Continued Human Evolution by Charles J. Vella, PhD, 2018

Rapid natural selection: recent genetic changes account for about 7 percent of the human genome; 2,465 genes, or 13 percent, have been actively shaped by recent evolution; genetic diversity is highest in African populations. Diversity decreases steadily the further a population has migrated from the African homeland. More genes under recent natural selection in East Asians and Europeans than in Africans, possibly because the people who left Africa were then forced to adapt to different environments. Under natural selection, a new beneficial mutation will rise in frequency (prevalence) in a population. As a new positively-selected allele rises to high frequency, nearby linked alleles on the chromosome can ‘hitchhike’ along with it to high frequency, creating a ‘selective sweep.’

Some more recent genetic changes in humans:

Brain shrinking: 1500 cc smaller than 100K ago

Losing our wisdom teeth - 10% smaller teeth and jaws

Descendants of farmers have a greater production of salivary amylase, *AMY1* gene, for starch processing

Drinking milk - Lactose tolerance: breaks down the milk sugar lactose; keeps the lactase gene turned on in adulthood; arose 5 times genetically (3 sub Saharan Africa), an example of convergent evolution; single individual mutation 7,500 years ago in N Europe; in 75% of Europeans today; 3000 ya

Thick, straight black hair in East Asians: within the past 30,000 years; due to a mutation in *EDAR* gene (more sweat glands, smaller breasts)

Lighter skin: Primates have unpigmented skin beneath their fur; lighter skin produces vitamin D; dark skin (original): less UV damage; *SLC24A5* gene that lightens skin color, now found in up to 95 percent of Europeans; 25 skin genes; golden gene in 98% of Europeans; different gene, *DCT*, in East Asians

*TYRP* that makes certain Solomon Islanders blond

Blue eyes: *HERC2* mutation that results in blue eyes (no pigment); 9000 ya

Red hair: *MC1R* that causes red hair

Dry ear wax: Originally, stinky armpits and sticky earwax; but East Asians have dry, flaky earwax that does not stick together; *ABCC11;* correlates with less sweat; 30000ya

Malaria resistance: Hemoglobin S (sickle cell anemia) & hemoglobin E, *DARC* gene: 25 new genes that protect against malaria in Africa

City dwellers: more resistant to diseases like tuberculosis, smallpox and leprosy.

More Oxygen: Hemoglobin gene in Serpas who tolerate low oxygen levels: from Denisovan gene

Gene protection vs. smallpox: correlates with HIV resistance from a genetic mutation now found in 10 percent of Europeans.

Faster sperm: newly selected mutations in genes controlling sperm production

Longevity genes: we are getting older

Brain neurotransmitters: serotonin, glutamate, and dopamine

DRD4: mutation related to ADHD: 20% in Europeans & Africans; 40% in indigenous North Americans; 80% of indigenous South Americans; Migratory gene?

Red alcohol flush: gene in Southern Chine where rice production started

Cold adaptation: In Eskimo populations, genes that help people adapt to cold.

Folic Acid: Among primitive farming tribes, big eaters of tubers, which contain little folic acid, selection has shaped the genes involved in synthesizing folic acid in the body,

HIV & Ebola: continued new anti-viral resistance

Autism**:** increasing rates