Genetic systems known as autosomal markers were analyzed at DNA Diagnostics Center. Testing revealed a unique DNA fingerprint or profile. These eighteen markers correlate at a rate of 80% with probable ethnic ancestry as indicated. They reflect major human migrations as depicted on the following map. Since you receive one allele (unit of human variation) from one parent and one from the other, you can potentially have two markers, one or none. It is not possible to say which parent you get a marker from in any instance, and the fact that you do not have a marker does not mean that you lack that ancestry. Due to the nature of autosomal DNA, one sibling can get a marker and another could miss getting it.

<table>
<thead>
<tr>
<th>Marker</th>
<th>Allele</th>
<th>Allele</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATIVE AMERICAN I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NATIVE AMERICAN II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EUROPEAN I</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EUROPEAN II</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EASTERN EUROPEAN I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EASTERN EUROPEAN II</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>JEWISH I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JEWISH II</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>JEWISH III</td>
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<td>✓</td>
</tr>
<tr>
<td>JEWISH IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASIAN I</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ASIAN II</td>
<td></td>
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<tr>
<td>ASIAN III</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>ASIAN IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUB-SAHARAN AFRICAN I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUB-SAHARAN AFRICAN II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUB-SAHARAN AFRICAN III</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>SUB-SAHARAN AFRICAN IV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key to Ethnic Groups

NATIVE AMERICAN I. This marker is inherited by an individual who has some degree of Native American ancestry. Often it comes from only one parent. As with other markers, if you didn’t get it, that does not mean you don’t have any Native American ancestry. Pairs of markers (alleles) are reshuffled from generation to generation, and it could have been lost. You may have it, but a sibling might not. By “Native American” is meant any of the indigenous groups who lived in either North or South America before Columbus. It is the same designation as American Indian. Native American DNA is so distinctive that this test can detect even small amounts of it because of multigenerational interbreeding and effective conservation of admixture markers. But despite what you may have heard, no DNA test can definitively tell you what percentage of admixture you have. Studies show about 80% of modern-day North and South American indigenous peoples have at least one of these markers. NA I is strong throughout the Americas, from Apaches and Algonquian Indians to Mexican and Peruvian Indians.

NATIVE AMERICAN II. Similar to Native American I but found typically in people who are half or less Native American and about half Iberian with sometimes a lesser amount of Sub-Saharan African, i.e., Hispanic or Latino.

EUROPEAN markers are located on two different chromosomes and relate to prehistoric human migrations in Eurasia. Certain readings on these two sites are nearly specific to European populations, including European emigrants to North and South America. Europe embraces, north to south, Scandinavia, Spain, Italy and Greece, and west to east, the British Isles, Poland and that part of Russia west of the Ural Mountains. Both EUROPEAN markers were carried westward by proto-Europeans approximately 40,000 years ago after they split off from an earlier stock from which Asians and Native Americans are also descended.

EUROPEAN I is a Mediterranean marker. If you have it, your ancestors passed down to you a genetic heritage emphasizing the South of Europe, populated by the oldest Europeans. The frequency of this marker decreases as we go north. Conversely, EUROPEAN II is more common in the Atlantic-facing countries of the British Isles and Northern Europe, particularly Northwest Europe.

EASTERN EUROPEAN. These are two markers, each diagnostic of Eastern European ancestry in your family tree. They are most common in Swedes, Poles, Lithuanians, Belarusians, Latvians, Ukrainians and Russians. They are found frequently also in Ashkenazi Jews. Except for Sweden, all the matching countries are predominately Slavic in their demography and culture.

JEWISH. These markers do not necessarily point to Jewish ancestry but can also signal ancestry in any of the places where Jews historically lived due to Jews' admixture with local populations, conversion, identity loss and the phenomenon of Crypto-Judaism. Still, statistics show that over 80% of modern-day Jews have one or more markers. They are sensitive for both major branches of Judaism, Ashkenazi and Sephardic, or Spanish, Jews. Ashkenazi Jews ("German," in Hebrew) started out in the Rhineland and northern France following the collapse of the Roman Empire. During the Age of Charlemagne around 800 they began to settle eastward as the lands of the Central and Eastern European Slavs were conquered by the Franks and Germans. There they met the Turkic Khazar people moving in from the Caucasus region. They reached a high point in their development in seventeenth-century Poland, Lithuania, Silesia, the Ukraine, Russia and Romania. During Germany's Third Reich, six million or more of them were killed in the Holocaust. In contemporary times, they represent perhaps the best-known face of Judaism, accounting for about 80% of American and Israeli Jews. Because they trace back to a small nucleus (founder effect or bottlenecking) which kept expanding while preserving the same gene pool (genetic drift), Ashkenazi Jews have very recognizable genetic traits. They are subject to a range of hereditary disorders such as Tay-Sachs disease. As in the case of other markers, Jewish I, II and III are not completely conclusive in showing ancestry, nor do they tell you how much you may have or where in your genealogies it may stem from.

JEWISH I. This is the most common of the three markers. It can occur without known Jewish ancestry for a variety of reasons including an ancestor’s conversion to Christianity during the centuries of persecutions against Jews in Europe. Its frequency is highest in Poles, Russians,
Germans, Hungarians, Romanians and Slavic peoples who intermarried with Ashkenazi Jews. It also appears in Spanish, Portuguese and Moroccan Jews (Sephardim).

**JEWISH II.** This marker is the strongest. It is found in Jewish families who have intermarried with other Jews down through the centuries. It is characteristic of Ashkenazi Jews.

**JEWISH III.** This marker is an indication of Middle Eastern roots. Preserved by Jews, it is also borne by Kurds, Syrians, Arabs, Berbers, Basques, Turks, Greeks, Italians and other populations from the ancient world. It is particularly common in Sephardic Jews.

**JEWISH IV.** A marker indicative of Tatar or Khazar heritage. Khazars were a Central Asian people of Turkic, Hunnish and Iranian elements that arose in the Caucasus region. After converting to Judaism in the early Middle Ages, they moved westward into Russia and the Ukraine under pressure from Islam, eventually becoming a large component of Eastern and Central European Jewry. Many Ashkenazi Jews now find they have some Khazar (or intermingled Tatar) ancestry.

**ASIAN I, II, III, IV.** In the context of DNA Fingerprint Plus, Asia consists of China, Siberia, Mongolia, Korea, Japan and other islands around the China Sea, as well as India, Southeast Asia and Australia. Asian I is centered in North China, Asian II in India and Asian III and IV in Southeast Asia.

**SUB-SAHARAN AFRICAN (Black).** Humans are believed to have lived originally in Africa. All non-African peoples are thought to have left that continent in a single small group about 80,000 years ago, developing into the proto-Arab, Indian, Southeast Asian, Australoid, East Asian, European and Native American ethnic groups. Sub-Saharan Africa (below the Sahara Desert) excludes North Africa, which is considered Caucasian (White) and customarily grouped with the Middle East. Between the sixteenth and nineteenth centuries, about 15 million Africans were transported to the New World as slaves, primarily from West Africa, Angola and Mozambique. Their descendants are the African Americans, among others. African ancestry is not uncommon in Portuguese, Sicilian and Middle Eastern people. SSA I follows the out-of-Africa trail of early Eurasians through Arabia and South India and occurs at its highest frequency in the Horn of Africa. SSA II originates apparently in Southwest Africa, is deep seated and includes West Africans, Romani, Melungeons, Basques and Levantine peoples. SSA III is another deep seated marker from the interior of the African continent. It is very rarely found in Asian peoples. SSA IV includes Berbers and African Americans and is also found in Greeks, Egyptians, Italians and other Mediterranean peoples.

**References and Suggestions for Further Reading**

4. DNA-Interactive (web site) http://www.dnai.org/index.html. Easy to explore video modules on the many applications of DNA in the words of the founders and practitioners of genetics today.

Understanding Your Results (FAQs): http://dnaconsultants.com/DNAScience#testfaq.

Statement on Ethnicity. Allelic population analysis is a science still in the early stages of development. As our understanding of human history and prehistory improves and more specific markers are discovered for distinct populations we can expect the accuracy of prediction of the ethnic constituents in our ancestry to increase. Here are some links to common ancestries mentioned in this report.
Albanian Arab Ashkenazi Austrian Belgian British Croatian Czech/Slovak Danish Dutch English Europeans French German Greek Hungarian Irish (included in British) Italian Jews Middle Eastern Moroccan Norwegian Polish Romani/Gypsy Russian Scottish Sephardic Slovenian South Slavic Spanish/Portuguese Swedish Swiss Tunisian Turkish Welsh

Reliability. While the laboratory methods used to determine your DNA markers are completely accurate and their statistical analysis is reliable, interpretation of the numerical results is subjective. Conclusions will vary. To form more confident opinions, we suggest that you combine the findings in this report with other testimony, such as that of DNA haplotypes, genealogical records and family history.

Confidentiality. Your testing, results and this report are 100% confidential.

Preservation. Have you preserved your DNA? Purchase our economical DNA Archiving Pack and enjoy a new sense of security. It’s easy to do and you can store your DNA in a safe place at home.
Following Up. Join a Forum at DNA Communities for free. Just follow the prompts to register and set your preferences. Begin exploring your results and sharing your genealogy with others. Choose from European, World, Native American, Melungeon, African, Jewish and Gypsy/Roma discussions. Visit our blog for interesting reviews of news and research about genetics and ancestry tracing. Also, check out the populations where your ancestors originated on Population Pages.

Upgrade. Purchase the Premium Upgrade on our site. You will receive a complete DNA Fingerprint Plus without the need to be resampled.

Susan Levin  
Assistant Investigator  
DNA Consultants  
December 17, 2015

Disclaimers
This 18 Marker Test is a probabilistic prediction of ancestry for personal knowledge only. It is a non-chain of custody form of testing and is not intended for legal or official purposes. Its results may or may not confirm expected ethnic composition, family history or genealogical determinations. Alone, it may not be used to prove identity, biological relationships, nationality, citizenship, immigration or tribal enrollment.
PREHISTORIC MOVEMENTS OF ETHNIC GROUPS