

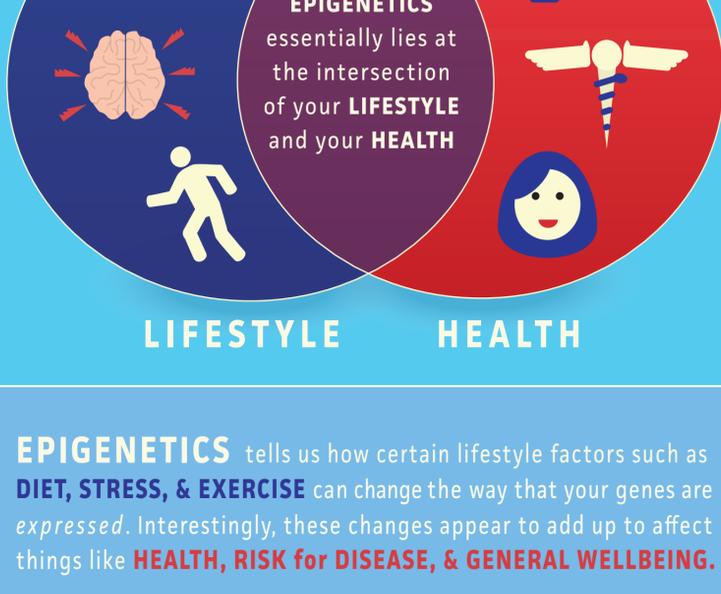
BEYOND THE DNA

YOUR FRIENDLY GUIDE TO EPIGENETICS & HEALTH

epi what?

EPI-GENETICS!

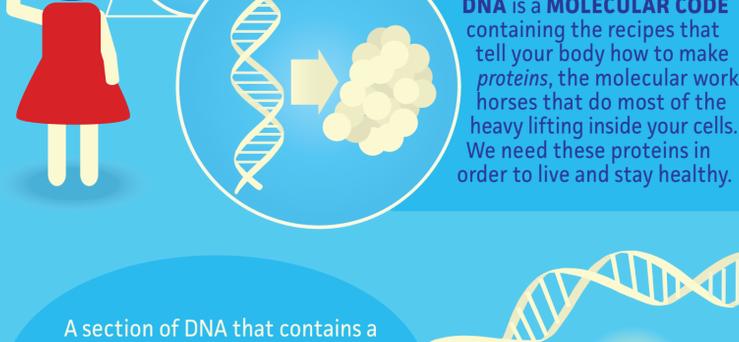
A relatively new field in biology that's causing quite a buzz!



EPIGENETICS tells us how certain lifestyle factors such as **DIET, STRESS, & EXERCISE** can change the way that your genes are *expressed*. Interestingly, these changes appear to add up to affect things like **HEALTH, RISK for DISEASE, & GENERAL WELLBEING**.

A DNA "PRIMER"

YOUR BODY'S GUIDE TO LIFE



A section of DNA that contains a complete recipe for a single protein is called a **GENE**

BUT... Not all of your genes are read all of the time. Different genes may be "expressed" (on) or "silent" (off)

MUTATIONS in your DNA can cause your body to produce faulty proteins, which cause disease. **RISK** for conditions, like heart disease, cancer, or diabetes all have roots in **DNA** and **GENETICS**

BUT RESEARCH SHOWS YOUR DNA ISN'T THE END OF THE STORY

your **EPIGENOME (n.)** is a series of chemical tags that lie on top of your genes, and tell your body which genes to read, and how often.

There is another important layer of information, stored in what is known as the **EPIGENOME**

Different patterns in your epigenome

effectively turn different genes "on" & "off"

adding up to produce biological differences in your body

e.g. **EPIGENETICS IS ONE REASON IDENTICAL TWINS BEGIN TO LOOK DIFFERENT WITH AGE**

Unlike your genes, which are permanent, **EPIGENES** can and do change throughout your life

More importantly, these changes are influenced by your **LIFESTYLE** and **ENVIRONMENT** - things like **DIET, STRESS, & EXERCISE** can all influence the ways your genes are "expressed"

The same genes that determine your health, risk for disease, and well-being are **influenced** by epigenetics

THE NITTY GRITTY

HOW DOES IT WORK?

Now that we're familiar with the epigenome let's take a look at what's happening in your cells to make these changes possible

All your DNA is wrapped around special proteins called **HISTONES**

Most of your genes are loosely wound around these histones, making them **EASY** for cells to **READ**

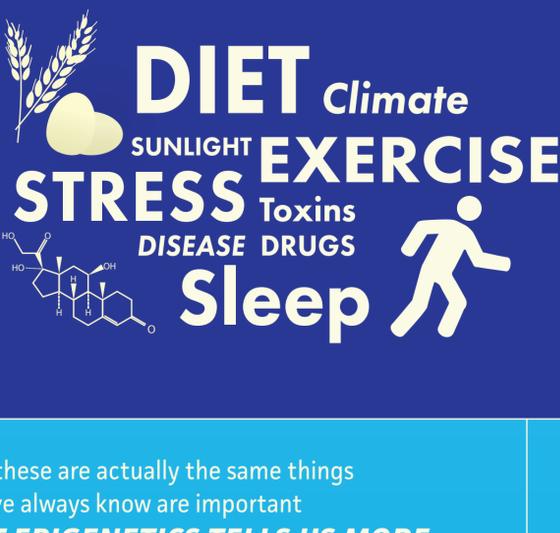
"OFF" Genes that are tightly coiled together can't be read by your cells. These genes are "silenced"

"ON" Genes that are loosely wrapped can be "expressed" meaning that they can be read to make proteins

CH₃ methyl group

Adding a chemical tag, called a **METHYL GROUP**, causes the histones to coil up, which makes a gene less readable to the cell

And this process *responds* to signals from your **ENVIRONMENT** and your **EVERYDAY LIFE**



And these are actually the same things you've always know are important **BUT EPIGENETICS TELLS US MORE...**

The patterns of methylation formed in your development **LAST A LIFETIME OR LONGER**

We're learning that epigenetic changes are likely passed down from **PARENT** to **CHILD**

Genes in Life .org

YOU CAN LEARN MORE ABOUT THIS AT THE **UNIVERSITY OF UTAH EPIGENETICS PORTAL:**

google: "University of Utah epigenetics", or go to <http://learn.genetics.utah.edu/content/epigenetics/>

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Infographic by Collin Willes