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

**Table of Contents**

- Prediction Results: Skin Color ........................................ 1
- Prediction Results: Eye Color .......................................... 2
- Prediction Results: Hair Color ......................................... 3
- Prediction Results: Freckling ........................................... 4
- Genomic Ancestry Results ............................................. 5-6
- Face Morphology Results ............................................... 7
- Composite Profile ....................................................... 8
- Disclaimer ............................................................. 9-10

**Sample Description and Genotyping Results**

7.56 ng of DNA extracted from a swab with suspected semen was sent to AKESOgen for genotyping on the Illumina CytoSNP-850k chip. The overall genotyping call rate was 98.95% (842,350 SNPs), which indicates that the sample was most likely single-source.

Analysis of the sex chromosomes showed the subject is male.
The subject is predicted to have **skin color = 4.692**.

In the range of previously observed prediction values for skin color, this value falls at **98.0%**.

Based on these results, this subject:
- Has **Dark** skin color with 54.3% confidence
- Has **Dark or Dark Olive** skin color with 99.99% confidence
- Does not have **Very Fair** skin color with 99.99% confidence
- Does not have **Fair** skin color with 99.99% confidence
- Does not have **Light Olive** skin color with 99.99% confidence

Consistency of this value with the five possible trait values for skin color is shown below.
The subject is predicted to have eye color = 4.078.

In the range of previously observed prediction values for eye color, this value falls at 93.3%.

Based on these results, this subject:
- Has Brown eye color with 52.0% confidence
- Has Brown or Hazel eye color with 56.2% confidence
- Does not have Blue eye color with 99.99% confidence
- Does not have Green eye color with 99.99% confidence

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

The hair color model is based on 2534 unrelated individuals from a range of ethnic backgrounds. The categorical trait values are coded from lightest to darkest, such that:

- Red = 1
- Blond = 2
- Brown = 3
- Black = 4

The subject is predicted to have hair color = 3.787.

In the range of previously observed prediction values for hair color, this value falls at 90.3%.

Based on these results, this subject:
- Has Black hair color with 99.5% confidence
- Does not have Brown hair color with 99.5% confidence
- Does not have Red hair color with 99.99% confidence
- Does not have Blond hair color with 99.99% confidence

Consistency of this value with the four possible trait values for hair color is shown below.
The subject is predicted to have **freckles = 1.468**.

In the range of previously observed prediction values for freckles, this value falls at 18.9%.

Based on these results, this subject:
- **Has Zero** freckles with 94.3% confidence
- **Does not have Few** freckles with 94.3% confidence
- **Does not have Some** freckles with 99.99% 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.

The freckles model is based on 581 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 genome for this subject best matches African-American ancestry. The evidence supporting this conclusion follows.

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

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>90.2%</td>
</tr>
<tr>
<td>Europe</td>
<td>9.5%</td>
</tr>
<tr>
<td>Americas</td>
<td>**</td>
</tr>
<tr>
<td>Central Asia</td>
<td>**</td>
</tr>
<tr>
<td>East Asia</td>
<td>**</td>
</tr>
<tr>
<td>Middle East</td>
<td>**</td>
</tr>
<tr>
<td>Oceania</td>
<td>**</td>
</tr>
</tbody>
</table>

** - No significant ancestry from this population

On a global scale, this genome (crosshairs) clusters with known African and African-American individuals (red and blue points, respectively, on top right plot).

This subject shows primarily African ancestry with some European ancestry. These proportions are also shown on the map to the right. This ancestry is common in African-American individuals.
Partitioning analysis within Africa and Europe yields the following results:

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa - West</td>
<td>82.07%</td>
</tr>
<tr>
<td>Europe - Southwest</td>
<td>4.57%</td>
</tr>
<tr>
<td>Europe - Northwest</td>
<td>3.59%</td>
</tr>
<tr>
<td>Europe - Southeast</td>
<td>3.07%</td>
</tr>
</tbody>
</table>

The individual shows ancestry primarily from West Africa. Various regions of Europe (Southwest, Northwest, and Southeast) each show very small contributions (less than 5% each). In the Snapshot ancestry database of nearly 10,000 subjects, this pattern is typically seen in African-American subjects.

The principal component plot at the left shows only subjects from Africa and Europe, as well as admixed individuals. It can be interpreted as showing increasing African ancestry from left to right. This subject (crosshairs) clusters with known African-American and African-Caribbean subjects (green points).

West Africa includes subjects from the Bambara, Dogon, Esan, Gambian, Mandinka, Mende, and Yoruba populations.
Snapshot Prediction Results

Face Morphology

Below is the predicted face for this subject from the front and from the side. This prediction was compared to the average predicted face for subjects with the same sex and ancestry. The heat maps show how the predicted face differs from this average face in area and X, Y, and Z displacement. In all heat maps, red indicates an increase in value of the prediction as compared to the average, and blue indicates a decrease. X displacement is relative to the center of the face — i.e., red means farther from the center — whereas Y displacement is relative to the bottom of the chin.

Area: Larger mouth and brow; smaller nose and eyes

X Displacement: Wider face, mouth, nostrils, and jaw; slightly narrower chin

Y Displacement: Shorter chin; higher nose tip; lower eyes and brow

Z Displacement: More protruding eyes and mouth; flatter nose and chin

Relative to the average male with African ancestry
**Snapshot Prediction Results**

**Composite Profile**

#OPD-FL-2001-380051-Snapshot

PNL Document #15K11P55-5BE8XMUM9E

---

**Width**

Wider face, nostrils, mouth, and jaw; shorter chin; more protruding eyes and mouth with a flatter nose

**Depth**

---

**Predicted (□) & Excluded (□ □) Phenotypes**

<table>
<thead>
<tr>
<th>Category</th>
<th>Prediction</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skin Color</strong></td>
<td>Dark / Dark Olive</td>
<td>98.0% confidence</td>
</tr>
<tr>
<td></td>
<td>NOT Very Fair / Fair / Light Olive</td>
<td>99.99% confidence</td>
</tr>
<tr>
<td><strong>Eye Color</strong></td>
<td>Brown / Hazel</td>
<td>93.3% confidence</td>
</tr>
<tr>
<td></td>
<td>NOT Blue / Green</td>
<td>99.99% confidence</td>
</tr>
<tr>
<td><strong>Hair Color</strong></td>
<td>Black</td>
<td>90.3% confidence</td>
</tr>
<tr>
<td></td>
<td>NOT Brown / Red / Blond</td>
<td>99.5% confidence</td>
</tr>
<tr>
<td><strong>Freckles</strong></td>
<td>Zero</td>
<td>18.9% confidence</td>
</tr>
<tr>
<td></td>
<td>NOT Few / Some / Many</td>
<td>94.3% confidence</td>
</tr>
</tbody>
</table>

**Sex:** Male **♂**

**Age:** Unknown

(Composite shown at age 25)

**Body Mass:** Unknown

(Composite shown at BMI 22, Normal)

**Ancestry:** African-American
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.

**Terms of Service**

Requests for and use of the results of any product or service ("Service" or "Services") provided by Parabon NanoLabs, Inc. ("Parabon") are subject to the following terms and conditions and all applicable laws. By requesting and making use of the results of the Services, including the Materials (as defined herein) you accept and agree to these terms and conditions without limitation or qualification.

**NO WARRANTIES**

THE SERVICES ARE PROVIDED TO YOU ON AN AS IS AS AVAILABLE BASIS WITHOUT WARRANTY OF ANY KIND EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT. PARABON MAKES NO WARRANTY AS TO THE RELIABILITY OF THE RESULTS OF THE SERVICES, INCLUDING WITHOUT LIMITATION THE CONTENTS OF ANY REPORT OR ANY OTHER INFORMATION SUPPLIED OR OTHERWISE MADE AVAILABLE TO YOU THROUGH OR IN CONNECTION WITH THE SERVICES (COLLECTIVELY, "MATERIALS"). ANY USE OF THE MATERIALS, INCLUDING ANY RELIANCE THEREON, IS AT YOUR SOLE RISK. PARABON MAKES NO REPRESENTATIONS OR WARRANTIES THAT THE SERVICES WILL BE UNINTERRUPTED OR THAT THE MATERIALS WILL BE ERROR-FREE.

**LIMITATION OF LIABILITY**

PARABON SPECIFICALLY DISCLAIMS ANY LIABILITY, WHETHER BASED IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE, FOR ANY DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE SERVICES, INCLUDING WITHOUT LIMITATION THE USE OF ANY MATERIALS, EVEN IF PARABON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INCLUDING WITHOUT LIMITATION DAMAGES ARISING FROM RELIANCE BY ANY PARTY ON THE CONTENTS OF THE MATERIALS, OR DAMAGES ARISING IN CONNECTION WITH MISTAKES OR OMISSIONS IN, OR DELAYS IN TRANSMISSION OF, MATERIALS OR OTHER INFORMATION SENT TO OR BY YOU, AS APPLICABLE, WHETHER CAUSED IN WHOLE OR IN PART BY NEGLIGENCE, FORCE MAJEURE, TELECOMMUNICATIONS FAILURE, THEFT, OR DESTRUCTION OF, OR UNAUTHORIZED ACCESS TO THE MATERIALS.
INTELLECTUAL PROPERTY

Parabon retains all right, title and interest in and to the Services and the Materials, including without limitation all trademarks, trade names, logos and service marks (collectively, "Trademarks"), and all patents, copyrights, trade secrets and know how relating thereto or comprised thereby (collectively, "Intellectual Property"). Parabon hereby grants to you a non-exclusive, non-assignable, limited purpose, license to access and use the Materials (which shall at all times be and remain the sole and exclusive property of Parabon) for your own personal or internal purposes (as applicable). You shall not modify or, except as expressly permitted herein to the contrary, reproduce or distribute the Materials in any manner without our prior written consent thereto, or make any use of the Intellectual Property without our express prior written consent thereto. Notwithstanding the foregoing, if you are an authorized law enforcement organization or professional, you may disclose the Materials to the news media for distribution for the purpose of aiding an investigation of, or reporting on, a crime.

MODIFICATION OF TERMS OF SERVICES

Parabon reserves the right to modify these terms and conditions at any time. Such modifications will be posted on the Parabon Snapshot Web Site, and you are deemed to be apprised of and bound by any changes to the Web Site. Parabon may make changes in the Services described on the Web Site at any time.

GOVERNING LAW AND GENERAL PROVISIONS

Any claims relating to the Services ("Claim") will be governed by the laws of the Commonwealth of Virginia, U.S.A., excluding the application of its conflicts of law rules. You hereby agree that those state and federal courts located in Fairfax, Virginia shall have exclusive jurisdiction over all Claims.

INDEMNIFICATION

You shall defend, indemnify and hold harmless Parabon and its affiliates, and their respective officers, directors, employees and advisors, from and against any and all claims, demands, suits or proceedings brought against Parabon by any third party based upon or arising out of your request for, access to and use of the Services and/or the Materials, and any breach by you of these terms and conditions.

VIOLATIONS AND ADDITIONAL POLICIES

Parabon reserves the right to seek all remedies available at law and in equity for violations of these terms and conditions, including the right to refuse to fulfill your requests for Services and/or Materials.