

How Well-informed are We about Ashkenazic Genetics?

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Abstract: *Genetic research of Ashkenazic Jewry has made an enormous leap forward with the introduction of modern DNA research. It is characterized by the influence demography, history, religion, and politics have on the interpretation of the results. By way of a sample article the author shows how geneticists report results pertaining to mitochondrial DNA (female line), Y chromosomal DNA (male descent) and autosomal DNA (demographic history). Certain results are not mentioned, such as the 80 percent European background of Ashkenazic women, and the significant difference between West and East European Ashkenazic mitochondrial DNA. A genetic link between Ashkenazic men and the Biblical Israelites, for which is no evidence, is reported though. The author is of the opinion that the reporting is not always based on scientific principles.*

Keywords: *history, demography, genetics.*

1. INTRODUCTION

The field of molecular genetics is a relatively young field that started about 50 years after World War II. One consequence of this young age is that the field of modern Jewish genetics is also very young. Due to World War II, East European Ashkenazim have become the largest Ashkenazic group. As a result, most of the Ashkenazic studies are carried out with East European Ashkenazim. Their historiography is characterized by two contradictory assumptions, East European Jews originate from Germany and East European Jews do not originate from Germany, the East European Jewish (Baron 1957. Vol. 16, 4; Weinryb 1972) and German-Jewish (specifically *Germania Judaica* I, II, and III) view, respectively.

Ashkenazic historiography is now dominated by East European Ashkenazim. This observation takes us straight to the controversy about the demographic development of East European Ashkenazim, the explosive population increases of more than 1 percent annually between 1500 and 1800. Most Jewish geneticists involved in Ashkenazic genetics follow East European Jewish historiography including the explosive growth rates (e.g. Atzmon, Bonne-Tamir, Friedman, Hammer, Nebel, Ostrer, Pe'er, Skorecki) that have become a dogma for East European Jewish historians. They also cling to the explosive growth rates because this is the only way to explain how a small number of German Jews can lead to some two million East European Jews in 1800.

Furthermore, an article about Jewish genetics will be reviewed by Jewish peers. The number of Jewish geneticists dealing with the origin of Ashkenazic Jews is small, and so is the number of Jewish peers because they come from amidst these same geneticists.

In earlier publications (van Straten 2007; van Straten 2017; van Straten 2021, 23–33), I showed that there is no evidence for an origin from Germany according to German-Jewish historians and that according to modern specialists in the field of demography, e.g. Jim Oeppen and Anthony Wrigley, the aforementioned explosive growth rates were not possible in Europe between 1500 and 1800.

Another issue that may affect conclusions drawn by Jewish geneticists is politics (Ostrer, H. 2012, 220). “The stakes in genetic analysis are high. It is more than an issue of who belongs in the family and can partake in Jewish life and Israeli citizenship. It touches on the heart of Zionist claims for a

Jewish homeland in Israel. One can imagine future disputes about exactly how large the shared Middle Eastern ancestry of Jewish groups has to be to justify Zionist claims.”

This quote shows the ethical problem Jewish geneticists are confronted with, on the one hand they have to carry out honest research, on the other hand they should not come to the conclusion that today's Jews originate partly or not at all from the Middle East. Earlier (van Straten 2021, 88), I showed that it is irrelevant whether or not today's Jews originate from Palestine. The quote may be viewed as an incentive to manipulation, which could take place for example, via interpretation of the results, unconsciously, or via the peer review.

An additional complicating factor is the fact that the outcome of genetic research may also have consequences for the genetic situation of the Jewish geneticist himself. How will a Jewish geneticist react when genetic research shows that his male or female ancestors are European?

To show how we are informed about the state of affairs in mostly Ashkenazic genetics, I will use a recent article about the Erfurt Jews (Waldman 2022).

In the introduction, the authors write “The AJ population today harbors dozens of recessive pathogenic variants that occur at higher frequency than in any other population [5-9], implying that AJ descend from a small set of ancestral founders [10-14].”

Reference number 10 is Jared Diamond (1994) who starts his article as follows: “A long-standing puzzle of human population genetics has been the incidence of a dozen autosomal recessive diseases at high frequencies in eastern European (Ashkenazi) Jews.”

Diamond hits the nail on the head, the pathogenic variants were found among East European Ashkenazim. As American Ashkenazim are virtually all East European Ashkenazim, they consider anything that has to do with themselves as Ashkenazic. Because East European Ashkenazim originated from the region around the Black Sea from before the beginning of the Common Era (van Straten 2017), they must have picked these specific pathogens up around that region. This also explains why these diseases are not found at a higher frequency in Dutch or German Jews than in their non-Jewish counterparts (Fraikor 1977).

Depending on the purpose of the investigation, mitochondrial DNA (mtDNA) and Y chromosomal DNA are used to follow the female and male origin, respectively. Autosomal/nuclear DNA may be used to study a general development such as a genetic bottleneck.

2. MITOCHONDRIAL DNA

To the best of my knowledge, in 1991, Tikochinski et al. wrote the first report on mtDNA. The authors found 21 maternal lineages, eight among Ashkenazim, ten among Sephardim, and three were common to both groups. Their conclusion is “that the original Jewish population was unusually polymorphic mitochondrially, that the pattern of later growth in the Jewish population has reduced the extinction rate for mtDNA lineages, or that some of the 21 lineages we have defined represent introgression events during the diaspora.” The last possibility probably refers partly to the mtDNAs of the women with whom the two groups intermarried.

The first extensive report on mtDNA (Behar et al. 2006) shows that there were four lineages which they considered to be the major lineages of Ashkenazic Jews, “likely of Near Eastern origin”. The most common one being K1a1b1a. They were the result of four founding mothers. The authors came to this conclusion because these lineages were not or hardly found among non-Jewish Europeans. The findings supported a Middle Eastern origin of Ashkenazic women. I will use K1a1b1a, with a frequency of 24 percent among Ashkenazic Jews, as representative of the four major lineages.

In an even more extensive work on Ashkenazic mtDNA, a new approach was used, a genealogical one (Costa et al. 2013). This means that the geneticists not only looked at K1a1b1a but also at its precursors, K1a1b1, K1a1b etc. They found that K1a1b1 arrived in Europe some 15000 years ago, and some 7000 years later, K1a1b1a appeared. By using this method, Costa et al. were able to link K1a1b1a irrefutably to Europe. This means that K1a1b1a is a European lineage. The same held for the other three major lineages, adding up to 41 percent of Ashkenazic lineages being European.

This clearly refuted Behar’s evidence that would link Ashkenazic women to the Middle East. In addition, if Behar’s suggestion would be right, how come these K lineages are not found among Samaritans (Costa et al. 2013, Suppl. Note 1), who were closely related to the Israelites?

The authors also looked at the minor lineages, and the conclusion was that these lineages added another 40.7 percent of European lineages to the 41 already present. All in all, just over 80 percent of all Ashkenazic mtDNA was European. The more than 80 percent European origin is not mentioned by most Jewish geneticists.

Another point hitherto not mentioned by geneticists like Behar, Hammer, and Ostrer is the finding that there was a significant genetic difference between West and East European Ashkenazim (see Table 1). Particularly interesting hereby is the difference between Ukrainian Ashkenazim - the largest (2,680,000 in 1897) and oldest Jewish population in the Russian Empire –and the Ashkenazim in Germany/Switzerland.

Table 1. *The percentage of K1a1b1a and H in Ashkenazic Jews in Eastern and Western Europe and Ukraine and the Netherlands/Germany (based on Costa et al. 2013).*

Lineage	Eastern Europe %	Western Europe %	Ukraine %	German/Swiss %
K1a1b1a	18.7	34.3	9.3	37.5
H	24.3	15.2	35.2	16.1

The frequency of K1a1b1a among Ukrainian Ashkenazim is only 9,3 percent, while among German/Swiss Ashkenazim it is 37.5 percent. Maybe even more special was the frequency of the European lineage H: 35.2 percent among Ukrainian Ashkenazim, 39 percent among the general Ukrainian population, and 16.1 percent among the German/Swiss Ashkenazim. Israelites/Jews have been living in the Crimea and north of the Black Sea, “Ukraine”, from before the beginning of the Common Era (Dan’shin 1996; Harkavy 1867, 77–97; Levinskaya 1996, 108-110; Levinskaya and Tokhtas’yey 1996, 5; Theophanes Abbas Agri et Confessor 1839, 545). These Israelites/Jews were Hellenized, and admixture with “Ukrainians” would have been no problem at all, even logical. A source about a somewhat later period mentions that this region had a Jewish presence during the Roman time and thereafter (Halpern 1960, 290). However, it is not possible to conclude much from the high percentage of lineage H, other than that it shows that Ukrainian Jews differed substantially from West European Ashkenazim probably because of their different demographic history.

Waldman et al. (2022) write: “While the Ashkenazi population is overall highly genetically homogeneous ... there are subtle average differences in ancestry between AJ with origins in Eastern vs Western Europe ...”. Table 1 shows significant differences and Ashkenazim are thus not genetically homogeneous either.

It appears that K1a1b1a is a major lineage for West European Ashkenazim but not for Ukrainian Ashkenazim.

If Ukrainian Jews do not originate from Western Europe, why do they have 9.3 percent of the western K1a1b1a? In the 8th and 10th centuries, the Byzantine Emperors Leo III and Romanos I Lekapenos, respectively, ordered the Jews to be baptized. As a result, Jews from Italy, Greece and other regions of the Byzantine Empire fled to Khazaria (Starr 1939, 2, 7, 34) (partly in today’s Ukraine). These Jews may be responsible for introducing the western K1a1b1a. As it entered Ukrainian Jews rather late, it added up to only 9.3 percent.

This interesting detail is not mentioned by Jewish geneticists either.

One of the references quoted to show that the differences are subtle, is an article that uses approximate Bayesian computation (Gladstein and Hammer 2019). I will discuss this article under the heading “Autosomal DNA”.

A question that may arise about the Costa article is, if so much intermarriage took place that 80 percent of Ashkenazic women are of European descent, how come nothing is known about a registration of the conversions of some kind? As mentioned before, Biblical Israelites could marry “foreign” women. It is also known that already before the beginning of the Common Era, Israelites went abroad, for example Israelites were present in the Greek colonies in Anatolia, in 300 BCE. The men who went abroad - it is mostly men who venture abroad - married local, foreign girls. This situation may have continued for a number of generations. By the time, young men started to marry within the group, the

“foreign” mtDNA would have become the DNA representing that group. This simple development explains how K1a1b1a became the major lineage among West European Ashkenazim and why no registrations of conversions are found. It also explains why Chinese, Indian, Ethiopian, and European Jews look like non-Jewish Chinese, Indians, Ethiopians and Europeans, respectively.

Interesting is the large number of European minor lineages among Ashkenazic Jews. The male ancestors of today’s Ashkenazim must have married all kinds of European women.

The fact that hardly any of the major lineages were found in non-Jewish Europeans (Behar et al. 2006), is due to the extinction of these lineages over the last 2000 years among non-Jewish Europeans. Mitochondrial lineages come and go.

Further on in their introduction Waldman et al. (2022) write: “Genetic evidence supports a mixed Middle Eastern (ME) and European (EU) ancestry in AJ. This is based on uniparental markers with origins in either region (Behar et al., 2006, 2017; Costa et al., 2013; Hammer et al. 2000, 2009; Nebel et al. 2001).” Only the 2006 article by Behar et al. and the article by Costa et al. refer to mtDNA. Waldman et al. imply that the article by Behar et al. show a Middle Eastern origin (because that is what they claim) and the article by Costa et al. a European origin. This is misleading because, as mentioned above, the former was clearly refuted by the latter. What we see here is that Jewish geneticists pretend that the article by Behar was not refuted. It is strange that this passed the peer review, but explainable in view of Ostrer’s quote and the implications for the ancestry of the Jewish authors of the paper (and their peers).

3. Y CHROMOSOMAL DNA

Lay-Jews

A wrong custom pertaining to the investigation of Y chromosomal DNA of Ashkenazim by some Jewish geneticists (Behar, Hammer, Nebel, Ostrer), is to include Russians and other European populations in admixture investigations with whom East European Ashkenazim did not intermarry. Russians are the inhabitants of what in earlier times was called the Grand Duchy of Moscow (the later Russian Soviet Republic; in 1897, it had only 250.000 Jews). Until relatively recently, Jews were barred from the Duchy. If also Germans and Austrians are pooled with the Russians, one should not be surprised if hardly any admixture is found because the majority of Ashkenazic Jews sampled are American Jews, and their ancestors did not mix with these nationalities. The nationality to check is of course the Ukrainians, but that they did not do.

Another wrong custom is the way the term Sephardic is used. Already in 2000, Zoossman-Diskin warned that the term “Sephardic” should not be used for North African or Oriental Jews. Nevertheless, many Jewish geneticists (Atzmon, Behar, Carmi, Friedman Nebel, Ostrer, Pe’er, Waldman) do use the term wrongly. A good example is Behar (2008) who named Turkish Jews an extension of Iberian Jewry. The arguments provided by Behar to show this are clearly wrong. For example, “Turkish Jews only settled in the country after 1492 as a result of the expulsion of the Iberian Jews.” Around the turn of the 17th century, the Sephardic congregations in Istanbul amounted to less than 25 percent of the Jewish population of Istanbul. The majority of the Jews were Romaniotes (Levy 1994, note 25; van Straten 2021, 77–83). Interesting in this respect is that the surname Behar is a Turkish-Jewish surname. Also in this case it is amazing how, in view of all the evidence against Behar’s conclusions, the manuscript passed the peer review. The peers obviously did not look at the history and demography of the Jews involved.

In the same article, Behar et al. concluded that Moroccan Jews were an extension of the Sephardic Jews as well. Again, there is evidence to the contrary (Corcos 1976, 300) that shows that in the 16th century the most important group of Jews were those who were born there. Most of these Jews were Berbers who only spoke a Berber language. This would agree with my own observation that many Moroccan Jews in Israel are phenotypically similar to the Berber migrant workers in the Netherlands.

In 2013, it was claimed that five of the seven major Ashkenazic lineages, E3b, G, J1, J2, Q were also part of the ancestral gene pool of the Israelites (Ostrer and Słorecki 2013). An amazing conclusion because nothing is known about the genetic profile of the Israelites because no ancient DNA has been recovered from skeletons from Israelites as this is forbidden by Jewish law. This means that the con-

clusion by the authors is not based on evidence because it cannot be tested. This passed the peer review because it is important to show a link between Ashkenazic Jews and the Biblical Israelites.

If the five lineages in the above-mentioned article would belong to the Biblical Israelites, Abraham must have lived at the time of the common ancestor of these five lineages, otherwise it is impossible that they are descendants of Abraham. However, this common ancestor lived tens of thousands of years ago, while Abraham is supposed to have lived between 3000 and 4000 years ago. As a matter of fact, there is also archaeological evidence that arch-father Abraham is a mere legend (Finkelstein and Silberman 2002, 27–47). Ostrer and Skorecki do not mention anything about arch-father Abraham or the archeological evidence. However, if their conclusion would be right, they would also show that the ancestral Israelites were a genetically heterogeneous population. In view of the reasonable opinion that the existence of arch-father Abraham is a legend, a genealogical firm that shows your ancestry back to arch-father Abraham is a company of doubtful reliability.

Jewish Priests

A special group of Jews are the priests, the *kohanim*, descendants of the High Priest Aaron. In 1997, the “Cohen gene” was found (Skorecki et al.), the gene of the High Priest. However, in 2000, the *Cohen* gene as a Jewish gene was refuted (Zoosmann-Diskin 2000). The main reasons were that the gene is not a Jewish gene but occurs among other peoples as well. Furthermore, the term Sephardic Jews was used in a political way, namely for North African and Turkish Jews instead of for Jews from Iberia only. The name of the journal is remarkable because it is a journal of comparative human biology and not of genetics. It is obvious that the author was unable to get his article published in a typical genealogical journal. The rebuttal by Zoosmann-Diskin of the finding of the *Cohen* gene was not published in *Nature* or a typical genetics journal. Or was the article maybe not good enough?

Almost 10 years later, it was shown that the Cohen gene was indeed not a Cohen gene (Hammer et al. 2009) without referring to the article by Zoosmann-Diskin. The conclusion of the paper by Hammer et al. was that there were 21 different lineages among the Jewish priests, of which J1-P58* (46.1 %), J2-M410* (14.4 %) and J2-M12 (7.4 %) were the most frequent ones. If only the two most frequent lineages are important, Aaron must have lived during the time of the common ancestor of both lineages. However, that ancestor lived more than 25000 years ago. It looks as if the above-mentioned geneticists had no choice but check the Cohen issue thoroughly in view of the article by Zoosmann-Diskin, came to a similar conclusion, and the Jewish peers allowed it to be published.

Furthermore, the frequencies of the different lineages don't mean anything as far as the situation in Palestine is concerned. If J2-M12 was a major lineage among the Jewish priests in Palestine but members of this lineage arrived in Europe much later than members of the J1-P58* lineage, they very well could be a minor lineage in Europe while being a major one in Palestine.

If the authors would have been more familiar with the history of the Biblical Israelites, they would have known that King Jeroboam I, the first king of the northern kingdom, appointed his own priests, from the elite of his people, 1 Kings 12: 32–32. We do not know who the elite were but it is known that in addition to Israelites, also Arameans and Phoenicians (the Greek word for Canaanites) lived in the kingdom. It is known for example that King Ahab married a Phoenician princess, 1 Kings 16: 31. It is therefore feasible that some of Jeroboam's “Jewish” priests were Phoenicians (Canaanites). A good way to appease them. During an investigation of some 3000-year-old skeletons from the Canaanite city of Sidon, the lineage J2-M12 was found in Phoenician skeletons (Haber et al. 2017). So, maybe part of today's Jewish priests are descendants of Phoenician priests who fled to the kingdom of Judah when the northern kingdom was destroyed by the Assyrians in 720 BCE.

4. AUTOSOMAL DNA

The problems with autosomal DNA are of a different nature. In three representative articles (Carmi et al. 2014; Palamara et al. 2012; Xue et al. 2017) models were used to explain specific parts of the demographic history of Ashkenazic Jewry such as bottlenecks and the size of admixture. These models were based on what these geneticists consider the best demographic history of Ashkenazic Jewry: the migrations from the West. In other words, they follow East European Jewish historians. This means that their models are based on wrong data and thus not valid.

The three authors calculated bottlenecks around 1200 CE yielding annual growth of 1.1 percent. Considering that in Eastern Europe between 1000 and 1600, the annual growth rate was only .2 percent and the Jews lived under the same environmental conditions as the non-Jews, it will be clear that the calculated bottlenecks are not possible. Nevertheless, also Waldman et al.(2022) refer to these studies without a comment. The opinion of modern *experts* in the field of demography like the abovementioned Jim Oeppen and Anthony Wrigley who maintain that population increases of one percent or more were not possible in Europe before 1800, are ignored by historians like Stampfer and the geneticists who follow these historians (see also my earlier remarks on the subject (van Straten 2021, 23–25). Regarding a Jewish population increase of 1.7 percent in Eastern Europe between 1500 and 1700 (Stampfer 2012, 136), Anthony Wrigley wrote (personal communication):

“It was very rare to reach such a rate in pre-industrial times. There are a few exceptions. Rates of growth in colonial North America were such as to double the population in about 30 years, a combination of high fertility brought about by early marriage and low mortality with the bulk of the population widely scattered at low densities, and with unlimited new land to be taken up. But back in Europe rates of increase of 1% p.a. were rare and not long sustained. If the Jewish population which you have in mind was largely urban such a rate is even less plausible. Most towns and cities were dependent on substantial in-migration flows even to maintain their numbers.” These populations were largely urban indeed.

It is quite possible that the non-Jewish co-authors figured that these explosive population increases are “typical Jewish” and didn’t look into the matter any further.

Recently, a possible difference between East and West European Ashkenazim was investigated (Gladstein and Hammer 2019). The authors used a special kind of Bayesian statistics. Out of three models they chose the model that agreed best with Ashkenazic history, that is again an origin from the West. In Bayesian statistics, data are used that were obtained earlier. These data are called priors. These priors *have* to be right. The data Gladstein and Hammer used were the erroneous demographic data by DellaPergola (2001, 22) that result in more than 1 percent growth before 1800. This means that they used wrong priors. When wrong priors are used, one can obtain any result including the right one and the statistical analysis is of no use. Thus, their “right” conclusion cannot be used.

The basic problem is that for the historians as well as for the geneticists an origin from German is essential for being able to explain the explosive population increases. An origin via Anatolia and the region around the Black Sea (van Straten 2017), is not possible according to Stampfer (2012, 128) of the Hebrew University because the Mongols killed the Jews who were the descendants of these Jews. No reference is given for his statement. When it comes to religion, the Mongols were tolerant: “Chingis never abandoned that sophisticated blend of shamanism, polytheism, and totemism endemic to the steppe. His successors considered the clergy of all religions sorcerers, and, though they adopted exclusivist religions, retained his tolerance for other faiths ... For this they were, ironically, much praised. Christians, Muslims, Taoists, Buddhists, and Confucianists all perceived Mongol tolerance as special sympathy for their own creeds.” (Halperin 1985, 24).

5. CONCLUSIONS

The article about the Erfurt Jews (Waldman 2022) was taken as an example of how Jewish geneticists report studies about Ashkenazic genetics.

The high frequencies of pathogenic recessive genes are misleadingly reported as Ashkenazic diseases, they are East European Ashkenazic diseases.

The articles by Behar and Costa are reported as if they complement each other, which they don’t.

That genetic bottlenecks in the Middle Ages, as shown by quantitative modeling, lead to implausible annual growth rates of more than one percent during hundreds of years before 1800 is not reported.

More generally, unwelcome results - 80 percent of Ashkenazic mtDNA is European, the difference between West and East European Ashkenazim, and the 35.2 percent of the European lineage H among Ukrainian Jews - are not reported.

On the other hand, various Y lineages are reported as part of the ancestral gene pool of the Biblical Israelites without any knowledge of the genetic profile of these Israelites.

The custom of men living abroad to marry local girls, with or without conversion, has made it impossible to link Ashkenazic women to the Biblical Israelites. The same conclusion probably holds for most of the Jewish groups.

Finally, Ashkenazic genetics is reported in the scientific literature in a biased way. Reason is the fear for conclusions that do not agree with the general idea that Ashkenazim are descendants of the Biblical Israelites.

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