Epigenetics

Epigenetics is the study of how your behaviors and environment can cause changes that affect the way your genes work. Unlike genetic changes, epigenetics changes are reversible.[4]

Today, the most common definition of the word is a back-transition of "epi" (upon, above, beyond) and "genetic" (DNA sequence) referring to a layer of information that exists beyond that encoded in the DNA sequence, thereby making the genome function distinctively in different cell types.

We have been led to believe that our genes determine the character of our lives, yet new research surprisingly reveals that it is the character of our lives that controls our genes. Rather than being victims of our heredity, we are actually masters of our genome.

We use to think that a new embryo's epigenome was completely erased and rebuilt from scratch. But this isn't completely true. Some epigenetic tags remain in place as genetic information passes from generation to generation, a process called epigenetic inheritance.

Most epigenetic modification, by whatever mechanism, is believed to be erased with each new generation…. However, one of the more startling reports published in 2005 challenges this belief and suggests that epigenetic changes may endure in at least four subsequent generations of organisms.

It has been reported that during the attack on 9/11 roughly 1700 pregnant women were directly affected by the attack and aftermath. Reports also show that these women were affected by PTSD symptoms and that their newborn children also demonstrated PTSD symptoms. Additionally, these children were found to have inherited their mother's experiences from that day in the form of phobias, fears, and trauma responses. What this means is that the trauma was marked on the mother's DNA and subsequently the child's DNA through epigenetics mechanisms.

Victor McKusick's latest edition of Mendelian Inheritance in Man lists over 4,000 human traits, diseases, and disorders that have a simple genetic basis."

We cannot change the genes we inherit, but we can recognize our susceptibility to certain traits and act to minimize the chance of developing problems. Most of the common genetic diseases-heart disease, cancer, diabetes, alcoholism, psychiatric illnesses-are influenced by environmental factors as well as genes.

A large number of studies demonstrate that genes influence addiction to alcohol, and alcoholism tends to run in families. If your father was an alcoholic, you are more likely to become an alcoholic yourself, even if you were adopted into a foster home at birth and never met your father. In fact, sons of hospitalized alcoholic fathers are four times more likely to become alcoholic than those without an alcoholic father, even when both groups are reared by nonalcoholic foster parents. So, genes affect alcoholism, but there is no gene that forces anyone to drink. Genes may make us susceptible to alcoholic abuse; they may increase or decrease our "risk" of becoming an alcoholic