

# It's All in the Genes

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When I was a kid, I loved the G.I. Joe cartoon. The show was centered on the Joes, which was the code name for "America's daring, highly-trained, Special Mission force. Its purpose: To defend human freedom against Cobra, a ruthless terrorist organization determined to rule the world."

Cobra's attempts at world domination were constantly foiled by G.I. Joe, mostly due to the incompetence of their leader, Cobra Commander. The Commander would belittle his soldiers before sending them to certain death, while he would lead the retreat at the first sign of danger.

Tired of his failures, the brass in Cobra decided to replace Cobra Commander. Thanks to a cloning breakthrough by Cobra's evil scientist, Dr. Mindbender, they were able to manufacture one: Serpentor. He was created using the DNA extracted from the unearthed remains of some of history's greatest and most ruthless military minds: Julius Caesar, Napoleon Bonaparte, Attila the Hun, Philip II of Macedon and his son Alexander the Great, Ivan the Terrible, Vlad the Impaler, Hannibal, Genghis Khan, and Grigori Rasputin.

As Cobra's genetically-enhanced super-leader, Serpentor rallied his troops and led several victorious assaults against G.I. Joe. The strong wills of his genetic donors, however, caused him to suffer from multiple personality disorder. Additionally, his DNA became increasingly unstable and ultimately led to his downfall. While Dr. Mindbender's genetic cloning technique was a great idea in theory, the technology was not advanced enough to perfect it.

Apparently, genetics is not only a difficult discipline to master in the cartoons, it's pretty tricky in real life, too.

That's why the U.S. Government Accountability Office is warning consumers to stay away from products that you can use to perform at-home, personalized genetics tests that claim to create personalized supplements, cure disease, or repair damaged DNA. The GAO conducted an undercover investigation into these products and released a report that states, "There is no scientific basis for such claims."

The GAO's investigation compared the test results generated for 15 diseases including Alzheimer's, breast cancer, celiac disease and hypertension. According to the report, the results of the tests were often "misleading and of no practical use to consumers." The report asserted that the tests were defective because results for one patient might vary widely from one test to the next, predictions often contradicted the patient's real-life diagnoses, and follow-up consultations provided little treatment regimens.

In addition to the investigation by the GAO, on June 14 the U.S. Food and Drug Administration issued a warning to five companies that manufacture laboratory-to-consumer genetic tests – 23andMe, Navigenics, DeCODE Genetics, Illumina and Knome – notifying them that they must submit their products for review or discuss with officials why their products do not require FDA approval. The FDA claims it is concerned that consumers are being "misled by incorrect test results or unsupported clinical interpretations" and are then using these results to make important medical decisions.

The FDA, however, did not say that genetic testing products should be taken off the market. In fact, according to one GAO official, many experts believe the science behind the tests shows great promise for the future. However, like Serpentor, the technology has not yet caught up to the idea. I just hope that if the technology is perfected, the doctors use it to cure genetic diseases and not clone super villains.