

Global Focus on Knowledge Lecture Series
Puzzling Out the System of Life

What Our Genome Says about the Origins of the Japanese

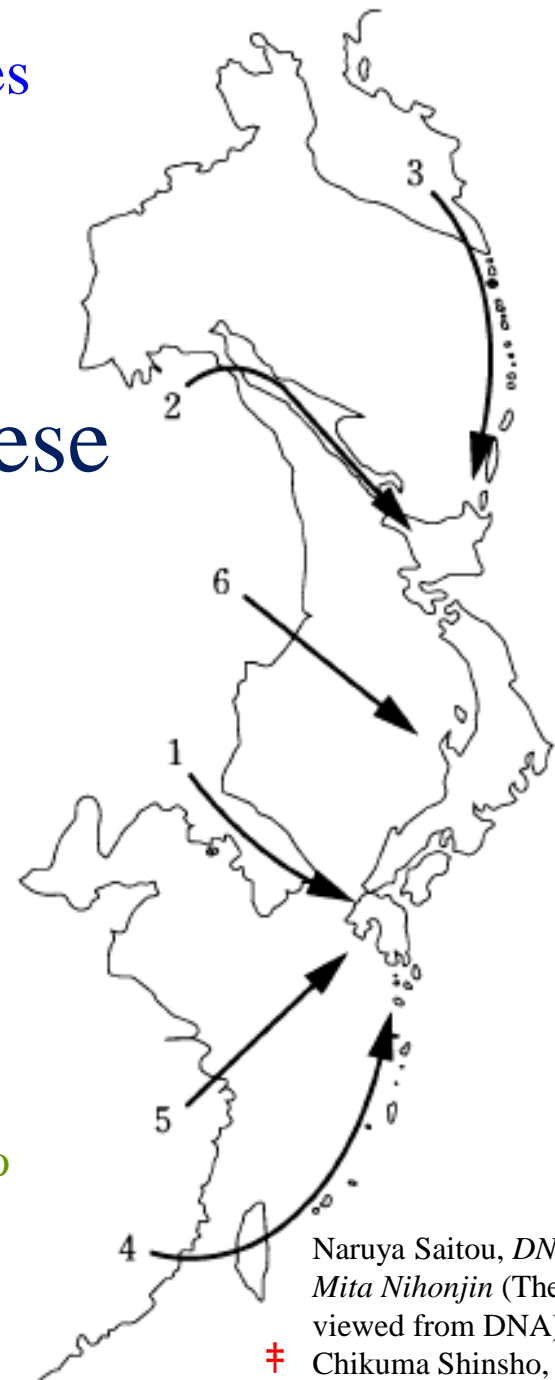
Naruya Saitou

National Institute of Genetics



May 1, Year 9 of the Scientific Era
Bldg 18 Lecture Hall, Komaba Campus, The Univ. of Tokyo

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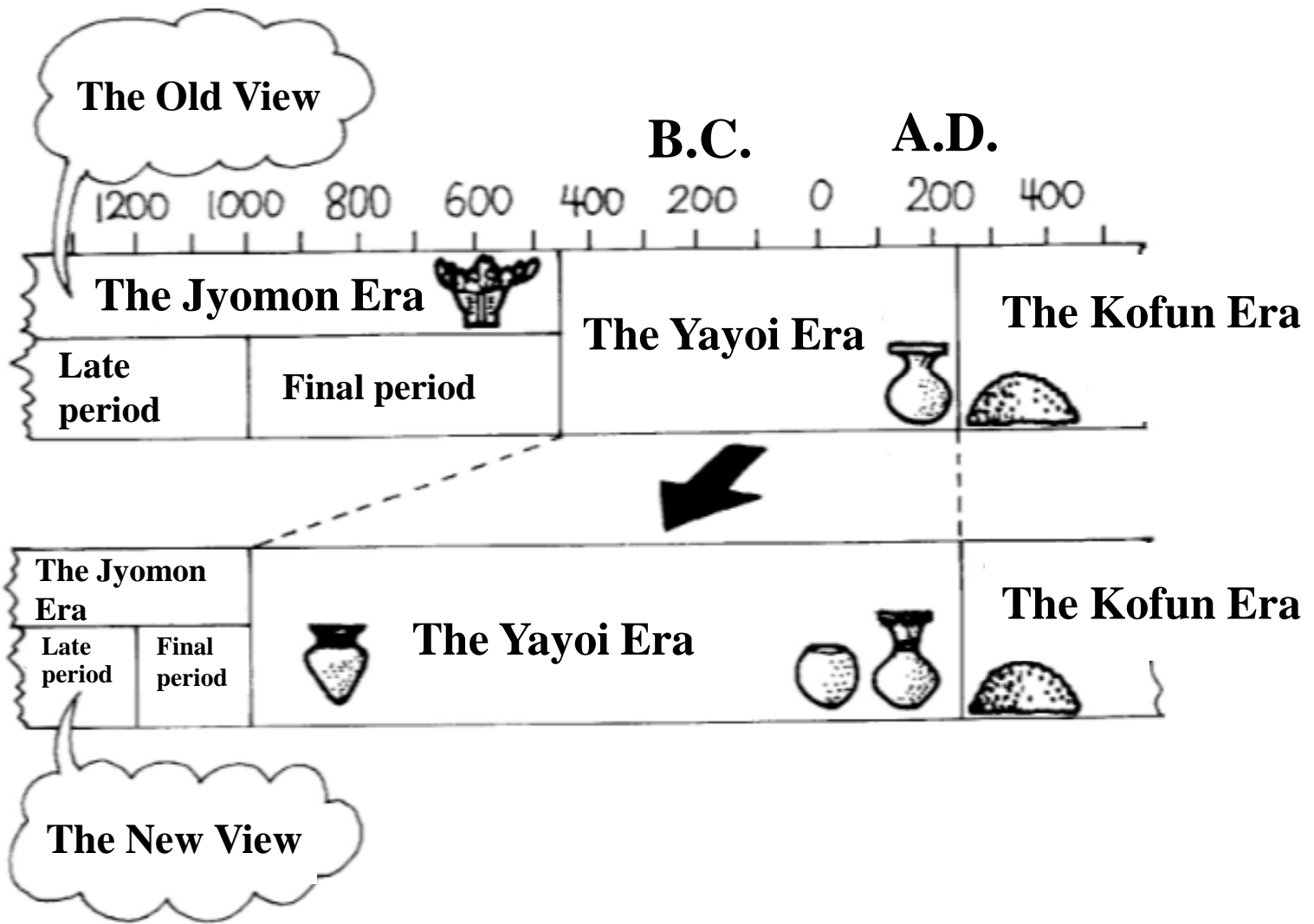


Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA),
† Chikuma Shinsho, 2005

Who Is "Japanese"?

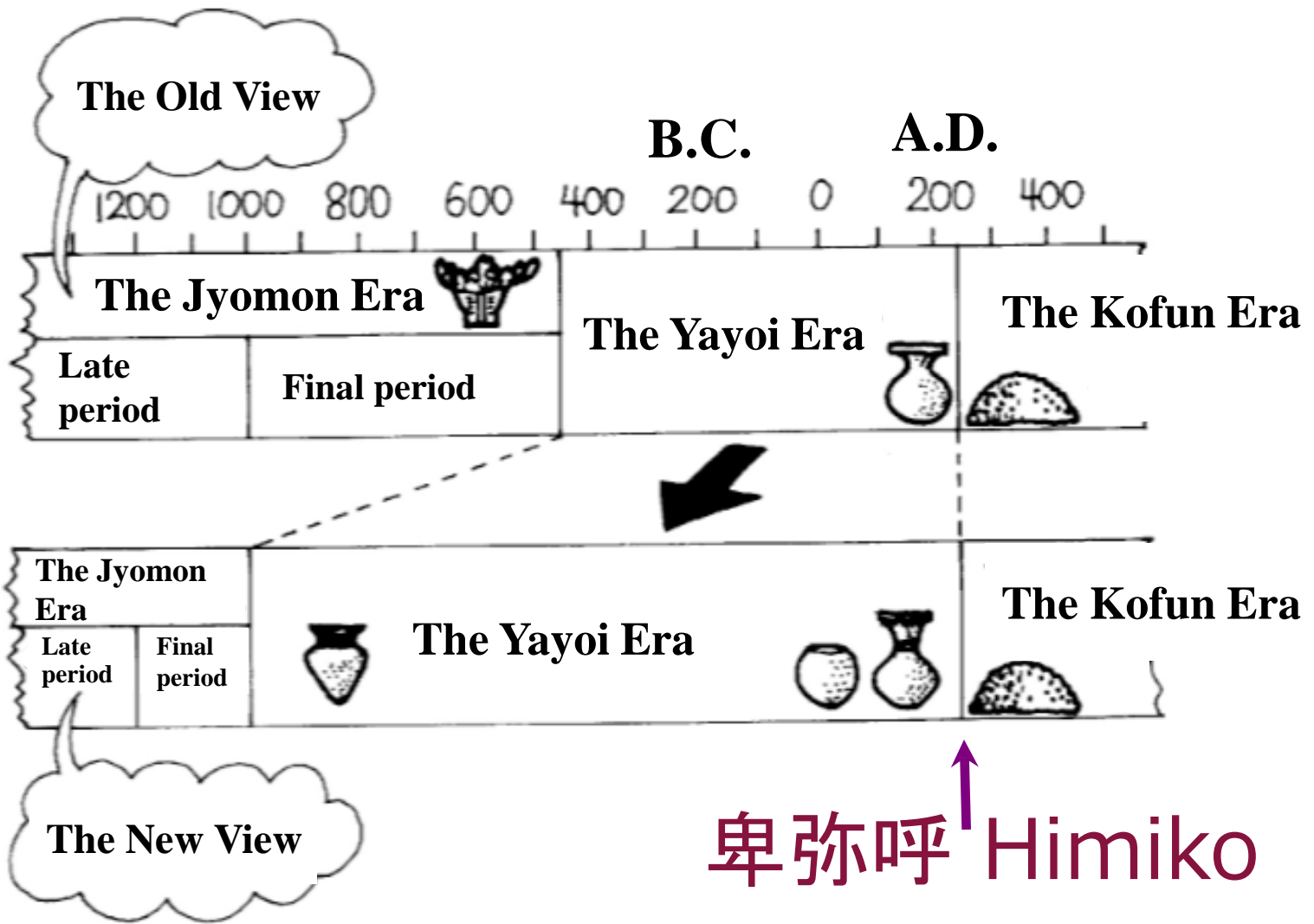
- People with Japanese nationality?
- People who speak Japanese?
- People who look Japanese?
- People who live in Japan?

Periods of Human History in the Japanese Islands



† Naruya Saitou, *E de Wakaru Jinrui no Shinka*(Evolution of the Human Race which is Understood with Pictures), Koudan Sha, 2009.

Periods of Human History in the Japanese Islands



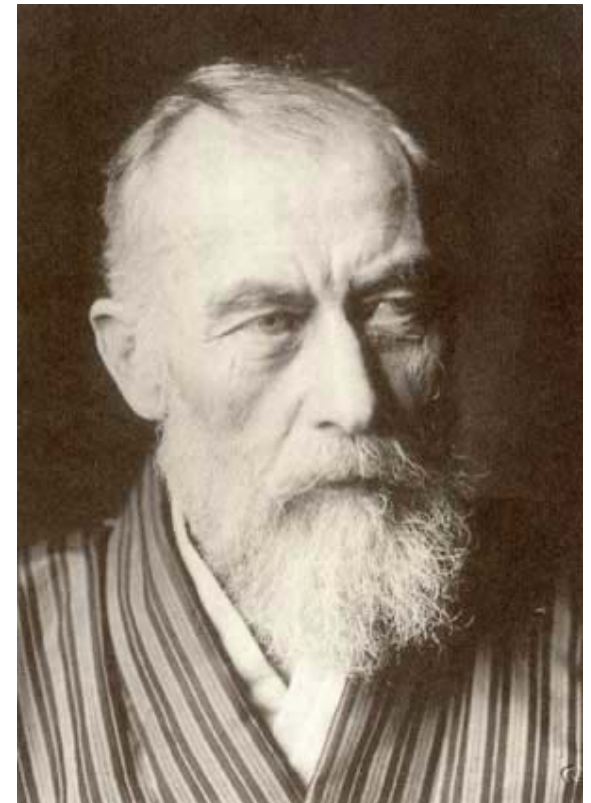
† Naruya Saitou, *E de Wakaru Jinrui no Shinka*(Evolution of the Human Race which is Understood with Pictures), Koudan Sha, 2009.

Emergence of the People of the Japanese Islands: Three Hypotheses

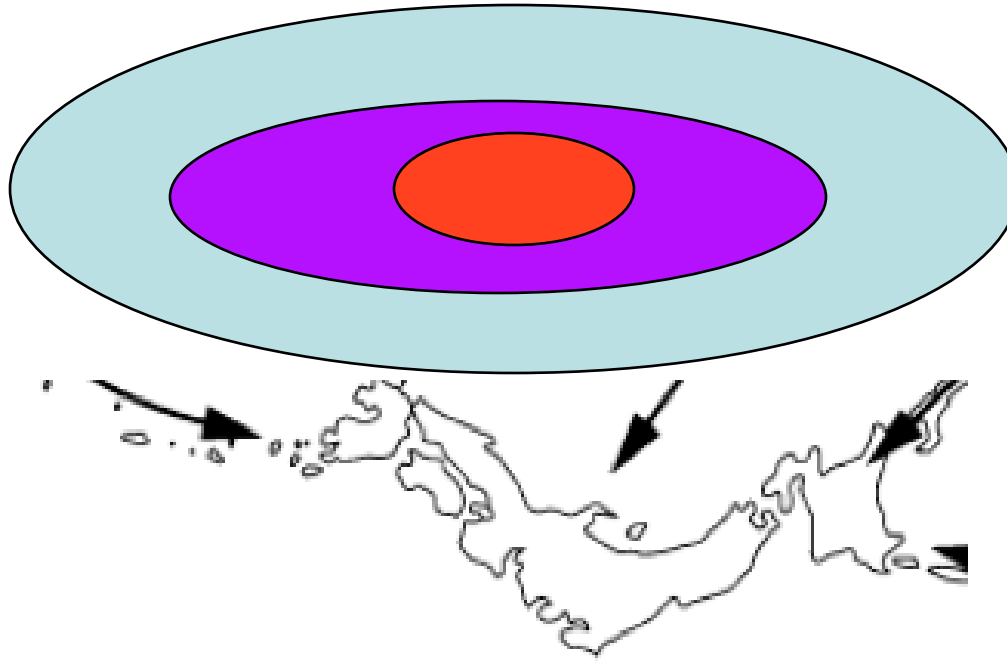
- **Replacement:** Descendants of the first migrants were the original inhabitants, and descendants of a second wave, of a different lineage, are the modern Japanese.
- **Mixing:** Descendants of the first migrants interbred with later migrants to give rise to the modern Japanese.
- **Continuity:** Descendants of the first migrants changed over time and became the modern Japanese.

Three Major Hypotheses of the Emergence of the People of the Japanese Islands

- Replacement: von Siebold, Morse, Shogoro Tsuboi, Yoshikiyo Koganei, others
- Interbreeding: **Erwin von Bälz**, Ryozo Torii, Kenji Kiyono, Takeo Kanaseki, Bin Yamaguchi, Kazuro Hanihara, Kei'ichi Omoto, Satoshi Horai, Katsushi Tokunaga, others
- Continuity: Kotondo Hasebe, Hisashi Suzuki



Center/Periphery Theory



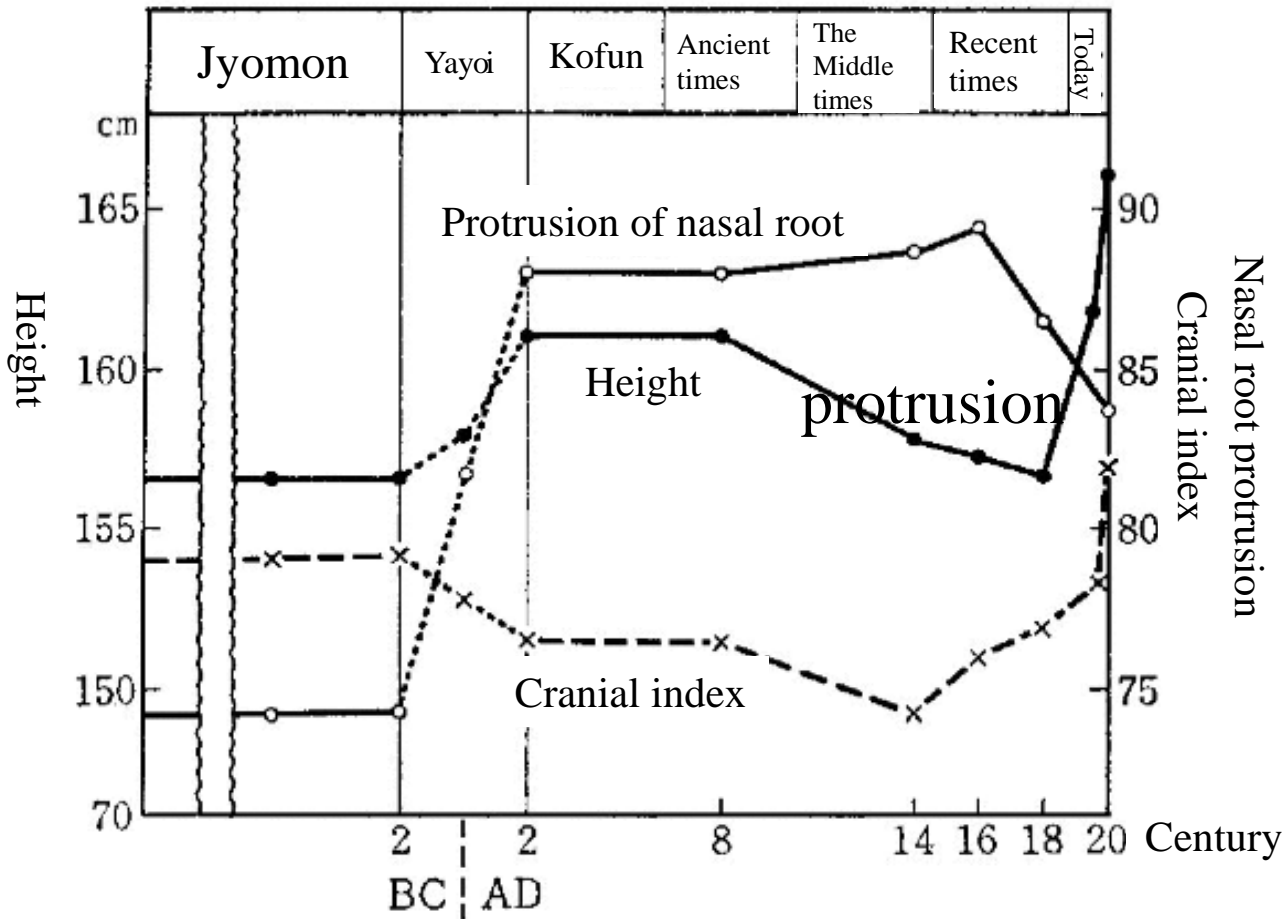
- Where a distribution is observed in the pattern ABA, the older are A words, the older B words tend to be.

A = Ainu and Okinawans

B = Main-island Japanese

Secular Change in Nasal Root Protrusion, Height and Cranial Index

Suzuki, *Hone kara Mita Nihonjin no Roots* (The Roots of the Japanese as Seen in Their Bones) (1983)



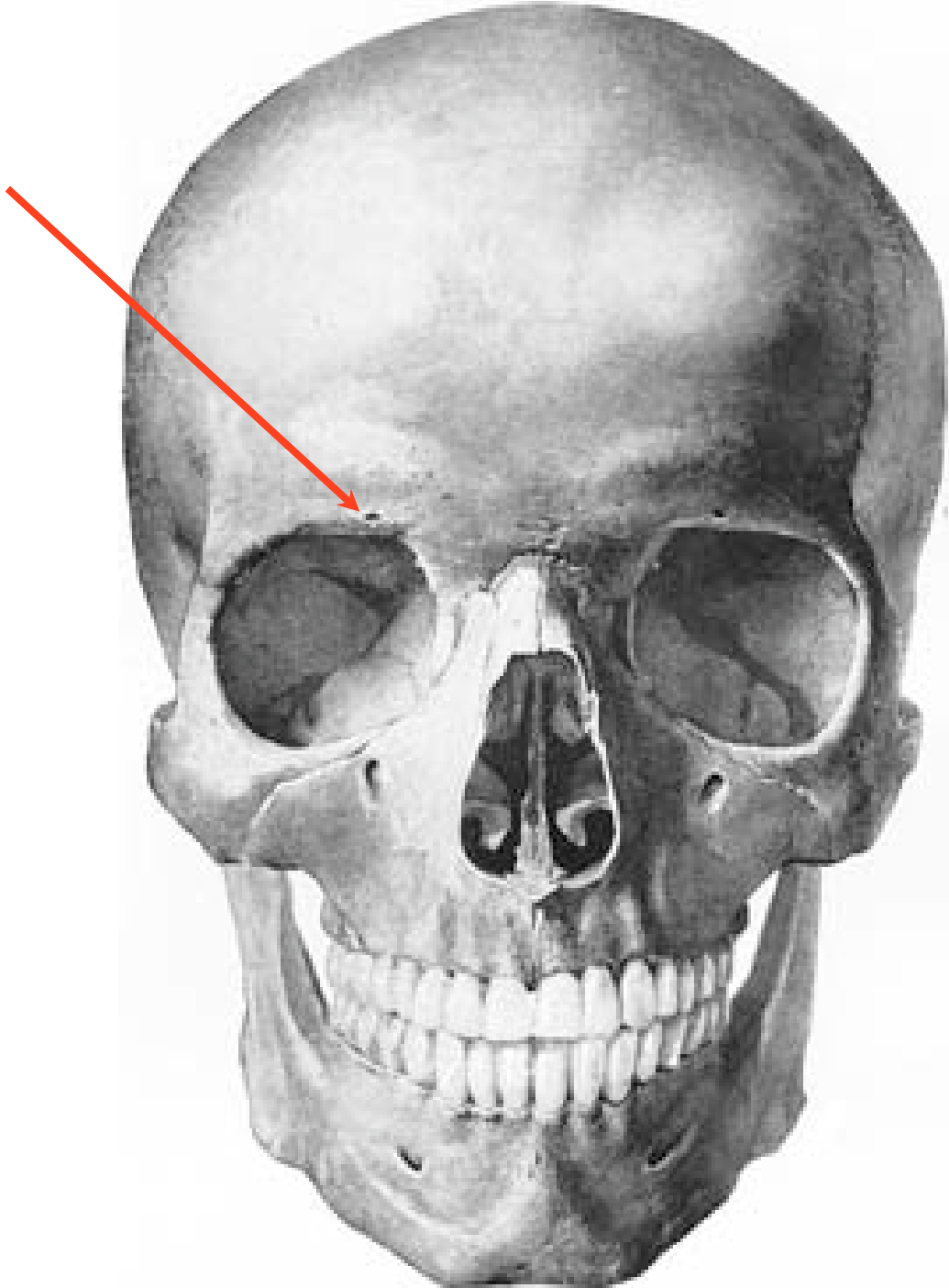
Modern Japanese:

- Tall stature * Y
- High nose * J
- Round head * J

Fig VII-9 Secular change in Japanese traits

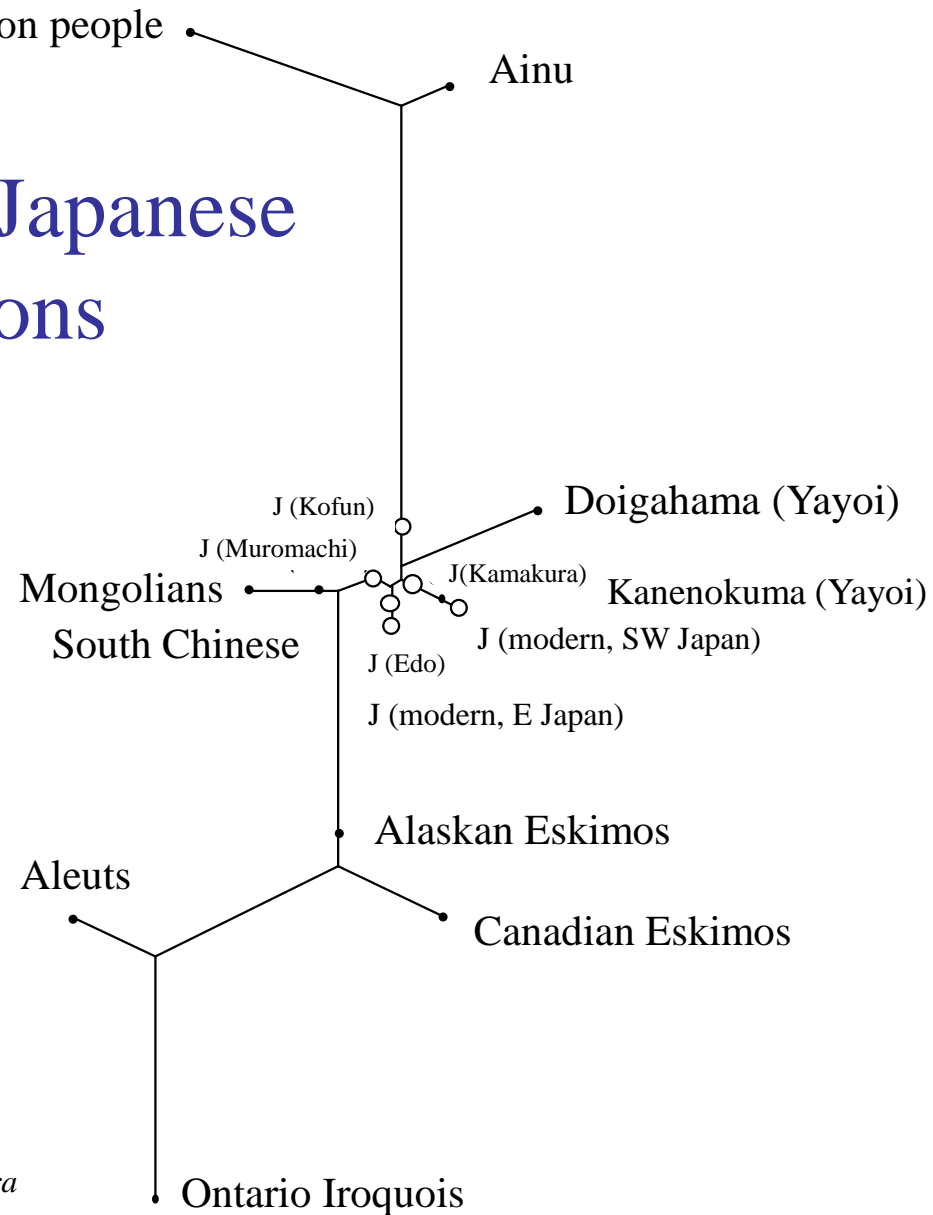
✦ Hisashi Suzuki, *Hone kara Mita Nihonjin no Roots* (The Roots of the Japanese as Seen in Their Bones), Iwanami Shinsho, 1983





Neighbor-Joining Tree of Japanese and Neighboring Populations According to Continuous Variation in Skulls

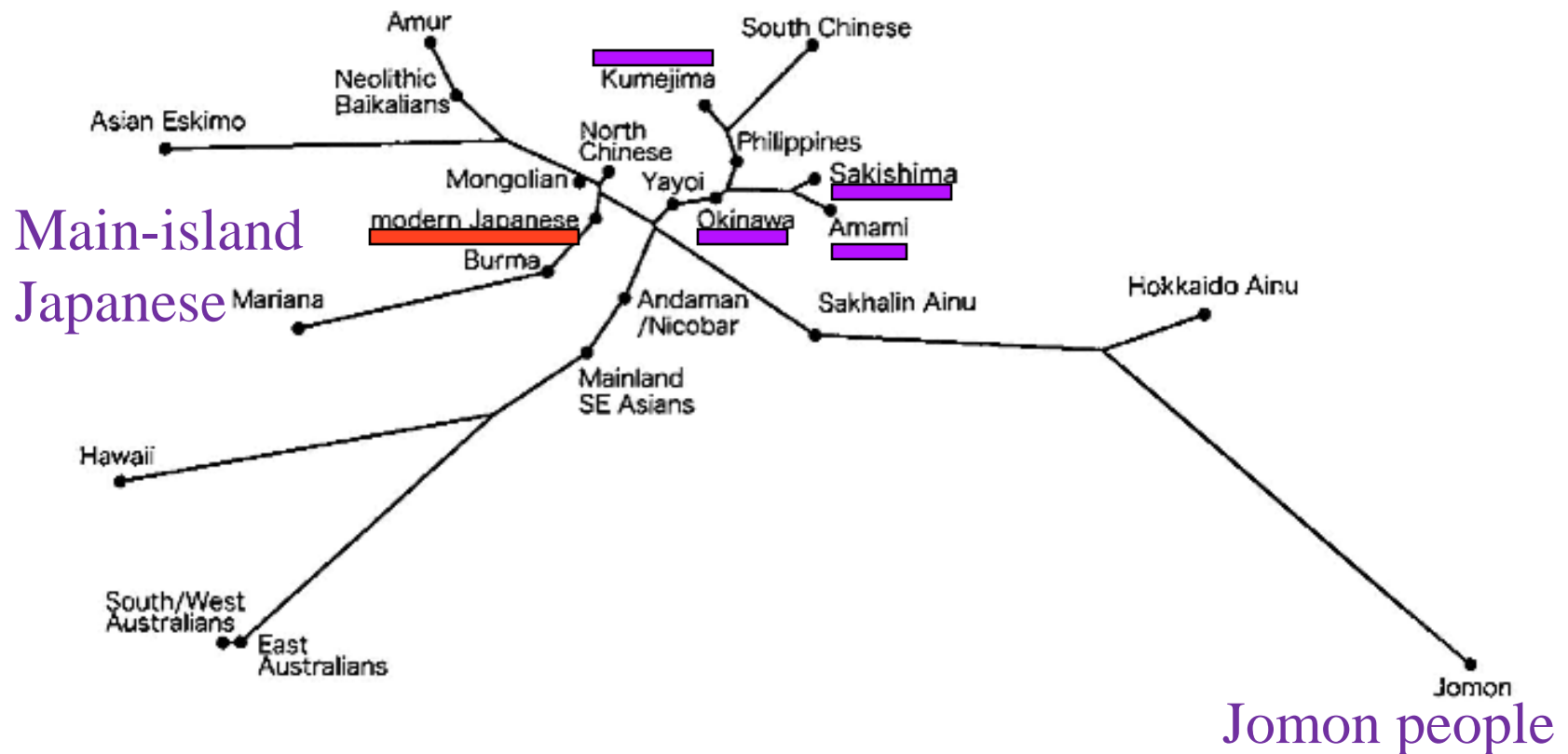
Dodo, Ishida and Saitou (1992)



† Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Relatedness of Human Populations According to Continuous Variation in Morphology

Hajime Ishida, et al (2006)



Anthropological Science
Vol. 114 (2006), No. 2 pp.141-151

"Nonmetric cranial variation of early modern human skeletal remains from Kumejima, Okinawa and the peopling of the Ryukyu Islands"

Tadahiko Fukumine, Tsunehiko Hanihara, Akira Nishime, Hajime Ishida



Emergence of the Japanese According to the Dual-Structure Model

Hanihara, *Nihonjin no Naritachi* (Emergence of the Japanese), (1990)

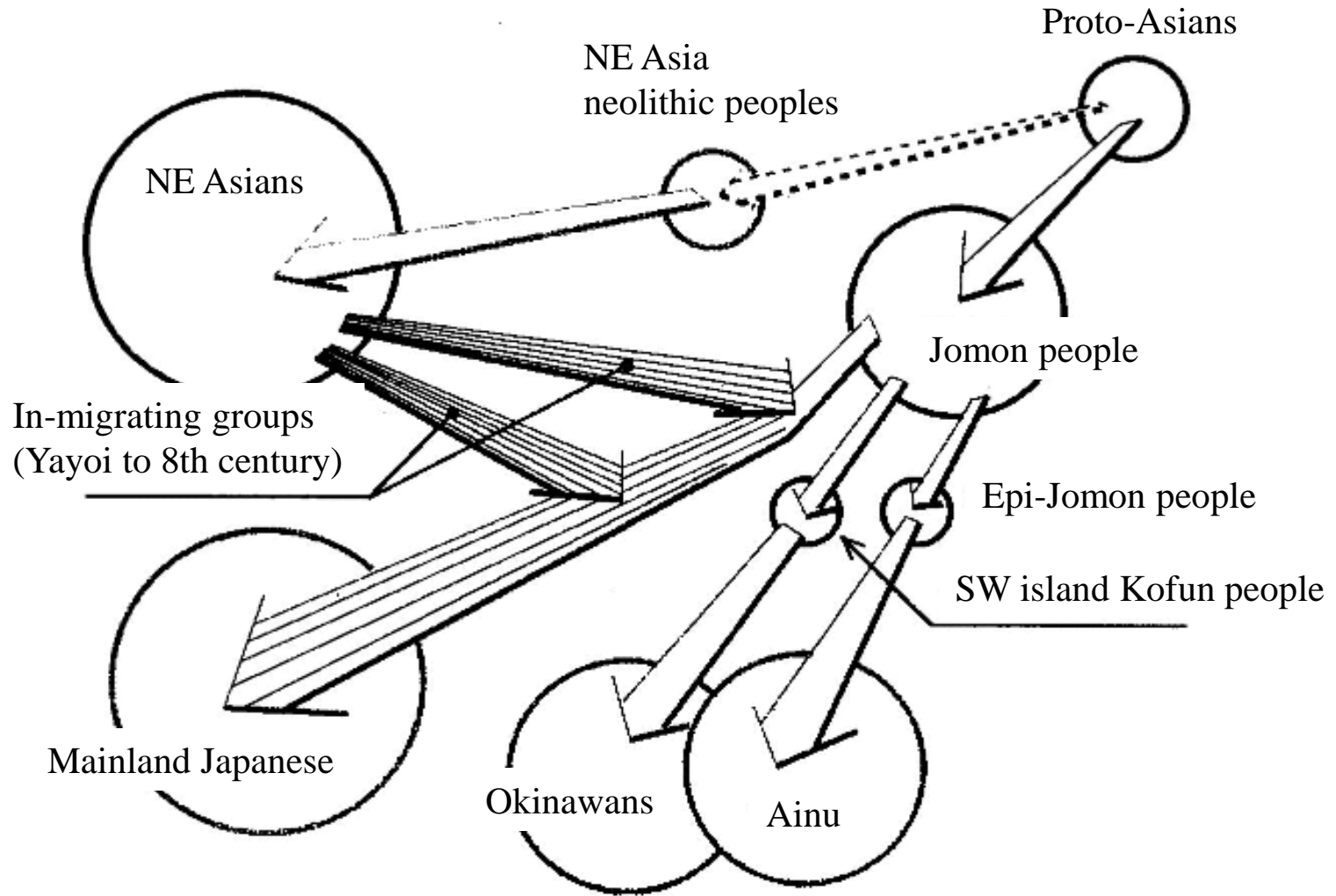
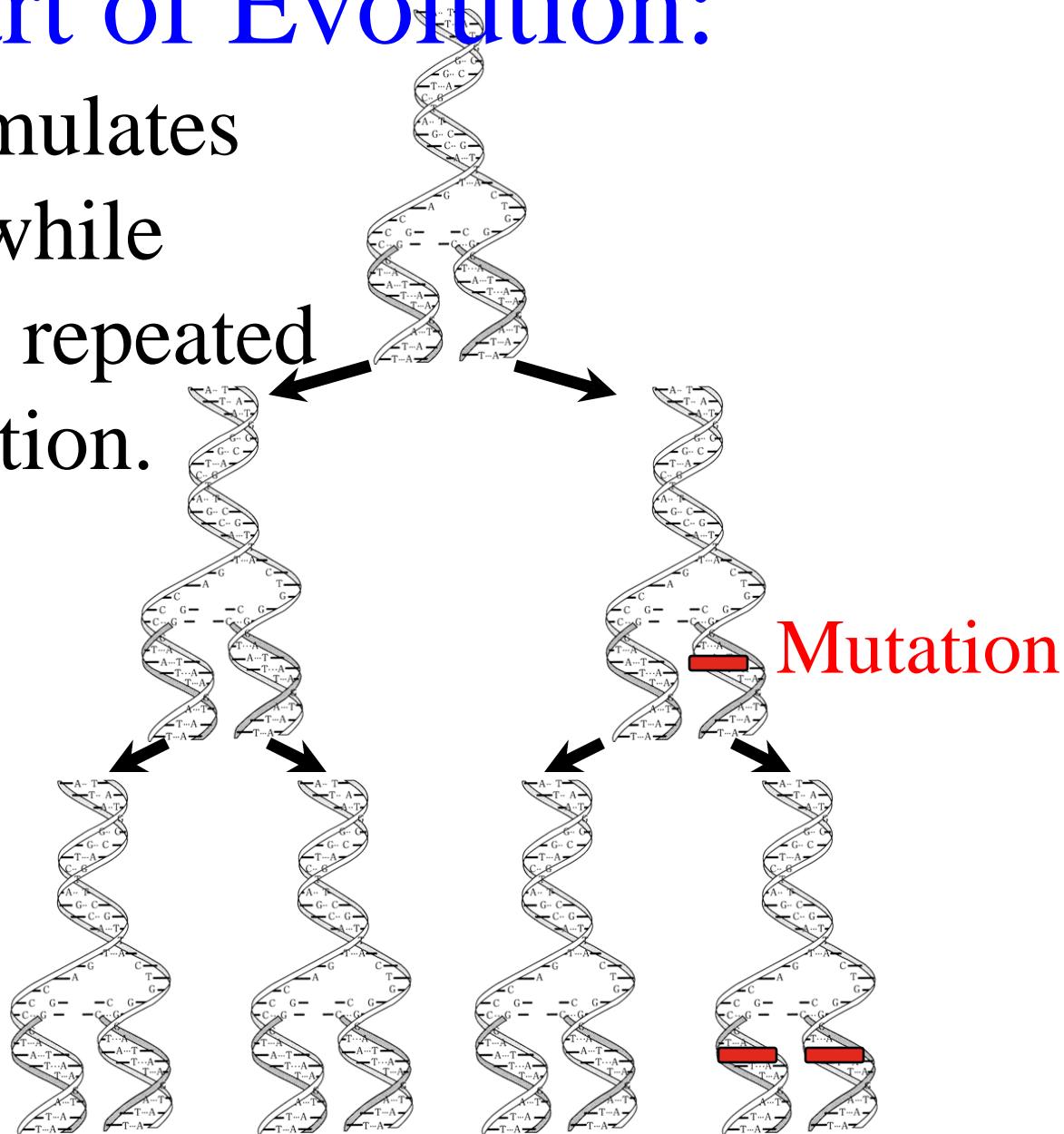


Fig 11-8 The process of emergence of the Japanese
(Based on principal component analysis of craniometric values)

Kazuro Hanihara,
Nihonjin no Naritachi
(*Emergence of the*
Japanese), Jimbun
Shoin, 1990

The Heart of Evolution:

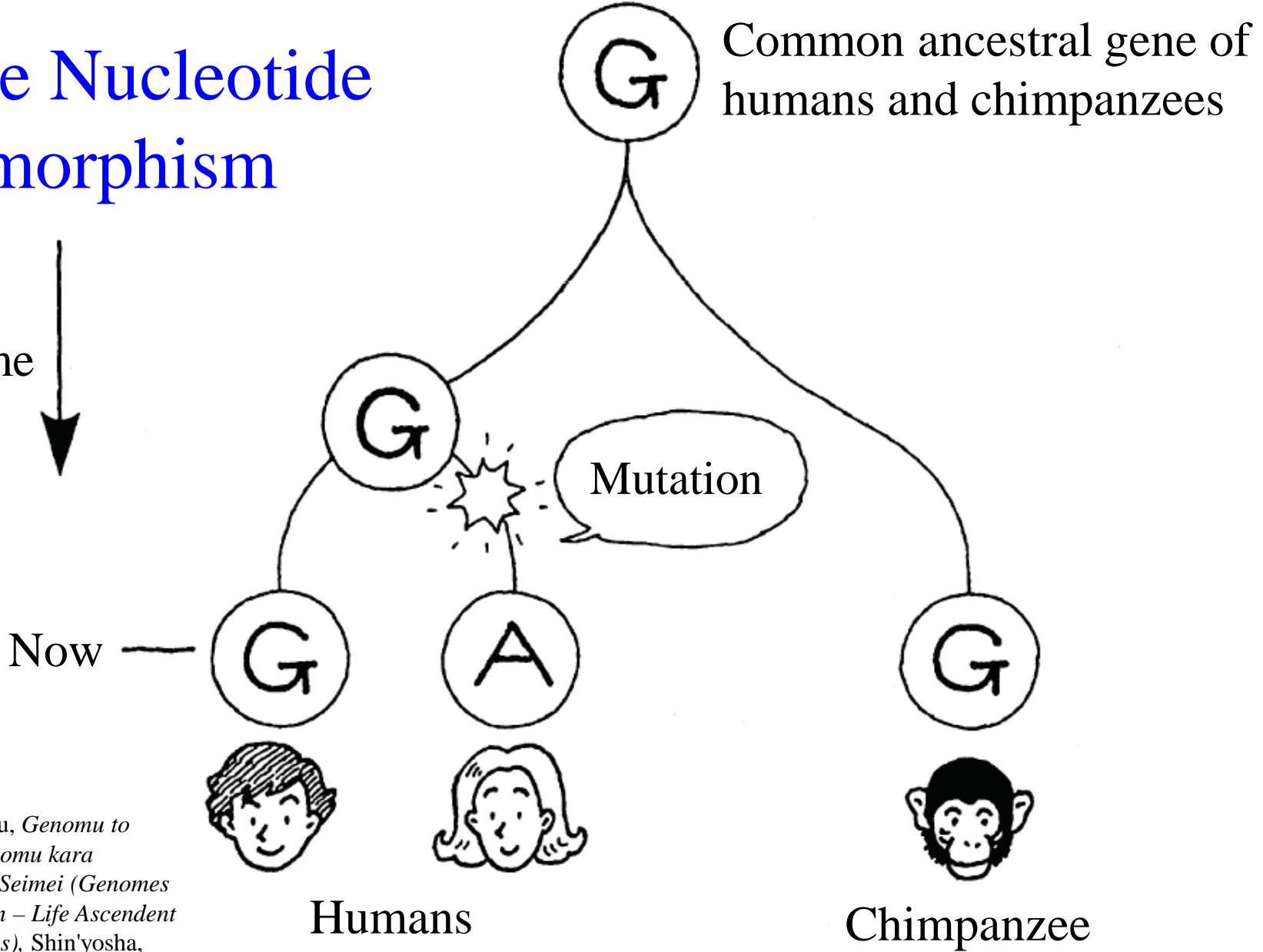
DNA accumulates mutations while undergoing repeated self-replication.



SNP

Single Nucleotide Polymorphism

Time ↓



Naruya Saitou, *Genomu to Shinka – Genomu kara Tachinoboru Seimei (Genomes and Evolution – Life Ascendent from Genomes)*, Shin'yosha, 2004.

Illustrations: Saori Yasutomi

Naruya Saitou, *Genomu to Shinka – Genomu kara Tachinoboru Seimei (Genomes and Evolution – Life Ascendent from Genomes)*, Shin'yosha, 2004.

SNP

Single Nucleotide Polymorphism

Looking at nucleotide sequences in genes on homologous chromosomes ...

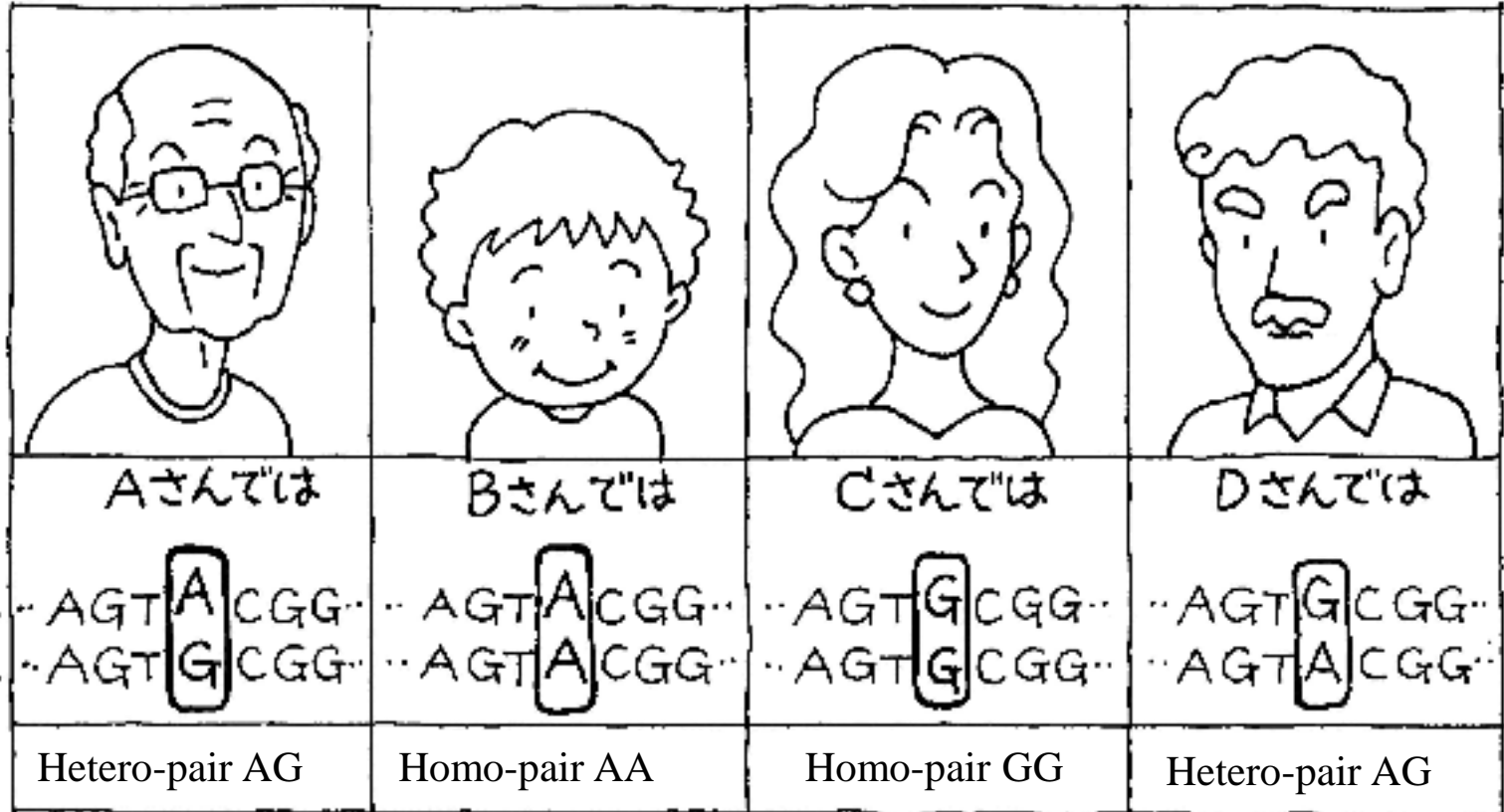


Fig 4-6 Single nucleotide polymorphism

SNP (A Single-Nucleosome polymorphism) is a DNA sequence variation occurring when a single nucleotide in a genome. In the above figure, there are examples of each individuals, that is Homo-pair of G or A, and Herero-pair of A and G.

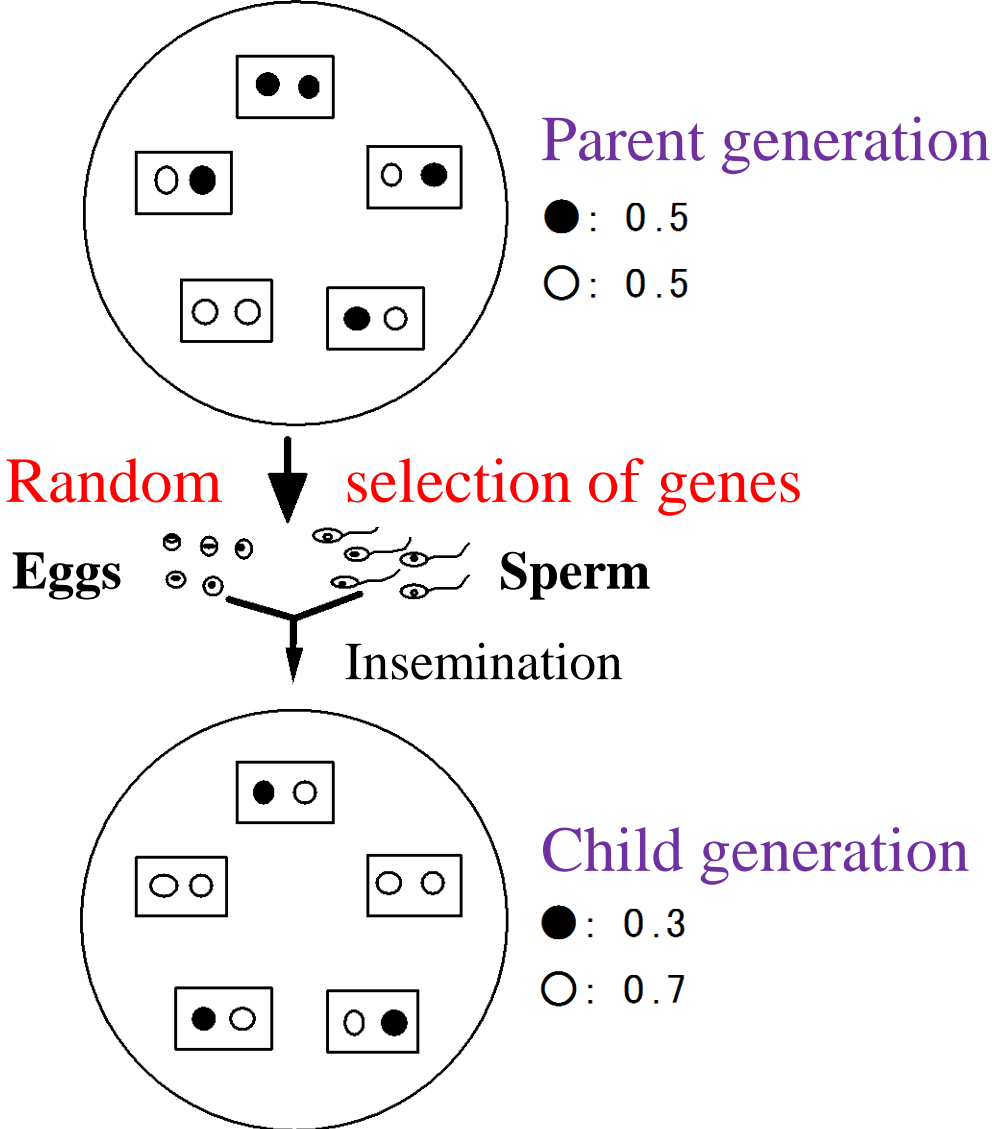
Individual Genetic Differences among Human Beings

0.07%

= $0.07 \times 0.01 \times 3 \text{ billion} \times 2$

= c.4.2 million nucleotide differences

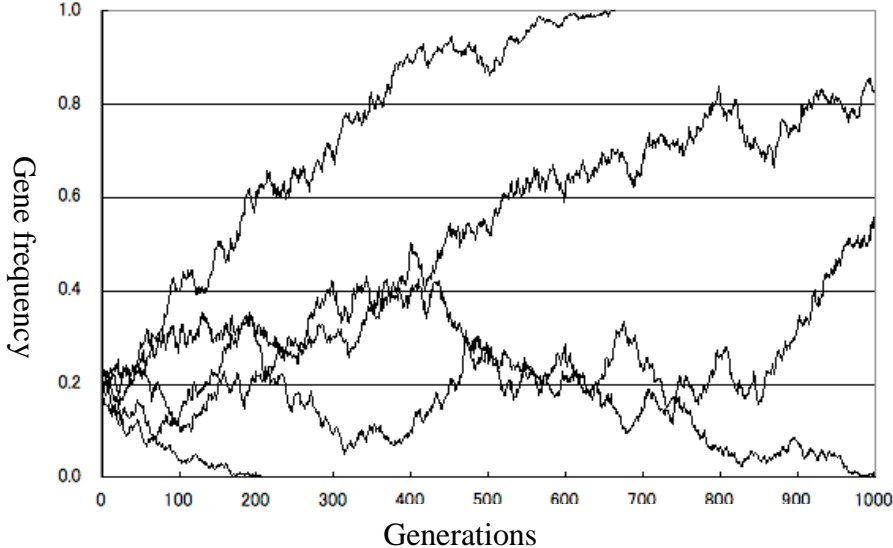
Random Genetic Drift



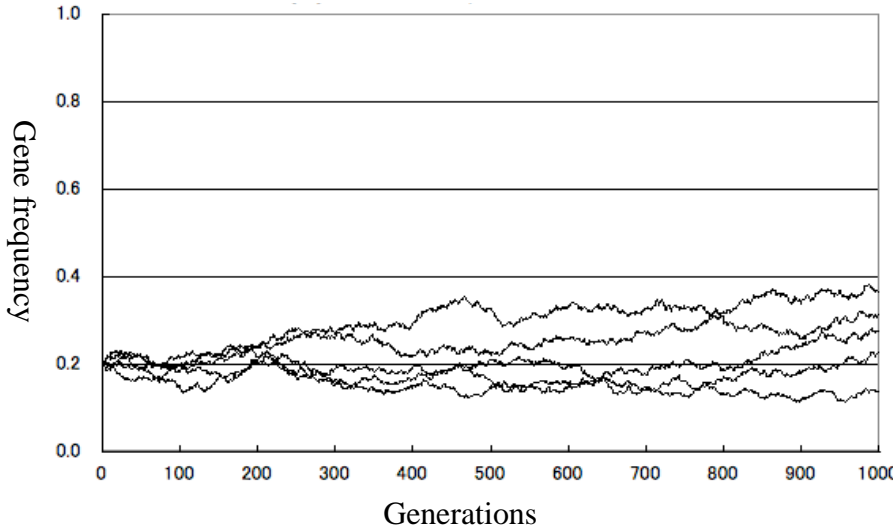
Computer Simulation of Random Genetic Drift

(Saitou, *Genomu Shinka-gaku Nyumon* (Introduction to Genome Evolution))

(A) 1,000 individuals



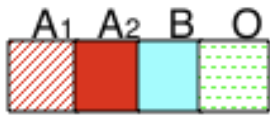
(B) 10,000 individuals



Naruya Saitou, *Genomu Shinka Gaku Nyumon* (Introduction to Genome Evolution), Kyouritsu Shuppan, 2007.



ABO Blood Type Gene Frequency



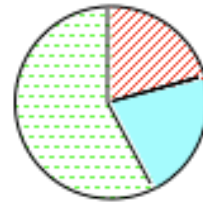
Japanese



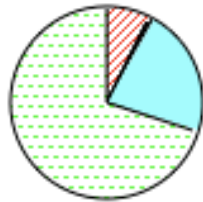
Koreans



Chinese



Indonesians



Dogrib



Guayami



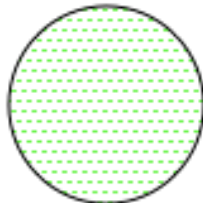
Wapisiana



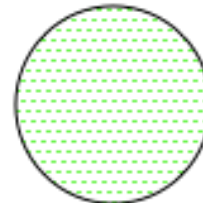
Aymara



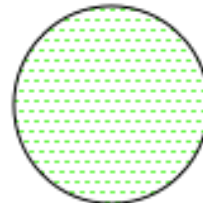
Yanomama



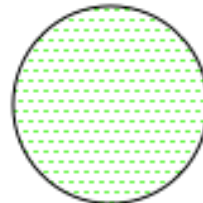
Baniva



Cayapo



Maquiritare



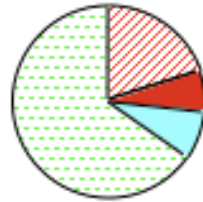
Papuans



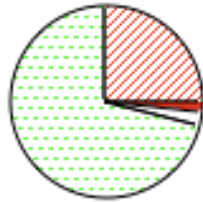
Iranians



Germans

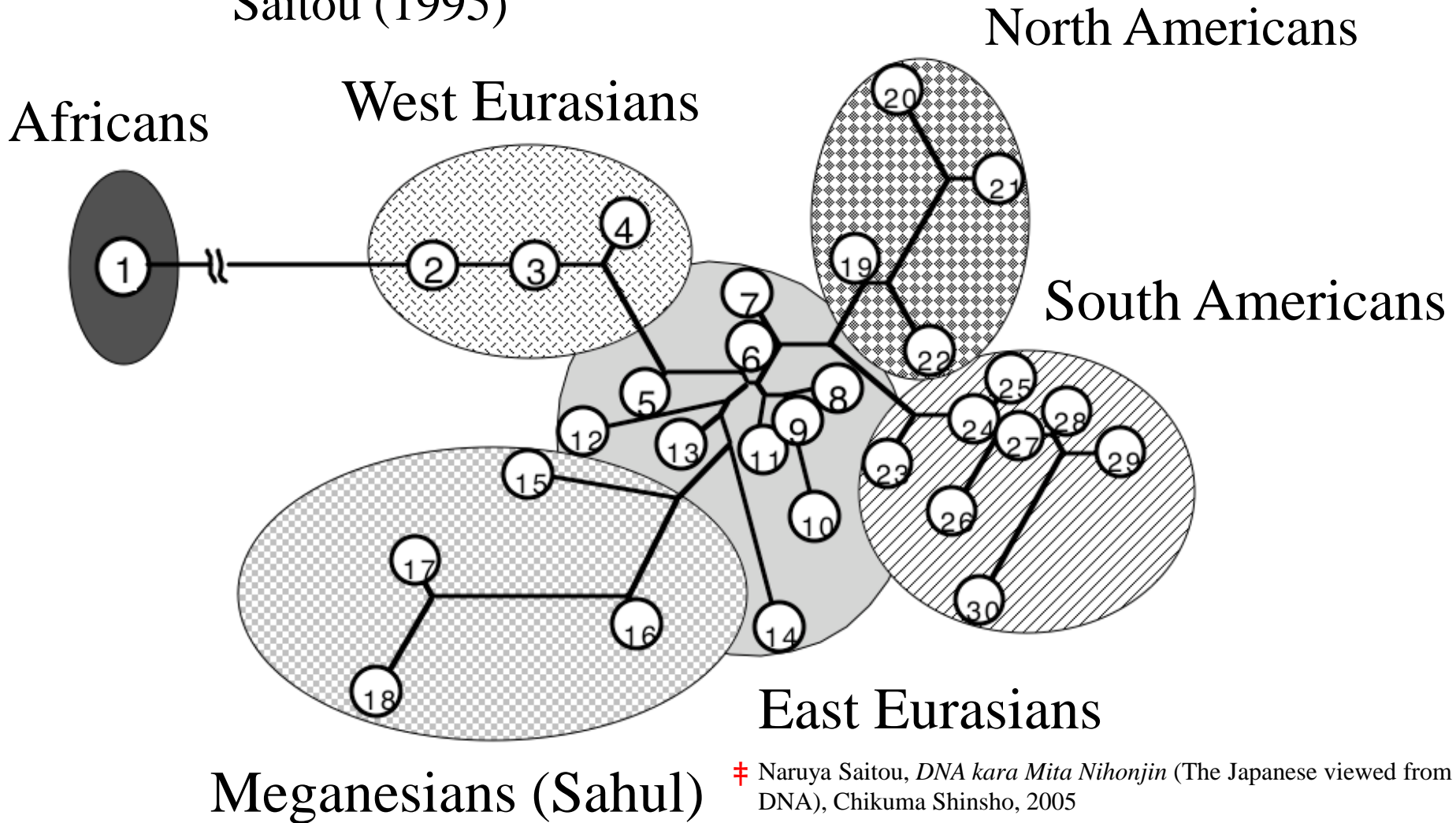


San



Genetic Neighbor-Joining Tree for 30 Populations Worldwide

Saitou (1995)



† Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Saitou N. (1995) A genetic affinity analysis of human populations. *Human Evolution*, Vol. 10, No. 1, pp. 17-33.

Genealogical tree of human mitochondrial DNA

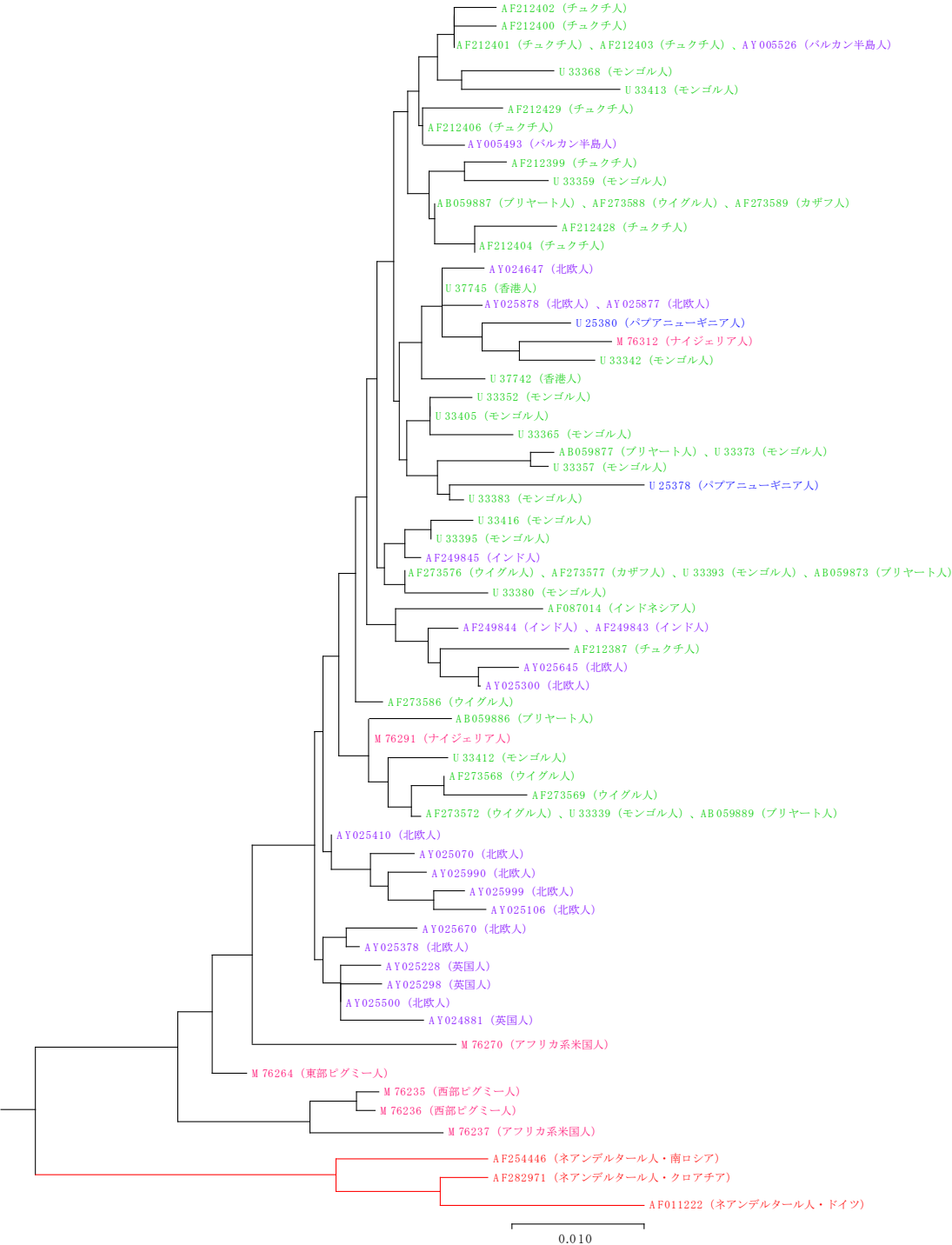
Modern East Eurasians

Modern Oceanians

Modern West Eurasians

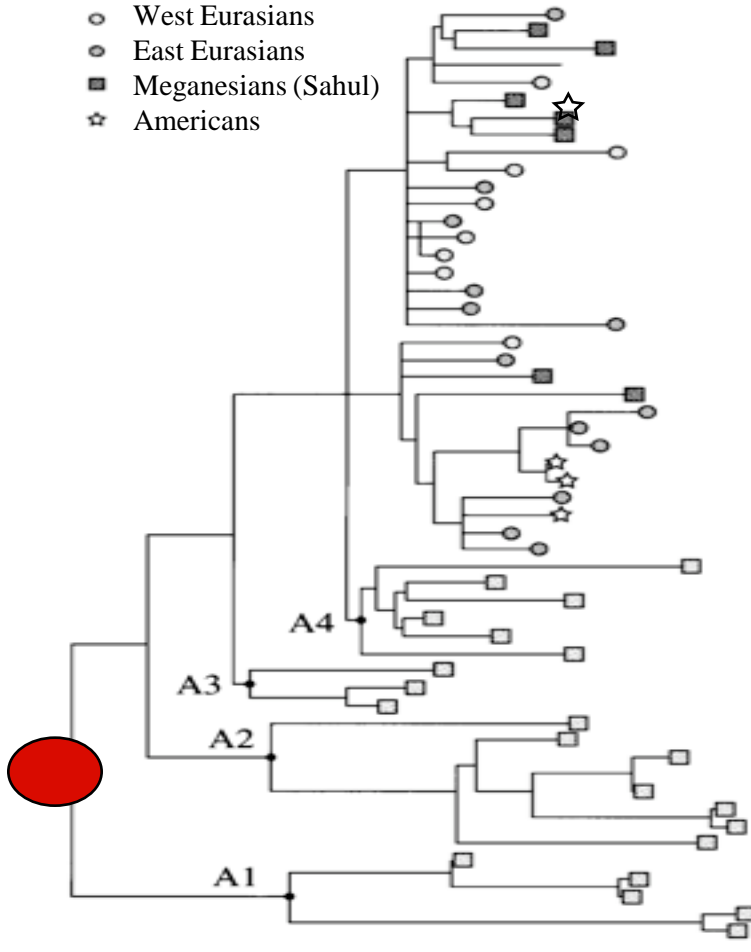
Modern Africans

Neanderthals



- Africans
- West Eurasians
- East Eurasians
- Meganesians (Sahul)
- ☆ Americans

Genealogical tree of human mitochondrial DNA, 52 complete sequences

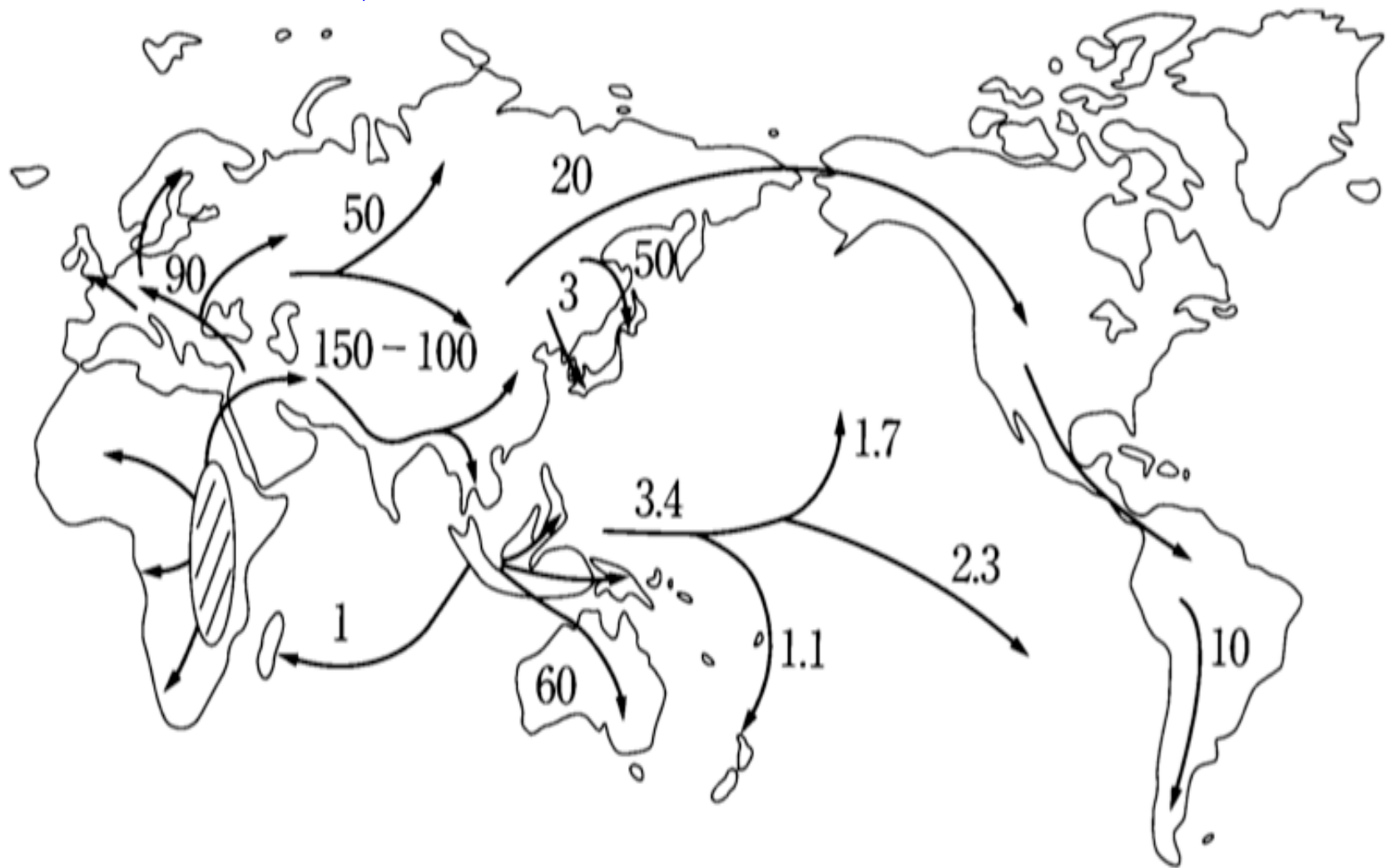


Africans

A genealogical chart of mtDNA in the entire world
(Ingman et al., 2000)

✚ Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Inferred Route of Human Diffusion from Africa Over Past 150,000 Years

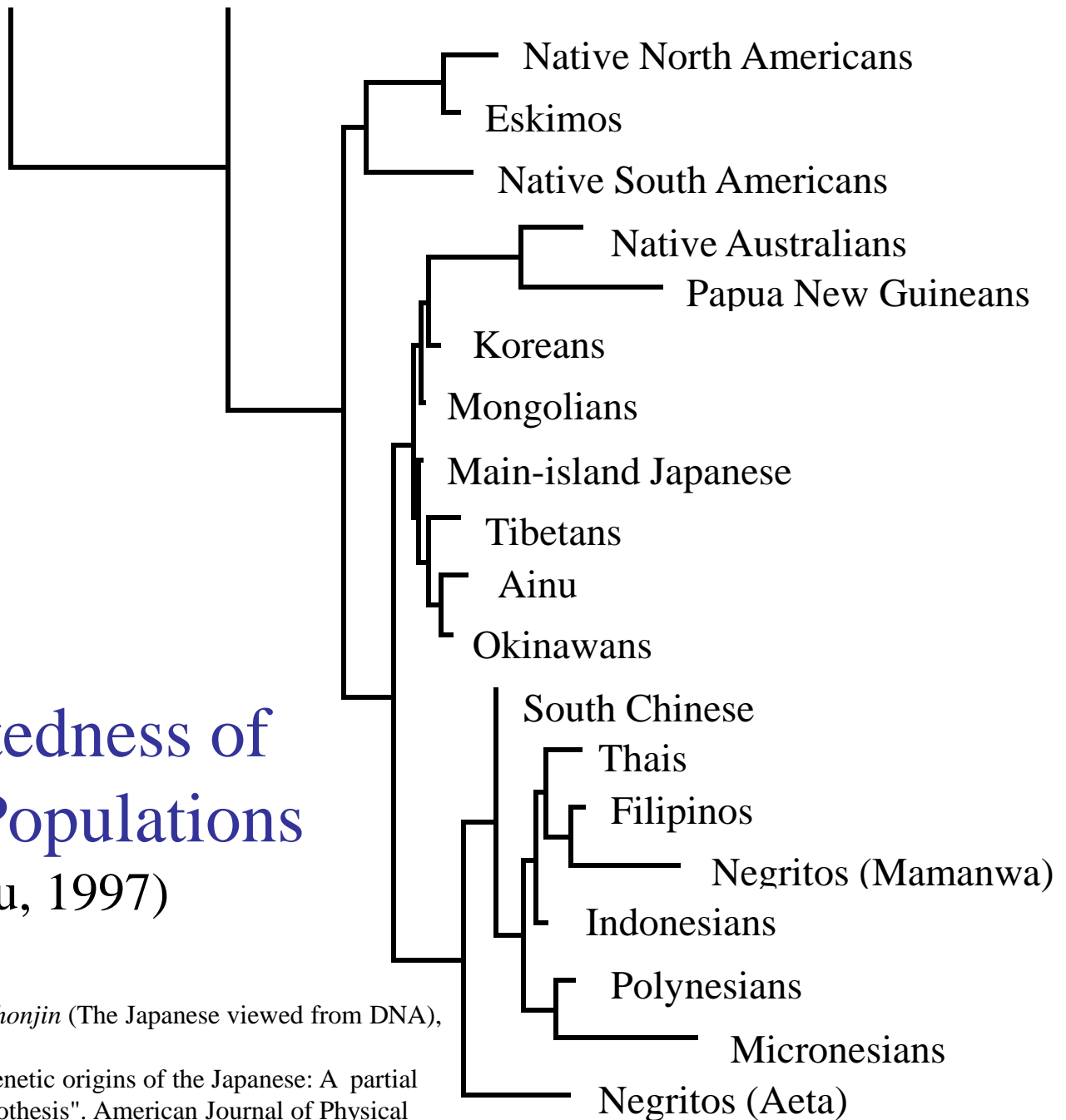


† Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Taiwan, the Philippines, Northeast China, Mongolia



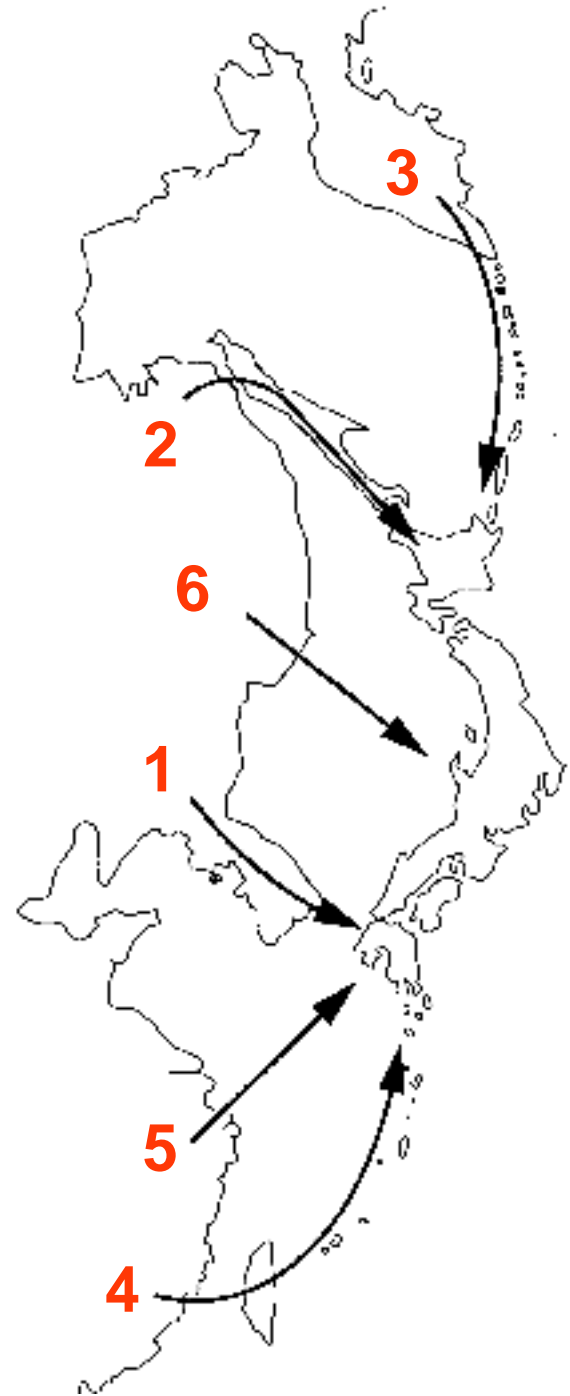
Genetic Relatedness of Pacific Rim Populations (Omoto and Saitou, 1997)



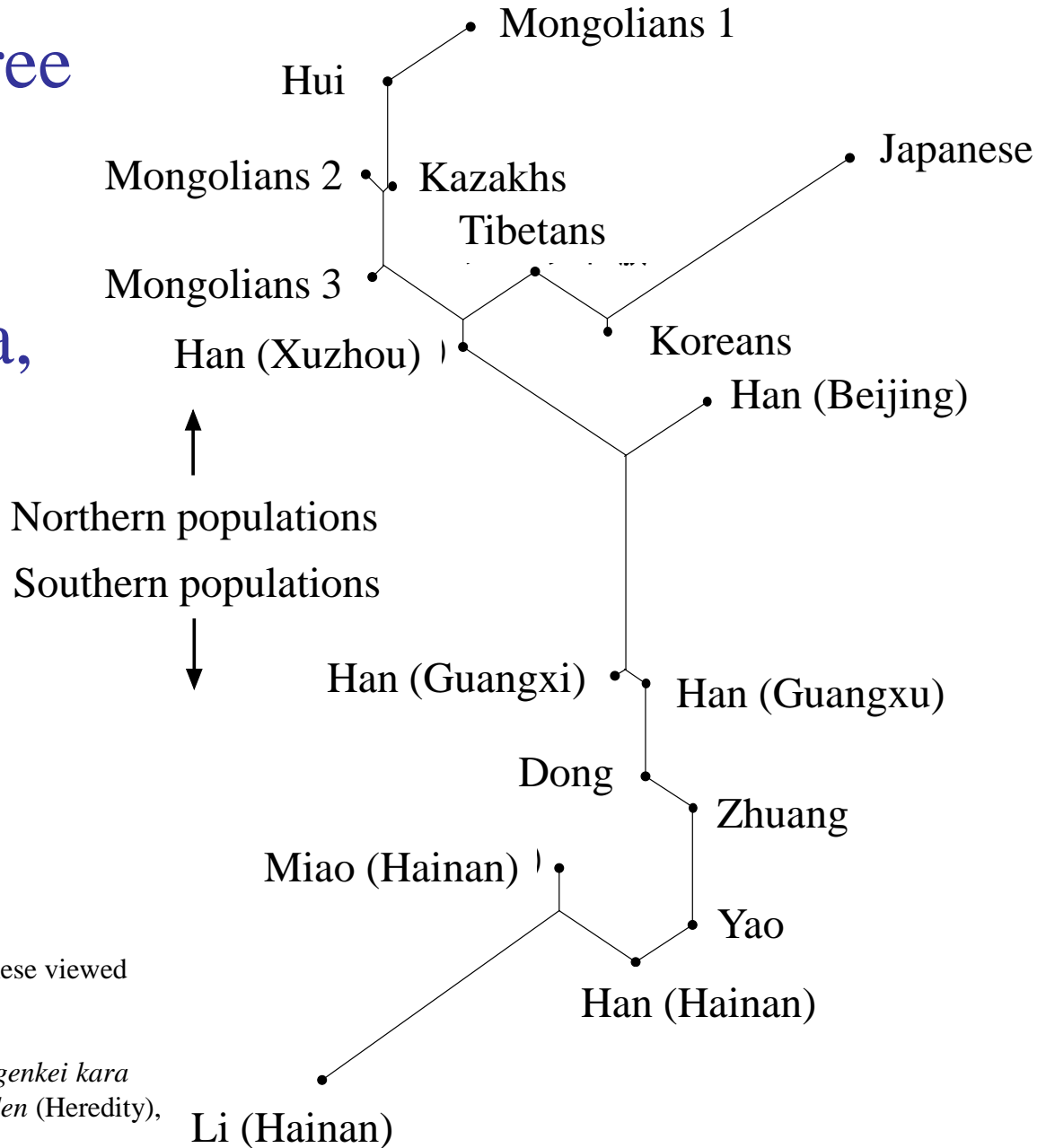
- ‡ Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005
Omoto K. and Saitou N. (1997) Genetic origins of the Japanese: A partial support for the "dual structure hypothesis". *American Journal of Physical Anthropology*, Vol. 102, No. 4, pp. 437-446.

Migratory Routes to the Japanese Islands

DNA kara Mita Nihonjin
(The Japanese viewed from DNA)



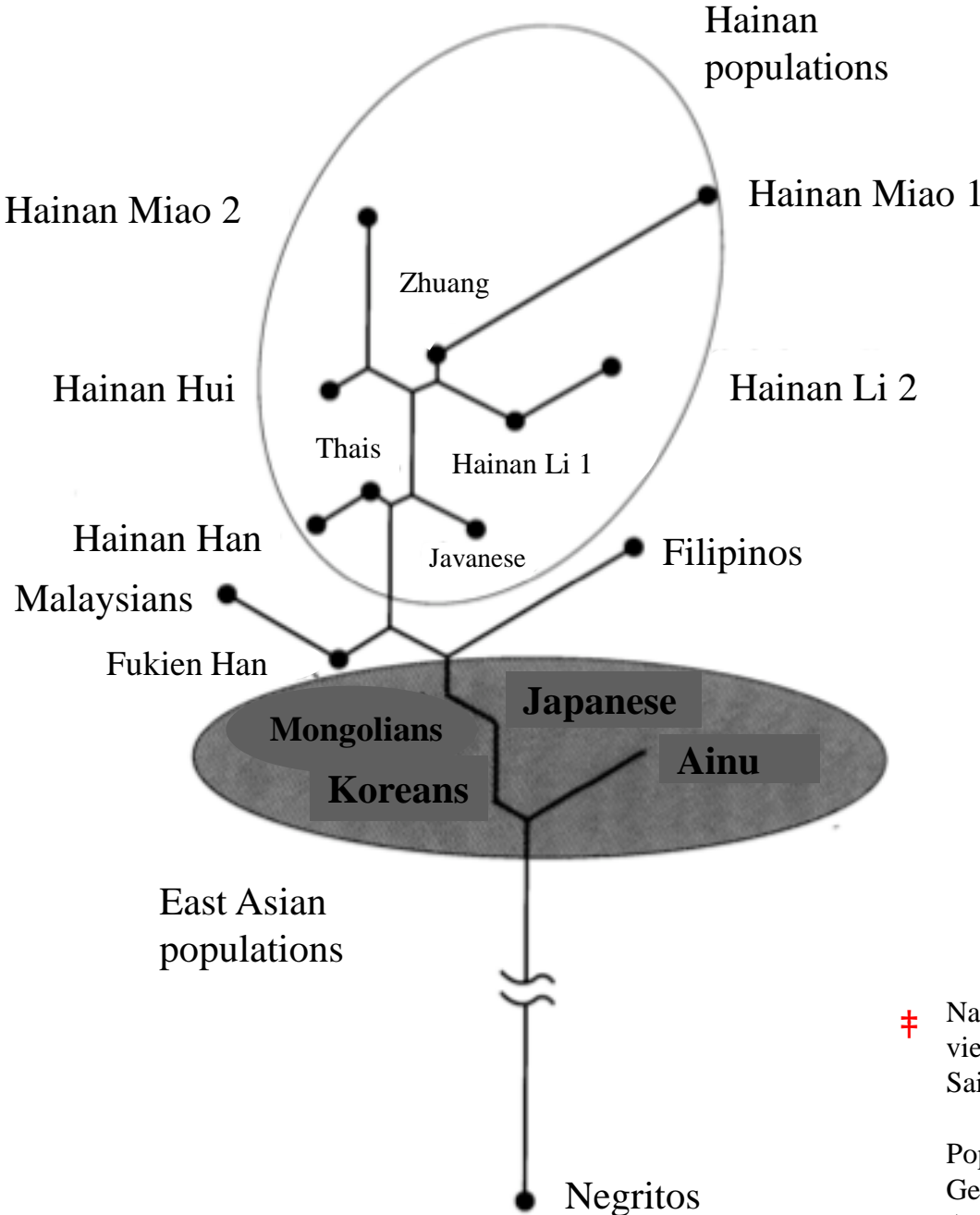
Neighbor-Joining Tree for East Asian Populations with Focus on China, Based on HLA Data Tokunaga and Saitou (1988)



† Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Naruya Saitou, Katsushi Tokunaga (1998) *HLA kougenkei kara Mita Nihonjin* (The Japanese viewed from HLA), *Iden* (Heredity), Vol. 42, No. 10, pp. 40-46.

Genetic Relatedness Estimated from Data on 10 Genes, Including ABO Blood Type Saitou (1994)

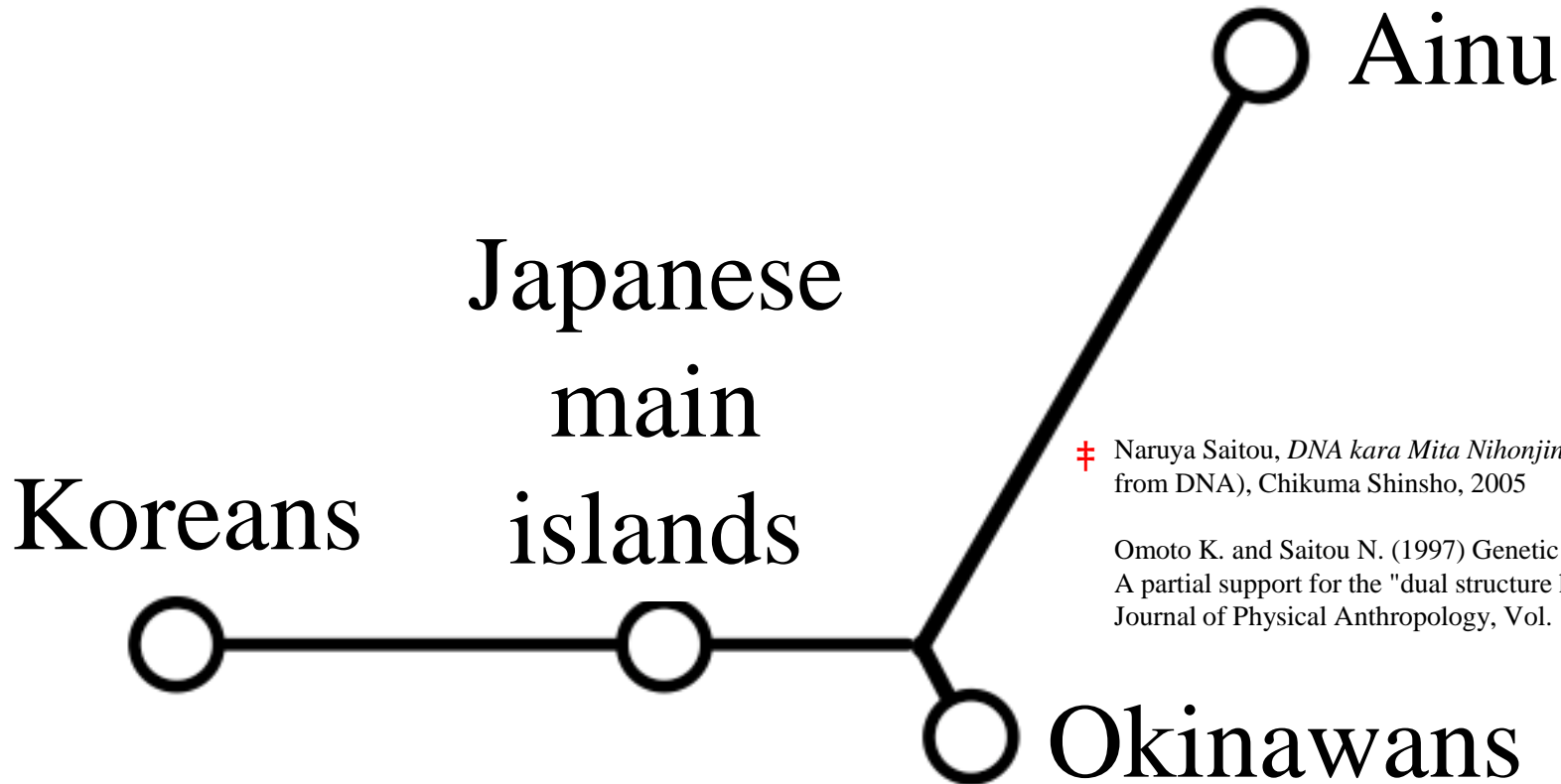


‡ Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005
Saitou N., Omoto K., Du C., and Du R. (1994)

Population genetic study in Hainan Island, China. II.
Genetic affinity analyses.
Anthropological Science, Vol. 102, No. 2, pp. 129-147.

Genetic Relatedness among Four Populations in the Japanese Islands Area: An Unrooted Genealogical Tree

Omoto and Saitou (1997)

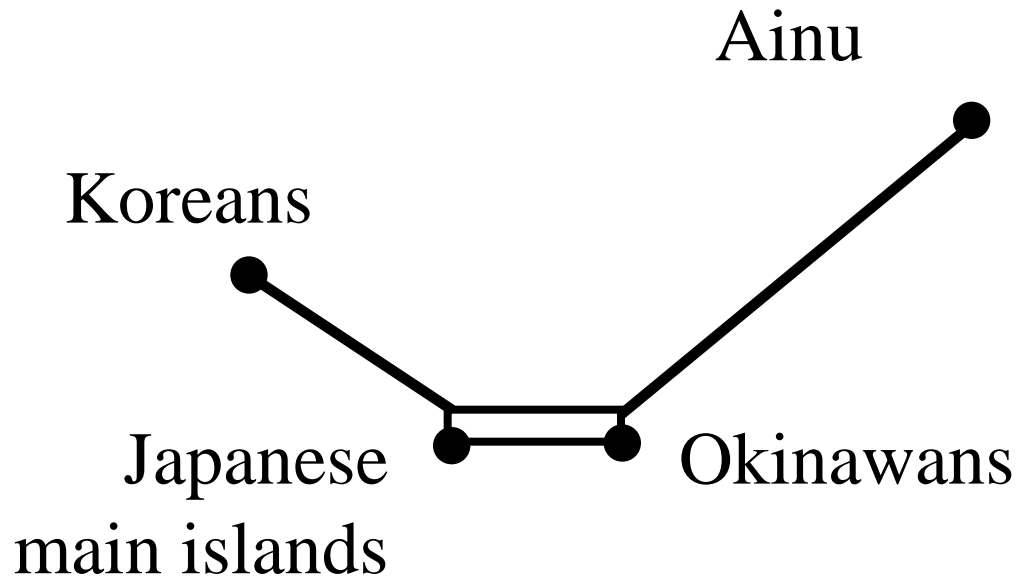


‡ Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Omoto K. and Saitou N. (1997) Genetic origins of the Japanese: A partial support for the "dual structure hypothesis". *American Journal of Physical Anthropology*, Vol. 102, No. 4, pp. 437-446.

Genetic Relatedness among Four Populations in the Japanese Islands Area: A Genealogical Network

Saitou (2008)



‡ Saitou N. (2008) Genetic Relationships of Human Populations in and around the Japanese Archipelago. In Matsumura S., Forster P. and Renfrew C. (eds.), "Simulations, genetics and human prehistory", McDonald Institute Monographs, Cambridge, pp. 89-92.

Your Genome Is . . .

You

Your Genome Is . . .

Mother

Father

You

Your Genome Is . . .

Grandmother

Grandfather

Grandmother

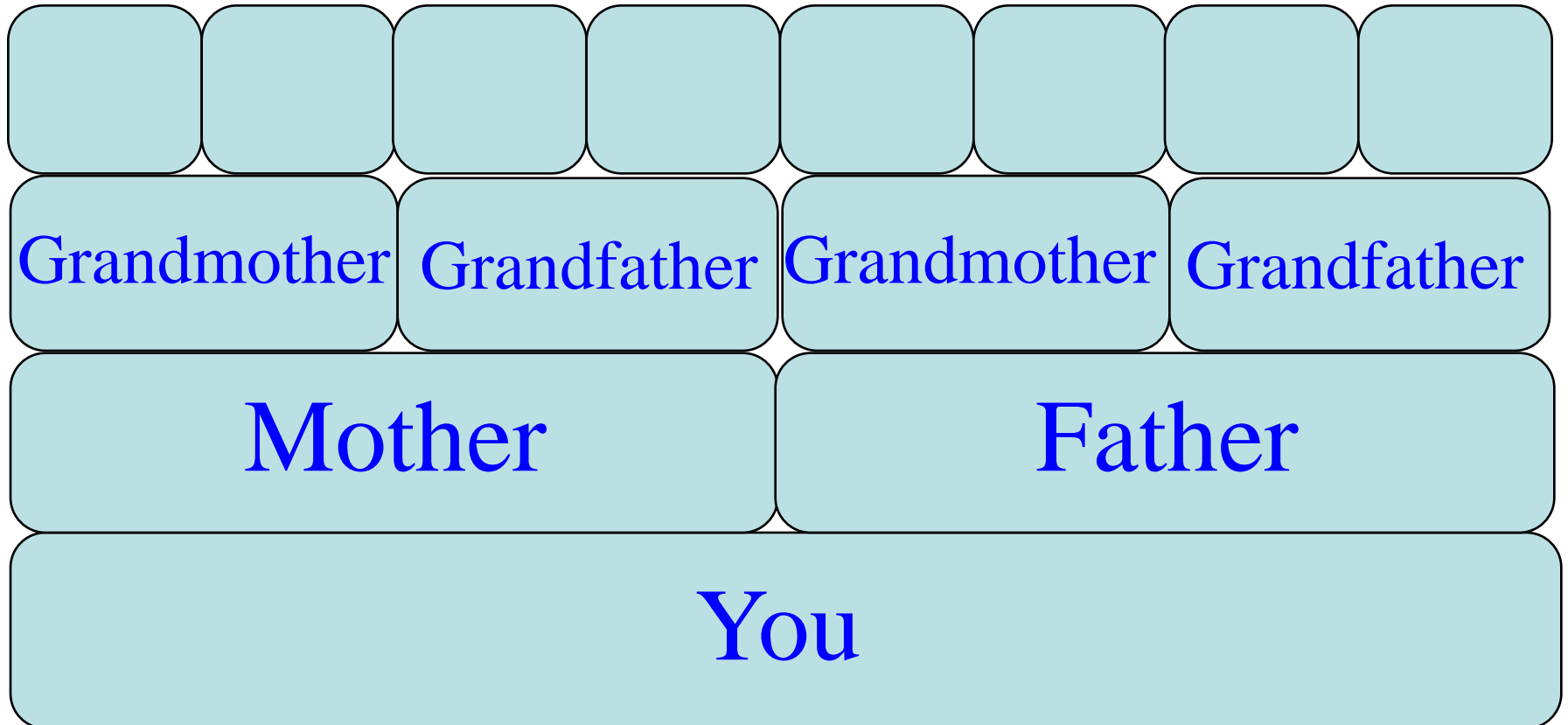
Grandfather

Mother

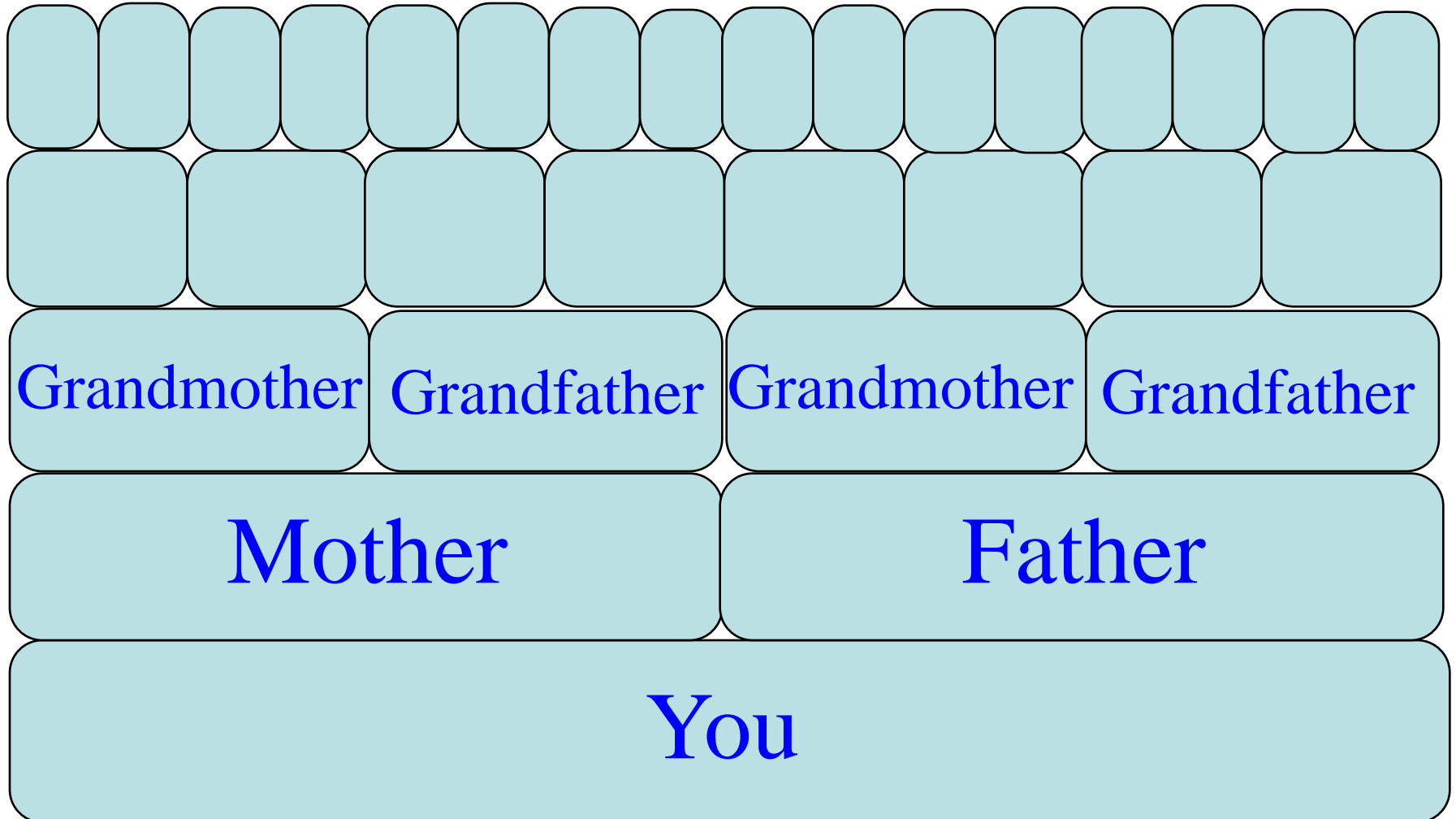
Father

You

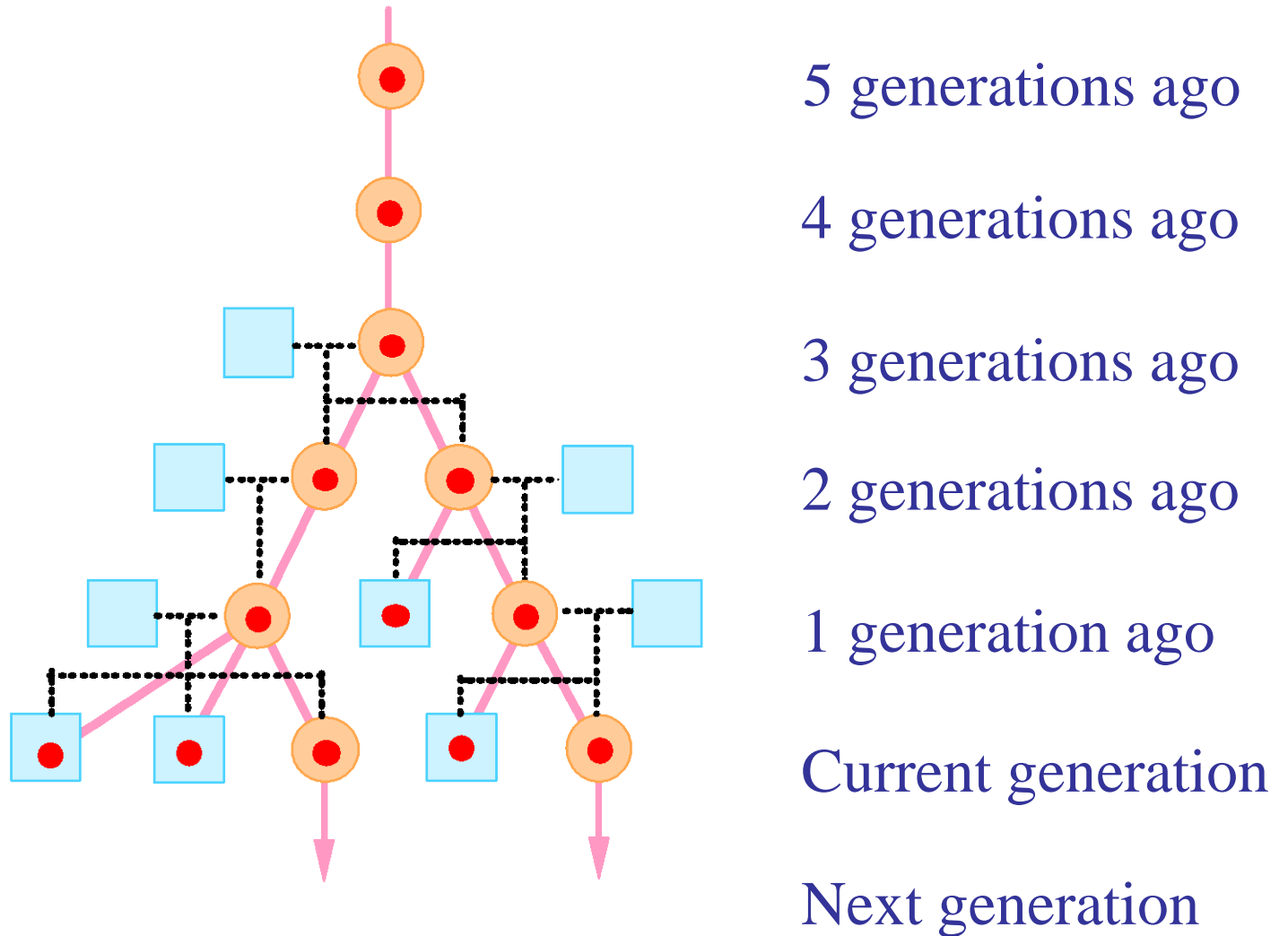
Your Genome is Your Ancestral Fitness



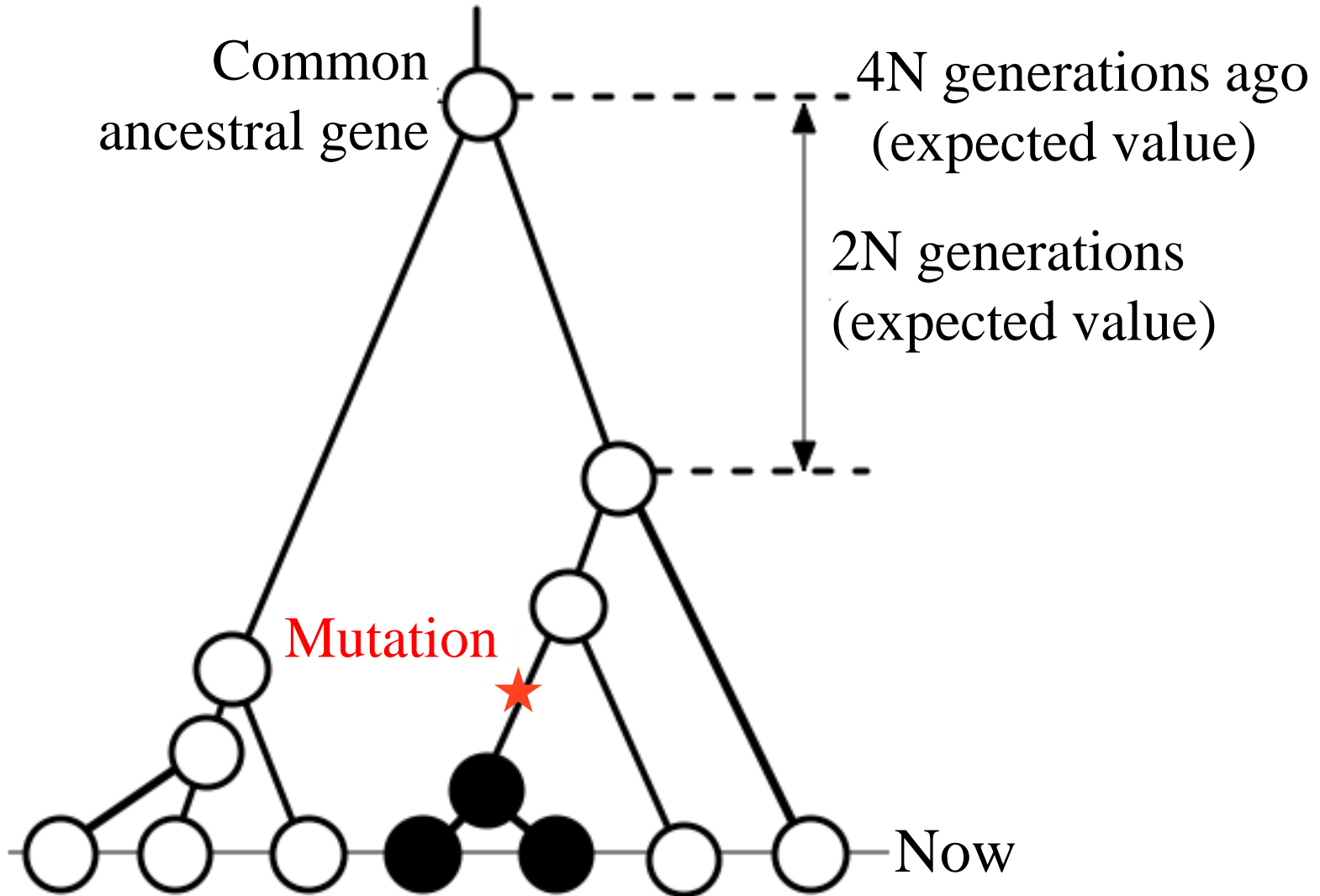
Your Genome is Your Ancestral Fitness



Mitochondrial DNA Is Matrilineal



Gene Genealogy



84 185 60

Nucleotide sequences compared (multiple alignment)

nucleotides 1 - 60

```
1 atgcttacaagcaagtacagcaatcaaccttcaactatcacacatcaactgcaactccaa
2 .....
3 .....
4 .....
5 .....
6 .....
7 .....
8 .....
9 .....t.....
10 .....
11 .....
12 .....
13 .....g.....
14 .....
15 .....
16 .....
17 .....
18 .....
19 .....a.....
20 .....
21 .....
22 .....
23 .....g.....
24 .....g.....
25 .....g.....
26 .....
27 .....
28 .....
29 .....
30 .....
```

Y Chromosome Haplotypes Present Only in Japanese Islanders

Table 4-3 Gene frequency (%) in Y chromosome haplotypes among Asian populations, with a focus on the Japanese islands

Population	1	2	3 *	4 *	5	6	7 †
Buryats	8.4	—	—	—	1.0	—	— †
Nivkhi	3.8	—	—	—	2.9	—	1.9 †
Japanese islanders (Ainu group)	1.3	—	8.1	6	—	—	— †
Japanese islanders (Honshu group)	1	5	2.0	1.7	3.8	2.0	— †
Japanese islanders (Kyushu group)	8	4	1.6	1.2	3.4	2.4	— †
Japanese islanders (Okinawa group)	—	4	3.6	2.0	2.2	1.6	2 †
North Chinese Han	8	—	—	—	2.2	5.5	8 †
South Chinese Han (Taiwan)	1.4	—	—	—	1.0	6.2	— †
Indigenous Taiwanese ("Takasago" mountain peoples)	1	—	—	—	3	1.3	— †
Filipinos	—	—	—	—	2	3.8	2 †
Thais	—	—	—	—	4.4	3.5	3 †
Malaysians	—	—	—	—	2.5	2.5	— †

* YAP+ haplotypes (those with the Alu insertion sequence), Tajima and Horai (2004)

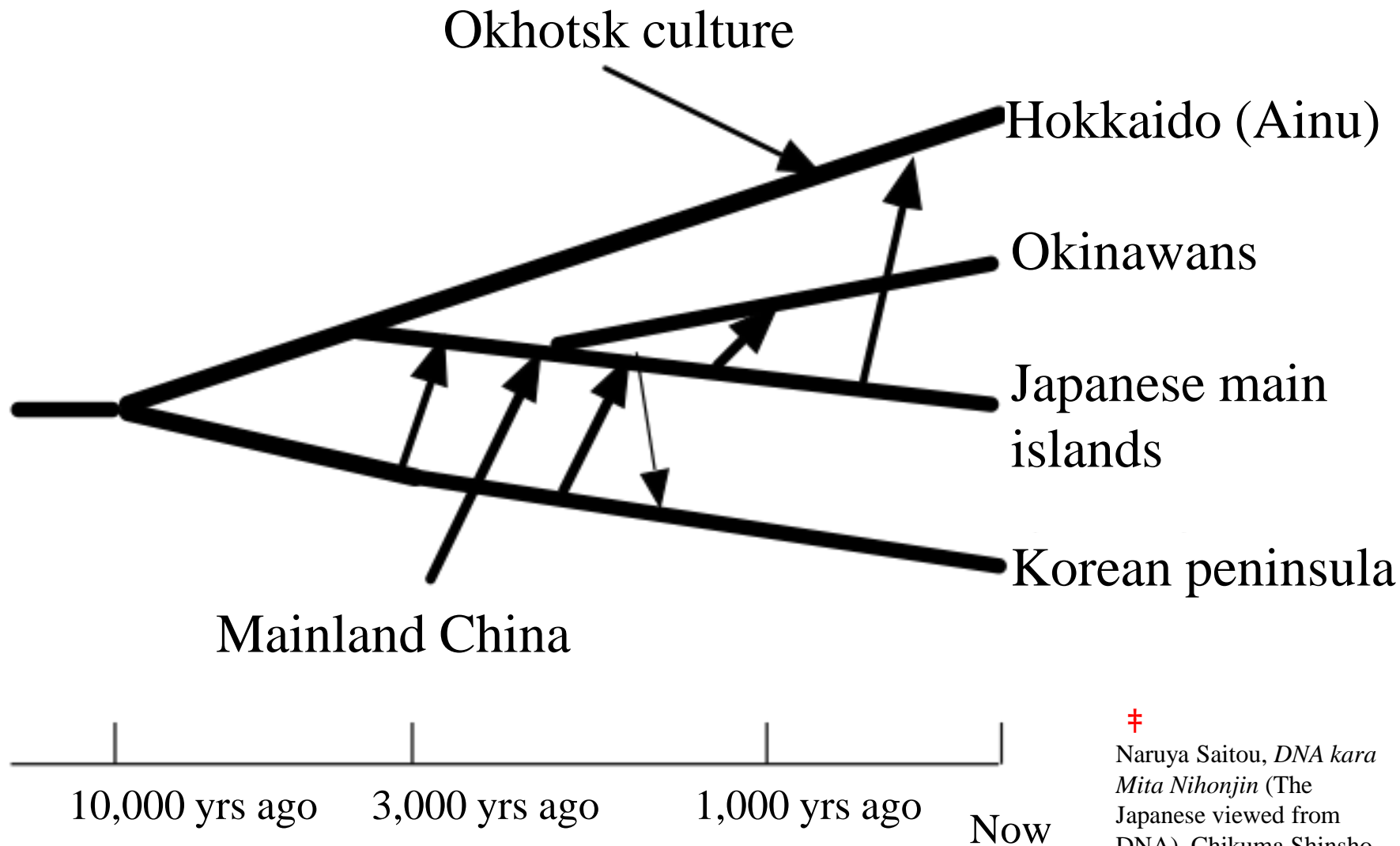
Leukocyte Blood-Type HLA Data

Table 4-2 HLA haplotype frequencies compared

No.	A-B-DRB1	Japanese main islands	Okinawans	Ainu	Koreans	Chinese Koreans	Northern Han	Chinese Manchurians	Buryats
1	24-52-1502	8.6	1.5	1.0	1.4	2.2	-	-	-
2	33-44-1302	4.8	-	-	5.1	3.5	2.0	-	-
3	24-7-0101	4.0	1.8	1.0	3.2	1.7	-	-	-
4	24-54-0405	3.1	6.1	-	1.2	0.9	-	1.2	1.3
5	24-61-0901	1.6	2.3	2.0	-	1.2	0.9	-	1.0
6	11-62-0406	1.2	1.5	-	0.7	2.5	-	1.7	-
7	24-59-0405	0.8	4.1	-	-	0.7	-	0.6	-
8	2-51-0901	0.7	1.4	-	1.3	-	0.7	0.6	2.5
9	26-62-1501	0.5	2.0	-	0.8	-	-	-	-
10	31-51-1202	0.5	-	8.0	-	-	-	-	-
11	2-35-1501	0.4	4.9	1.0	-	-	1.0	-	-
12	24-35-1401	0.4	-	6.0	-	-	-	-	-
13	2-61-0405	-	2.7	-	0.5	-	-	-	-
14	2-48-0407	-	2.3	-	-	-	-	-	-
15	2-35-0403	-	1.8	0.8	-	-	-	-	-
16	24-61-1501	-	1.5	-	-	-	-	-	-
17	2-52-1502	-	1.5	-	-	-	-	-	-
18	2-35-1401	-	1.5	-	-	-	-	-	-
19	2-35-1201	-	1.3	-	-	-	-	-	0.7
20	24-35-0802	-	1.2	-	-	-	-	-	-
21	2-62-1401	-	-	12.8	-	-	-	-	-
22	31-39-1406	-	-	8.0	-	-	-	-	-
23	2-62-0802	-	-	8.0	-	-	-	-	-
24	2-39-1106	-	-	4.0	-	-	-	-	-

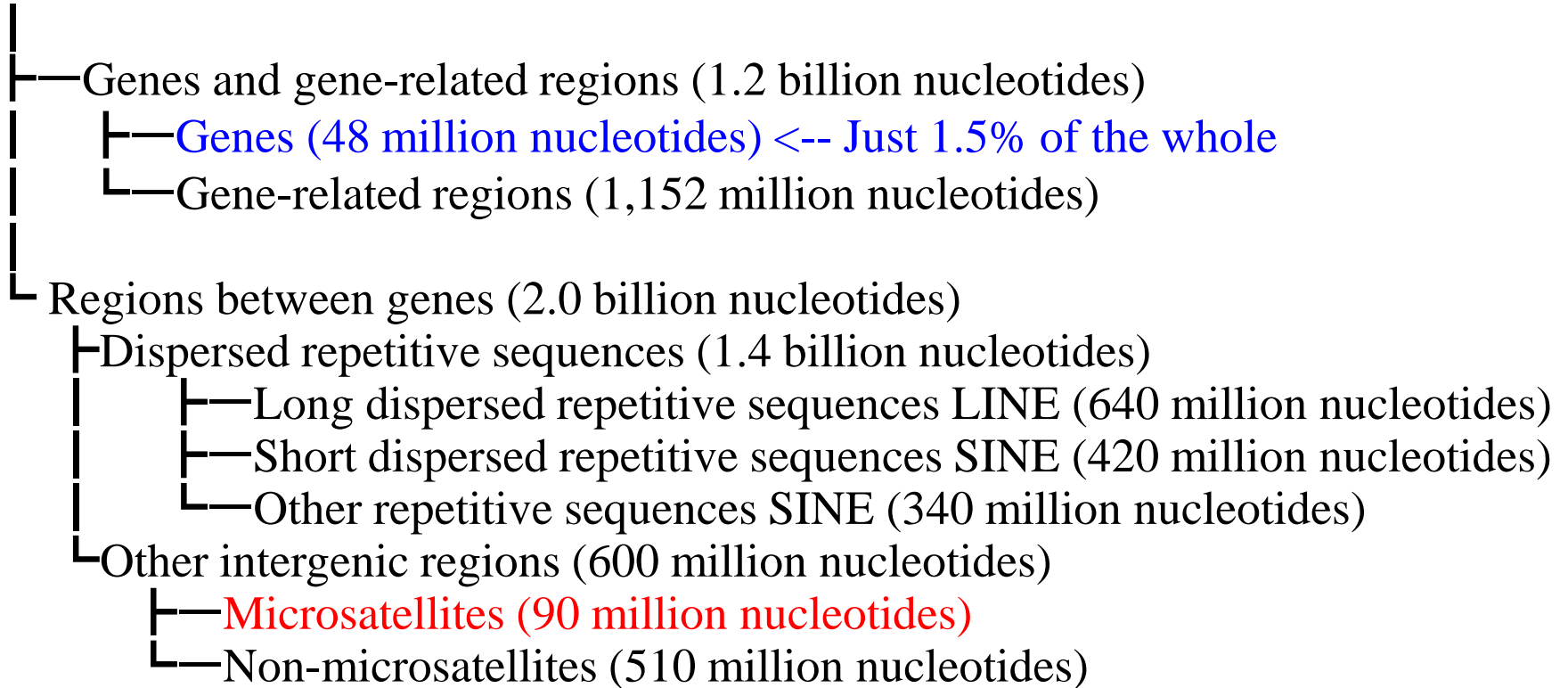
Microevolution and Inter-relatedness among Populations in the Japanese Islands

DNA kara Mita Nihonjin (The Japanese viewed from DNA)



†
Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

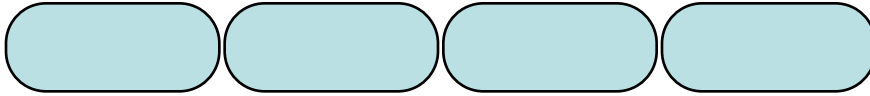
Entire human genome (3.2 billion nucleotides)



- ‡ The International Chimpanzee Chromosome 22 Consortium [H.Watanabe, A.Fujiyama, M.Hattori, T. D.Taylor, A.Toyoda, Y.Kuroki, H.Noguchi, A.BenKahla, H.Lehrach, R.Sudbrak, M.Kube,S.Taenzer, P.Galgoczy, M.Platzer, M.Scharfe, G.Nordsiek, H.Blocker, I.Hellmann, P.Khaitovich, S.Paabo, R.Reinhardt, H.-J.Zheng,X.-L.Zhang, G.-F.Zhu, B.-F.Wang, G.Fu, S.-X.Ren9, G.-P.Zhao, Z.Chen, Y.-S.Lee, J.-E.Cheong, S.-H.Choi, K.-M.Wu, T.-T.Liu, K.-J.Hsiao, S.-F.Tsai, C.-G.Kim, S.Oota, T.Kitano, Y.Kohara, N.Saitou, H.-S.Park, S.-Y.Wang, M.-L.Yaspo, and Y.Sakaki] (2004) DNA sequence and comparative analysis of chimpanzee chromosome 22. **Nature**, vol. 429, No. 6990, pp. 382-388

Microsatellite DNA Polymorphism

A)




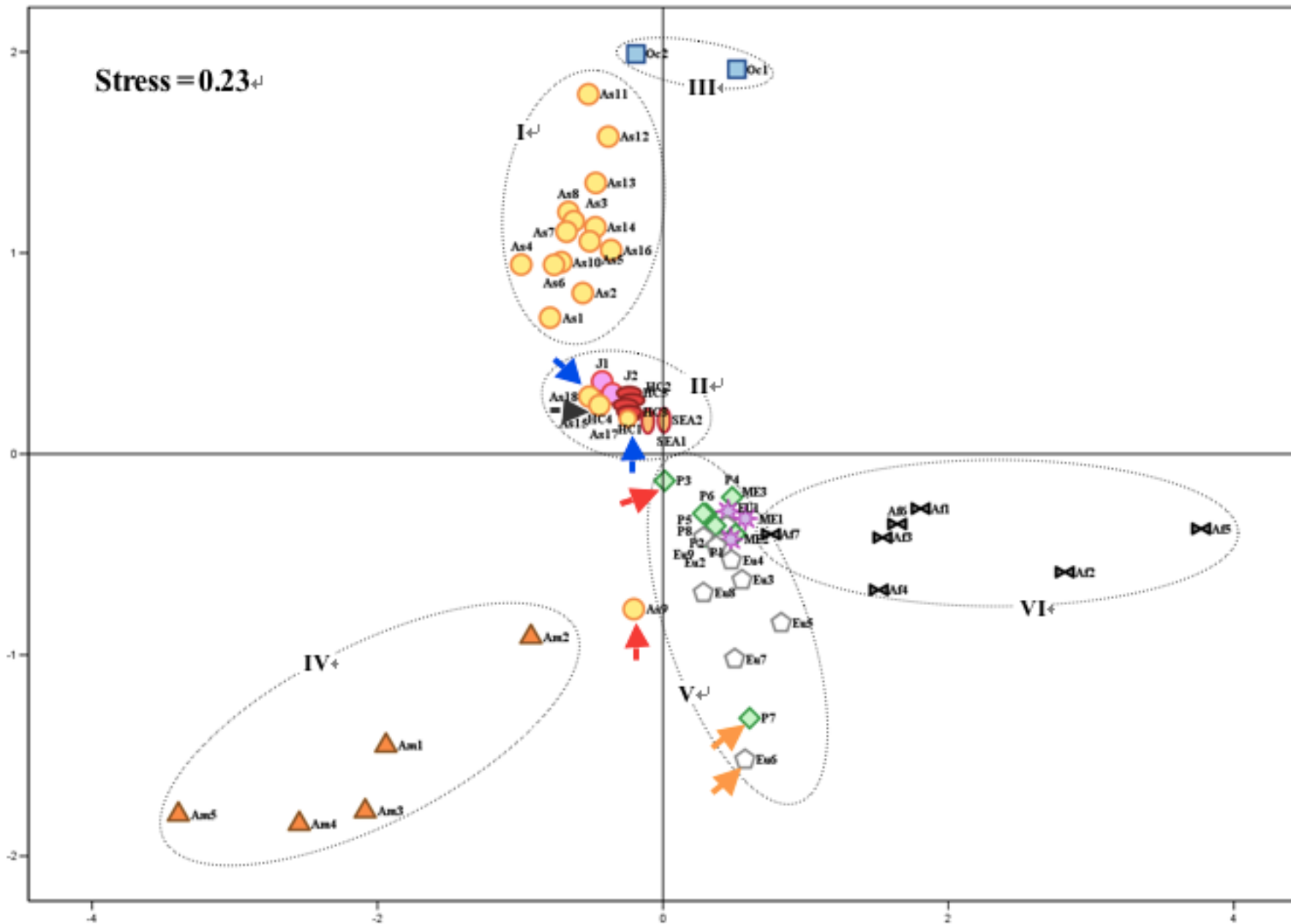
B)



C)



 = CTG, etc.

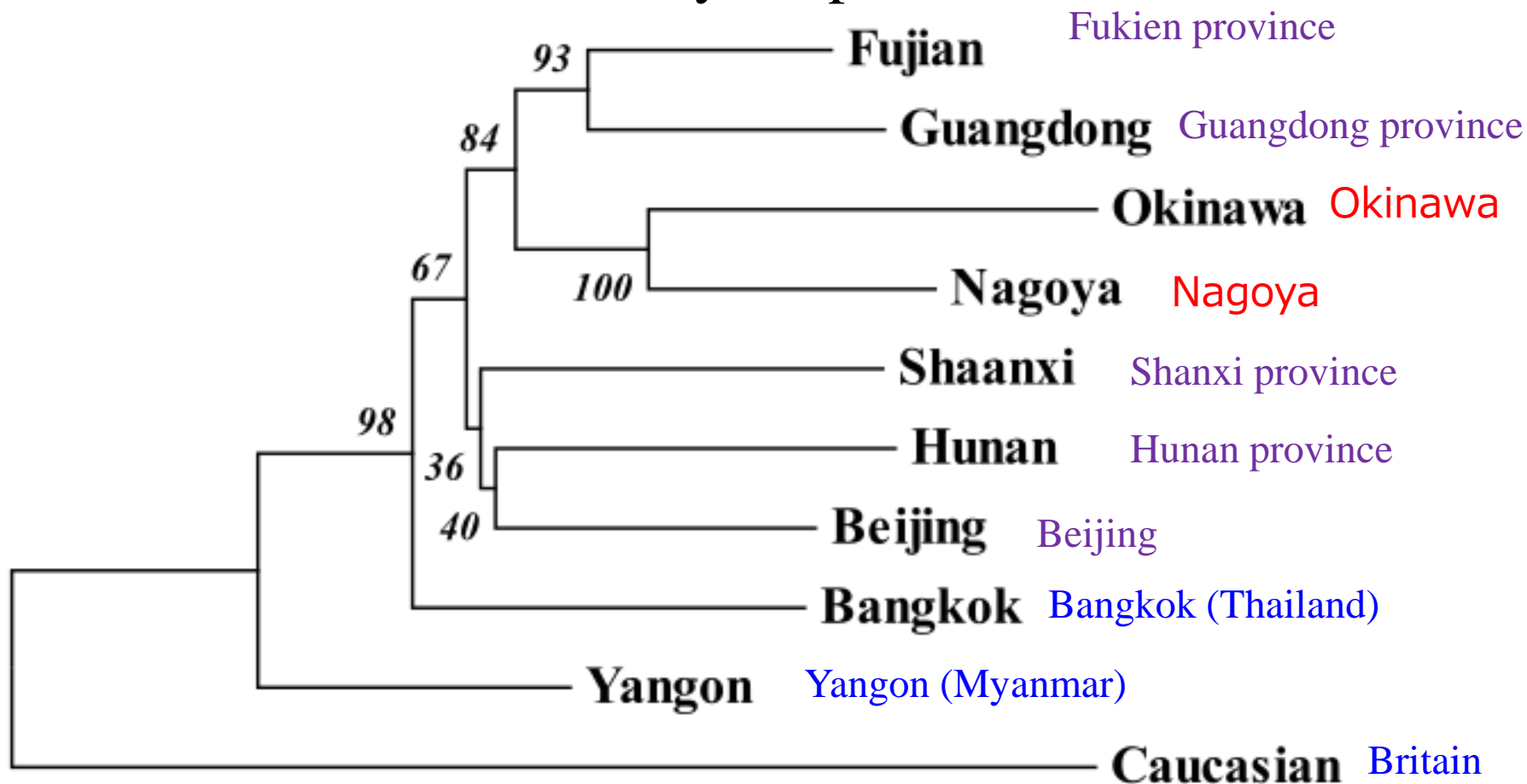


Lee, Yamamoto, Katsumata, Saitou et al, 2006

Studies Exploring Genetic Diversity among Five Populations of Han Chinese (International project in joint research with the Chinese Academy of Sciences [Beijing Institute of Genomics/Institute of Genetics and Developmental Biology])



Estimate of Genetic Relatedness among Nine Asian Populations Resulting from Microsatellite DNA Polymorphism



0.02 (Lee, Yamamoto, Saitou et al, 2006; Human Genetics)

Relationships between Japanese Islanders and Other Populations

Yamaguchi, Kamatani et al (2008)

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according to copyright issues.**

Yamaguchi et al.

The American Journal of Human Genetics, Volume 83, Issue 4,
pages 445-456 (2008)

Large-Scale SNP Analysis of Japanese Islanders

Yamaguchi, Kamatani et al (2008)

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according to copyright issues.**

Yamaguchi et al.

The American Journal of Human Genetics, Volume 83, Issue 4,
pages 445-456 (2008)

Placement of Regional Residents (1)

Yamaguchi, Kamatani et al (2008)

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according to copyright issues.**

Yamaguchi et al.

The American Journal of Human Genetics, Volume 83, Issue 4,
pages 445-456 (2008)

Placement of Regional Residents (2)

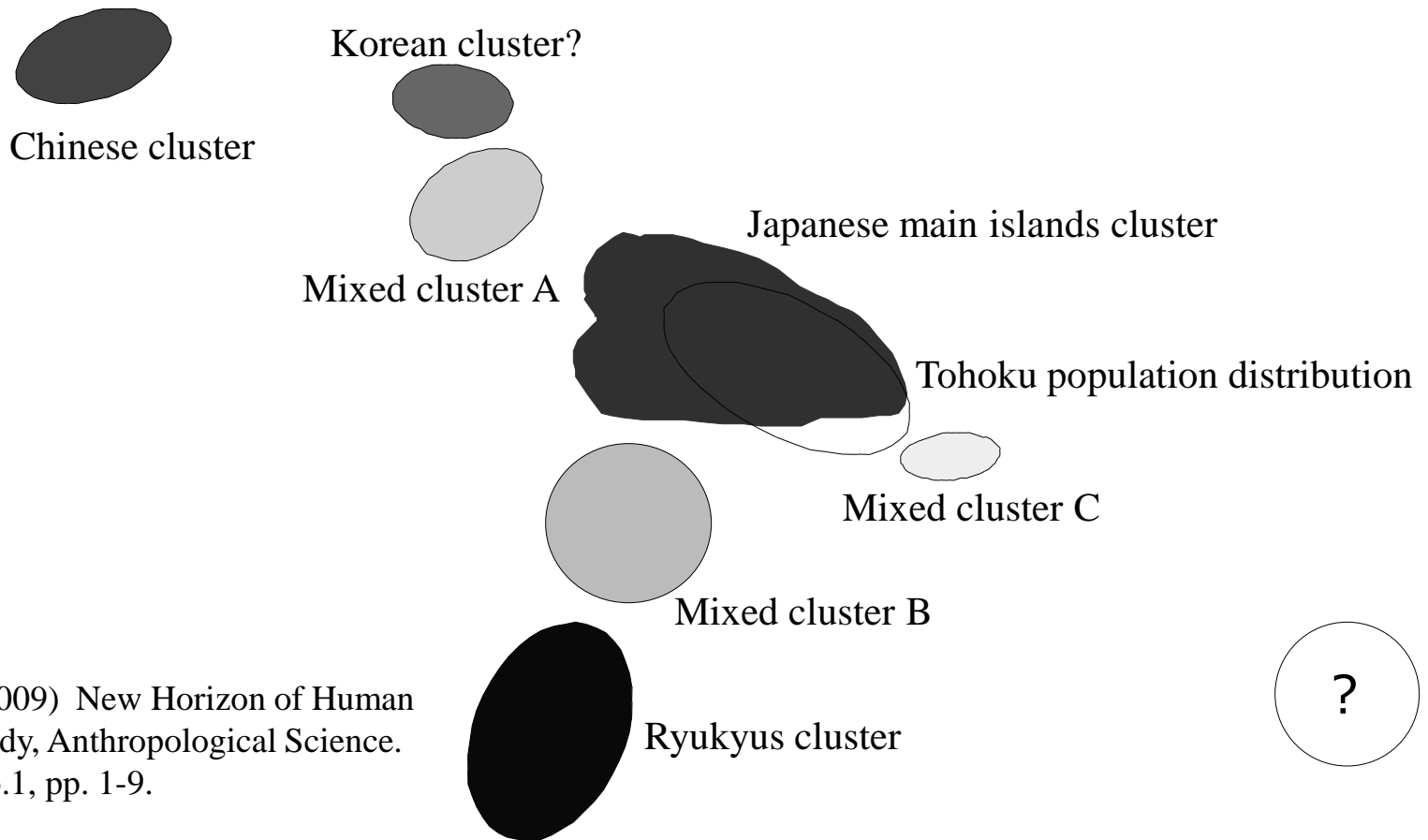
Yamaguchi, Kamatani et al (2008)

**Inserted here was deleted
according to copyright issues.**

Yamaguchi et al.

The American Journal of Human Genetics, Volume 83, Issue 4,
pages 445-456 (2008)

Interpreting SNP Analysis Results

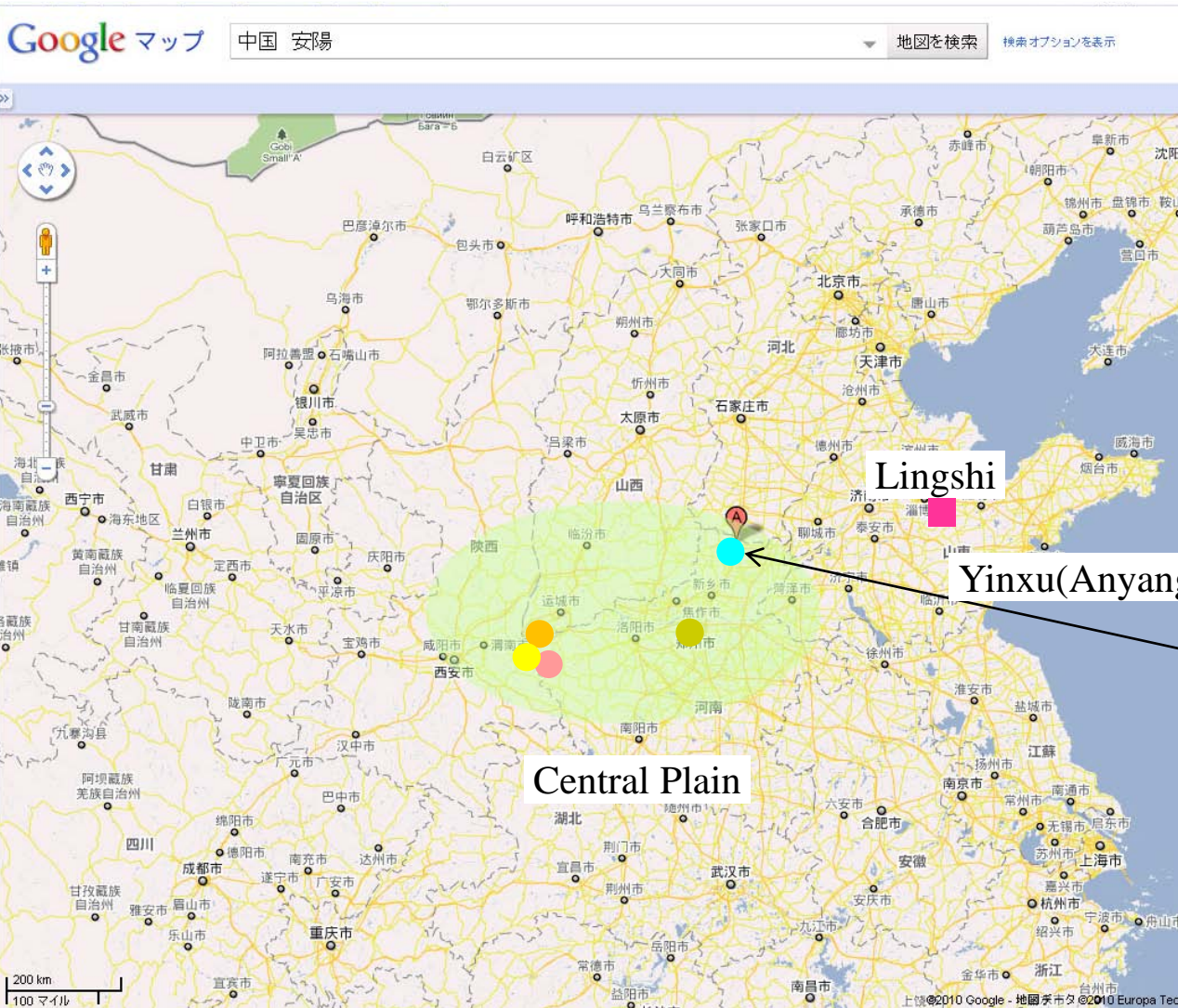


† Saitou N. (2009) New Horizon of Human Genome Study, Anthropological Science. Vol.117, No.1, pp. 1-9.

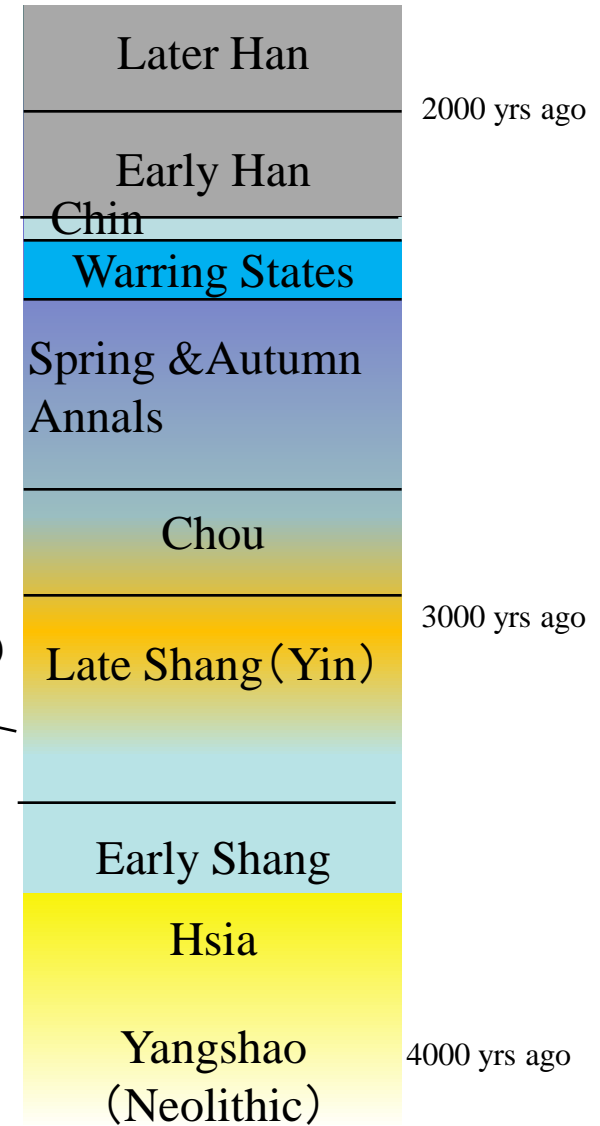


1046 - Center

Map of China

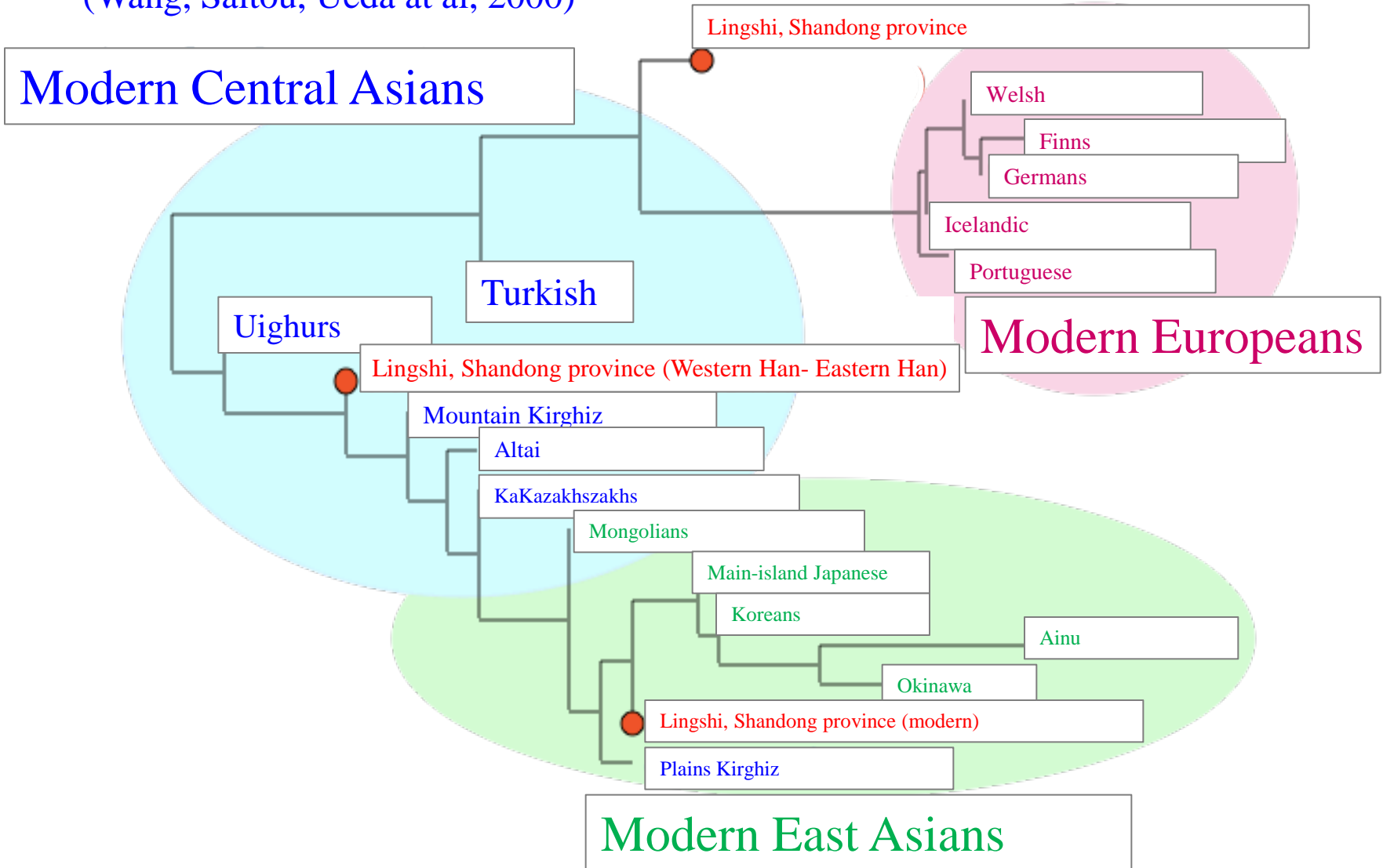


Chinese Chronology

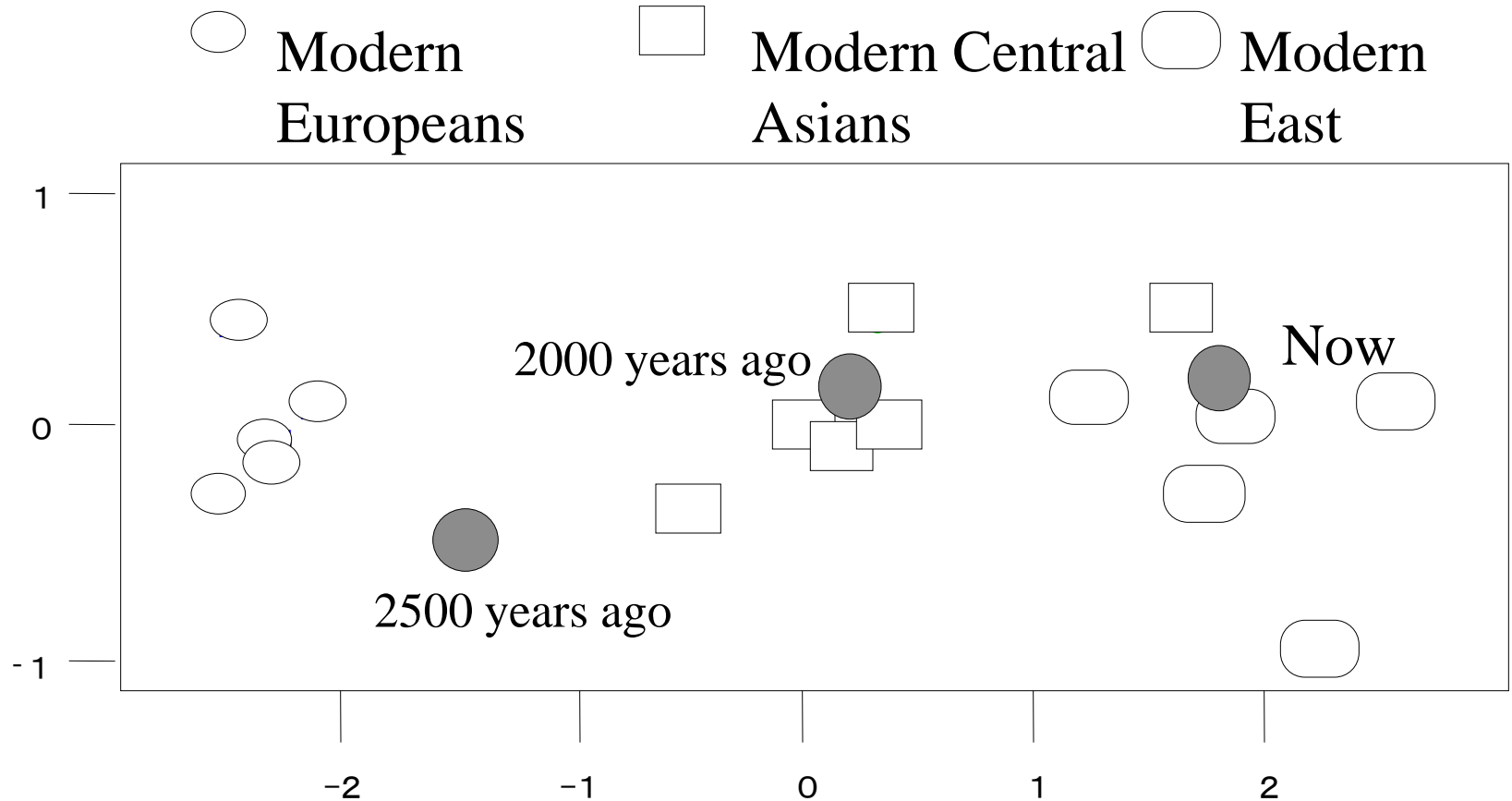


Genetic Relatedness between Two Populations in Ancient China and Modern Humans

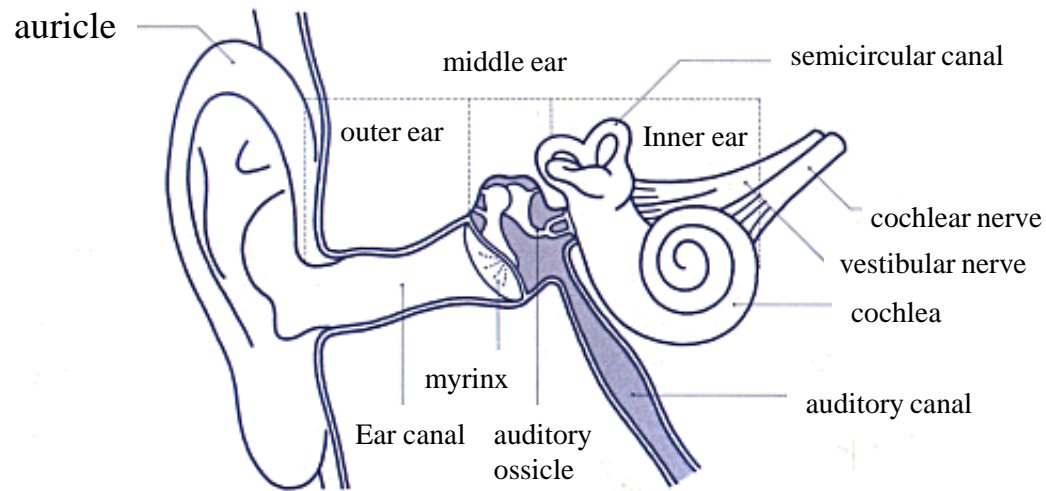
(Wang, Saitou, Ueda et al, 2000)



Two Populations in Ancient China and Modern Populations Compared (Wang, Saitou, Ueda et al, 2000)



Earwax Inheritance Patterns



Asians exhibit high frequencies of both moist and dry earwax.

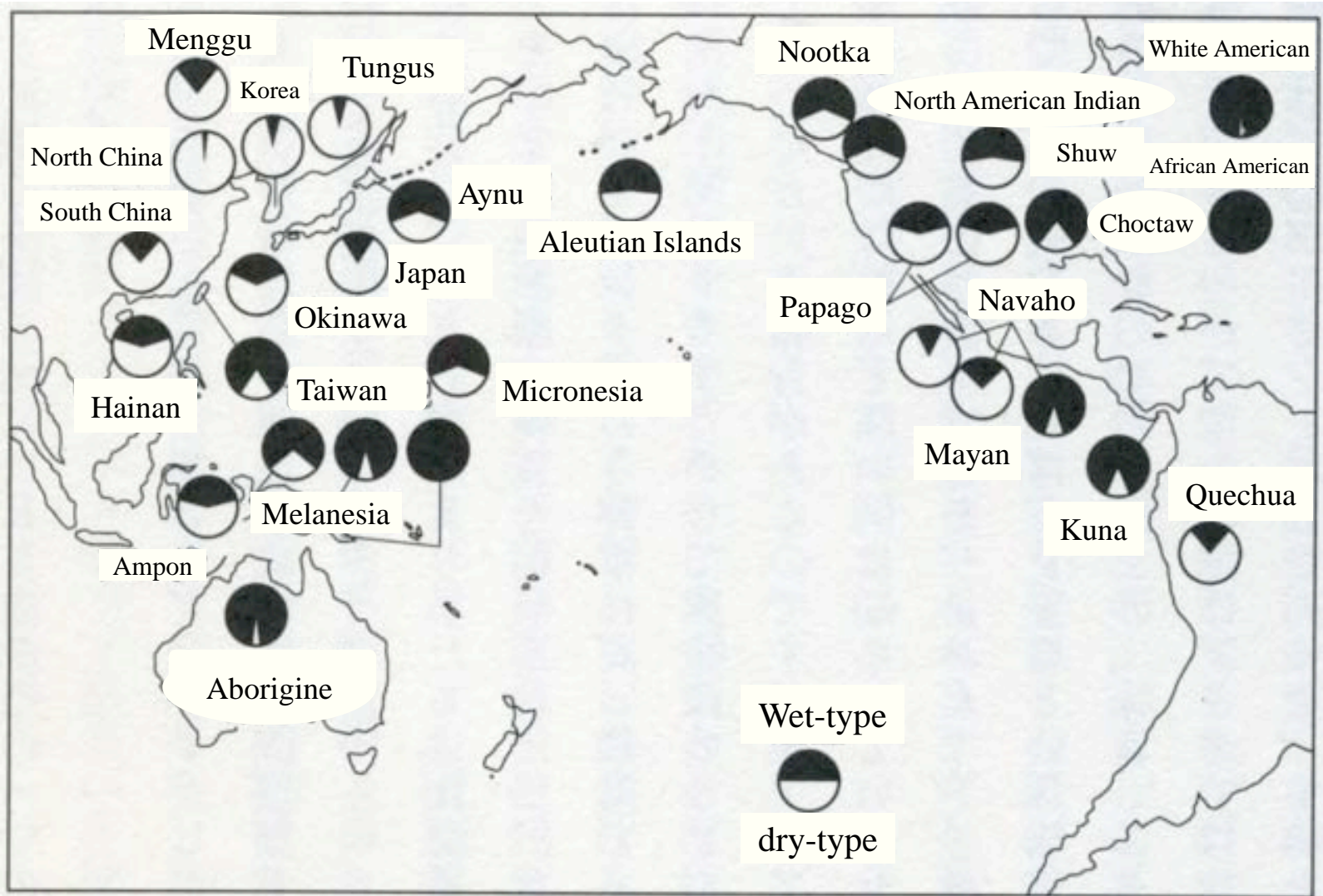
Moist is the dominant form of earwax.

A single gene determines whether an individual's earwax is moist or dry.

The gene determining earwax type is on an autosomal chromosome.

Population Differences in Earwax Allele Frequencies

Omoto, *Bunshi-jinruigaku to Nihonin no Kigen*



≠ (Molecular Anthropology and the Origins of the Japanese) (1996)

A Short History of Earwax-Type Studies

1930s: Buntaro Adachi (Kyoto Imperial University Faculty of Medicine) produces scientific studies of earwax types.



Buntaro Adachi

1960s: Ei Matsunaga (Sapporo Medical University/National Institute of Genetics) confirms inheritance patterns in earwax types.



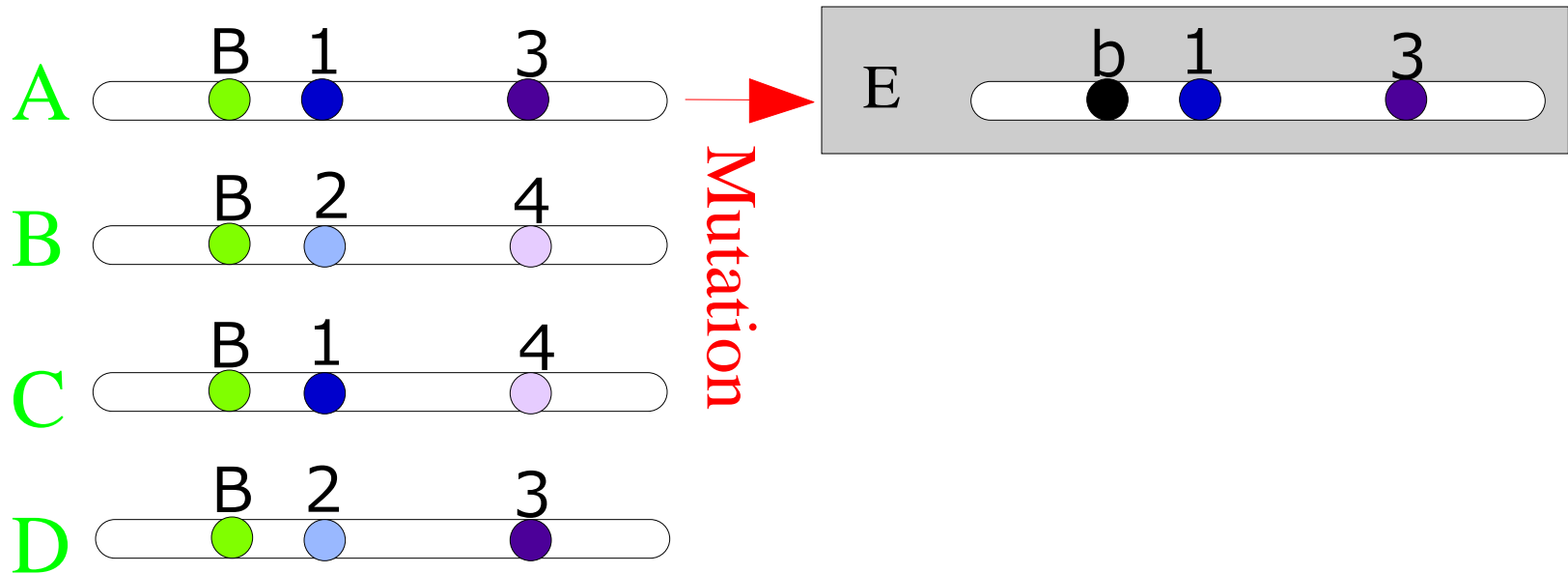
Ei Matsunaga

2002: Tomita, Shinkawa et al (Nagasaki University) specify the position of the earwax-type gene in the human genome.

†Photo provided by:
National Institute of
Genetics

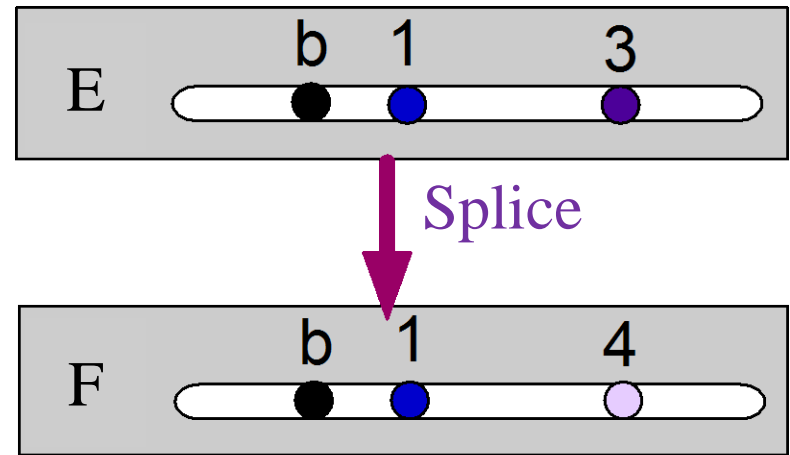
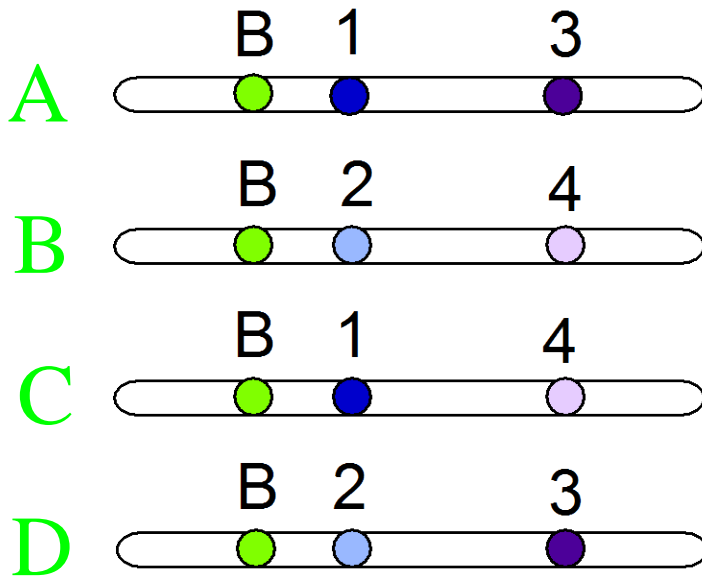
2006: Yoshiura, Shinkawa (Nagasaki University) et al identify the earwax-type gene.

How to Infer Where a Disease-Related Gene Is Located on a Chromosome (Genetic linkage analysis)



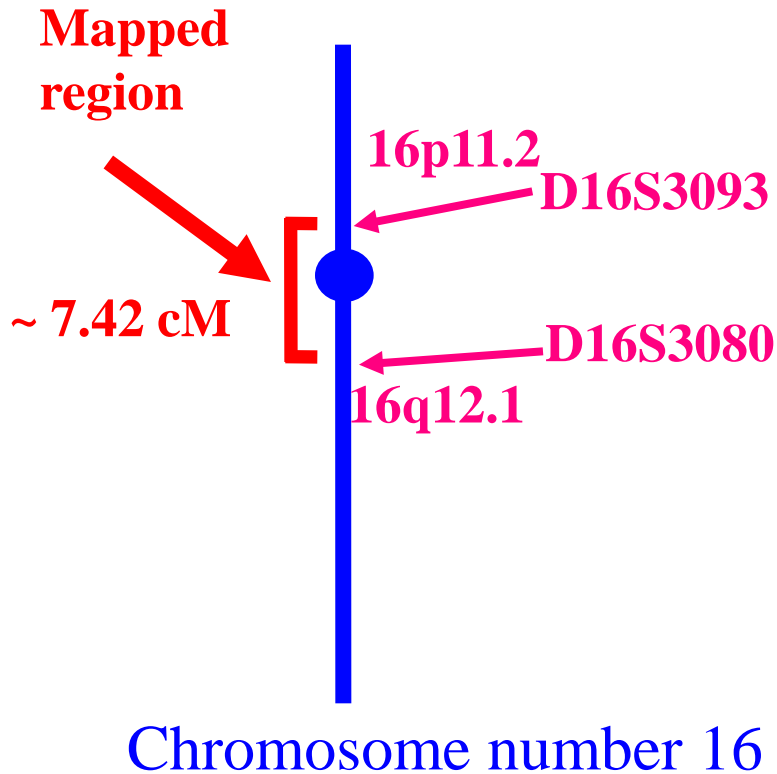
- ● Disease-causing gene b and original gene B
- ● Genes (1 and 2) near the disease gene
- ● Genes (3 and 4) distant from the disease gene

Splice so that only the gene b-1 combination remains



- ● Disease-causing gene b and original gene B
- ● Genes (1 and 2) near the disease gen
- ● Genes (3 and 4) distant from the disease gene

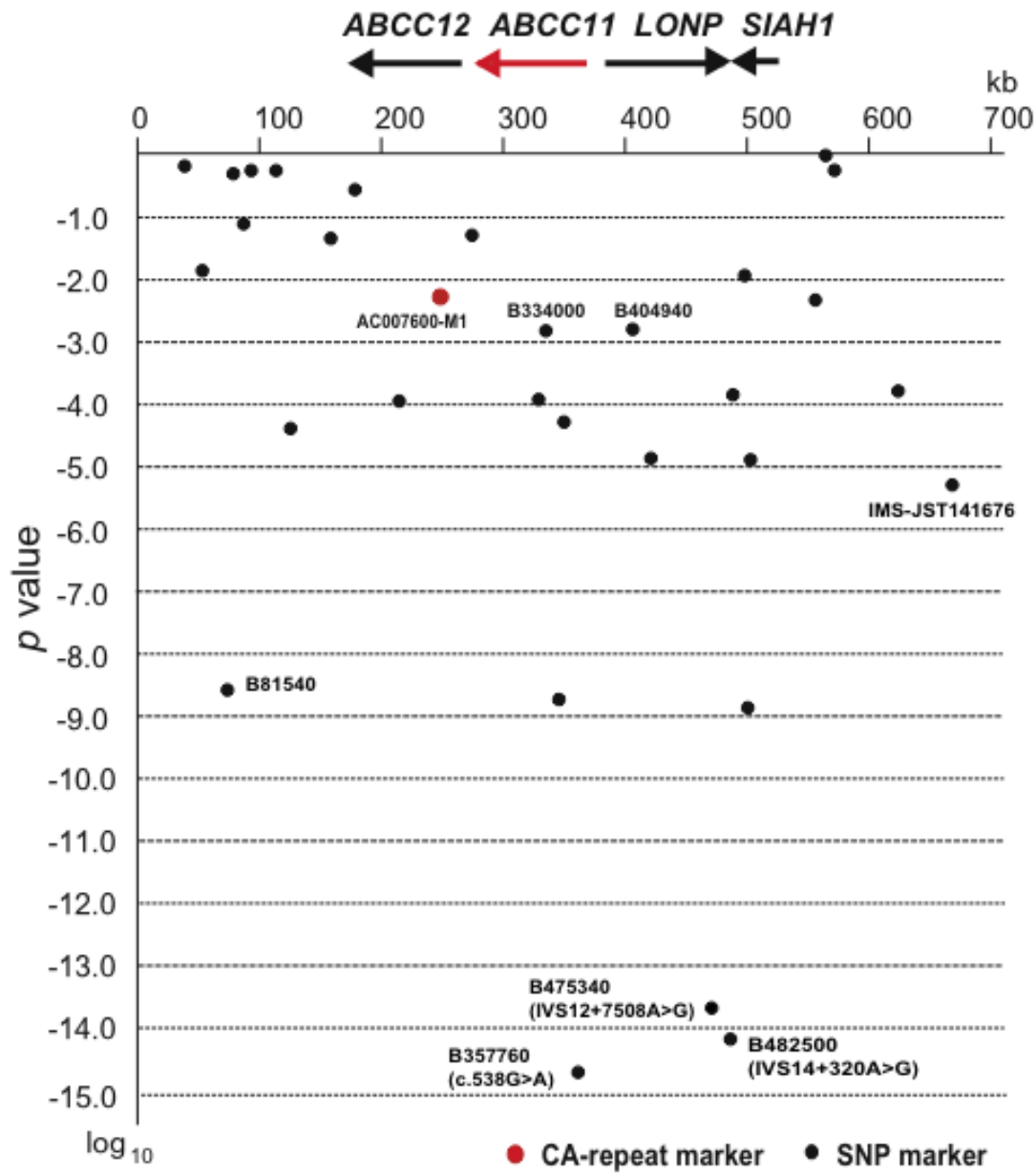
Pedigree Analysis with a Microsatellite DNA Polymorphism



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according to copyright issues.

Tomita et al.
The Lancet
Volume 359, Issue 9322, Pages 2000-2002
(2002)

(Tomita et al. 2002, *Lancet*)

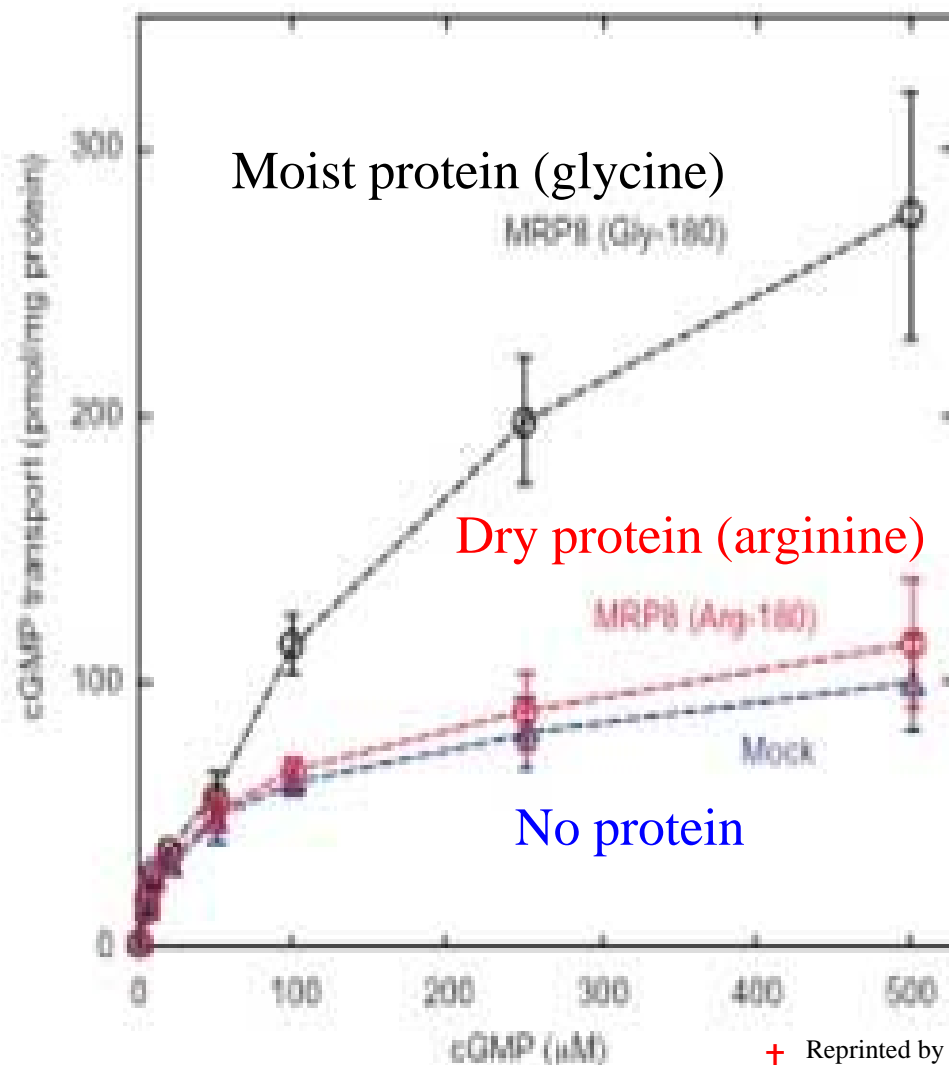


Yoshiura et al (2006)

† Reprinted by permission from Macmillan Publishers Ltd:
 A SNP in the ABCC11 gene is the determinant of human earwax type
 Nature Genetics 38, 324 - 330, copyright (2006)

Differences in the Function of ABCC11 Gene Product Are the Cause of the Differences in Earwax

Yoshiura et al (2006)



Dry (function-less) resulted from moist (functional) with modification of a single amino acid

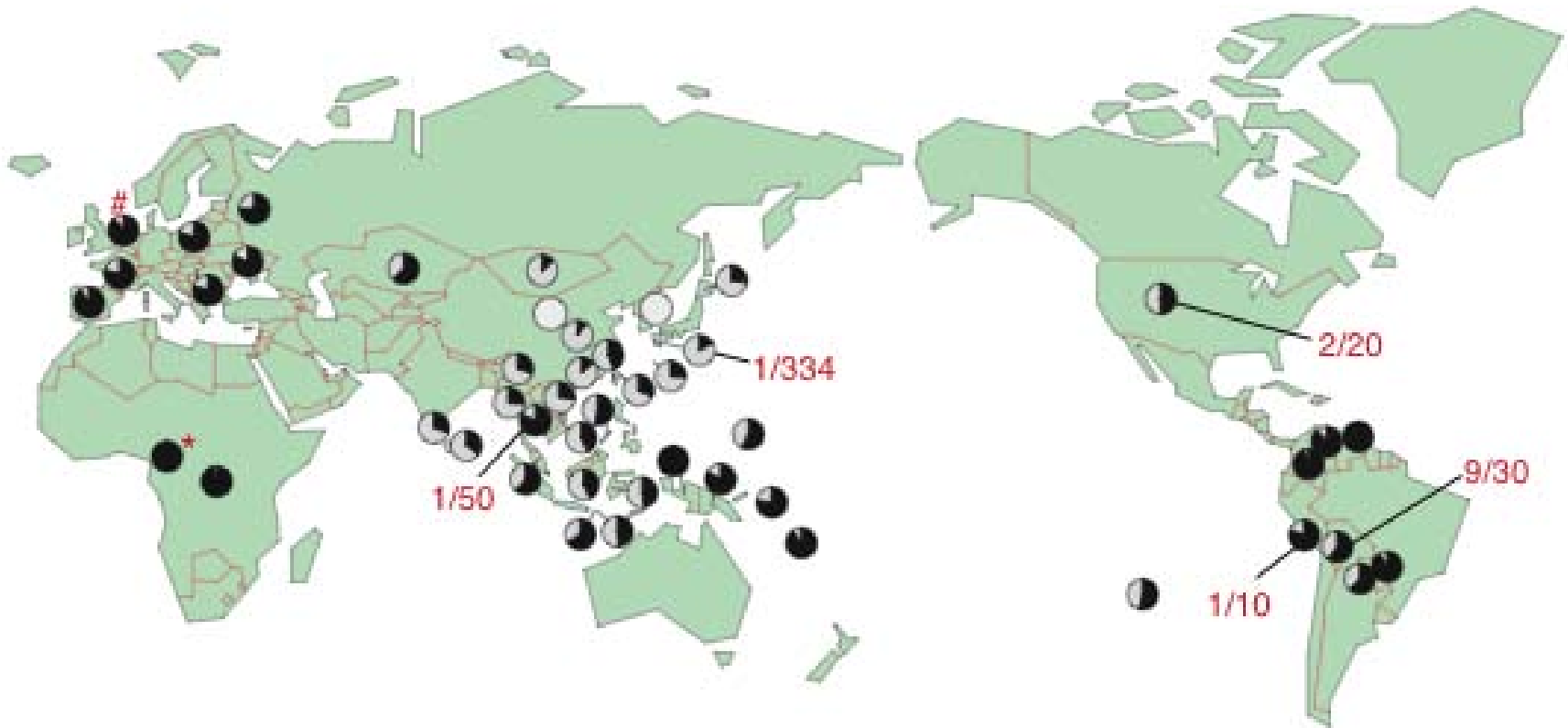
Dry protein (arginine)

No protein

Yoshiura et al (2006)

‡ Reprinted by permission from Macmillan Publishers Ltd: A SNP in the ABCC11 gene is the determinant of human earwax type Nature Genetics 38, 324 - 330, copyright (2006)

Distribution of Earwax Alleles ● : Moist ○ : Dry



Yoshiura et al., (2006)

‡ Reprinted by permission from Macmillan Publishers Ltd:
A SNP in the ABCC11 gene is the determinant of human earwax type
Nature Genetics 38, 324 - 330, copyright (2006)

A single-nucleotide polymorphism in the *ABCC11* gene is the determinant of human earwax type

Koh-ichiro Yoshiura^{1,2}, Akira Kinoshita^{1,2}, Takafumi Ishida³, Aya Ninokata³, Toshihisa Ishikawa⁴, Tadashi Kaname^{2,5}, Makoto Bannai⁶, Katsushi Tokunaga⁶, Shunro Sonoda⁷, Ryoichi Komaki⁸, Makoto Ihara⁹, Vladimir A. Saenko¹⁰, Gabit K. Alipov¹¹, Ichiro Sekine¹¹, Kazuki Komatsu¹², Haruo Takahashi¹², Mitsuko Nakashima^{1,2,13}, Nadiya Sosonkina^{1,2}, Christophe K. Mapendano^{1,2}, Mohsen Ghadami^{1,2}, Masayo Nomura^{1,2,14}, De-Sheng Liang^{2,15}, Nobutomo Miwa^{1,2}, Dae-Kwang Kim¹⁶, Ariuntuul Garidkhuu¹⁷, Nagato Natsume¹⁷, Tohru Ohta^{2,18}, Hiroaki Tomita¹⁹, Mihoko Kikuchi²⁰, Graciela Russomando²¹, Kenji Hirayama²⁰; [Minaka Ishibashi²²](#), [Aya Takahashi²²](#), [Naruya Saitou²²](#), Jeffery C. Murray²³, Susumu Saito²⁴, Yusuke Nakamura^{24,25}, & Norio Niikawa^{1,2}

Nature Genetics (2006)

Ainu-Language Place Names in Hokkaido

- Sapporo
- Wakkanai
- Noboribetsu
- Ebetsu
- Monbetsu
- Nakashibetsu

Ainu-Language Place Names in Tohoku



Ainu-Language Place Names in Tohoku



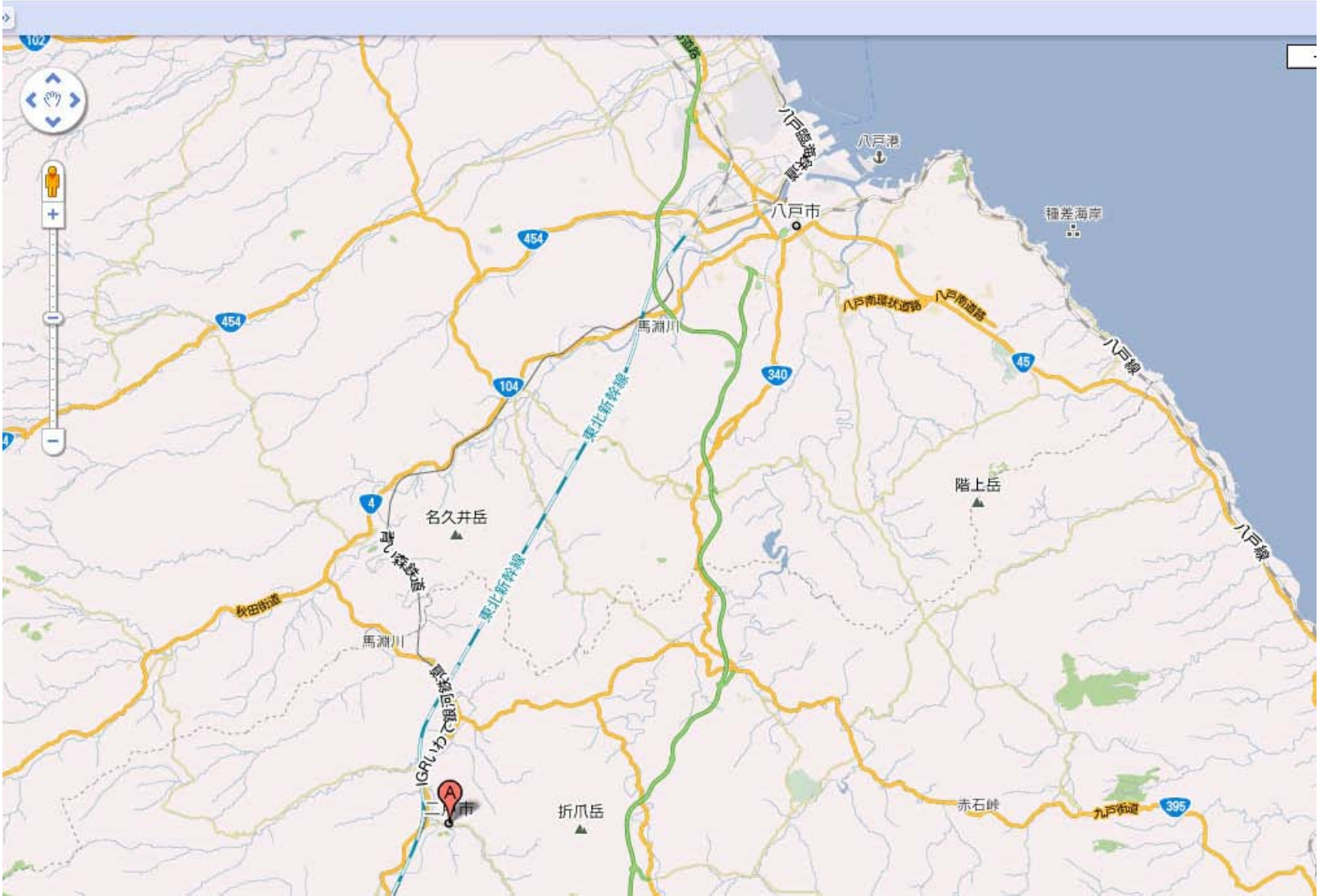
Ainu-Language Place Names in Tohoku

Google マップ

二戸市

地図を検索

検索オプションを表示

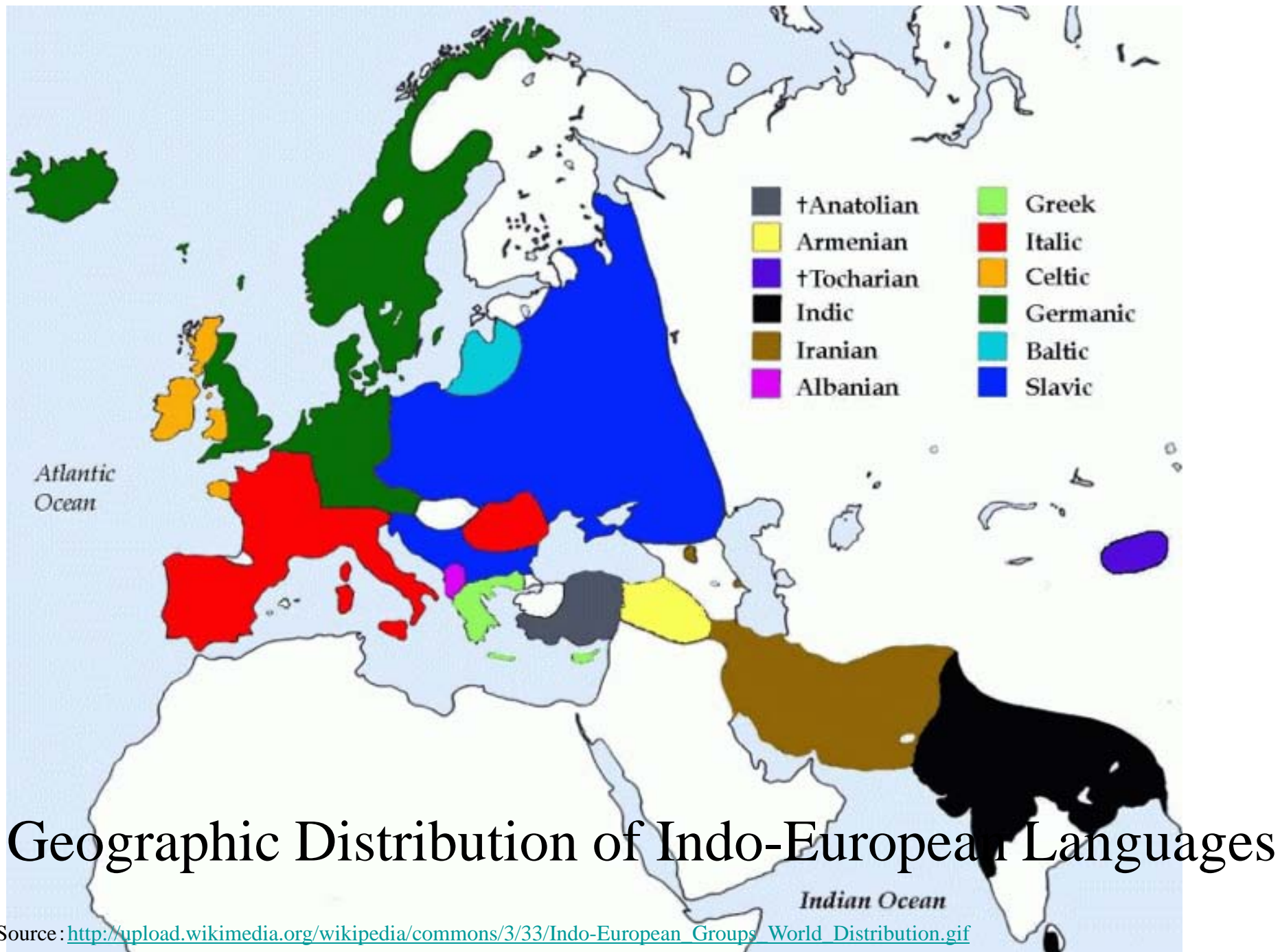


Ainu-Language Place Names in Tohoku



“ Sanesashi,
Sagamu country's little moor
was burning
Ah thou whom I inquired of,
standing in the midst of
the flames of the fire ”

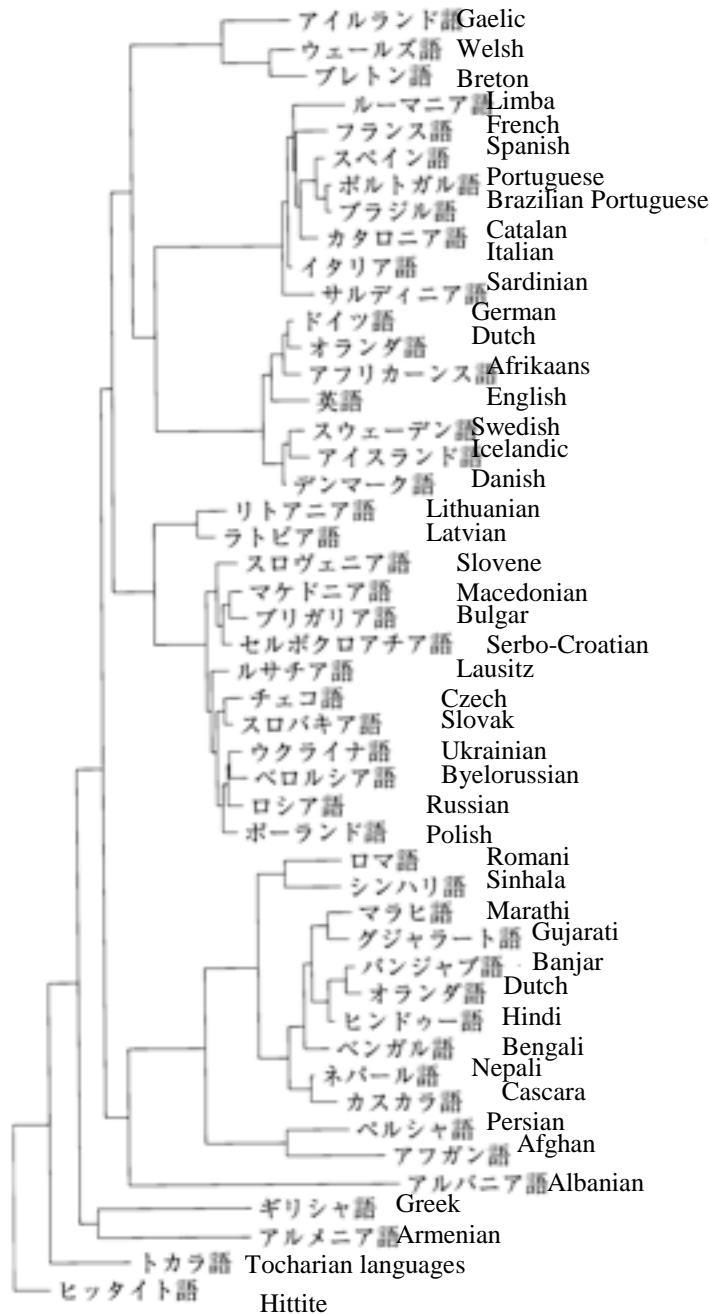
-- Princess Oto-tachibana



Source: http://upload.wikimedia.org/wikipedia/commons/3/33/Indo-European_Groups_World_Distribution.gif

Indo-European Language Family Tree

Gray & Atkinson (2004)



✦ Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Which Language or Language Family is Closest to Japanese?

- Korean:

Hakuseki Arai, Kurakichi Shiratori, Shiro Hattori, A. Vovin, Katsumi Matsumoto, others

- Ainu:

Shiro Hattori, Biden Yasumoto, Katsumi Matsumoto, Takeshi Umehara, others

- Koguryo (dead language):

Lee Ki-moon, Shichiro Murayama, C. Beckwith, Yoshizo Itabashi, others

- Altaic language family:

Katsuji Fujioka, Kyosuke Kindaichi, R.A. Miller, S.A. Starostin, others

- Austronesian language family:

Izuru Shinmura, Hisanosuke Izui, Shichiro Murayama, Takao Kawamoto, others

Comparison of Basic Lexical Terms in Five Altaic Proto-Languages

(Vovin, 2003)

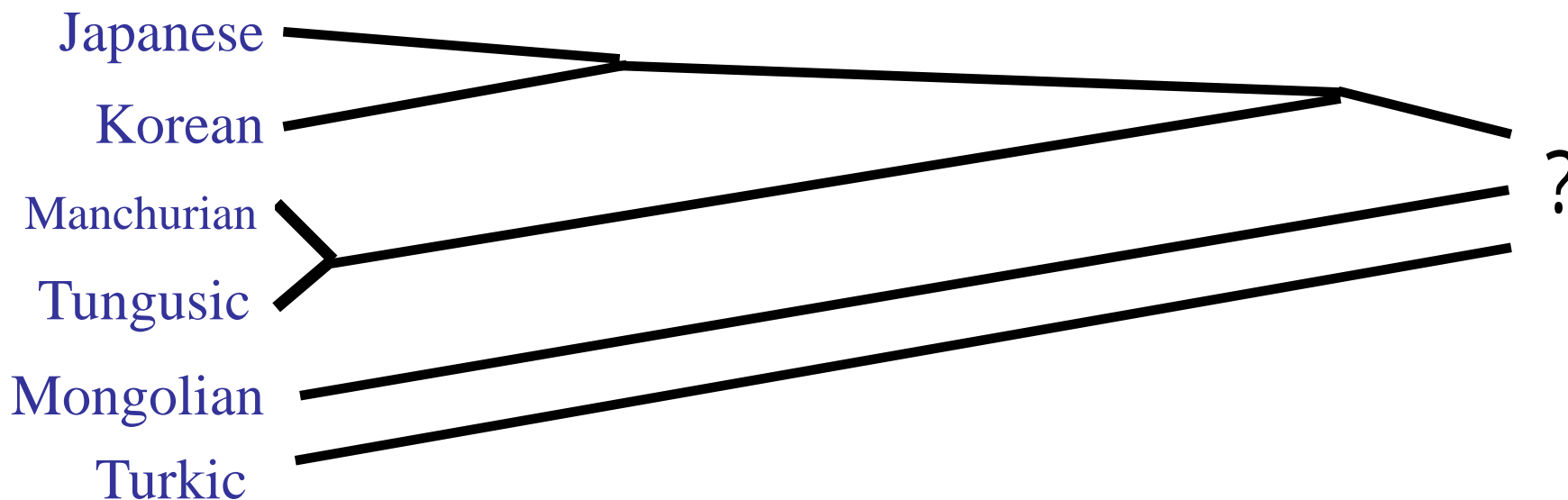
Japanese proto-language–Korean proto-language: Bone, hair, moon, fire, cloud, water, leg

Japanese proto-language–Korean proto-language–Manchurian Tungusic proto-language: Water, leg

Japanese proto-language–Mongolian proto-language: Blood

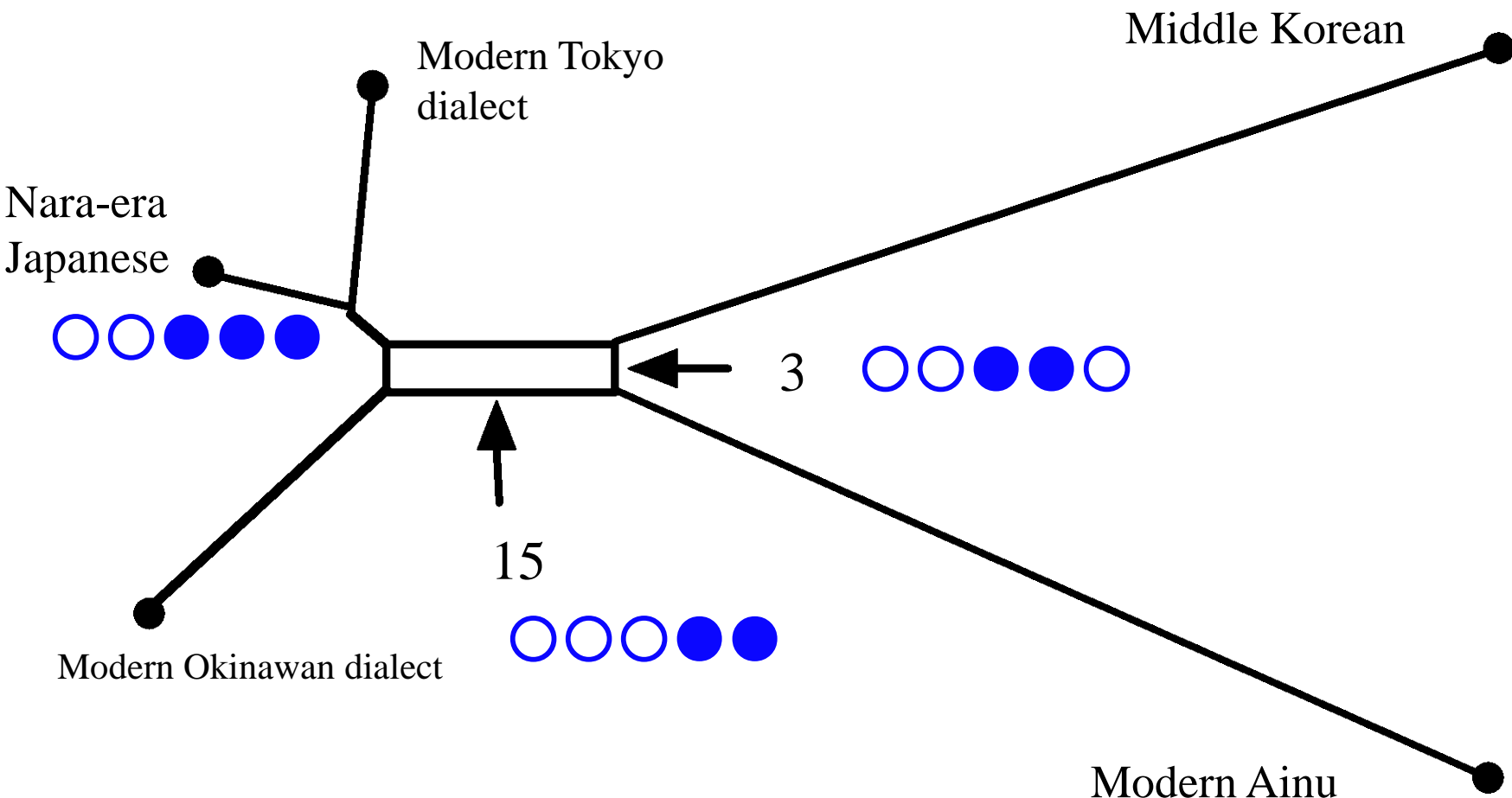
Korean proto-language–Manchurian Tungusic proto-language: Nose

Turkic proto-language–Other proto-language: None



Linguistic lineage network of languages in the vicinity of the Japanese islands based on initial-consonant matching patterns in 100 basic lexical terms collected by Yasumoto and Honda (1978)

From *DNA kara Mita Nihonjin* (The Japanese viewed from DNA)



† Naruya Saitou, *DNA kara Mita Nihonjin* (The Japanese viewed from DNA), Chikuma Shinsho, 2005

Quoted in Naruya Saitou, "Jinshu Yo Saraba" (A Farewell to Race),
collected in Yasuko Takezawa, ed., *Jinshu Gainen no Fuhensei wo
Tou*

(Is Race a Universal Idea?) (Jinbun Shouin, 2005)

In J.D. Salinger's *Raise the Roofbeam High,
Carpenters*, Zooey says:

"He said he even wished everybody
in the world looked exactly alike.
He said you'd keep thinking everybody
you met was your wife or your mother
or father,
and people would always be throwing
their arms around each other
wherever they went,
and it would look 'very nice'."



Jinshu Yo Saraba, Minzoku Yo Saraba (A Farewell to Race, A Farewell to Ethnicity)
(Saitou, Minzoku-gaku Kenkyuu: 1997)

"'Nihonjin' ga Kieru Toki" (When the "Japanese" Disappear)

(Saitou, in *DNA kara Mita Nihonjin* [The Japanese viewed from DNA], 2005)

Tairiku kara no Michi, Tairiku he no Yume (The Road the Continent, Dreams of the Continent)
(Saitou, Gakushi Kaiho: 2006)

A Floating City-State: Marinites

Work no.: B1-1

Designer: Rid

Location: Osaka prefecture

Affiliation: Osaka College of Art, Osaka University of Arts

Support Category

Designer's comments:

Marinites was originally one of the Seagull coalition of city-states that proclaimed their independence after forming the coalition of Pacific Ocean megafloat cities in 2129.

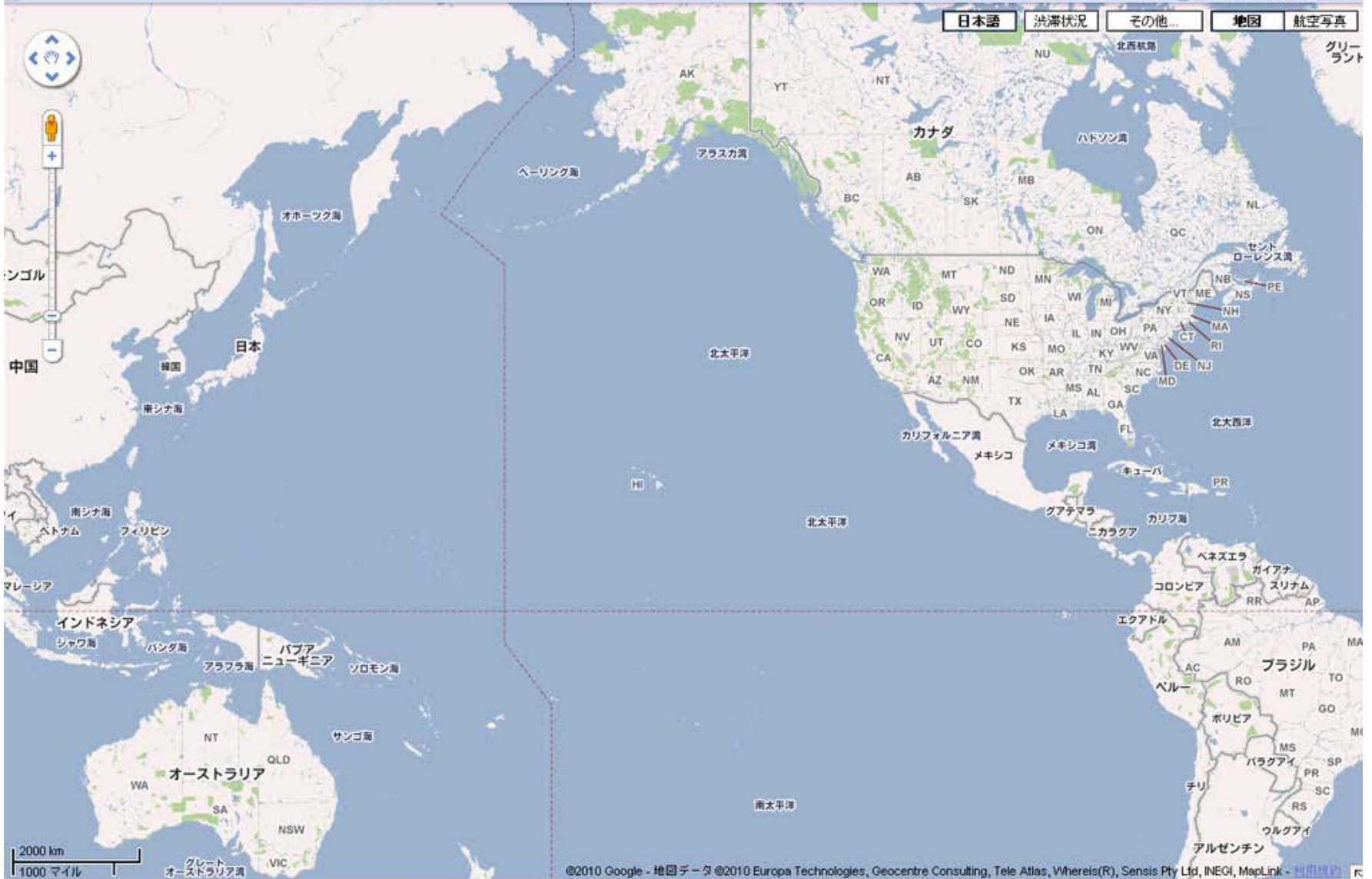
The structure comprises a built-up area resting on half-submerged floats and an airport island constructed likewise and linked to it by bridge, as well as an atoll encircled with giant embankments to prevent submersion due to global warming. Originally constructed as a marine technologies research facility, Marinites hosts many technical research facilities, shipyards and other industrial plant. Residential units for their employees' families are attached to their workplaces and zoned accordingly.

Inherent to the city are its large hydrogen plant and wave- and wind-power generators that even permit it to export energy.

Unlike other megafloat cities, Marinites is linked to a natural island by bridge and so enjoys its own supply of natural foods to complement those produced in its factories and megafloats, making it completely self-sufficient.

The city held fast to its neutrality during the Fourth Great War, when it took in large numbers of refugees. To accommodate these new residents, the city constructed new megafloats and embankments, enlarged its capacity and conducted maintenance works to achieve the configuration seen now in 2200.





*The Japanese viewed from
DNA,
by Naruya Saitou
Chikuma Shinsho
Published March 2005*

