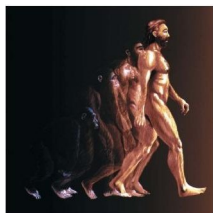


7 December 2007

By: Stefan Anitei, Science Editor



## **Humans Are Evolving Faster than Ever Now!**

*We are still in transition to adapt to high carb diet*

If you think that human evolution has stopped, you're extremely wrong: in fact, it has just sped up! And people on various continents are just turning more different. "Humans are evolving rapidly, and that the pace of change has accelerated a lot in the last 40,000 years, especially since the end of the Ice Age roughly 10,000 years ago," said Henry Harpending, a distinguished professor of anthropology, at the University of Utah, lead researcher of a genetic study on this topic that has recently been published in the journal "Proceedings of the National Academy of Sciences". "We aren't the same as people even 1,000 or 2,000 years ago, which may explain, for example, part of the difference between Viking invaders and their peaceful Swedish descendants. The dogma has been these are cultural fluctuations, but almost any temperament trait you look at is under strong genetic influence. Human races are evolving away from each other. Genes are evolving fast in Europe, Asia and Africa, but almost all of these are unique to their continent of origin. We are getting less alike, not merging into a single, mixed humanity. That is happening because humans dispersed from Africa to other regions 40,000 years ago, and there has not been much flow of genes between the regions since then." said Harpending. In fact, the boom in human population from millions to billions in the last 10,000 years has spurred the rhythm of evolution, because "we were in new environments to which we needed to adapt. And with a larger population, more mutations occurred." said Harpending. "History looks more and more like a science fiction novel in which mutants repeatedly arose and displaced normal humans - sometimes quietly, by surviving starvation and disease better, sometimes as a conquering horde. And we are those mutants." said co-author Gregory M. Cochran, a New Mexico physicist, self-taught evolutionary biologist and adjunct professor of anthropology, at the University of Utah. In 2005, the same team pointed that the above-average intelligence in Ashkenazi Jews (those coming from northern Europe) was due to a selection in medieval Europe, connected to their jobs as financiers, traders, managers and tax collectors. More intelligent individuals got more wealth, being able to support larger families, thus more kids with "intelligence" genes, even if also linked to genetic diseases, such as Tay-Sachs and Gaucher. The new research investigated the DNA for the mutations named "single nucleotide polymorphisms" (SNPs), involving just the shift of a single base in the DNA. They usually occur one at 1,000 base pairs. "Data examined in the study included 3.9 million SNPs from the 270 people in four populations: Han Chinese, Japanese, Africa's Yoruba tribe and northern Europeans, represented largely by data from Utah Mormons," said Harpending. In time, chromosomes randomly break and reattach, resulting new variants of the chromosome. "If a favorable mutation appears, then the number of copies of that chromosome will increase rapidly in the population because people with the mutation are more likely to survive and reproduce. And if it increases rapidly, it becomes common in the population in a short time," said Harpending. This allowed the researchers to assess when genes had evolved. If the same chromosome has a DNA stretch, in many people, with a similar pattern of SNPs, this means that the mutation is recent, as the chromosome has not had time to break up and recombine. The team looked for chromosome segments having this identical SNP patterns. It appeared that 7 % of human genes have changed (evolved) recently. The research discovered a much higher genetic diversity in the SNPs, than in the case of a constant human evolution. For example, in the case of Africans, the speed of their current gene evolution if applied to 4 million years ago, since the split between humans and chimpanzees would have created a genetic difference between chimps and modern humans, would be 100 times greater than in reality. Thus, Africans are experiencing a

recent evolutionary speed-up. A fast evolution along our history would have spread more genes to everyone, while many genes were found to be more frequent and specific to certain populations, pointing to a recent emergence inside those populations. Mutation patterns supported the idea that evolution is more rapid in larger populations. "The past 10,000 years have seen rapid skeletal and dental evolution in human populations, as well as the appearance of many new genetic responses to diet and disease. Human migrations into new Eurasian environments created selective pressures favoring less skin pigmentation (so more sunlight could be absorbed by skin to make vitamin D), adaptation to cold weather and dietary changes," wrote the authors. "Because human population grew from several million at the end of the Ice Age to 6 billion now, more favored new genes have emerged and evolution has sped up, both globally and among continental groups of people. We have to understand genetic change in order to understand history. For example, in China and most of Africa, few people can digest fresh milk into adulthood. Yet in Sweden and Denmark, the gene that makes the milk-digesting enzyme lactase remains active, so almost everyone can drink fresh milk," said Harpending. The mutation for lactose tolerance appeared to have boosted great historical population expansions, like that of Indo-Europeans from central Asia to India, Persia and across Europe, 4,000 to 5,000 years ago. Lactose-tolerant Indo-Europeans could drink milk, growing more vigorous and being able to inhabit areas where farming was not possible and game was scarce. "The invention of agriculture 12,000 years ago changed our diet and changed our social systems. If you suddenly take hunter-gatherers and give them a diet of corn, they frequently get diabetes. We're still adapting to that. Several new genes we see spreading through the population are involved with helping us prosper with high-carbohydrate diet." said Harpending.