Reading and Comparing DNA Test Results

There are many applications for mitochondrial and Y chromosome testing. These include confirming traditional research, determining the number of origins for a surname, and finding an ancestral homeland. Lower resolution tests are best for ruling out connections. Higher resolution tests should be used to confirm and clarify the findings of low resolution tests.

When you join a lineage or geographic project (/genographic-project.aspx) your results will be compared to other project members. Whether you join a project or not, your results will be compared with Family Tree DNA's database, the most comprehensive of its kind in the world.

Y CHROMOSOME RESULTS

The scientists on the Family Tree DNA advisory board (/about.aspx) provided estimates of the time frame in which individuals may be related. These estimates depend on the number of markers tested and on the closeness of the match. The more markers tested, and the greater the number of markers that match, the higher the likelihood that the common ancestor lived more recently.

In this example of twelve marker testing, the project administrator has organized results according to the participants' ancestral village.

IMG
In the chart above, the first two individuals match each other exactly. This is called a 12/12 match. The third twelve marker result on the chart does not match the other two results; it has one difference. This is called an 11/12 match, and its relationship to the first two in recent generations is inconclusive. The fourth participant has twelve differences from the first two participants. The high number of differences indicates that they do not share ancestry in many thousands of years. This is confirmed by their different haplogroup determination. You may read more about relatedness and twelve marker tests here (/genetic-distance-markers.aspx?testtype=12).

In the next example the administrator has chosen to group results according to haplogroups.

(+) Enlarge Chart Additional testing using Y-DNA 37 test results are shown. It is expected that thirty-seven marker results will produce exact and one point off matches within a lineage. These results are then interpreted in relationship to the genealogical records. Kit B91326 matches kits B25894 and B91325 on the first twelve markers. When extended to thirty-seven markers the results do not match closely. There is not likely to be a common ancestor in recent times. This result illustrates the value of testing more markers. The time frame for relatedness for twelve markers is much broader than the time frame for thirty-seven (/genetic-distance-37-markers.aspx) markers and sixty-seven (/genetic-distance-67-markers.aspx) markers.

MITOCHONDRIAL RESULTS

Testing mitochondrial DNA can help replace lost records and show us genetic connections where no records remain. When mitochondrial DNA results do not match, they conclusively disprove a suspected relationship.

In the first example the project administrator has arranged the results by major haplogroup. Because haplogroups are thousands of years old, looking at results this way allows project members to focus on potential relatives.

IMG3
Here the first three participants have the same HVR1 results. This might indicate common ancestry. The fourth participant, kit B59138, has one additional mutation in HVR1. Although this is only a single difference, they are highly unlikely to share a recent common ancestor on this

lineage. Mitochondrial DNA changes slowly, so any change should be considered significant.

In this example the project administrator has grouped the participants' results according to the county where the participants are brickwalled. Although counties for a state in the United States of America are used this could be applied to any location.

IMG4
This approach places participants near geographically significant matches. The combination of close geography and a match increases the probability of a more recent common ancestor. The owners of kits B2582 and B199857 trace their ancestry to the same location and match on HVR1 and on HVR2 as well as their haplogroup. There is a strong chance that they share ancestry that dates to the European settlement of the region. Traditional records should be examined.

settlement of the region. Traditional records should be examined. Both mitochondrial DNA and Y-DNA projects benefit from having more results to compare. The larger the set of results, the easier interpretation becomes. Increasing the number of lineages sampled is therefore important for understanding matches and the success of the project.