

## Richard C. Stewart

### 18 Marker Ethnic Panel

S2659

Eighteen markers commonly reported as part of an individual DNA profile or fingerprint have been found by DNA Consultants to correlate with probable ethnic ancestry as indicated. They reflect major human migrations as depicted on the following map. Since you receive one allele (DNA variable or unit of human variation) from one parent and one from the other in the process of recombination, you can potentially have two markers, one or none. It is not possible to say which parent you inherit a marker from, and the fact that you do not have a marker does *not* mean that you lack that ancestry, since either parent has a pair of alleles at the marker location and only one will be passed to each child. You can lack a marker while your sibling may not.

A false positive marker occurs when your profile contains the marker in question but control measures show that it is not a true indicator when considered together with all your other markers. Frequent false positives are 1) Finnic/Uralic for people with Native American ancestry, 2) Sub-Saharan African for Ashkenazi Jews and Russians, 3) Asian for certain Europeans and 4) Australoid/Southeast Asian for any of the other ethnic groups.

Marker	Parent 1	Parent 2	False Positive?
<b>NATIVE AMERICAN I</b>			
<b>NATIVE AMERICAN II (Hispanic)</b>	✓	✓	
<b>EUROPEAN I (Mediterranean)</b>	✓		
<b>EUROPEAN II</b>	✓		
<b>EASTERN EUROPEAN I</b>			
<b>EASTERN EUROPEAN II</b>			
<b>ASHKENAZI JEWISH I</b>			
<b>ASHKENAZI JEWISH II</b>			
<b>ASHKENAZI JEWISH III</b>	✓		
<b>TATAR/KHAZAR</b>			
<b>ASIAN I</b>			
<b>ASIAN II (various)</b>			
<b>SUB-SAHARAN AFRICAN I</b>			
<b>SUB-SAHARAN AFRICAN II</b>			
<b>SUB-SAHARAN AFRICAN III</b>			
<b>SUB-SAHARAN AFRICAN IV</b>			
<b>AUSTRALOID/SOUTHEAST ASIAN</b>			
<b>FINNIC/URALIC</b>			✓

**Full European Database Index: 2.14683E-11**

This number reflects the rarity or commonness of your genetic profile in Europe, that is, your proximity to 100% European ancestry, as opposed to having a degree of, or being mostly non-European (African, Middle Eastern, Asian, Native American). The index figure is expressed as a negative exponent, for example 1.0000E-12 equals  $1.0000 \times 10^{-12}$  or a likelihood of occurrence of 1 in 1 trillion. The lower the index (smaller the number) the less European you probably are in your overall background. The higher the index (larger the number) the less apt you are to have any non-European ancestors. You can look on this index as a measure of how European, specifically Western European, you are. The range is -10 (common) to -18 (rare).

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## Key to Ethnic Groups

**NATIVE AMERICAN I.** This marker is inherited by an individual who has some degree, whether large or small, 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 as **American Indian**. Because of the sensitivity of this test, your Native ancestors may have lived hundreds, even thousands of years ago. Native American DNA is so distinctive that this test can detect even small amounts of it. Note that since this marker occurs with the highest frequency in Native Americans and the lowest in Asians, it is a good means of distinguishing between the two. Since they share, to some extent, a common deep history, the two ethnic groups are often confused with each other.

**NATIVE AMERICAN II (Hispanic).** 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. Not always, but frequently, Europeans can thus be distinguished from Asians by their different values on these sites, mutations that characterize the generations of people who came after the split and living downstream from it. It is a great divide between Asians and Europeans.

Furthermore, if you have the **Mediterranean** marker, 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. This pattern exposes the refuges where European peoples wintered the Ice Age around the warmer Mediterranean Sea, emerging eventually and expanding northward to repopulate all of Europe beginning about 12,000 years ago. Native Americans split off from proto-Europeans, not from Asians, so they are likely to carry markers on these locations similar to Europeans. Technically speaking, the genetic distance between Native Americans and Europeans is smaller than that between them and Asians. Consequently, the markers called European and Asian offer a means to separate Asian from Native American ancestry. Remember, however, that the absence of a marker is not proof of the absence of that ancestry! European or Asian or a combination of the two may be revealed by other values in your genetic material. Only the DNA Fingerprint Ancestry Report will reveal all the details of your probably mixture of ethnic origins.

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

**ASHKENAZI JEWISH.** These markers do not *necessarily* point to Jewish ancestry. They can also signal ancestry in any of the places where Ashkenazi Jews historically lived. Thus, they are often found in combination with Eastern European. One of the two major branches of Jewry, the other being Sephardic, or Spanish, Jews, Ashkenazi ("German," in Hebrew) Jews 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 move eastward as the lands of the Central and Eastern European Slavs were conquered by the Franks and Germans. They reached a high point in their development as a people 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 and account 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 also subject potentially to a range of hereditary disorders such as Tay-Sachs disease. As in the case of other markers, these are not completely conclusive in showing Jewish ancestry, nor do they tell you how much you may have or where in your genealogies it may lie.

**TATAR/KHAZAR.** The Tatars and Khazars were a Central Asian people of Hunnish and Iranian origin who repeatedly broke into Russia and Eastern Europe from the **Steppes**. After converting to Judaism in the early Middle Ages, the Khazars, who lived in the Caucasus at that time, moved westward under pressure from Islam, eventually becoming a large component of Eastern European Jewry. Many Ashkenazi Jews now find they have some Tatar or Khazar ancestry.

**ASIAN I, II.** In the context of DNA Fingerprint Plus, Asia consists of China, Siberia, Mongolia, Korea, Japan and other islands around the China Sea, but not necessarily **India** or Southeast Asia, regions that fall, genetically speaking, midway between the first out-of-Africa people and modern-day **East Asians**. Customers who have Asian markers (unless they are false positives or evidence of Tatar/Khazar or rare admixture) are probably predominately, if not completely, East Asian in ancestry so great is the ethnic and historical divide between East Asians and the rest of the world. It is a complex of markers; often it is responsible for “false Asian” results.

**SUB-SAHARAN AFRICAN.** Humans are believed to have lived originally in Africa. All non-African peoples are thought to have left Africa in an initially small group about 75,000 years ago, developing into the proto-Arab, Indian, **Southeast Asian**, Australoid, East Asian, European and Native American ethnic groups. But presence of a Sub-Saharan African marker (unless a false positive) usually indicates some degree of that ancestry, partial or whole, from modern times. It is not deep history. **Sub-Saharan Africa** (below the Sahara Desert) excludes North Africa, which is mostly Caucasian, and is 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.

**AUSTRALOID/SOUTHEAST ASIAN.** The detection of these markers in your profile (unless false positive) points to ancestry from descendants of a people who lived at a time in human prehistory when the first out-of-Africa humans colonized India and Southeast Asia, including Indonesia and New Guinea, and crossed the water into Australia (as long ago as 125,000 years before present). In general, the older a people is the more diversity they exhibit, since they have had time to accumulate a lot of genetic change. Hence, **Australoid** (and African and Indian) genes are hard to separate from modern-day variations that may have developed because of a statistical phenomenon called **convergence**. This leads to a lot of false positives.

**FINNIC/URALIC.** An isolate more related genetically to distant Berbers in North Africa than to their neighbors the Swedes and Russians, the Finns and other Uralic people represent a special case. There is no one marker for them but rather a common set of variables tested by **ENFSI**. Unless you specifically know or you suspect you have recent **Finnish**, **Estonian**, **Saami** (Laplander) or similar **Ugric** or **Uralic** ancestors, usually a Finnic/Uralic match is false. Such a false positive is common in people of American Indian descent (although the reasons are obscure).

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## **Statement on Ethnicity**

Allelic population analysis is a science still in its infancy. As our understanding of human migration and deep history 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.

**Terminology.** Since racial terms are unclear and often emotionally charged, we have avoided them wherever possible. Such designations as “Caucasian” and “Hispanic” occur in the original studies. The language used to refer to different populations comes from the same sources. We do not endorse one name over another.

**Reliability.** While the laboratory methods used to determine your DNA markers are virtually error-free and their statistical analysis is reliable, interpretation of the numerical results is subjective. Conclusions will vary. Moreover, you should bear in mind that results are expressed in probabilities, so there is nothing that is absolute. 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.

# Human Migrations and Ethnic Divisions

