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Riordan Clinic

# Health Hunters Newsletter

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## Inside This Issue



# How Food Affects Our Genes

**THE AUTHOR**
*Dr. Ola Buhr, MD*

The topic of nutrition has been my passion (and possibly obsession) and has peaked my interest particularly when dealing with disease prevention and reversal of chronic illness. I have incredibly expanded my knowledge of nutrition working at the Riordan Clinic over the past year. Unfortunately, this important topic has been grossly undervalued in my conventional medical training and I have come to realize that nutrition is the key, the bedrock, the foundation to optimal health and wellness. Many of our Health Hunter readers already know that a nutrient dense, whole food, largely plant based, and organic diet supports our body's metabolic needs, cellular processes, and hormone functions. However, there is a growing field of study, one that is quickly expanding, called nutritional genomics (or nutrigenomics). This molecular and genetic process involves the interplay of nutrients (dietary chemicals) upon our human genome, creating a causal effect on the way our genes are expressed. I find this to be a rather complex topic relating to advanced biomolecular chemistry and genomics, but a fascinating field nonetheless still in its infancy. In this article I hope to introduce you to this new and rapidly expanding paradigm of medicine.

The concept of nutrition affecting our genes and their expression is not a new one. Doctor Roger Williams, PhD (a renowned biochemist) began describing the phenomenon in an article published in *The Lancet* in 1950 entitled "The Concept of Genetotrophic Disease". Through his research he observed that certain individuals are genetically predisposed to require higher levels of vitamins, minerals, and specific nutrients beyond the average daily intake for them to support "optimal function and prevent premature disease".[1] (p. 65) We are beginning to discover that "the unique genes of each individual require different levels of nutrition and a specific lifestyle for optimal health."[1] (p. 65) Doctor Williams theorized that when these specific needs are not met, chronic degenerative diseases result. Majority of the groundbreaking work within this expanding concept comes from the international scientific efforts of the Human Genome Project, funded by the United States government and completed in 2003. The thirteen-year project resulted in the sequencing and encoding of 99% of the 3,164.7 million base pairs of human DNA. The analysis and interpretation from this vast amount of genomic data is still in its initial stages but scientists and biomedical

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Please send any comments or suggestions to newseditor@riordanclinic.org.

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Sean Osler
Editor

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## Health Hunters Newsletter

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companies are already researching its clinical applications. Scientists are particularly interested in identifying and understanding causes of disease in order to act upon them for prevention and treatment. The human genome is estimated to encode 30,000 genes while over 50% of the functions of those genes remain yet to be discovered.

A gene is the functional and physical unit of heredity passed from parent to offspring. Our genes (these pieces of DNA) contain the information necessary for making a cell; they are the blueprints for the proteins and structures in our body. It is the job of these proteins to carry out highly specialized functions. The small molecules that result from these enzymatic reactions "provide the signaling and communication activities throughout our bodies". [1] (p. 72) The process of making these proteins from DNA is called gene expression. The genome comprises the complete genetic composition of an organism, you can think of it as the entire Encyclopedia Britannica encoding all the DNA of just one person. Each cell contains this vast genome, but the cell only uses the portions of the material relevant for its specific functions. For example a liver cell possesses genetic information to make bone but this material is "turned off" and therefore never expressed or created within the liver.

Just as we humans physically look a little different from everybody else so do our biochemical pathways and the genetic material residing within our cells. This concept is known as "biochemical individuality" and was first coined by Doctor Roger Williams in his book of the same name, published in 1956. "Each and every person is unique at the level of [their] DNA."[1] (p. 65) This uniqueness is becoming a subject of discussion specifically surrounding the field of pharmacology and pharmacogenetics. Even Allen Roses, the vice-president of genetics at GlaxoSmithKline, stated: "The vast majority of drugs—more than 90%—only work in 30 or 50% of the people. I wouldn't say that most drugs don't work. I would say that most drugs work in 30 to 50% of people. Drugs out there on the market work, but they don't work for everybody."[1] (p. 69) We are beginning to find out that the reason certain medications are not effective for some people is due to the different expression of their genetic material. The enzymes that are encoded by genes involved in metabolizing specific medications (termed cytochromes) may have an altered function (for example they may work poorly or not at all while others work "overtime"). These alterations in the DNA sequence are called SNPs or Single Nucleotide Polymorphisms. SNPs are transcribed into proteins or enzymes that become more active or less active in their specific function, "and are considered to account for much of the variability seen among different individuals." [1] (p. 67) Pharmaceutical companies have created a "one size fits all" model with drug therapies but we are beginning to see that a drug may be highly effective for one person, cause a fatal reaction in another, and for the third have no therapeutic effect at all. Even scarier is the information gathered from a 1998 meta-analysis published in the medical journal *JAMA* where a conclusion was made "that adverse drug reactions from properly prescribed medications represent between the fourth and sixth leading cause of death in the United States."[1] (p. 69)

One more important genetic phenomenon I want to define is that of epigenetics. Our genes (DNA base pairs) may be "fixed" at birth but the way they become expressed as proteins, enzymes, chemical messengers, and signaling molecules in our body is highly

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dependent on our diet, lifestyle, behavior, and environment (even in the periconceptual, fetal, and infant phases of life). Much more attention is being received in the field of epigenetics and this is now becoming regarded as a critical mechanism for in-utero development, aging, chronic diseases, and the formation of cancer. **Nutrition influences epigenetic gene regulation and by learning about this relationship we see that disease processes can be altered or modulated as we grow into adulthood.** Therefore even though our parents may have high blood pressure, diabetes, heart disease, or even cancer does not mean that this will be our lot in life too. We have plenty of control in what we put into our bodies and how we treat them that determines whether we live a life full of vitality and wellness or one of chronic degenerative disease. If we sustain our body with phytonutrient-rich minimally processed, whole foods "we can change the ways our genes get stimulated and the way they respond, and since genes regulate or direct our biological functions, that can also change our pattern of health."[2] (p. 5) Thus the epigenome is a multitude of chemical compounds that can tell the human genome what to do.

What do green tea, turmeric, red grapes, hops, soy, folate, retinoids, zinc, vitamin B12, and cruciferous vegetables all have in common? These are termed bioactive food components (BFCs) and all have the ability to directly communicate with our genetic material to enhance "DNA repair, hormonal regulation, cell differentiation, inflammation, controlled cell death (apoptosis), cell cycle control/proliferation, carcinogen metabolism, [detoxification, mitochondrial function], among others." [3] (p. 208) These BFCs are powerful because through epigenetic modulation they inherently possess properties to fight against cancer cells. Countless research studies have indicated that they are capable of activating genes, which suppress tumor growth and can silence specific sets of genes that contribute to the pathogenesis of cancer. Examples of dietary polyphenols affecting the epigenome involve DNA methylation (chemically modifying the DNA strand itself), histone acetylation (proteins closely associated with DNA), and chromatin remodeling. I cannot go into these details as they are beyond the scope of this article.

Here is a list of specific foods that contain phytochemicals known to positively support genetic expression: (List taken from the book *The Disease Delusion*)

1) Green tea, which contains catechins
2) 2) Turmeric, which contains curcumin
3) Soy, which contains genistein
4) Cruciferous vegetables, which contain glucosinolates (sulforaphanes, diindolylmethane (DIM), indole-3-carbinol)
5) Red grapes and Spanish peanuts, which contain resveratrol (in the skin of the peanuts)
6) Watercress and pomegranate, which contain ellagic acid
7) Hops, which contain humulones

We are just at the beginning stages of exploration and understanding regarding this magnificent interaction of bioactive food components upon our epigenome. There is still much to be discovered regarding how these dietary factors influence our complex network of bio-molecular communication pathways, therefore additional research opportunities

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# NUTRIENT STORE

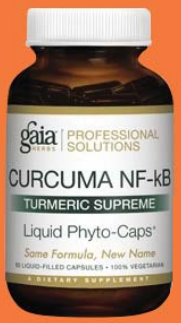
The following nutrients contain a couple of the phytochemicals known to support genetic expression that are mentioned in the lead article "How Food Affects Our Genes" by Dr. Ola Buhr.

## RESVERO ACTIVE
(VResveroA)
**$50.95**


Resvero™ Active is designed to support the immune system, the gastrointestinal system, and metabolic pathways with a concentrated source of resveratrol in a micronized emulsification.

*Due to manufacture restrictions this product cannot be sold online. To order please call 1.800.447.7276.

## Curcumin NF-kB: Turmeric Supreme
(VTurmSup)
**$28.95**




This unique formulation creates a powerful whole plant profile of Turmeric's valuable properties. Turmeric Supreme supports a healthy inflammatory response. The addition of Black Pepper extract aids in absorption.

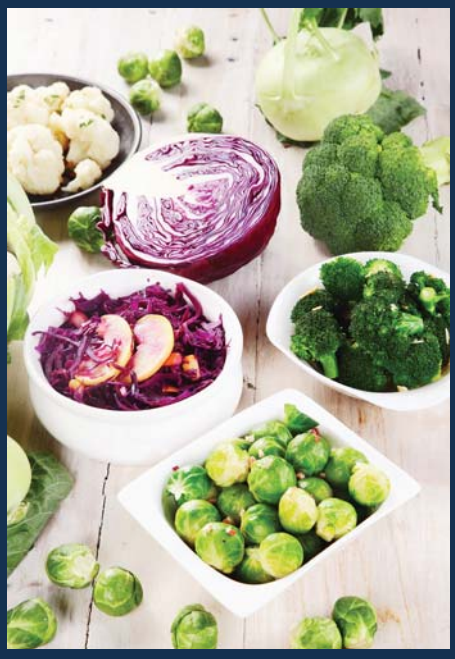
# NEUTROGENOMICS PATIENT PROFILE

*by Krystal Shaw, RN*

Neutrogenomics is a branch of nutritional genomics and is the study of the effects of food and food constituents on gene expression. It focuses on identifying and understanding the molecular level interaction between nutrients and the genome.

One such condition that Neutrogenomics can help to identify is Methylenetetrahydrofolate (MTHFR) mutation. One such result of this mutation is a decreased ability to process Amino Acids leading to undermethylation and contributing to decreased Serum, Calcium, Magnesium, Methionine and Vitamin B6 but a marked elevation in Folic Acid levels.

A young co-learner entered our office with the aforementioned condition in March of 2015 exhibiting symptoms of Oppositional Defiant Disorder (ODD), sleep disturbances, excessive carbohydrate cravings



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abound. Just this month the *Journal of the American Medical Association* published an article stating that although the "interplay between genes, environment, epigenetics, and disease is complicated and still poorly understood" the authors acknowledged that the interrelationship of nutrition has control over the human epigenome. The article also mentioned a 2014 study published in the Journal Science in which in-utero mice were fed a nutrient deficient diet and their epigenetic changes were passed on to the next generation. This is startling information, especially in this day and age where we are bombarded by fast food restaurants, food additives and chemicals, and highly processed meals that are nutrient deficient. In our American society where millions of people consume the Standard American Diet and eat processed, highly caloric meals they unfortunately remain nutritionally starved on a cellular level. This information can imprint on our epigenome and be passed on to our children. Remember, food is information for our genes. The information we receive from a calorie of a refined and enriched bagel is much different than that of a calorie from broccoli. Make wise food choices and pass those on to your children so that all generations can thrive in health and happiness. Eat those bright, colorful, fresh vegetables because they hold the information and control mechanisms to manifest and maintain a disease-free balance within our bodies.

Food by way of nutrients is not the only factor influencing our epigenome. "…Prenatal and early postnatal environmental factors, xenobiotic chemical exposures, behavioral cues, and low-dose radiation can also alter epigenetic marks and processes and subsequent changes in the risk of developing disease."[3] (p. 212) We are also seeing studies exemplify this inheritance transgenerationally, thereby affecting the health of our children. Xenobiotics (synthetic chemicals foreign to the body and ecological system) such as bisphenol A (BPA), a chemical found in a multitude of plastic products, has shown to be associated with higher body weight, increased breast and prostate cancer, and altered reproductive function in mouse models wherein mouse fetuses and neonates were exposed to the substance. Scientists also observed that when the mothers of these mice fetuses were exposed to bioactive food components (like genistein) the negative epigenomic effect was counteracted by the dietary supplements. This means that the phenomenon is modifiable and reversible showing us that "gene function [can change] under exogenous influence."[3] (p. 229) Researchers acknowledge "there is also a need to further our understanding of the interaction between diet, epigenetics, and crucial times of exposure during development and throughout the entire life span."[3] (p. 213).

This is new cutting-edge knowledge that brings us into an educated state of empowerment. We are no longer powerless human beings, victims of an inherited long strand of DNA material. Our cards have not necessarily been dealt at the moment of conception. Every fork-full we consume has the power to determine a complex interplay of reactions that can touch the very core of our genetic make-up. I want to leave

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you with a quote penned by holistic health practitioner Ann Wigmore "the food you eat can be either the safest and most powerful form of medicine or the slowest form of poison."

References


1) Jones, David, et al. *Textbook of Functional Medicine.* Boulder: Johnson Printing. 2005 and 2006. Print.
2) Bland, Jeffrey. *The Disease Delusion.* New York City: Harper Wave, 2014. Print.
3) Choi, Sang-Woon and Simonetta Friso. *Nutrients and Epigenetics.* Boca Raton: CRC Press, 2009. Print.
4) Feinberg A, Fallin D. "Epigenetics at the Crossroads of Genes and Environment." Journal of the American Medical Association. 2015 Sept 15; 314(11): 1129-1130.


# The Influence of Taste


**THE AUTHOR**

*Dr. Anne Zauderer, DC*


Have you ever stopped to wonder why sweet foods taste so good to us? What is it about a cup of ice cream that is so delicious? Or why we sometimes crave salty foods? In the modern world, most people don't stop to think about such questions. We don't think about how the deep, biological programming in the primitive parts of our brain influence the choices we make while grocery shopping. I'm here to tell you that it has a BIG impact! These biological needs are your body's way of trying to communicate something to you. In these parts of the brain, this is what each of the different taste cravings mean:

- **Salty**—the body is seeking electrolyte balance (especially for someone in adrenal fatigue)
- **Sweet**— this indicates a food that is rich in energy (calories) and nutrients
- **Sour**—this is the taste of acids (helps maintain pH balance in the body)
- **Bitter**—in nature this is the taste of natural toxins (this is why we avoid bitter tasting foods!)
- **Umami**—this indicates amino acids (protein)

Unfortunately, most modern, processed food is a sham. The food industry is a business and the goal of any great business is to make a profit. They are looking for ways to make food appealing enough to you so that you'll want to consume a lot of it while trying to make it as cheaply as possible. However, most modern convenience food uses chemical substitutes to mimic these flavors that our body craves. This triggers a response in the brain and makes us feel like we are satisfying that nutrient need with no nutritional value to back it up.

A great example of this is the "food enhancer" called MSG (monosodium glutamate). This is an additive that mimics the flavor umami. When companies add this chemical

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and multiple food allergies. Performing an Optimal Nutrient Evaluation and Methylation Profile aided in the identification of the above mutation and deficiencies that assisted our providers in making dietary and supplement recommendations that would change this boy's life.

By implementing a diet high in cruciferous vegetables, ground flax, and good fats, as well as severely limiting sugars and simple carbohydrates, by May 2015 our co-learner was growing more stable and happy with only a few incidents in the afternoon. With continued adjustments in supplementation such as B12 and Methionine, among others, by August of 2015 his parent's reported that he was "much better".

The performance of the Optimal Nutrient Evaluation and Methylation Profile provided the information necessary to correct deficiencies that were negatively impacting this family's life. Coupled with the exciting proposition that they were **ready** to implement lifestyle changes in diet and activity and make them habits to grow a happier family made for an unstoppable combination.

## Are you ready?

Talk with your Riordan Clinic provider today to see how Nutrient Lab Testing could benefit you!

# Doctor Call Time

## 30 Minute Conference Calls for Potential Patients

**1.800.615.2900**

Access Code #2571701

Mondays, 5:30pm
**Ron Hunninghake, MD**

Tuesdays, 1:00pm
**Anne Zauderer, DC**

Wednesdays, 8:00am
**Karen Wheeler, APRN**

Wednesdays, 5:30pm
**Jennifer Kaumeyer, ND**

Thursdays, 5:30pm
**Ola Buhr, MD**

Fridays, 1:00pm
**Karen Wheeler, APRN**

**Learn more about our team at:**
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to their foods, it makes the food taste heartier and more satisfying. This is an illusion. The brain thinks it is getting a good source of protein, whereas most of the foods it is added to do not provide the actual nutrition to back up that flavor. So what happens? You end up craving more of it. Have you ever had a super-sized meal from McDonald's that has well over your required amount of calories, yet felt hungry a few hours after consuming it? That's MSG. (Not only that, MSG is also an excitotoxin, which means it is toxic to your brain cells).

In nature, the flavor of foods indicates the nutritional value of food. A great experiment to prove this is what I call **"the carrot test."** Go to the grocery store and buy a bag of organic carrots and a bag of conventional carrots. Try one (with no dressing or dip) and then try the other. The organic carrots will taste sweeter and simply taste more like a carrot! This is because organic foods have more nutritional value and therefore they taste better to us. (You can do the same experiment with an apple).

So if we are eating a whole foods diet and are listening to our bodies, we can understand our nutritional needs by what foods we crave. A great example of this is a study that was done back in the 1920s. A pediatrician by the name of Clara Davis performed an experiment on fifteen babies, ages 6-11 months. These babies were from underprivileged families and had never been exposed to food beyond breastmilk. They were put on an experimental diet where, throughout the course of a day, they could choose from 34 different whole food choices ranging from vegetables, milk, and different meat proteins. (The diet excluded sugar, cream, butter, cheese and potato chips). Children were presented the food but they had complete control over what they ate and how much. The results of the study showed that throughout the course of the first few weeks, the children sampled a little bit of each of the foods. After that, each child came to have certain preferences. What

was remarkable was the fact that their preferences started to align with their individual nutritional needs. For instance, there was one child who had a severe case of Rickets (a Vitamin D deficiency). This child, of his own free will, would consume varying amounts of cod liver oil. He did this until his deficiency was resolved and then he never touched another drop.[1]

This speaks to the intuitive, nutritional nature we have as humans. If we can get back to a whole foods diet, we can better hear the needs of our body. Then we can give it the nutrition it is craving, rather than overconsuming foods that only serve to deepen our nutritional deficiencies.

*The Influence of Taste continues on page 7...*

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***"A great whole food recipe to start with is one of my favorites for winter!"***

# PALEO PUMPKIN CHILI

PREP TIME: 10 mins
COOK TIME: 25 mins
TOTAL TIME: 35 mins
Serves: 4 – 6

**INGREDIENTS**

- 1 tablespoon coconut oil
- 1 medium yellow onion, diced
- 4 garlic cloves, minced
- 1 pound organic grass-fed ground beef
- 2 cups chopped zucchini, cauliflower, or vegetables of choice
- 2 cups pumpkin puree
- 1 cup vegetable, beef, or chicken stock
- 2 14-oz cans fire roasted tomatoes
- ¼ teaspoon cinnamon
- ¼ teaspoon chili powder
- 1 teaspoon dried oregano
- 1 teaspoon cumin
- 1 teaspoon smoked paprika
- ½ teaspoon sea salt (more to taste)

**INSTRUCTIONS**

Add the coconut oil to a large pot over medium heat.
Add the onions, garlic, and beef and saute for 5 minutes, until beef is just browned.
Add the vegetables, pumpkin puree, stock, tomatoes, and spices.
Bring to a boil and then lower to a simmer.
Simmer for 15 - 20 minutes, until vegetables are tender. Serve hot.

Source: http://www.insonnetskitchen.com/paleo-pumpkin-chili/

1. Schatzker, Mark. The Dorito Effect. New York: Simon & Schuster, 2015.



As Riordan Clinic celebrates its 40th year we would love to hear stories of your experiences! Do you have a story about a particular staff member that touched your life? A service or therapy that impacted you in a positive and lasting way? Maybe a story of an event that you attended or a note about the campus?

**To share your story with us, please visit: riordanclinic.org/shareyourstory**

# OPTIMAL KIDS PROGRAM

**Improve your child's behavior, learning and mood through lifestyle and dietary modifications along with proper nutrient supplementation.**

Our approach investigates the root cause for children who are suffering from behavior, learning, anxiety and depression issues. Optimal Kids is designed for parents and loved ones who want to avoid medication while still improving the child's day to day life.

## Who would benefit?

Children who suffer from:

- Poor concentration
- Poor focus and memory
- ADD/ADHD
- Digestive complaints
- Hyperactivity
- Headaches
- Developmental delays
- Asthma and allergies
- Poor sleep habits
- Food sensitivities
- Depression
- Anxiety

And please include the phone number **316.531.6242** to learn more or schedule an appointment.

Optimal Kids

Improve your child's behavior, learning and mood

**riordanclinic.org/optimal-kids/**

# COOKING WITH DR. ANNE

**All classes will be taught at GreenAcres Market**

GreenAcres Market and the Riordan Clinic are teaming up to bring optimal nutrition and a chance to improve the behavior, learning and mood of children that suffer from poor concentration, hyperactivity, anxiety and food sensitivities.

Dr Anne, will don an apron and roll up her sleeves to offer FREE cooking classes during the months of October and November at GreenAcres Market—Bradley Fair in Wichita.

**Tuesday, October 20th at 7pm**

**Tuesday, November 3rd at 7pm**

**Tuesday, November 10th at 7pm**

This is to spotlight our new program called Optimal Kids which will result in a new protocol for treating children with behavior and health challenges.

Optimal Kids is a medical, nutrition and lifestyle program which includes a physical exam, detailed health history and lab work that requires five clinic visits during a three-month period. The cost of the Optimal Kids Program is $1,680.

GreenAcres Market will be offering three $800 scholarships to needs-based families. Those interested are encouraged to apply by calling 316.682.3100.

Whether parents decide to participate in Optimal Kids or not, they will learn plenty about the nutritional component of working toward balance and eliminating foods which foster dysfunctions in young systems by attending the GreenAcres FREE cooking classes.

Both parents and kids are encouraged to attend and take advantage of meal plans that will help the entire family.

**For more information on the Optimal Kids Program, contact us at 316.531.6242 or visit riordanclinic.org/events/.**