

23andMe (www.23andMe.com) is one of several companies offering personalized SNP genotyping to the general public. You pay them \$399, send them some spit (which contains some of your cheek cells), and they genotype your DNA at more than 555,000 SNPs using a DNA chip. To learn about the DNA chips (arrays) they use for SNP genotyping, check out this site:

<https://www.23andme.com/more/genotyping/>

Note: this genotyping technology uses hybridization, not sequencing. Soon, you will be able to have your whole genome sequenced for a mere \$50,000.

All of the SNPs genotyped by 23andMe have been genotyped in the HapMap project using the same technology, so we know the frequency of each allele in Northern European, Japanese, Chinese (Han), and Nigerian (Yoruban) people. Additional SNPs on the Y-chromosome and mitochondria have been genotyped in people from around the world.

Some of the SNPs genotyped by 23andMe are known to be associated with genetic diseases. That is, individuals with one of the two possible alleles at the SNP locus have an increased chance of getting the disease. This is either because the genotyped SNP influences the chance of getting the disease or because a non-genotyped SNP nearby in the genome (and in LD with the genotyped SNP) influences the chance of getting the disease.

If you go to the 23andMe web site (www.23andMe.com), you can sign up for a Demo account (you can use a fake name, email, etc. if you prefer). When you log in, you can learn about the results you would get if you purchased their service by exploring the SNP results of the "Mendel Family," a real family, with their names changed to protect their privacy. You can learn whether they have SNP alleles associated with an increased chance of getting certain diseases, and learn how much their risk is increased, and learn about their ancestry.

- 9) How many SNP loci were used to calculate Greg's risk of prostate cancer?
- 10) Question deleted
- 11) Do you think the SNPs they genotyped are the loci that actually cause the development of prostate cancer? Why or why not?
- 12) Do you think they have genotyped every locus that influences the chance of getting prostate cancer? Why or why not?
- 13) When scientists say they found a gene for prostate cancer, what do they mean?
- 14) How are the Y chromosome and mitochondria inherited?
- 15) How do we trace maternal vs. paternal ancestry?
- 16) How can one use SNPs to trace ancestry?