

## mtDNA Haplogroup Specific Control Region Mutation Motifs

### African Haplogroup

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
L0	(16129)-16187-16189-16223-16230-16311	247	
L0a	16129-16148-16172-16187-16188G-16189-16223-16230-16311-16320	93-185-189-236-247	523d-524d
L0a1	16129-16148-16168-16172-16187-16188G-16189-16223-16230-16311-16320	93-185-189-(236)-247	523d-524d
L0a1a	16129-16148-16168-16172-16187-16188G-16189-16223-16230-16311-16320	93-185-189-200-236-247	523d-524d
L0a1b	16129-16148-16168-16172-16187-16188G-16189-16223-16230-16278-16311-16320	93-95C-185-189-236-247	523d-524d
L0a2	@16129-16148-16172-16187-16188G-16189-16223-16230-16311-16320	93-152-189-236-247	64, 523d-524d
L0f	16169-16187-16189-16223-(16230)-16278-16311-16327	(146)-189-247	16368
L0k	16166C-16172-16187-16189-16214-16223-16230-16278-16291G-16311	146-189-195-247	
L0d	(16129)-(16187)-16189-16223-16230-16243-16311	247	
L1	(16187)-16189-16223-16278-16311	182-247	523d-524d
L1b	16126-(16187)-16189-16223-(16264)-16270-16278-16311	(182)-185T-(195)-247	357, 523d-524d
L1b1	16126-16187-16189-16223-16264-16270-16278-16293-16311	182-185T-195-247	357, 523d-524d
L1b1*	16126-16187-16189-16223-16264-16270-16278-@16293-16311	182-185T-195-247	357, 523d-524d
L1c	16129-16187-16189-16223-16278-16311	152-(182)-186A-189C-247(or 247d)-316	523d-524d
L1c1	16129-(16187)-16189-16223-16278-16293-16360	151-152-182-186A-189C-195-247(or 247d)-316	523d-524d
L1c2	16129-16187-16189-16223-16265C-(16278)-16286R-16294-16311-(16360)	(151)-152-182-186A-189C-195-198-247-297-316	16527, 523d-524d
L1c3a	16129-@16187-16189M-16215-(16223)-16278-16294-16311-16360	151-152-182-186A-189C-@195-247-316	523d-524d
L1c3b	16129-(16187)-16189-16223-16278-16293-16294-16311-16360	(151)-152-182-186A-189C-@195-247-316	523d-524d
L1c4	16129-16184-16187-16189-16223-16278-16294-16301-16311-16360	152-182-186A-189C-195-247-297-316	523d-524d
L5	16129-16148-16166-16189-16223-16278-16311	182-195-247	459.1C
L5a	16129-16148-16166-16189-16223-16278-16311-16355-16362	152-182-195-247	455.1T-459.1C
L5c	16111-16129-16148-16166-16189-16223-16254-16278-16360	195-247(or 247d)	459.1C-535
L2	16223-16278	146-152(or 150)-195	16390
L2a	16223-16278-16294	146-152-195	16390
L2a1	(16223)-16278-(16294)-16309	146-152-195	16390
L2a1a	16223-16278-16294-16309	146-152-195	16368-16390
L2a1a	16223-16278-16286-16294-16309	146-152-195	16390
L2a1b	16183C-16189-16223-16278-16290-16294-16309	146-152-195	16390
L2a1*	16189-16192-16223-16278-16294	146-152-195	16390
L2a2	16189-16223-16229-16278-16291-16294-16311	@146-152-195	16390

Haplogroup	HV1	HV2	HV3 etc.
L2b	16114A-16129-16213-16223-16278	146-150-152-182-195-198-204	16390
L2b1	16114A-(16129)-16213-16223-16278-16362	150-(152)-182-195-198-204	16390, 418
L2b2	16114A-16129-16213-16223-16274-16278	146-150-152-182-183-195-198-204	16390
L2c	16223-16278	93-146-150-152-182-(195)-325	16390, 523d-524d
L2c*	16223-16278	@93-150-152-182-195-325	16390, 523d-524d
L2c2	16223-16264-16278	93-146-150-152-182-195-325	16390, 523d-524d
L2d	16129-16189-16278-16300-16354	146-150-195	16390-16399, 456
L2e	16111A-16145-16184-16223-16239-16278-16355	146-182	16390-16399-16400, 479
L6	16048-16223-16224-16278	146-152-185C	
L4a	16223-16260-16311-16362	195-198	
L4b1	16179-16189-16223-16239-16311-16320-16362	150-199	
L4b2	16223-16293T-16311-16355-(16362)	146	16399
L3a	16223-16316	152	523d-524d
L3b	16124-16223-16278-(16362)		523d-524d
L3b1a	@16124-16223-16278-16362		523d-524d
L3b1b	16124-16223-(16278)-16362	152	523d-524d
L3b1*	16124-16223-16278-16311-16362		523d-524d
L3b2	16124-16189-16278-16362		16527, 523d-524d
L3c	16223-16311-16362	152-195	498, 1C-523d-524d
L3d	16124-16223	152	523d-524d
L3d1a	16124-16223-16319	152	523d-524d
L3d1c	16124-16166-16223	152	523d-524d
L3d1d	16124-16223-16256	152	16368, 523d-524d
L3d3	16111-16124-16223	152-199	523d-524d
L3d3	16124-16189-16223-16278-16304-16311	152	523d-524d
L3d4	16124-16223	152-189-195	523d-524d
L3e1	16223-16327	150-189-200	
L3e1a	16185-16223-16327	150-189-(200)	
L3e1b	16223-16325d-16327	150-189	
L3e1d	16176-16223-16327	150-152-189-200	
L3e2	16223-16320	150-195	
L3e2a	16223-16320	150-195-198	499
L3e2b	16172-16189-16223-16320	150-195	
L3e2b*	16172-16183C-16189-16223-16320	150-152-195	
L3e3	16223-16265T	150-195	523d-524d-573.pC
L3e4	16051-16223-16264	150	523d-524d
L3e5	16041-16223	150	398, 523d-524d
L3i1	16223-16153		
L3i2	16223-16260-16311	150-152-189	504
L3k	16223	235-150	494
L3x	16169	150	
L3x1	16169-16223-16278	150-204	
L3x2	16169-16195	150-249d	494
L3f	16209-16223		
L3f1b	16209-16223-16292-16311	189	
L3f1b1	16129-16209-16223-16292-16295-16311	189-200	
L3f2	16209-16223-16311		
L3f3	16176-16209-16223-16234	189-318	

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
<i>L3h1a1</i>	16223-16311		<i>516</i>
<i>L3h1a2</i>	16223-16311	146	<i>16399</i>
<i>L3h1a2*</i>	16192-16223-16311	146	<i>16399</i>
<i>L3h1b</i>	16223-16256A-16311	189C-195	
<i>M1</i>	16129-16189-(16223)-16249-16311	195	<i>16519, 489</i>
<i>M1a1</i>	16129-16189-16223-(16249)-16311-16359	195	<i>16519, 489</i>
<i>M23</i>	16223-16263-16311	152-195-204	<i>16519, 417, 489-533</i>
<i>U6</i>	16172-16219		
<i>U6a</i>	16172-16219-16278		
<i>U6bd</i>	16172-16219-16311		
<i>U6c</i>	16169-16172-16189	150	<i>437, 523d-524d</i>

\*For each mtDNA haplogroup, 73, 263, 315.1 and insertions in the HV2 poly-C stretch were ignored; all mutations are transitions unless exact nucleotide is brought out, suffix "d" indicates deletion and "." + a number (or p) + suffix indicates insertion; mutation sites which have been found in the majority, but not all samples from a respective haplogroup are given in parentheses; prefix "@" indicates back mutation; mtDNA haplogroups which need mutation motif outside of HV1 and HV2 region to estimate their own haplogroups are shown in italics.

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**West Eurasian Haplogroup**

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
R0a	16126-16362		64
HV0	16298	72	
HV1	16067		
HV2	16217	73-152	
HV4a	16221		
HV6	16172-16311		
HV7	16278-16311		16519
HV8	16311-16354		
HV9a	16311	131-152	
HV-14764	16319	143-152	
HV*	16223	235	523d-524d
HV*	16092-16278		
HV*	16129-16242-16356		
H		(73A)	
H1a	16162	73	16519
H1b	16189-16356		16519
H1f	16093-16189		16519
H1k	16189-16290		16519
<i>H1c</i>			16519, 477
H1c1	16263		16519, 477
<i>H1d</i>			16519, 456
H1o		267	16519, 485
H2a1	16354		
<i>H2a2a</i>	<i>rCRS</i>	<i>rCRS</i>	<i>rCRS</i>
H2a2b	16235-16291		
H2a3	16274		
H2b	16311	152	
H3a	16239G	152	
H5	16304		456
H36	16070	152	456
H6	16362	239	16482
H7*	16172-16173		16519
H8	16288-16362	146	
H9a	16168	152	
H10a	16114		
H11	16311	195	
H11a	16293-16311	195	
H12	16287	195	
H13a*	16218-16278	93	
H13a2	16148-16256-16319	189-193-249	
H14a	16256-16352		
<i>H15</i>			55-57
H20	16218-16328A		
H21	16192	186	
H22	16145-16227		
H27	16093-16129-16316		
H28		186A	
<i>H29</i>		93	573.pC
H30	16192	195	504
H31		146-195	
H38		235	
H39	16299		
T	16126-16294		16519
T1	16126-16163-16186-16189-16294		16519
T1a	16126-16163-16186-16189-16294	152-195	16519
T1b	16126-16163-16189-16243-16294		16519

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
T2	16126-16294-16296		<u>16519</u>
T2b	16126-16294-16296-16304		<u>16519</u>
T2c	16126-16292-16294-(16296)		<u>16519</u>
T2d	16126-16294-16296	152	<u>16519</u>
T2e	16126-16153-16294-(16296)	150	<u>16519</u>
T2f	16126-16182C-16183C-16189-16294-16296-16298	195	<u>16519</u>
T2g	16126-16294-16296	200	<u>16519</u>
J	16069-16126	295	<u>489</u>
<i>J1</i>	16069-16126	295	<u>462-489</u>
J1b	16069-16126-16145-16222-16261	295	<u>462-489</u>
J1b1	16069-16126-16145-(16172)-16261	242-295	<u>462-489</u>
J1b2	16069-16126-16145-16261	271-295	<u>462-489</u>
J1b3	16069-16126-16145-16222-16235-16261-16271	295	<u>462-489</u>
J1b*	16069-@16126-16145-16261	151-152-295	<u>462-489</u>
J1c	16069-16126	(185)-(228)-295	<u>462-489</u>
<i>J1c1</i>	16069-16126	(185)-228-295	<u>462-482-489</u>
J1c2	16069-16126	185-188-295	<u>462-489</u>
J1c7	16069-16126-16261	(185)-(228)-295	<u>462-489</u>
J1c8	16069-16126-16319	185-228-295	<u>462-489</u>
J1d	16069-16126-16193	152-295	<u>489</u>
J2	16069-16126	150-195-295	<u>489</u>
J2a	16069-16126-16145-16231-16261	150-152-195-215-295	<u>489</u>
J2b	16069-16126-16193	150-(152)-295	<u>489</u>
U1	16249	285	
U1a	16189-16249	285	
<i>U1a1</i>	16189-16249	285	<u>385, 523d-524d</u>
U1b	16111-16249-16327	146-285	
U2	16051		
U2d	16051-16189-16234-16294	152-199-@263	<u>16519, 471</u>
U2e	16051-16129C-16189-(16362)	152-217	<u>16519, 508</u>
U3	16343	150	
<i>U3a</i>	16343	150	<u>16390</u>
<i>U4/U9</i>		195	<u>499</u>
U4	16356	195	<u>16519, 499</u>
U4a1	16134-16356	152-(195)	<u>16519, 499</u>
U4a2	(16356)	195-310	<u>16519, 499</u>
U4a3	16265-16356-16362	195-247	<u>16519, 499-524.1A-524.2C</u>
U4b1	16356	146-195	<u>16519, 499</u>
U4b2	16136-16356	195	<u>16519, 499</u>
U4c1	16179-16356	195	<u>16519, 499</u>
U9a	16051-16278	@195	<u>499</u>
U9b	16242	195	<u>499-573.pC</u>
U5	16270		
U5a	16256-16270		
<i>U5a1</i>	16256-16270		<u>16399</u>
<i>U5a2</i>	16256-16270		<u>16526</u>
U5b	16270	150	
U5b1b	16189-16270	150	
U5b1b1	16144-16189-16270	150	
U5b1b2	16189-16270	150-217	
U5b1c	16192-16311	150	
U5b2a1	16189-@16192-@16270-16325	150-152	
<i>U5b2a2</i>	16189-16192-16270	150	<u>16398</u>

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
U5b3	(16192)-16270-16304	150-(228)	
U5b3a	16192-16235-16270-16304	150	
U7	16318Y	152	523d-524d
U8a		282	
U8a1	16146-16342	282	
U8b	16189-16234		
K	16224-16311		16519
<i>K1a</i>	16224-16311		16519, 497
<i>K1a*</i>	16224-16234-16311		16519, 497
<i>K1a*</i>	16093-16224-16311		16519, 497
<i>K1a4b</i>	16224-16311	280G	16519, 497
<i>K1a6</i>	16224-16311		16519-16527, 497
<i>K1a9</i>	16093-16224-16311	195	16519-16524, 497
<i>K1a10</i>	16048-16224-16311	195	16519, 497
<i>K1a11</i>	16129-16224-16311	150-199	16519, 16T, 497
<i>K1b1a</i>	16224-16311-16319	152	16519
<i>K1b1c</i>	16224-16311	94	16519
<i>K1b2</i>	16224-16311	146-195	16519, 524.1A-524.2C
<i>K1c</i>	16224-16311	146-152	16519, 498d
<i>K1c2</i>	16224-16311-16320	146-152	16519, 498d
<i>K2</i>	16224-16311	146	16519
<i>K2a</i>	16224-16311	146-152	16519
<i>K2b1</i>	16224-16270-16311	146	16519
R1	16311	295A	16519
R2	16071	152	16519
I	16129-16223	199-204-250	16391-16519
I1	16129-16223-16311	199-204-250	16391-16519, 573.pC
I1a	16129-16172-16223-16311	199-203-204-250	16391-16519, 455.1T-573.pC
I2	16129-16223	152-199-204-207-250	16391-16519, 573.pC
I3	16129-16223	152-199-204-207-239- 250	16391-16519, 524.1A-524.2C- 573.pC
I4	16129-16223-16304	199-204-250	16391-16519, 573.pC
I5	16129-16148-16223	199-204-250	16391-16519, 573.pC
N1a	16147R-16172-16223-16248-16320-16355	(152)-199-204	16519
N1d	16223-16301-16356	199-204	16519
N1b	16145-16176R-16223		16390-16519
N1c	16201-16223-16265		
N2a	16153-16223	189-199	
W	16223-16292	189-195-204-207	16519
W1b	16223-16292	189-195-204-207-227	16519
W1c	16223-16292	119-189-195-204-207	16519
W1e	16223-16292-16295	189-195-204-207	16519
W3'5	16223-16292	189-194-195-204-207	16519
W4	16223-16292	143-189-194-195-196- 204-207	16519
W5a	16223-16292-16362	189-194-195-204-207	16519
W6	16223-16292-16325	189-194-195-204-207	16519
X	16189-16278		16519
X1	16189-16278	146-153	16519
X1a	16104-16189-@16278	146-153	16519
X1b	16126-16189-16278	146-153-256	16519
X2	16189-16278	195	16519
X2a	16189-16213-16223-16278	153-195-200	16519
X2b	16189-16223-16278	(153)-195-225-226	16519

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
X2c	16183C-16189-16223-16255-16278	153-195-225-(227)	16519
X2e	16189A-16223-16278	153-195	16519
X2d	16189-16223-16278	@153-195-(204)-207	16519
X2f	16189-16223-16278	153-195-257	16519

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**South Asian (Indian) Haplogroup**

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
<i>M*-489</i>	16223		<u>489</u>
M2	16223-16274-16319		16519, 447G-489
M2a1	16223-16270-16319-16352	204	16519, 447G-489
M2b	16169.1C-16189-16223-16274-16319-16320	152-182-195	16519, 447G-489-523d-524d
M3	16126-16223		482-489
M4a	16145-16223-16261-16311		489
<i>M4b</i>	16223-16311		16519, 489-511
<i>M4b1</i>	16223-16289		16519, 489-511
M4b2	16223-16311	241	16519, 489-511
M4c	16184-16223-16311	195	16519, 489
M4d	16075-16169-16223-16311	143	489
M5	16129-16223		16519, <u>489</u>
M5*	16129-16223-16230-16233-16304		16519, 489
M5a1	16129-16223-16291		16519, 489
<i>M6</i>	16223-16231-16362		<u>461-489</u>
M25	16223-16304		489
M18	16223-16318T	194-246	489
M38a	16223	189-246	16519, 489
M38bc	16223	195-246	16519, 489
M38de	16223	199-246	16519, 489-523d-524d
M30	16223	195A	489-523d-524d
<i>M30a</i>	16223	195A	489-513-523d-524d
M30b	16223	152-195A	489-523d-524d
M30c	16223	146-195A	489-523d-524d
M30e	16223-16234	152-195A	489-523d-524d
M31a1	16223-16311	249d	16519, 489
<i>M31a1</i>	16223-16311	200	16519, <u>489</u>
M31a2	16126-16145-16223	195	489
M31b	16126-16136-16223	152	489
M31c	16136-16223-16311	188-234-282	489
M32a	16223-16319-16344-16357	195-207	16526, 489
M32c	16086-16148-16223-16259-16278-16319		16399-16526, 489-523d-524d
M33a*	16223-16316	150-293	489
<i>M33a1</i>	16223-16294	195	489-573.pC
M33a2	16169-16172-16223		489
M33b	16223-16324-16362		489
M33d	16178-16223-16288	152-204-207	489-513
M34	16223-16249		489-569
M34a	16223-16249-16359	114	489-569
M34b	16051-16223-16249-16250		489-569
M35	16223	199	489
M35a	16093-16223	199	482-489
M35b	16223-16304	199-204	489
M35c	16145-16189-16223-16290		16381, 489
M36	16223	239	489
M37a	16223	151-152	489
M37e	16111-16189-16223-16295		489
<i>M39</i>	16223		<u>55.1T-65.1T-66T</u> , 489
<i>M40</i>	16223		<u>16463</u> , 489
M40a	16179-16223-16294	200	16463, 489
M41	16223-16327-16330		375, 489
M42a	16223-16287-16356		489
M42b	16189-16223	93-234	489

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
M44	16223-16301	146	489
M45	16189-16223-16300	152	489
M48	16223-16225-16234	199	16390, 489
M49	16223-16234		489
M49ab	16153-16223-16234		489
M49d	16223-16234-16243		489
M52a	16223-16275-16327A		16390, 489-523d-524d-573.pC
M52b	16111-16192-16223	150	489
M53	16051-16183C-16189-16223-16316	240	390T, 489-523d-524d -572
M54	16183C-16189-16223-16294	152	16519, 482-489-523d-524d
M56	16223-16311		61, 489
M57a	16111-16223-16311	152	489
M57b	16223-16311	146-189	489
M60a	16223-16284-16319		489-523d-524d
M60b	16223-16266-16357	189	489-523d-524d
M61	16223-16270-16362	152	16381, 489
M62	16223-16295	150	489
M62a	16147-16223-16295	146-150-310	489
M62b	16223-16260-16295	150-204	16519, 489
M63	16172-16192-16223	214	489
M64	16223-16263	152	16527, 489
U2	16051		
U2a	16051-16206C		
U2b	16051	146	
U2c	16051-16234	152	
R5	16304		16524
R5a	16266-16304		16524
R5a1	16266-16304	93-200	16524, 523d-524d
R5a2	16304-16356	152	16524, 523d-524d
R6	16274-16362	195	
R6*	16093-16179-16227-16245-16274-16278-16362	195-246	
R6*	16129-16213-16362		
R7	16260-16261-16319-16362		
R8a1		195-198	
R8a2		185-189	
R8b		195	16390, 456
R30a*	16126-16181-16209		16519
R30a*		207	16519
R30b	16189-16298-16299	152-299d	16159, 373, 480
R30*	16129-16311	152-215	16497-16519, 373
R31a	16172-16304-16362	146-338	523d-524d
R31b	16051-16093-16189-16218-16291-16362	207-228-234	
N5	16111-16311		

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**East Asian Haplogroup**

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
D4/G	16223-16362		489
D1	16223-16325-16362		489
D4a	16129-16223-16362	152	(16519), 489
D4a3	16129-16223-16249-16362	152	16519, 489
D4a4	16129-16223-16294-16362	152	16519, 489
D4b1	16223-16319-16362		489-523d-524d
D4b2a	16223-16355-16362	280	489-523d-524d
<i>D4b2a</i>	16223-16362	199	489-523d-524d
D4b2b	(16223)-16362	194	16519, 489-523d-524d
D4c	16245-16362		489
D4e1	16223-16362	94	489
D2	16129-16223-16271-16362		489
D4e*	16223-16256-16362		489
D4g1	16223-16278-16362		489-573.pC
D4g2	16223-16362	195-298	489
D4g2a	(16223)-16274-16362	298	489
D4h1	16174-16223-16362	146-183	489
D4h*	16174-16223-16311-16362	152	489
D4h3	16223-16301-16342-16362		489
D4i	16223-16294-16362		489
D4j1	16184-16223-16311-16362		489
D4j2	16223-16291-16362	152	489
D4j*	16223-16293-16362		489
D4k	16192-16223-@16362	195	489
<i>D4l</i>	16223-16362		16368, 489
D4m1	16244-16362		489
D4m2	16042-16223-16362		489
D4n	16223-16355A-16362		489
D4o	16223-16290-16362	195	489
D4q	16223-16256-16362	200	489
D4r	16223-16362	195-198	489
D5	16189-16223-16362	150	489
D5a1	16182C-16183C-16189-16223-16362	150-309d	16390, 68, 489
D5a2	16182Y-16183C-16189-16223-16266-16362	150	489-523d-524d
D5a3	16182C-16183C-16189-16223-16360-16362	150	489
<i>D5b</i>	16189-16223-16362	150	456-489
D5b1a	16167-16189-16223-16362	150	456-489
D5b1b	16189-16216-16223-16362	150	16519, 456-489
D5c	16188.1C-16193.1C-16362	150-(151)-152	489
D5d	16148-16189-16223-16362	150	489
D6a	16189-16223-16274-16362	146	489
D6c	16189-16223-16311-16362	152	489
G1a1	16223-16325-16362	150	16519, 489
G1a2	16184-16223-16290-16362	150	489
G1a3	16184-16214-16223-16362	@150	489
<i>G1b</i>	16129-16223-@16362		16017, 489
G2a	16189-16223-16278-16362		489
G2a1	16223-16227-16278-(16362)		489
G2a2	16051-16150-16223-16278-16362		489
G2a3	(16189)-16223-16278-16362	260	489
G2a4	16204-16223-16278-16362	146-152	489
G2b	16172-16223-16362	@263	489
G2c	16093-16223-16278-16303-16311-16362		64, 489
G3a	16223-16274-(16362)	143-(152)	489
G3b1	16223-16274-16362	195	489

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
G4	16114A-16223-16362	191.1A	489
M7a	16209-16223		489
M7a1	16209-16223-16324		489-(523d-524d)
M7a2	16140-16209-16223	146	489
M7b	(16129)-16223-16297	150-199	489
M7b1	16129-16192-16223-16297	150-199	489
M7b2	16129-16189-16223-16297-16298	150-199	489
M7b4	@16129-16223-16297	150-199-204	489
M7b3	16086-@16223-16297-16324	199	489
M7d	16129-16152-16179-16192-16223	@199	489
M7c	16223	146-199	16519, 489-523d-524d
M7c1	16223-16295	(146)-199	16519, 489-523d-524d (or 513d-514d)
M7c3	@16223	146A-199	489-523d-524d
M8	16223-16298		489
M8a	16223-16298-16319		489
M8a1	16223-16298-16319-16311		489
M8a2	16184-16223-16298-16319		489
CZ	16223-16298	249d	489
C	(16223)-16298-16327	249d	16519, 489
C1	(16223)-(16298)-16325-16327	249d-290d-291d	16519, 489-523d-524d
C1a	16223-16298-16325-16327-16356	93-249d-290d-291d	16519, 489-523d-524d
C1b	(16223)-(16298)-16325-16327	249d-290d-291d	16519, 489-493-523d-524d
C1c	16223-16298-16325-16327	249d-290d-291d	16519, 489-@523d-@524d
C1d	16051-(16223)-(16298)-16325-16327	194-249d-290d-291d	16519, 489-523d-524d
C1d1c	16051-16188-16223-(16298)-16325-16327-16362	(194)-249d-290d-291d	16519, 489-523d-524d
C4a1	16129-16223-16298-16327	195-249d	16519, 489
C4a2'3'4	16223-16298-16327-16357	249d	16519, 489
C4b1/C7a	16223-16298-16327	146-249d	16519, 489
C5	16223-16288-16298-16327	249d	16519, 489
C5a	16223-16261-16288-16298-@16327	249d	16519, 489
C7a1	16223-16298-16327	146-153-249d	16519, 489
pre-Z	16223-16260-16298	152-249d	489
Z	16185-16223-16260-16298	152-249d(or 247d)	489
Z*	16185-16223-16260-16294-16298	150-249d	489
M9a*	16223-16234-16362	153	489
M9a	16223-16234-16316-16362		489
M9d	16158-16223-16234-16362	150-152-153	16519, 489
M9c	16223-16234-16271-16362	153	489
M9b	16051-16209-16223-16362		489-573.pC
M10	16223-16311		489-573.pC
M10a	16129-16223-16311-16357		16497, 489 523d-524d-573.pC
M10b	16066-16223-16311		489-573.pC
M11	16223	215-318-326	489
M12	16223-16234-16290		489
M13a	16145-16188(or 16188d)-16223	152	16381, 489

Haplogroup	HV1	HV2	HV3 etc.
F	16304	249d	
F1ac	16129-16304	249d	16519, 523d-524d
F1a	16129-16172-16304	249d	16519, 523d-524d
F1a1	(16129)-16162-16172-(16304)	249d	(16519), 523d-524d
F1a2	@16129-16172-16304	249d	16465-16519, 523d-524d
F1a3	@16129-16172-16284-16304-16311	249d	16390-16519, 523d-524d
F1c	16111-16129-16304	152-249d	16519, 523d-524d
F1bde	(16183C)-16189-16304	249d	16519, 523d-524d
F1b	(16182C)-16183C-16189-16232A-16249-16304-16311	249d	(16519), 523d-524d
F1d	16189-16304	146-249d	16519, 523d-524d
F1e	16189-16304-16355	249d	16519, 523d-524d
F2*	@16304	235-249d	
F2a	16291-16304	249d	
F2b	16203-16304	249d	
F3	16298-@16304-16362	249d	
F3a	16298-@16304-16355-16362	249d	
F3b	16220C-16298-@16304-16362	249d	
F4a	16207-16304-16362	146-249d	16399
F4b	16218-16304-16311	249d	573.pC
R9b	16304-16309		16390-(16519)
R11	16183C-16189-16311	185-189	16519
B4	16183C-16189-16217		
B4a	16182C-16183C-16189-16217-16261		(16519), 523d-524d
B4a1a	16182C-16183C-16189-16217-16261	146	(16519), 523d-524d
B4a1b	16182C-16183C-16189-16217-16261-16288-16311		(16519), 523d-524d
B4g	16182C-16183C-16189-16217-16261-16292		16519, 523d-524d
B4b	16183C-16189-16217		16519, 499
B4b1	16136-16183C-16189-16217		16519, 499
B2a	16111-16183C-16189-16217		16483-16519, 499
B2c	16182C-16183C-16189-16217		16519, 499
B2f	16183C-16189-16217-(16298)	114G	16519, 499
B4d1	16183C-16189-16217	316	
B4d3	16183C-16185-16189d-16217-16234	(151)	16519, 546
B4c1a	16183C-16189-16217-16311		
B4c1b	16140-16183C-16189-16217-16274	150	
B4c1c	16183C-16189-16217-16311	150-195-214	
B4c2	16147-16184A-16189-16217-16235		
B4f	16168-16172-16183C-16189-16217-16249-16325	200	16390
B5	16140-16189		16519, 523d-524d
B5a	16140-16189-16266R	210	16519, 523d-524d
B5a2	16129-16140-16187-16189-16266R	93-210	16519, 523d-524d
B5b	16140-16183C-16189-16243		16519, 523d-524d (or 513d-514d)
B5b2	16111-16140-16183C-16189-16234-16243		(16463)-16519, 523d-524d
B5b3	16140-16183C-16189-16243-16256	103-189-199-203-204	16519, 523d-524d
A	16223-16290-16319	235	
A4	16223-16290-16319-16362	235	523d-524d
A2	16111-16223-16290-16319-(16362)	146-(235)	64, 523d-524d
A4a	16223-16249-16290-16319-16362	(235)	523d-524d
A4b	16189-16223-16290-16319-16362	235	523d-524d

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
A4c	16223-16290-16319-16362	200-235	523d-524d
A4d	16223-16290-16319-16362	151-235	523d-524d
A5a	16187-16223-16290-16319	235	523d-524d
A5b	16126-(16223)-16235-16290-16319	235	
A5c	16129-16213-16223-16290-16319	152-235	@523d-@524d
A7	16051-16223-16290-16319	152-235	523d-524d
A8	16223-16242-16290-16319	146-152-(235)	64, 523d-524d
A11	16223-16290-16293C-16319	152-235	523d-524d
N9a	16223-16257A-16261	150	
N9a1	16111-16129-16223-16257A-16261	150	
N9a3	16129-16223-16257A-16261	150	
N9a2	16172-16223-16257A-16261	150	
<i>N9a2ab</i>	16172-16223-16257A-16261	150	<u>16497</u>
N9a4	16145-16172-16223-16245-16257A-(16261)	150	524.1A-524.2C
N9a5	16172-16189-16209-16223-16257A-16261	150	
N9a6	16223-16257A-16261-16292	150	
N9b	16183C-16189-16223		16519
<i>N9b1b</i>	16129-16183C-16189-16223		<u>16390-16519</u>
N9b1c	16183C-16189-16223	94	16519
N9b2	16183C-16189-16223-16294-16309		16519
Y	16126-16231		
Y1	16126-16231-16266		
Y1b	16126-16231-16266	146	16519
Y2	16126-16231-16311		482

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**Southeast Asian Haplogroup**

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
<i>El1a1a</i>	16223-16291-16362		<i>16390-16519, 489</i>
<i>El1a2</i>	16223-16362		<i>16390-16519, 373, 489</i>
<i>E1b</i>	16223-16362	152	<i>16390-16519, 489</i>
<i>E1b1</i>	16223-16261-16362	152	<i>16390-16519, 489</i>
<i>E2</i>	16051-16223-16362	195	<i>16390, 489</i>
<i>E2*</i>	16051-16185-16223-16362	195	<i>16390, 489</i>
<i>M13b1</i>	(16093)-16129-16223-16263	207	<i>16381-16519, 489</i>
<i>M13b2</i>	16129-16172-16195-16270		<i>489</i>
<i>M-12406</i>	16124-16189-16278-16293C-16362		<i>489</i>
<i>M14*</i>	16183C-16189-@16278-16293Y-16325-16362	146	<i>489-513</i>
<i>M17a</i>	16129-16209-16223-16325		<i>489</i>
<i>M17b</i>	16189-16209-16223		<i>489</i>
<i>M17c</i>	16209-16223-16304		<i>489</i>
<i>M17*</i>	16129-16209-16223-16272	152-225-249d-316	<i>16159, 489-523d-524d</i>
<i>M21a</i>	(16093)-16129-16223-16256-16271-(16362)		<i>489</i>
<i>M21b</i>	16223-16239-16263-16325		<i>16519, 489</i>
<i>M21c</i>	16223-16242	200-204	<i>16519, 489</i>
<i>M21d</i>	16145-(16181)-16192-16223-16291-16304	210	<i>489</i>
<i>M22</i>	16223-16290-16304		<i>489</i>
<i>M46*</i>	16140-16172-16189-16223-16278	249	<i>489-523d-524d</i>
<i>M46*</i>	16214A-16223-16278	152	<i>489-523d-524d</i>
<i>M46*</i>	16223-16243-16262-16278-16311-16319		<i>489-523d-524d</i>
<i>M47</i>	16129-16166C-16189-16223-16287-16319		<i>489</i>
<i>M50</i>	16223-16263-16278		<i>489</i>
<i>M50*</i>	16166C-16223-16263-16309		<i>489</i>
<i>M50*</i>	16209-16223-16224-16263-16278-16319	146	<i>489-523d-524d</i>
<i>M51</i>	16223-16278	150	<i>489</i>
<i>M51a1</i>	16223-16278-16294	150	<i>489</i>
<i>M51*</i>	16189-16278-16223	150	<i>489-523d-524d</i>
<i>M71a</i>	16223-16271	151	<i>(16159), 489</i>
<i>M71a</i>	16129-16140-16223-16271	143-146	<i>489</i>
<i>M72</i>	16166d-16172-16214-16223		<i>489</i>
<i>M73a</i>	16184A-16223-16278		<i>489</i>
<i>M73b</i>	16223-16278-16354	199	<i>489</i>
<i>M77</i>	16129-16183C-16189-16213-16218-16223		<i>489</i>
<i>M-5040</i>	16223-16274-16311-16362		<i>16381, 63-64-66-489</i>
<i>M-4491</i>	16217-16223-16319	94-173-204	<i>16381, 482-489</i>
<i>M*</i>	16172-16223-16311	146	<i>489-523d-524d</i>
<i>M*</i>	16124-16179A-16223-16261		<i>489</i>
<i>R9b*</i>	16304-16362		
<i>R9c</i>	16256-16304-16335		
<i>R9e</i>	16157-16304	151	<i>479</i>
<i>B6</i>	16093-16179-16189	150	
<i>B6</i>	16051-16093-16183C-16189-16220		<i>16519, 356.1C</i>
<i>B6*</i>	16051-16183C-16189		<i>16519, 356.1C</i>
<i>B*</i>	16129-16183C-16189-16352-16355	150-152-185-189	<i>573.pC</i>
<i>R21</i>	16168-16295-16304	146-152-199-249	
<i>R22</i>	16249-16288-16304	329	
<i>R23</i>	16256-16290		<i>16465</i>
<i>R24</i>	16051-16185-16189-16324	146	
<i>R*</i>	16304	183-185	
<i>N21</i>	16193-(16223)	150-195-337d	
<i>N22</i>	16168-(16223)-16249		
<i>N-4977</i>	16069-16172-(16223)-16278-16291A-16298-16362	150-199	

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
N-4562	16172-16183C-16189-16223-16362	185-189	(523d-524d)
N*	16223-16263-16274-16311-16343		

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**Oceanian Haplogroup**

Haplogroup	HV1	HV2	HV3 <i>etc.</i>
M27a	16048-16077T-16172-16223-16311-16320	195-234	489-537
M27b	16209-(16223)-16299	152	16390, 489
M27c	16223-16301-16304	146-186	489
M28	16148-16223-16362	152-195	16468, 489
M28a	16086-16129-16148-16223-16362	152-195	16468, 489
M28b	16148-16223-16362	94-152-195-204	16468, 489
M29	16189-16223-16311	151-152-211	464-489-513
M29a	16189-16223-16311	151-152-211-310	464-489-513
M29b	16189-16223-16294-16311	151-152-211	464-489-513
Q	16129-16223-16241-16311		489
Q1	16129-16144-16148-(16223)-16241-16265C-16311-16343	89-(92)-146	489
Q2	16066-16129-16223-16241-@16311	195-228T	489
Q3	16129-16223-16241-16311	143	489
P1	16176-16266-16357	212	
P2	16188-16278-16357	103-143	16497
P3		127-128	573.pC
P4a	16319	152	507-517
P4b	16274-16291		
P6	16311-16362		
S1	16075		
S3	16140-16187-16189-16287-16311	151-152-195	63-64-66
O	16213		
O1	16213-16303-16362	152	509

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