

Parabon[®] Snapshot[™] Phenotype Report

#LVMPD-NV-041028-1027-Snapshot

Agency: Las Vegas Metropolitan Police Department

Agency Case #: 041028-1027

Evidence ID #: 2923-8/16; JM-30A1

DNA Vial #: LVMPD-NV-041028-1027-Snapshot

Report Preparation Date: 15 May 2017

PNL Document #17E15P50-P47CSG68



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For additional information about the contents of this report, please refer to the **Parabon Snapshot Phenotype Report Guide**.

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Sample Description and Genotyping Results

2.5 ng of DNA extracted from blood was sent to AKESOgen for genotyping on the Illumina CytoSNP-850K chip. The overall genotyping call rate for this sample was 66.3%. Of the SNPs needed for Snapshot, 69.3% had called genotypes. Note that this is slightly below Snapshot's usual cutoff of a 70% effective genotyping call rate, but Parabon chose to proceed with the analysis due to the apparent high quality of the SNP data. Confidence intervals were calculated using this same set of SNPs.

Snapshot Prediction Results

Skin Color



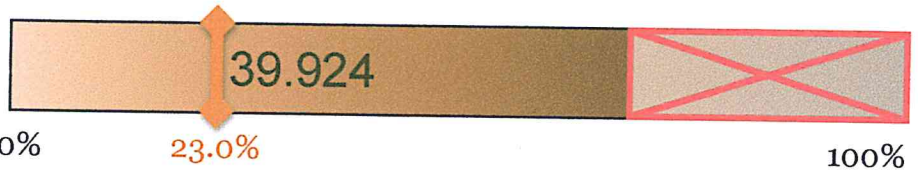
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Background

The skin color model is based on unrelated individuals from a range of ethnic backgrounds. Each subject's melanin index (M-index, a measure of the amount of light absorbed by skin, or skin darkness) was measured objectively using three separate measurements from a reflectance spectrophotometer on the forehead. Outlier values were discarded, and each subject's remaining measurements were averaged. Larger numbers mean darker skin color, with an overall range of 10.367 – 111.033.

The subject is predicted to have **M-index = 39.924**.

In the range of previously observed prediction values for M-index, this value falls at 23.0%.

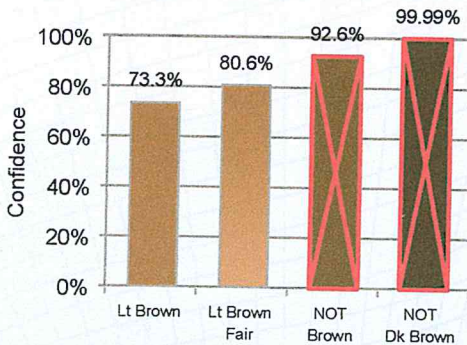


This M-index value corresponds to a skin color value of **2.641**.

Based on these results, this subject likely self-describes as:

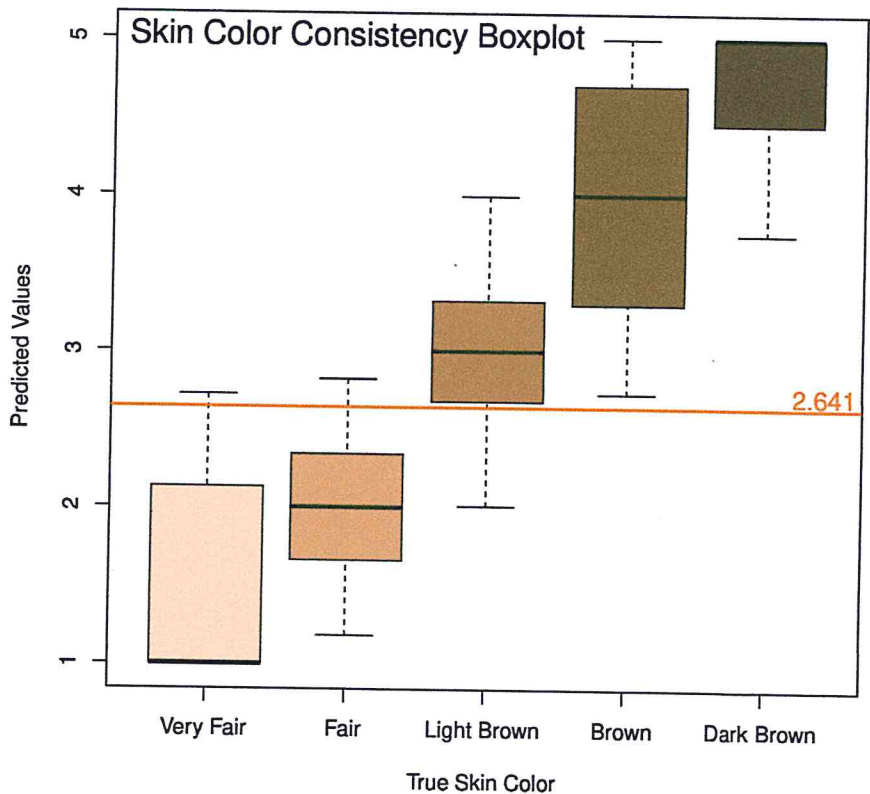
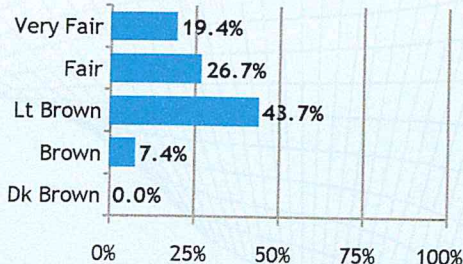
- Has **Light Brown** skin color with 73.3% confidence
- Has **Light Brown or Fair** skin color with 80.6% confidence
- Does not have **Brown** skin color with 92.6% confidence
- Does not have **Dark Brown** skin color with 99.99% confidence

Predictions



Consistency of this value with the five possible trait values for skin color is shown below.

Skin Index Consistency Values



Snapshot Prediction Results

Eye Color



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Background

The eye color model is based on unrelated individuals from a range of ethnic backgrounds. The categorical trait values are coded from lightest to darkest, such that:

- Blue = 1
- Green = 2
- Hazel = 3
- Brown = 4
- Black = 5

The subject is predicted to have **eye color = 4.127**.

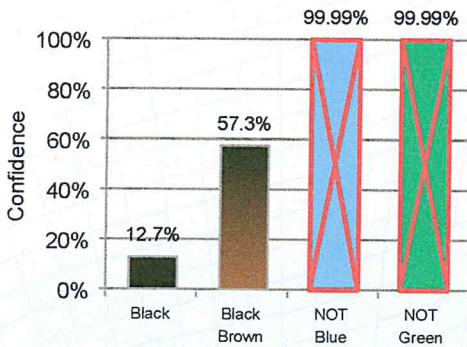
In the range of previously observed prediction values for eye color, this value falls at 98.7%.



Based on these results, this subject:

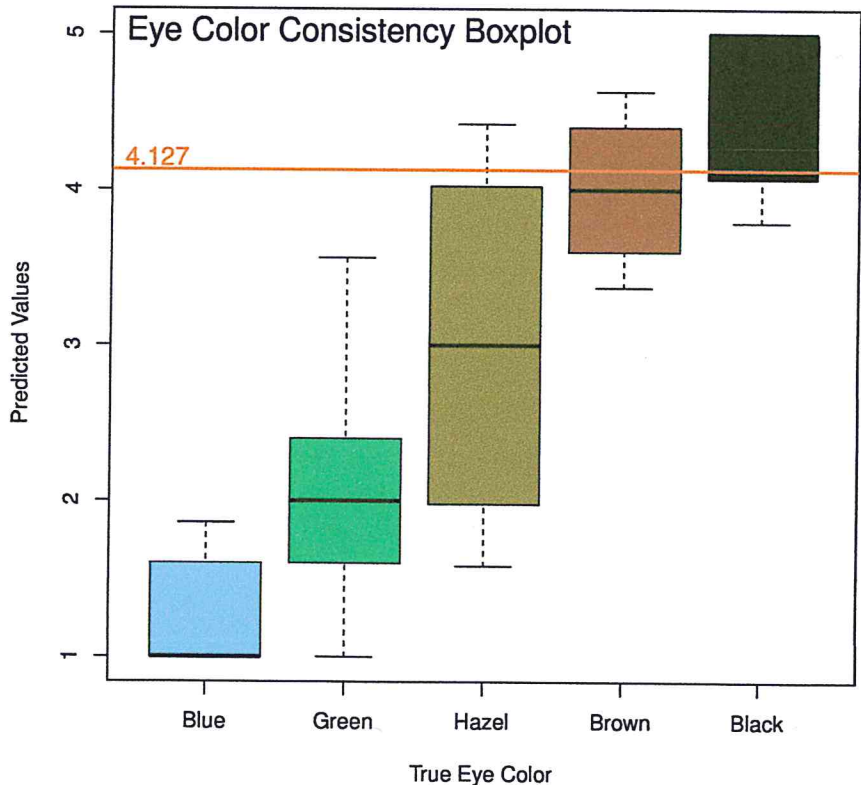
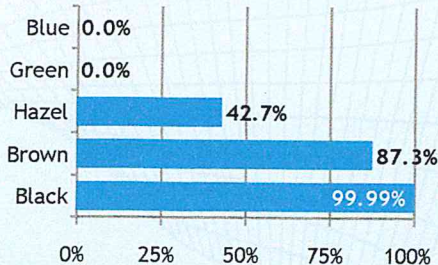
- Has **Black** eye color with 12.7% confidence
- Has **Black or Brown** eye color with 57.3% confidence
- Does not have **Blue** eye color with 99.99% confidence
- Does not have **Green** eye color with 99.99% confidence

Predictions



Consistency of this value with the five possible trait values for eye color is shown below.

Eye Color Consistency Values



Snapshot Prediction Results



Hair Color

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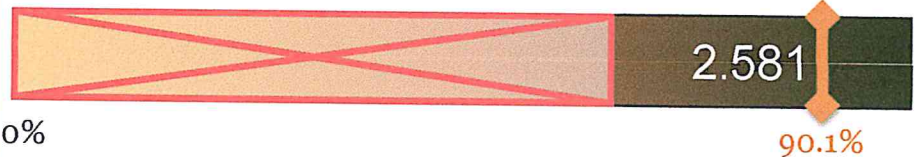
PNL Document #17E15P50-P47CSG68

Background

The hair darkness model is based on unrelated individuals from a range of ethnic backgrounds. The categorical trait values are coded from lightest to darkest, such that Blond = 1, Brown = 2, Black = 3.

The hair redness model is also based on unrelated individuals. The binary trait values are coded as Red = 1 and Not Red = 0.

The subject is predicted to have **hair darkness** = **2.581**. In the range of previously observed prediction values, this falls at 90.1%.



0%

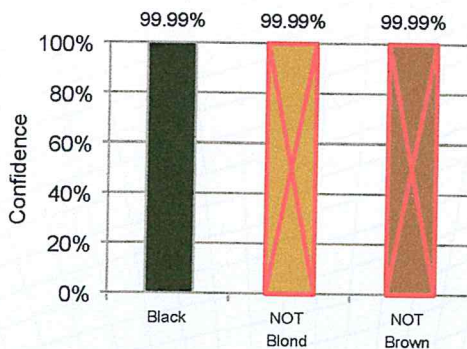
90.1%

Based on these results, this subject:

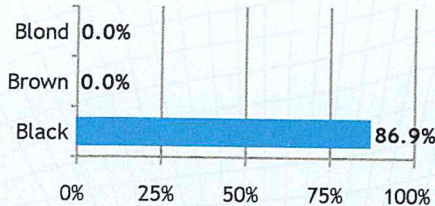
- Has **Black** hair darkness with 99.99% confidence
- Does not have **Blond** hair darkness with 99.99% confidence
- Does not have **Brown** hair darkness with 99.99% confidence

Consistency of this value with the three possible trait values for hair darkness is shown below.

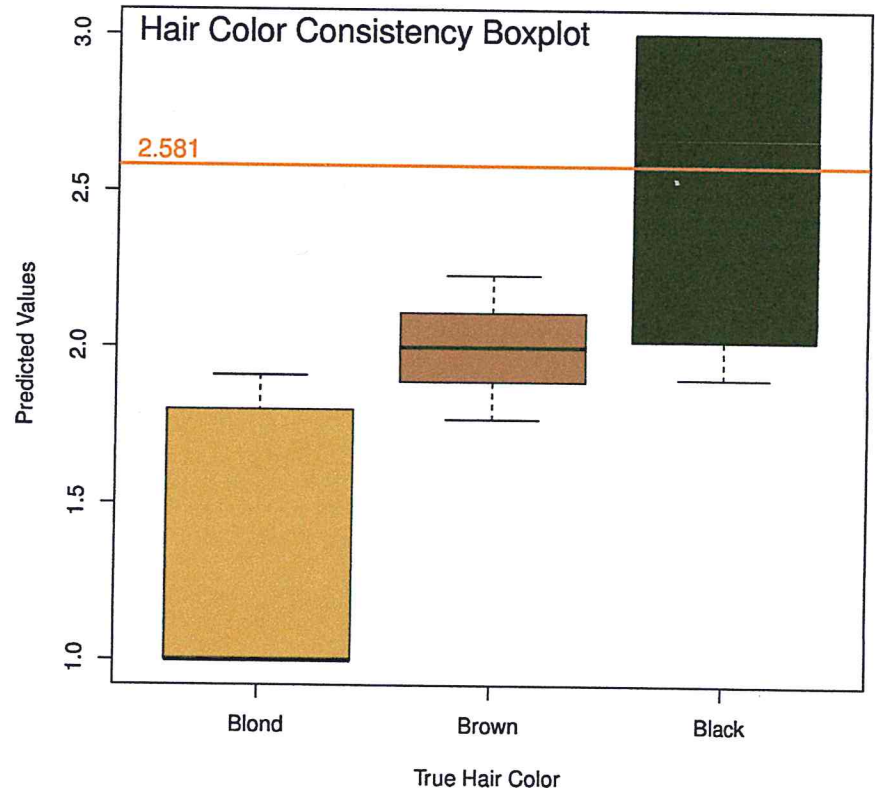
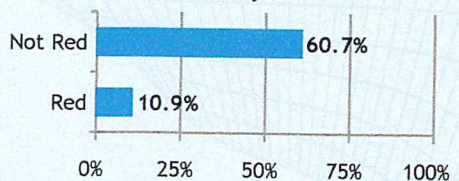
Predictions



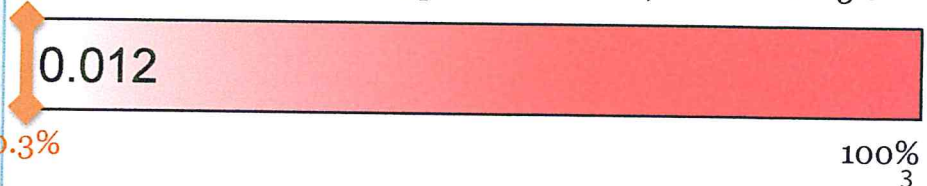
Hair Darkness Consistency Values



Hair Redness Consistency Values



The subject is predicted to have **hair redness** = **0.012**. In the range of previously observed prediction values, this falls at 0.3%.



0.012

0.3%

100%
3

Snapshot Prediction Results



Freckles

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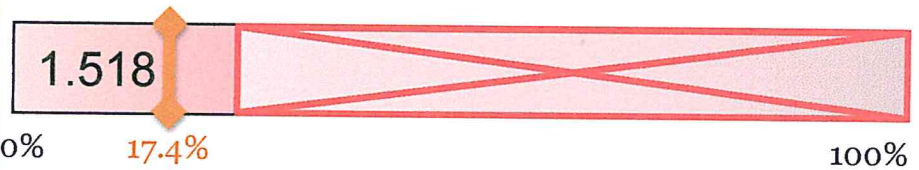
Background

The freckles model is based on unrelated individuals from a range of ethnic backgrounds. The categorical trait values are coded from lightest to darkest, such that:

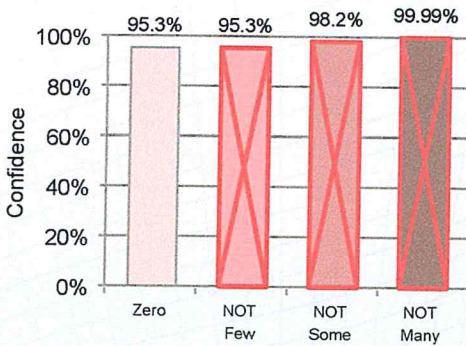
- Zero = 1
- Few = 2
- Some = 3
- Many = 4

The subject is predicted to have **freckles = 1.518**.

In the range of previously observed prediction values for freckles, this value falls at 17.4%.



Predictions

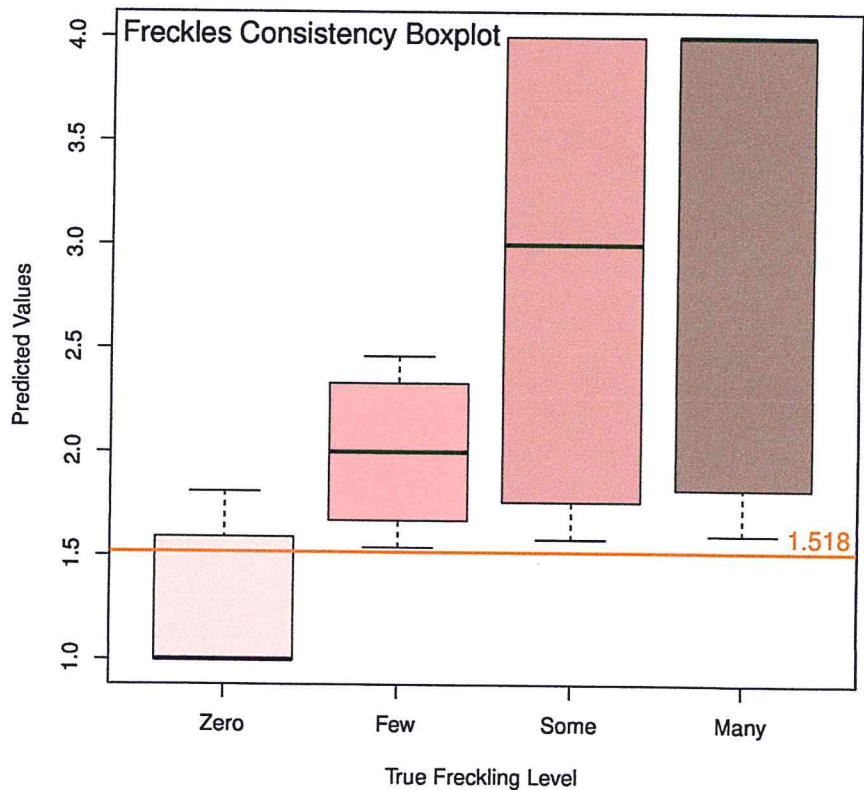
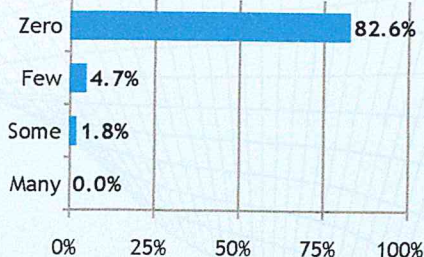


Based on these results, this subject:

- Has **Zero** freckles with 95.3% confidence
- Does not have **Few** freckles with 95.3% confidence
- Does not have **Some** freckles with 98.2% confidence
- Does not have **Many** freckles with 99.99% confidence

Consistency of this value with the four possible trait values for freckles is shown below.

Freckles Consistency Values



Snapshot Prediction Results

Genomic Ancestry



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The genome for this subject best matches Admixed South East Asian, European, and African ancestry. The evidence supporting this conclusion follows.

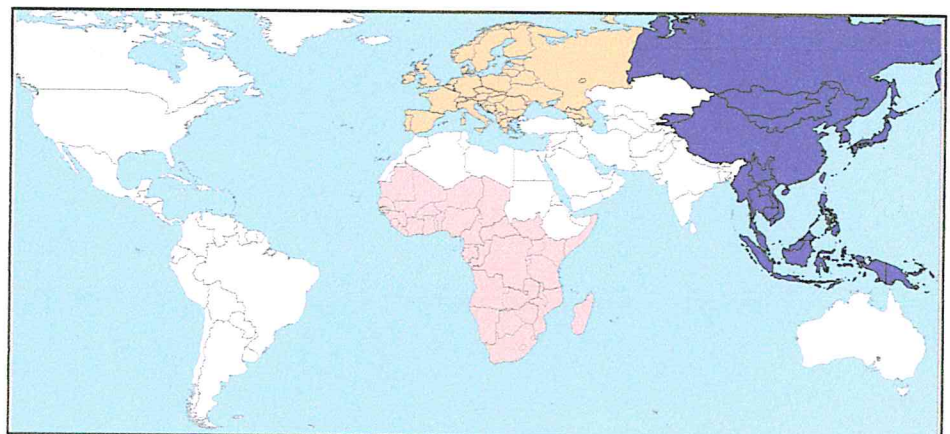
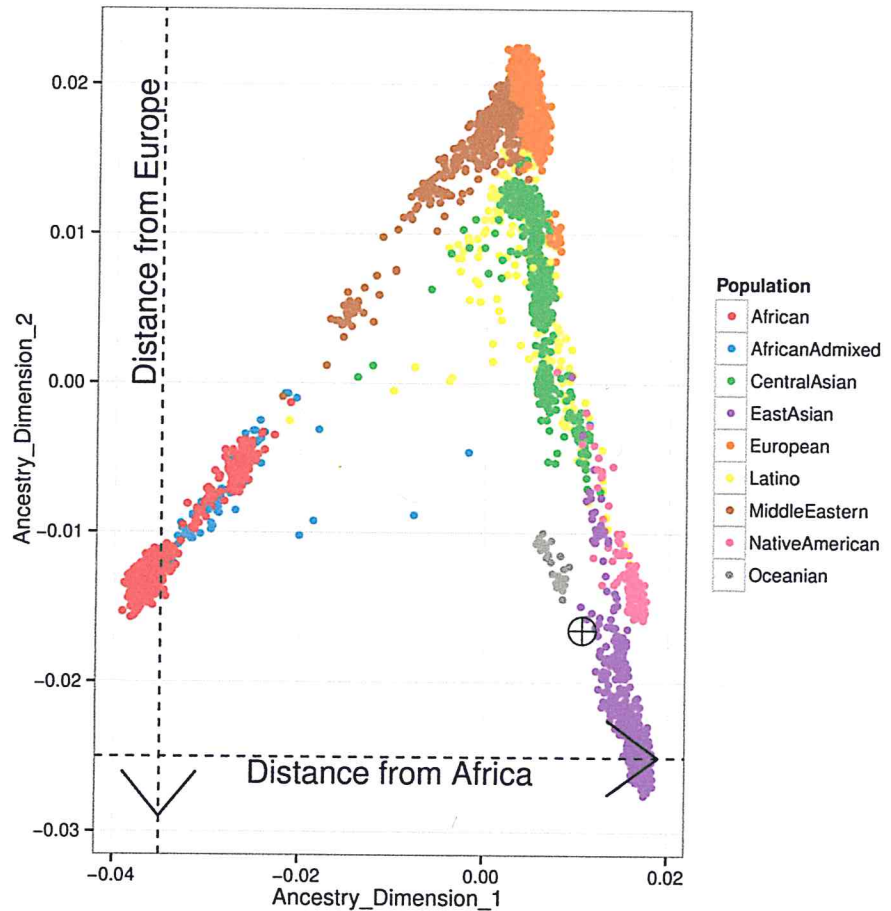
Partitioning this genome according to its proportional membership in the seven continental regions yields:

Region	Percent
East Asia	67.96%
Europe	17.83%
Africa	9.62%
Central Asia	**
Oceania	**
Americas	**
Middle East	**

** - No significant ancestry from this population

On a global scale, this genome (crosshairs) does not fall within any single group but clusters closest to known East Asian individuals (purple points on top right plot).

This subject shows primarily East Asian ancestry, with smaller amounts of European and African ancestry. This ancestry has not been observed in any subjects from a single population and thus likely represents recent admixture.



Snapshot Prediction Results

Genomic Ancestry



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Partitioning analysis within 32 regional populations yields the following results:



Region	Percent
East Asia - Southeast	31.57%
East Asia - Central	29.54%
Europe - North	12.70%
Africa - West	8.75%
East Asia - Polynesian	6.32%

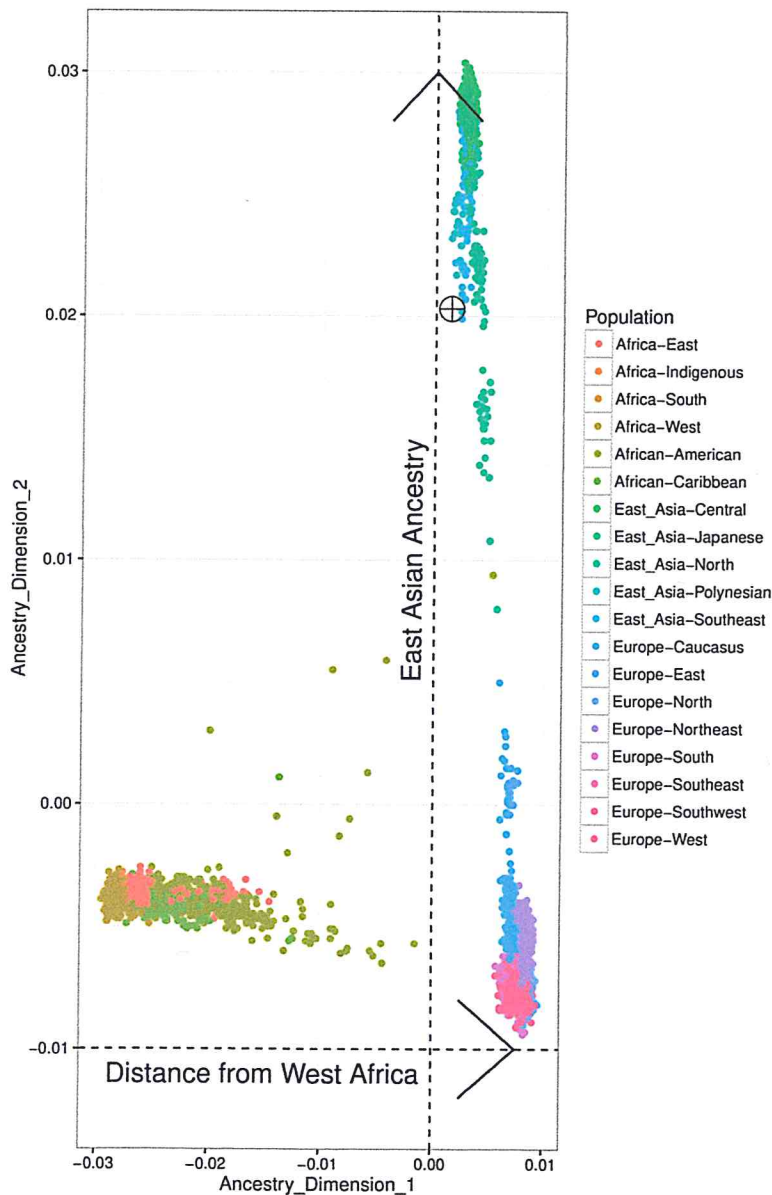
This individual shows an even mix of Southeast Asian and Central East Asian ancestry, with smaller amounts from North Europe, West Africa, and Polynesia. In the Snapshot database of subjects with verified ancestry, this pattern has not been observed, suggesting this individual is either the result of recent admixture or is from a region that has not been sampled. The Asian ancestry proportions have been observed in subjects from Southern China and Southeast Asia, and thus this individual may be 3/4 South East Asian and 1/4 admixed European and African.

The low call rate, coupled with the unusual admixture, is a cause for concern. However, in other samples with similarly low call rates, ancestry noise levels have been at or below 5%, so it is unlikely that 25% of this individual's ancestry would be attributable to noise. Attempting to isolate the actual signal by applying mixture deconvolution or filtering to only the best-scoring SNPs had no effect on the inferred ancestry, suggesting that the ancestry described on this page is real signal. Simulating the addition of 20% genotyping noise to South East Asian reference samples introduces ~10% African and ~10% European ancestry, but this tended to come from South Africa and East Europe, suggesting that the West African and North European signals are real.

Based on the SNPs available on this chip, this individual's most likely Y chromosome haplogroup is O2a2b2a2, a subclade of O-P164, which is most common in Southeast Asia.

The plot at the left shows only subjects from Africa, Europe, and East Asia. It can be interpreted as showing increasing distance from West Africa from left to right and increasing East Asian ancestry from bottom to top. This subject (crosshairs) does not fall within any single group but clusters closest known Southeast Asian subjects (turquoise points).

Southeast Asia contains subjects from the Cambodian, Dai, Lahu, Thai & Vietnamese populations. Central East Asia contains subjects from the Han, Miao, Naxi, She, Tujia & Yizu populations. North Europe contains subjects from the Belgian, British, Dutch, German, Irish, Northern European, Orcadian, Scottish & UK populations. West Africa contains subjects from the Bambaran, Dogon, Esan, Gambian, Mandenka, Mende & Yoruba populations. Polynesia contains subjects from Samoa & Tonga.



Snapshot Prediction Results

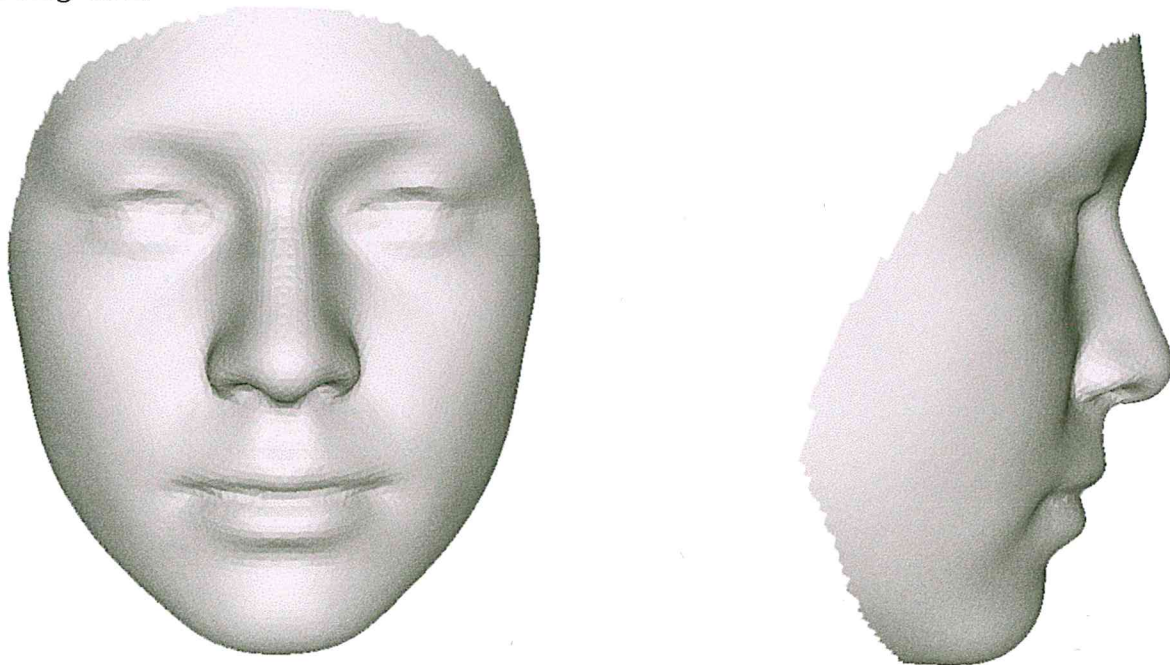


Face Morphology

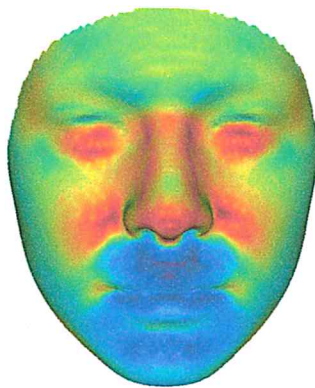
#LVMPD-NV-041028-1027-Snapshot

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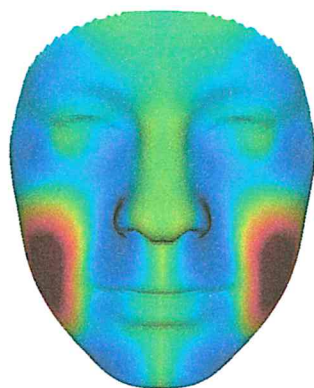
Below is the predicted face for this subject from the front and from the side. This prediction — which was generated using sex, ancestry, *and* thousands of SNP genotypes — was compared to a baseline prediction based *solely* on sex and ancestry. The heat maps at the bottom show how the subject's prediction differs from the simpler model in area and in X, Y, and Z displacement. In all heat maps, red indicates an increase in the value of the prediction as compared to this baseline face, and blue indicates a decrease. X displacement is measured relative to the center of the face, so red means "wider" and blue means "narrower". Y and Z displacement are measured absolutely — i.e., red means "higher" in Y and "more protruding" in Z.



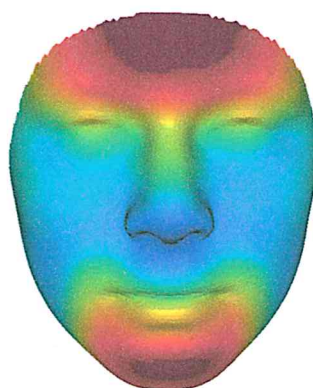
Predicted face for this subject



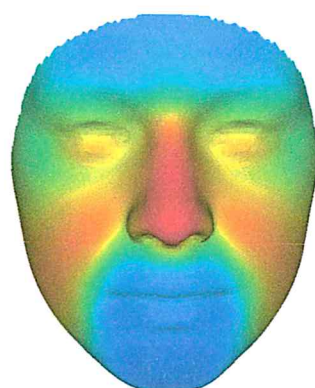
Area: Larger eyes, nose, and cheeks; smaller mouth and chin



X Displacement: Wider jaw; narrower brow, cheeks, nose, mouth, and chin



Y Displacement: Higher forehead and chin; lower nose, cheeks, and jaw



Z Displacement: Protruding eyes, nose & cheeks; recessed brow, mouth & chin



Magnitude

Relative to a face predicted using only matching sex and ancestry

Snapshot Prediction Results

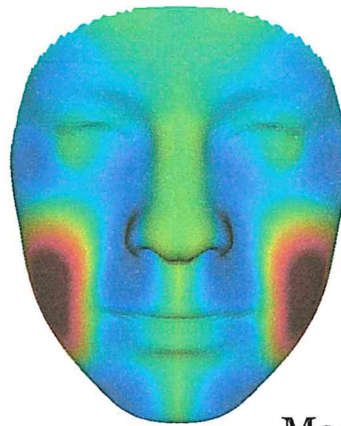
Composite Profile



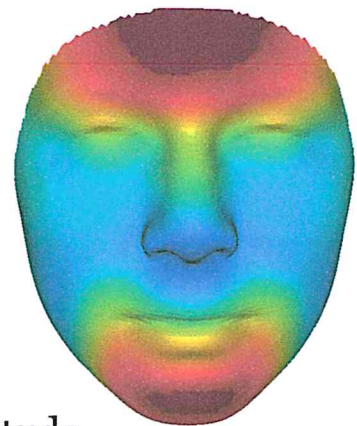
#LVMPD-NV-041028-1027-Snapshot
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Width



Height



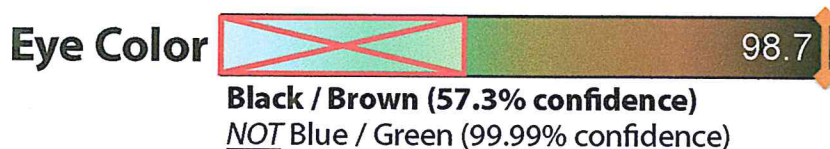
Face morphology differences are emphasized relative to a baseline face prediction made using only sex and ancestry.

Predicted (▣) & Excluded (⊠) Phenotypes



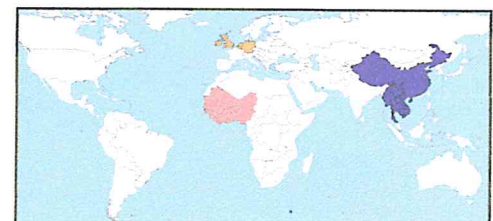
Sex: Male ♂

Age: Unknown
(Composite shown at age 25)



Body Mass: Unknown
(Composite shown at BMI 22, Normal)

Ancestry: Admixed
South East Asian,
European, and African

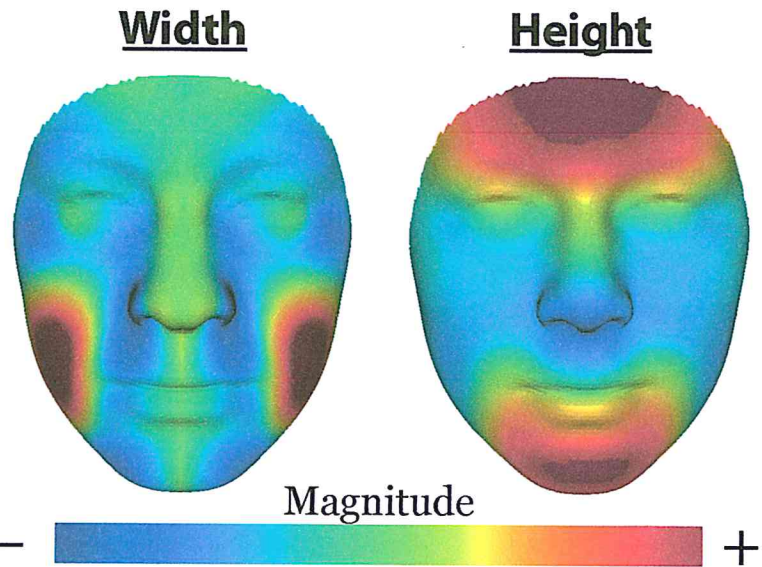


Snapshot Prediction Results

Composite Profile



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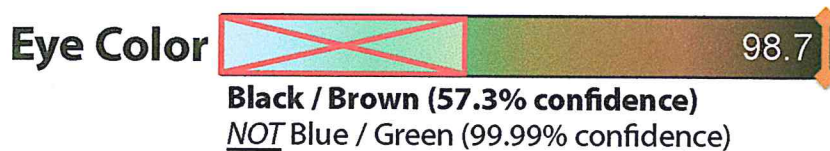
Face morphology differences are emphasized relative to a baseline face prediction made using only sex and ancestry.

Predicted (▣) & Excluded (⊠) Phenotypes



Sex: Male ♂

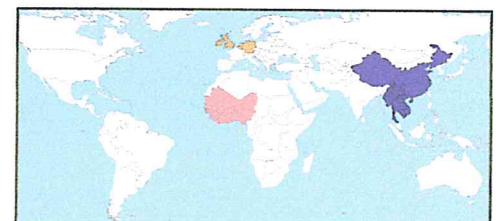
Age: Unknown
(Age progressed to ~40 years)



Body Mass: Unknown
(Composite shown at BMI 22, Normal)

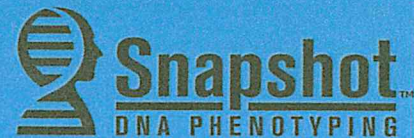


Ancestry: Admixed
South East Asian,
European, and African



Snapshot Prediction Results

Disclaimer



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The Parabon® Snapshot™ DNA Phenotyping Service provides predictions of human appearance from DNA. The Snapshot phenotype prediction models are derived from the application of statistical methods and machine learning algorithms to Parabon's reference database of genotype and phenotype (trait) information, which has been provided by self-consented individuals representing a diverse set of ancestry groups. The Snapshot composite images presented in this report are algorithmic predictions of face morphology, based on the sex, ancestry and genotype of the tested subject, onto which individually predicted pigmentation traits are superimposed. The shape of the head is inferred from the predicted face shape and ear shape is currently not predicted. The predictions depict the tested subject at approximately twenty-five (25) years of age and average body-mass index (BMI), unless otherwise indicated. Trait variations due to age, weight, or personal choice, such as dyed hair or facial hair, are not captured.

The Snapshot reference database and the Snapshot prediction models derived therefrom do not represent the full range of human genetic diversity, as they do not include subjects from all human populations and necessarily reflect only a subset of the total genetic variation within any given population. Moreover, environmental factors, such as nutrition, can affect appearance in ways that are inherently unpredictable. Accordingly, discretion should be used when attempting to include or exclude individuals in an investigation by comparison of appearance with Snapshot predictions. Mixture deconvolution is under active development, and results are offered provisionally. Confidence intervals have been calculated using the corresponding subset of SNPs during cross-validation.

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By default, Snapshot composites are generated at a target age of 25 years and a body mass index (BMI) of 22, which is the average of the 'Normal' BMI range. However, if additional information about the lifestyle or age of the unknown subject is known, such information can be incorporated into a composite by Parabon's Forensic Art Department.

IMPORTANT: Snapshot composites are **NOT** intended for use with facial recognition software.

Furthermore, Snapshot composites must be used, at all times, in conjunction with their associated phenotype and ancestry predictions. Accordingly, Snapshot composites may NOT be distributed as standalone images ("faces"), either within your organization or externally to any third party.

Snapshot Prediction Results



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To: yolandacsi <yolandacsi@aol.com>
Subject: Parabon Snapshot Account Created for yolandacsi@aol.com
Date: Mon, May 15, 2017 10:08 am

The following Parabon Snapshot account was created at 2017-05-15 17:07:25 UTC

Email Address: yolandacsi@aol.com

To activate this account, please visit the link below:

<https://snapshot.parabon-nanolabs.com/user-activation/1FBS-GP0R-TJVC-SD9C>

NOTE: This activation link will expire 7 days from when it was sent.

Once there, you will be asked to verify the email address listed above and create a new password for your Snapshot account. Then you will be given the opportunity to update your contact information and download any Snapshot-related documents that may have been shared with you.