

# Is an Historical Book of Mormon Incompatible with DNA Science?

One of the most recent and seemingly sophisticated attacks against the Book of Mormon has come from some who claim to use DNA to demonstrate that there never were any Israelites in the ancient New World.

While DNA science is relatively new, it has proven to be an accurate and valuable tool in a number of research areas. *Nuclear* DNA (*nDNA*) studies have been useful in criminal and forensic studies (as popularized by shows such as *CSI*) and even in helping identify victims of the 9-11 terrorist attacks. Likewise, *mitochondrial* DNA (*mtDNA*)—DNA that is passed from mother to child—has been useful in population studies. Some critics claim that mtDNA suggests that *all* ancient Americans came to the New World via an ancient land strip connecting Alaska and Siberia (across the Bering Strait). These critics claim that all the mtDNA evidence, thus far discovered, is consistent with an Asiatic populating of the Americas and that there is no evidence for any ancient “Israelite” DNA.

It should be noted that those who claim that DNA has demonstrated a non-historical Book of Mormon have not done any actual DNA research on this issue, but have instead used the DNA studies of others who never intended their research to be litmus tests for Book of Mormon historicity.

While it’s true that DNA studies thus far support the populating of the ancient New World by Asiatic migrations, they fall short of disconfirming the Book of Mormon narrative. Following are several reasons why:

## The Book of Mormon doesn’t deal with all ancient New World peoples

Despite common misconceptions among many LDS, the Book of Mormon does not claim to be a record of all those who inhabited the New World. For at least seventy years many (and today probably most) LDS scholars have found evidence within the Book of Mormon text that Book of Mormon geography encompassed a limited area (generally believed to have transpired in Mesoamerica) and that Book of Mormon peoples interacted with pre-existing populations. (These theories are treated in separate brochures entitled “Where did Book of Mormon Events Take Place,” “Who are the Lamanites?” and “Were the Lehites Alone in the Americas?”)

## We don’t know what Israelite DNA from Lehi’s time looks like

In order to know if ancient Israelite DNA could be found in the ancient New World, we’d have to recognize this DNA. There are at least two problems with this.

First, the initial inclination of most people is that ancient Israelite DNA should be noticeable in current Jewish populations, based on the assumption that the Jews are a race

that has remained genetically homogenous since ancient times. The reality, however, is that “Israelite,” like Jew, Mormon, or American, is a cultural rather than biological definition. Other than a few extreme examples, current Jewish populations (from whence samples are drawn for “Israelite DNA”) do not necessarily reflect the DNA make-up of ancient Israelite populations.

Second, even anciently the Israelites were comprised of various differing cultural backgrounds (each carrying different mtDNA markers from their mothers). By the time Jesus was born, the Jews were an even more genetically diverse group, having intermarried with Canaanites, Babylonians, Persians, Greeks and Romans, as these outsiders conquered Judah. That is even truer today.

## DNA markers can disappear

According to most LDS scholars, the Lehites and Mulekites would have been small incursions into much larger existing populations, probably of Asiatic origin. When small populations mix with large populations we have a significant risk of losing the DNA signatures of the smaller population. These markers can disappear for any of the following reasons.

**Genetic Bottleneck.** This occurs when a significant portion of a population does not reproduce, or at least does not pass on *mtDNA* (which is only passed on by the mother). If, for example, few Lehite women were born to the Book of Mormon peoples, the Nephites would have married native women and *their* DNA (not Sariah’s DNA) would have passed on to the children. Another cause for a bottleneck is when a large portion of a population dies (often due to war, famine, or disease) and the DNA traits of the surviving group does not accurately represent the diversity of the larger group from which they emerged (such a bottleneck may have occurred when diseases introduced by the Spaniards wiped out millions of native Americans).

**Founder Effect.** This type of genetic bottleneck happens when a small (founder) group leaves a larger group (as with the Lehites/Mulekites leaving a larger Israelite group). In some of these occurrences, the smaller group contains only a small fraction of the genetic markers of the larger group (which is often the case when a small group is isolated from the larger group). In these instances, the smaller group’s DNA signature is significantly different than that of the group’s origin. Thus, for the Book of Mormon, the DNA sampling of the Lehites/Mulekites (if we had it) may not accurately reflect the DNA markers of their Israelite heritage.

**Genetic Drift.** With mtDNA we have a problem with “lucky genes.” MtDNA follows a *single line* of transmission (mother to child), obscuring the fact that founding mothers have many other descendants whose mtDNA may be different. For example, if you go back two generations (to your grandparents), there are four individuals (two parents for each

of your parents), two of which are female (grandmothers on both sides). Only one of these grandmothers will have passed on her mtDNA to you, regardless of whether you are male or female. You will not have the mtDNA of one of your grandmothers. If we go back ten generations, you have 1,024 ancestral slots (or number of possible contributors to your genetic makeup – the further we go back the more ancestral slots. The actual number of progenitors – due to coalescence [the intermarrying of relatives – including distant relatives] – is actually lower). Of these, half are female. You will inherit the mtDNA of *only one* of these 512 female ancestral slots. Small populations are more susceptible to drift and the smaller the population the faster they drift, and there are (conservatively) at least 70 generations between modern Native Americans and Sariah, and more ancestral slots than there have been people on Earth.

## Conclusions

As far as I'm aware, there has never been a scientific DNA study done to test the authenticity of the Book of Mormon. Reports claiming to use DNA to refute the Book of Mormon are based on studies never designed to answer the question of Book of Mormon historicity.

We don't know what a "Lehite" gene would have looked like, so we don't know what to look for. It is likely that the Middle Eastern DNA of Lehi's day looked completely different than the "Israelite" DNA available today.

Population genetics demonstrate that the DNA signature of small populations can disappear when infused into larger populations.

DNA evidence is not incompatible with a belief that the Book of Mormon is an authentic ancient document.

## Additional Information

For more information and greater details on this topic see the following:

[http://en.wikipedia.org/wiki/Population\\_bottleneck](http://en.wikipedia.org/wiki/Population_bottleneck)

[http://www.brainencyclopedia.com/encyclopedia/f/fo/founder\\_s\\_effect.html](http://www.brainencyclopedia.com/encyclopedia/f/fo/founder_s_effect.html)

Jeff Lindsay, "Does DNA Evidence Refute the Book of Mormon?"

<http://www.jefflindsay.com/LDSFAQ/DNA.shtml>

Kevin L. Barney, "A Brief Review of Murphy and Southerton's 'Galileo Event,'"

[http://www.fairlds.org/apol/Book\\_of\\_Mormon/Book\\_of\\_Mormon08.html](http://www.fairlds.org/apol/Book_of_Mormon/Book_of_Mormon08.html)

Cooper Johnson, "DNA and the Book of Mormon,"

[http://www.fairlds.org/apol/Book\\_of\\_Mormon/Book\\_of\\_Mormon01.html](http://www.fairlds.org/apol/Book_of_Mormon/Book_of_Mormon01.html)

Brant Gardner, "The Tempest in a Teapot: DNA Studies and the Book of Mormon," [http://www.fairlds.org/apol/Book\\_of\\_Mormon/Book\\_of\\_Mormon07.html](http://www.fairlds.org/apol/Book_of_Mormon/Book_of_Mormon07.html)

David Stewart, "DNA and the Book of Mormon," <http://www.fairlds.org/apol/bom/bom12.html>

John L. Sorenson and Matthew Roper, "Before DNA," *Journal of Book of Mormon Studies* 12:1 (2003), 6-23. Also at [http://www.fairlds.org/pubs/Sorenson\\_Roper\\_DNA.pdf](http://www.fairlds.org/pubs/Sorenson_Roper_DNA.pdf)

Michael F. Whiting, "DNA and the Book of Mormon: A Phylogenetic Perspective," *Journal of Book of Mormon Studies* 12:1 (2003), 24-35. Also at [http://www.fairlds.org/pubs/Whiting\\_DNA.pdf](http://www.fairlds.org/pubs/Whiting_DNA.pdf)

John M. Butler, "A Few Thoughts From a Believing DNA Scientist," *Journal of Book of Mormon Studies* 12:1 (2003), 36-37. Also at [http://www.fairlds.org/pubs/Butler\\_DNA.pdf](http://www.fairlds.org/pubs/Butler_DNA.pdf)

D. Jeffrey Meldrum and Trent D. Stephens, "Who Are The Children of Lehi?" *Journal of Book of Mormon Studies* 12:1 (2003), 38-51. Also at [http://www.fairlds.org/pubs/Stephens\\_Meldrum\\_DNA.pdf](http://www.fairlds.org/pubs/Stephens_Meldrum_DNA.pdf)

David A. McClellan, "Detecting Lehi's Genetic Signature: Possible, Probable, or Not?" *FARMS Review* 15:2 (2004), 35-90.

Matthew Roper, "Swimming in the Gene Pool: Israelite Kinship Relations, Genes and Genealogy," *FARMS Review* 15:2 (2004), 91-128.

Dean H. Leavitt, Jonathan C. Marshall, and Keith A. Crandall, "The Search for the Seed of Lehi: How Defining Alternative Models Helps in the Interpretation of Genetic Data," *Dialogue: A Journal of Mormon Thought* 36:4 (2003), 133-150.



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