



Healthy Aging in Neighborhoods of Diversity across the Life Span

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The Healthy Journey

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DNA and HANDLS

by Allison Udris & Jennifer Norbeck

As participants in HANDLS, you have provided and continue to provide DNA that is collected each time you give a blood sample. By allowing us to store your DNA for this research you have contributed an important resource that helps HANDLS researchers discover information about aging and age-related disease. When you grant permission by signing the consent form at the time of your visit to HANDLS, you are contributing to advances in medical research.

The data that HANDLS has collected over time has taught us about how people age, factors that influence healthy aging, and factors that influence age-related

Genetics is the study of heredity and the variation of inherited traits

diseases. The saliva and blood samples help HANDLS researchers study DNA to look at health characteristics of our participants. They are especially valuable for focusing on the health problems we find right here in Baltimore. This also contributes to medical advances that help society.

What is DNA?

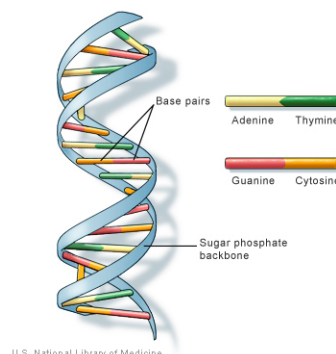
DNA stands for deoxyribonucleic acid. It is found in the cells of our bodies. DNA is the material responsible for you inheriting your mother's eye color or your father's height. It is a molecule that holds the instructions for our bodies to grow, live, and reproduce. These instructions are a code that is based on chemical bases that are known as the building blocks of life: adenine (A), guanine (G), cytosine (C), and thymine (T). Our DNA has almost 3 billion bases and makes up almost 20,000 genes. The order of these different building blocks A, G, C, T

provides the instructions for growth, development, life or death of cells and whole organisms. So, if the order of the building blocks is CGAT the instructions to our cells would be different than building blocks that are in the order of TCAG. Just like in spelling CAT spells one-word and ACT spells a very different one. DNA is passed down from parents to children, and DNA is found inside of each of our cells. All living things have DNA. Your DNA makes you unique. No two living things have the same DNA sequences in their bodies (unless they are identical twins).

DNA is not visible to the naked eye – in fact, it can only be seen under an electron microscope.

DNA was discovered in the late 1800s by a Swiss biochemist named Frederick Miescher. However, information about the structure of DNA was unknown until 1953 thanks to scientists such as James Watson, Francis Crick, Maurice Wilkins, and Rosalind Franklin. These scientists made discoveries that helped us learn about the specific structure of DNA. One of the things they learned was that DNA is shaped like a double helix, or a twisted ladder. This is made up of sugar and phosphate groups, nitrogen bases, and hydrogen bonds.

DNA is a double helix or twisted ladder made up of base pairs attached to a sugar-phosphate backbone. One side of the double helix was contributed by your mother. The other side of the double helix was contributed by your father.



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CONTENTS

DNA and HANDLS	1
Beating the winter blues	3

Why is HANDLS studying DNA?

Now you are familiar with what DNA is and can imagine what it must look like. However, you may be wondering why HANDLS investigators are interested in DNA. HANDLS has been collecting DNA samples since your first examination visit in 2004. HANDLS is interested in studying DNA to learn about health disparities. What is a health disparity? Many people suffer from diseases and disabilities. A health disparity is a difference in rates of disease, disability, and other health outcomes among groups of people. For example, there is a disparity if one group of people has a higher rate of diabetes than another group of people. In our study, African Americans are more likely to have high blood pressure and blood pressure that is more difficult to control. Researchers like to study health disparities by considering variables such as race, ethnicity, gender, and age.

HANDLS studies DNA to learn about health disparities

How can DNA help HANDLS learn about health disparities? Studying DNA helps HANDLS investigators determine if certain groups of people are at greater risk for unique health outcomes, and why some people have better health than others. For example, studying DNA from people with similar backgrounds can help scientists and doctors determine if these people share traits that might cause a health condition, such as high blood pressure or a memory problem. HANDLS also studies DNA to find traits among groups of people that might lead to breakthroughs in causes and cures to certain diseases. HANDLS researchers using DNA showed that there are genetic differences among African Americans and Whites that partially explains the low Vitamin D levels found among African Americans and some Whites. Recently, HANDLS researchers also discovered that there are likely different genes involved in hypertension among African American and White women. These are important findings that would not have been found without your participation in HANDLS. Eventually, these findings may lead to new ways to diagnose or treat low vitamin D levels and high blood pressure.

What is the difference between HANDLS genetic research and ancestry testing?

You may remember seeing advertisements or commercials on TV for ancestry testing from companies like 23andMe, MyHeritage, or AncestryDNA. These at-home test kits help you find out information about your family tree. These tests also give clues about where your ancestors might have come from. Interestingly, people with similar backgrounds regarding ancestry may share certain genetic patterns. The more closely related certain individuals, families, or populations are, the more DNA patterns they typically share.

You might wonder about the difference between the HANDLS tests and what you've seen on TV. HANDLS is mainly interested in studying health, as opposed to ancestry. HANDLS does not perform ancestry tests.

How can I find out more about the HANDLS study?

Did you know that HANDLS has a website? Visit <https://handls.nih.gov/> for more information. If you click the link *Publications and Presentations*, you can see titles of papers that have been written using DNA and other data from HANDLS. This website also contains information for participants. You can watch the HANDLS consent video, find out where the MRVs are located, and find past newsletters.

If you have further questions, please see the links below or ask a HANDLS staff member. Thank you for your continuing participation in the HANDLS study. You have advanced science and our knowledge about aging and the diseases related to aging.

For More Information

- *DNA stated clearly* – this short film explains how DNA is formed: <https://www.youtube.com/watch?v=zwibgNGe4aY&t=137s>
- *Genetics Home Reference* provides information about the effects of genetic variation on human health: <https://ghr.nlm.nih.gov/>
- *What is Genetic Ancestry Testing?* <https://ghr.nlm.nih.gov/primer/testing/ancestrytesting>
- *NIH shares information about DNA:* <https://www.genome.gov/25520880/deoxyribonucleic-acid-dna-fact-sheet/>

Beating the winter blues

Allison Udris

During the cold winter months, you may notice changes in your mood. Many people experience Seasonal Affective Disorder (SAD), which is a form of depression that occurs seasonally during the winter months. Believe it or not, women are four times as likely to experience SAD than men. Five percent of Americans experience SAD each year. Also, if you already experience depression or bipolar disorder, you may notice your symptoms are worse during the winter. According to the National Institutes of Mental Health (NIMH*), symptoms of SAD include:

- Having low energy
- Hypersomnia (excessive daytime sleepiness)
- Overeating
- Weight gain
- Craving for carbohydrates
- Social withdrawal (feel like “hibernating”)

Many people experience Seasonal Affective Disorder, a form of depression that occurs during the winter months.

You may be wondering what you can do to beat the winter blues. Here are some tips:

- **Take a multivitamin.** Vitamin deficiencies can contribute to feelings of depression. Vitamin D is especially important to ward off feelings of depression associated with SAD.
- **Talk it out.** You may feel more isolated in the winter because it is too cold to go outside. However, socializing and talking to others can help with feelings of loneliness. Pick up the phone and call a friend, relative, or neighbor. If your symptoms are severe, consider talking to a psychiatrist or therapist. If you are religious, consider speaking to your pastor. If you struggle with an addiction of any kind, there are many options for 12-step groups which are convenient and free of charge.
- **Let in the light.** It gets dark much earlier in the winter. During the day, consider opening your curtains to let in some sunlight. You can also use artificial lighting if your room does not have a

window. You can even decorate your home with bright colors that lift your mood.

- **Break a sweat.** Exercise is wonderful for your body, and also for your mind. Did you know that regular exercise can create mood-boosting chemicals in your brain? During the winter, it is cold and difficult to go outside for a walk. You may not belong to a gym, and that is fine. There are many workouts you can do from home. Consider climbing the stairs, doing some simple stretches, or lifting 5- to 10-pound weights. You can even do these exercises during commercials when you are watching TV!
- **Avoid drugs and alcohol.** Sometimes people use drugs or alcohol to cope with feelings of depression. Some substances are called stimulants (e.g., nicotine, cocaine, methamphetamines) and others are depressants (e.g., alcohol, heroin, fentanyl). Stimulants speed up activities in the body and can temporarily enhance alertness and energy. However, they can result in an “energy crash,” which can cause you to become fatigued, depressed, and unable to focus. Depressants slow down activities in the body, especially the nervous system. When overused, depressants have a sedative effect and slow down physical and psychological activity in the body. This explains why alcohol consumption and depression are related; depressants block messages that our body’s nerves send to the brain, affecting our movements, emotions, senses, and judgements.

If you believe you may have Major Depression, this is a serious condition that should be treated by a professional counselor or psychiatrist. If you would like a referral to meet with a mental health professional, please consider reaching out to your primary care doctor or to HANDLS staff. The HANDLS study has a clinical social worker and licensed professional counselor on staff. Although HANDLS cannot provide treatment, we are happy to provide referrals.

*<https://www.nimh.nih.gov/health/topics/seasonal-affective-disorder/index.shtml>



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The Quarterly Newsletter for the HANDLS Community Healthy Aging in Neighborhoods of Diversity across the Life Span

The purpose of this study is to learn about changes in health over time. Using our medical research vehicles, we want to study as many people with different backgrounds as we can. We want this study to help us understand healthy aging by examining the effects of different backgrounds on changes in health over time. The information that we gather will help improve health and prevent disabilities. We want to do this for people from all backgrounds, particularly those in poor and minority communities.

**For information about our study call 1-877-677-9538
or visit our website handls.nih.gov**

