Study finds genetic links among Jewish people

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Using sophisticated genetic analysis, scientists at Albert Einstein College of Medicine of Yeshiva University and New York University School of Medicine have published a study indicating that Jews are a widely dispersed people with a common ancestry. Jews from different regions of the world were found to share many genetic traits that are distinct from other groups and that date back to ancient times.

The study also provides the first detailed genetic maps of the major Jewish subpopulations, a resource that can be used to study the genetic origins of disease. The findings appear in the June 3 online issue of the American Journal of Human Genetics.

"This study provides new genomic information that can benefit not only those of Jewish ancestry, but the population at large," said co-author Edward Burns, M.D., executive dean and professor of pathology and of medicine at Einstein. "By providing a comprehensive genetic fingerprint of various Jewish subpopulations, it can help us understand genetic links to heart disease, cancer, diabetes and other common diseases."

To better understand the ways in which current Jewish groups are related, Dr. Burns and his colleagues, including principal investigator Harry Ostrer, M.D., professor of pediatrics, pathology and medicine at NYU, performed a genome-wide analysis of the three major groups formed by the Diasporas (the scattering of Jews into Europe, and throughout the Middle East): Eastern European Ashkenazim; Italian, Greek, and Turkish Sephardim; and Iranian, Iraqi, and Syrian Mizrahim

Jews.

A total of 237 participants were recruited from Jewish communities in the metropolitan New York region, Seattle, Athens, Rome and Israel. Subjects were included only if all four grandparents came from the same Jewish community. The results were compared with a genetic analysis of 418 people from non-Jewish groups around the world.

The researchers found that Jews from the major Diaspora groups formed a distinct population cluster, albeit one that is closely related to European and Middle Eastern non-Jewish populations. Each of the Diaspora groups also formed its own cluster within the larger Jewish cluster. Further, each group demonstrated Middle-Eastern ancestry and varying degrees of mixing with surrounding populations. The genetic analysis showed that the two major groups, Middle Eastern Jews and European Jews, diverged from each other approximately 2,500 years ago.

"The study supports the idea of a Jewish people linked by a shared genetic history," said Dr. Ostrer of NYU. "Yet the admixture with European people explains why so many European and Syrian Jews have blue eyes and blond hair."

"The goal of the study was to determine a genomic baseline," said lead author Gil Atzmon, Ph.D., assistant professor of medicine and of genetics at Einstein. "With this established, we'll be able to more easily identify genes associated with complex disorders like diabetes that are determined by multiple variants across the genome. Armed with this information, we will be better positioned to treat patients."

More information: Atzmon et al.: “Abraham’s Children in the Genome Era: Major Jewish Diaspora Populations Comprise Distinct Genetic Clusters with Shared Middle Eastern Ancestry.” Publishing in the American Journal of Human Genetics, June 11, 2010

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