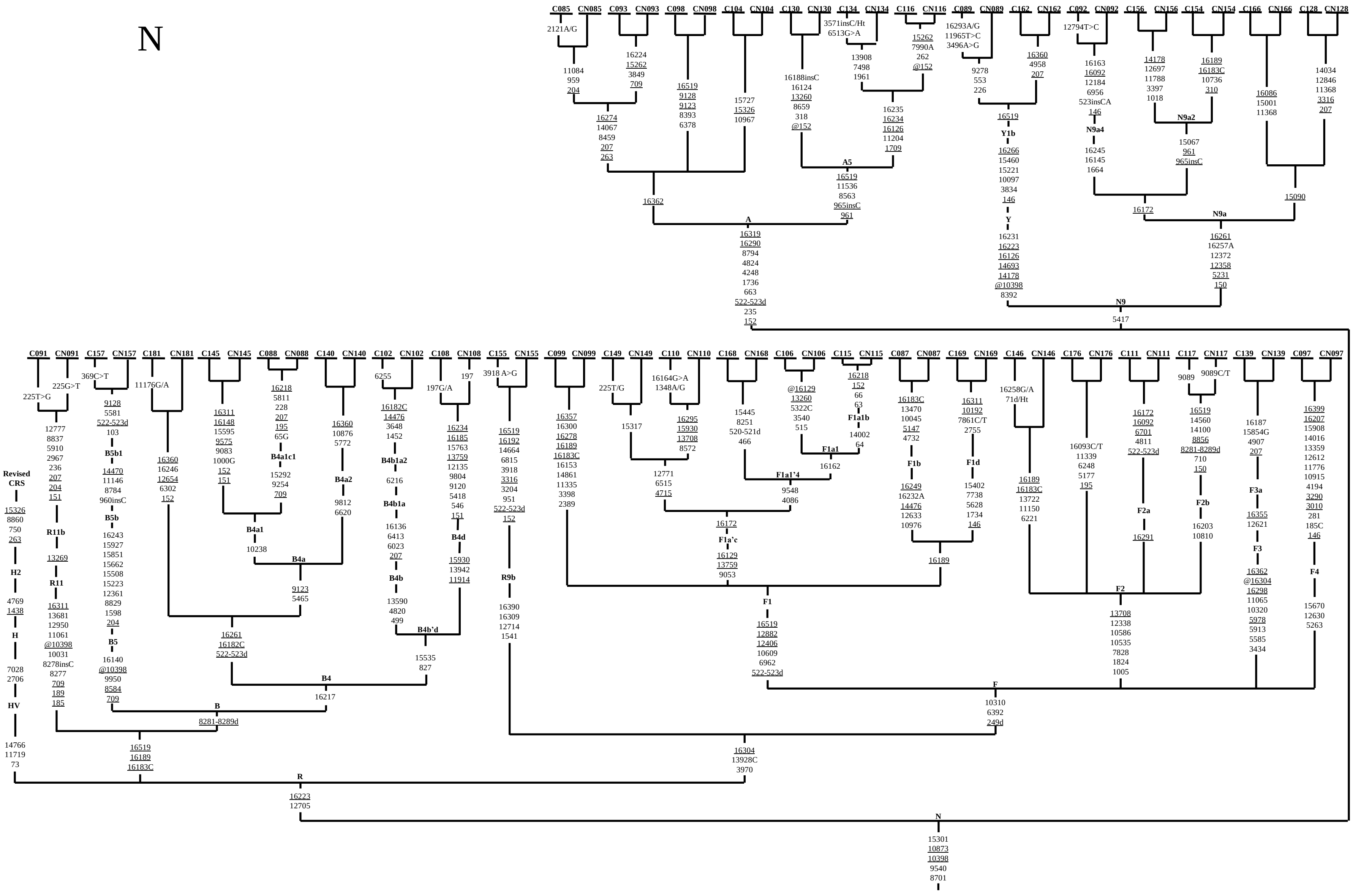
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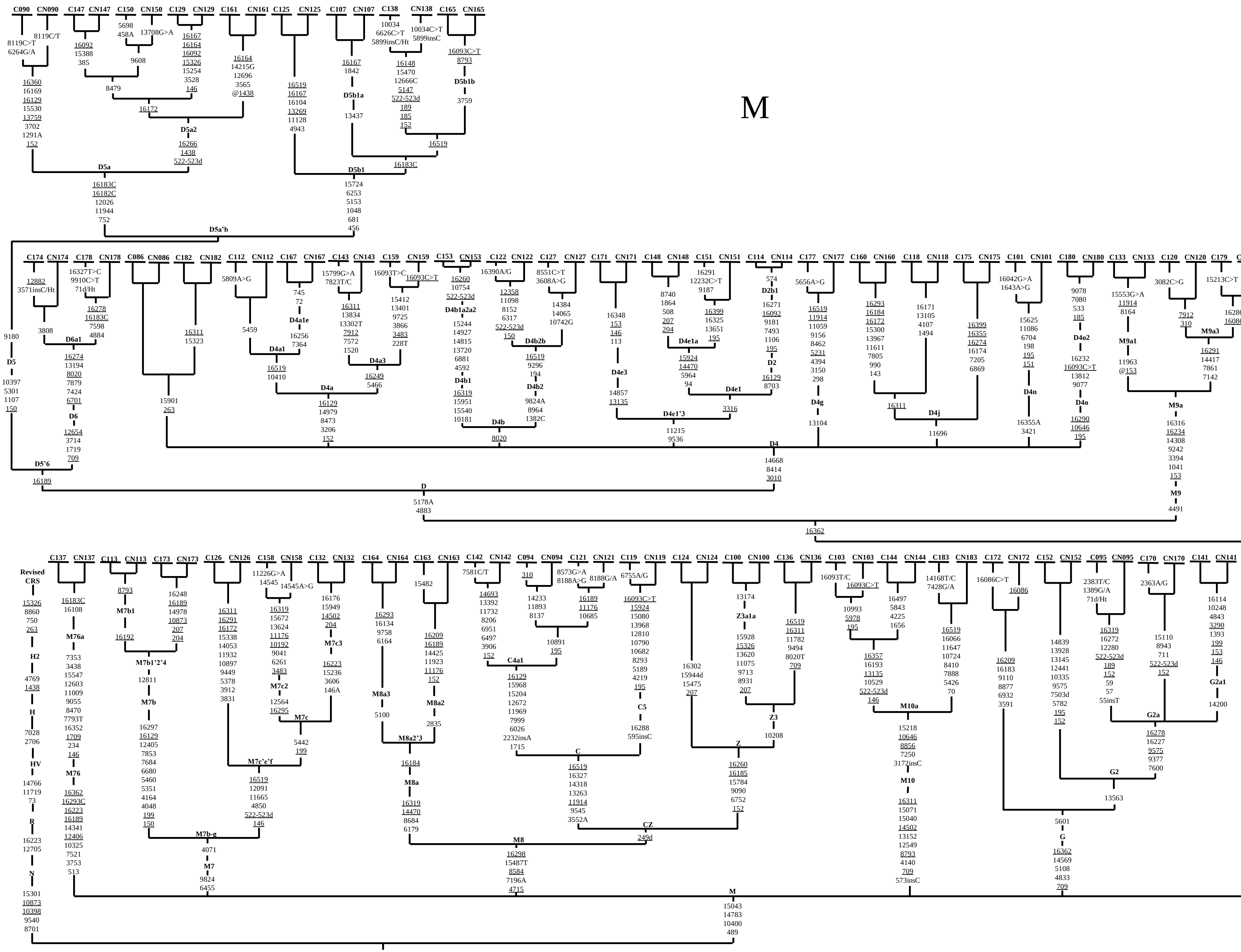

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