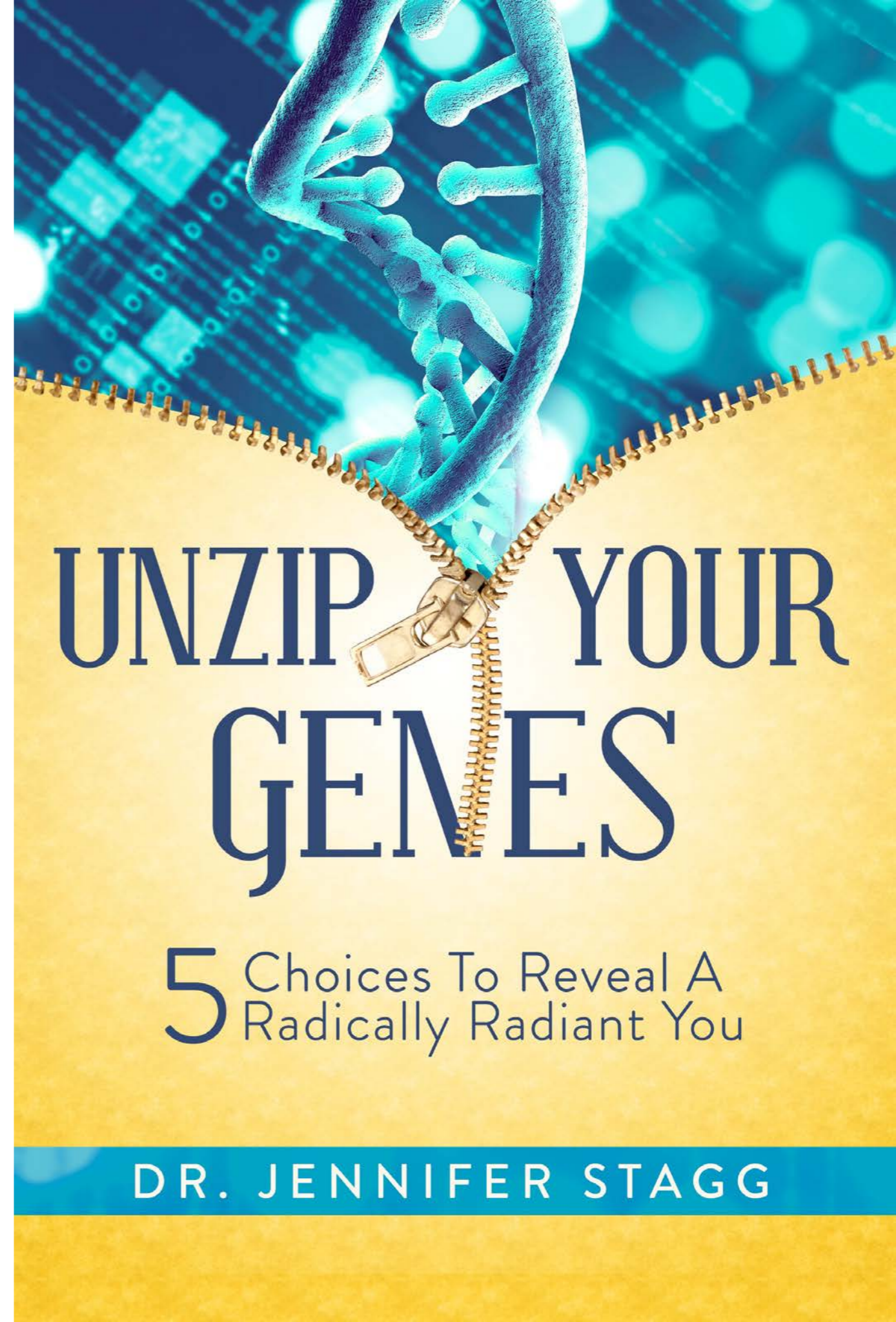


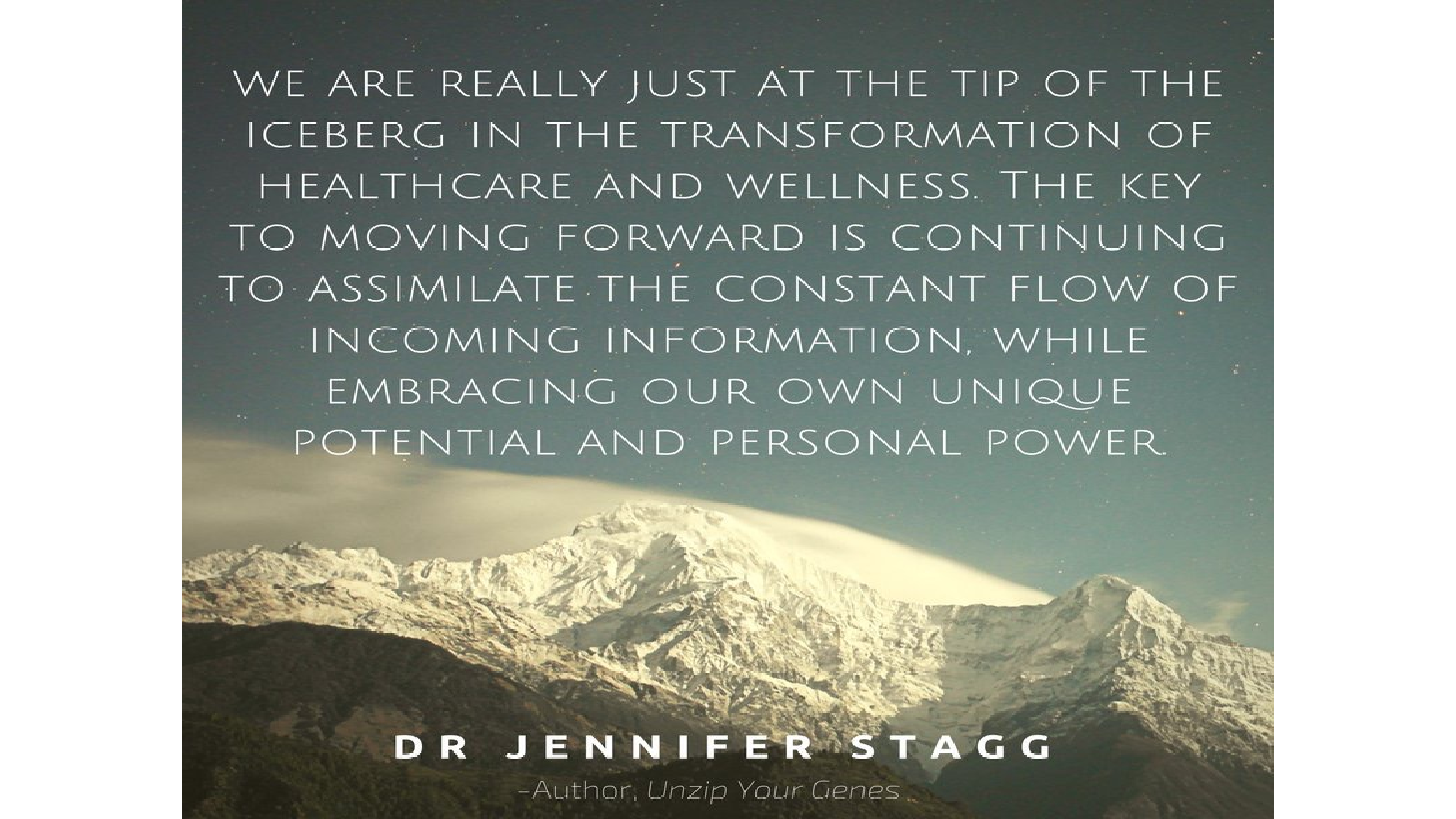
# Precision Medicine: Tools for Patient Success

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WE ARE REALLY JUST AT THE TIP OF THE  
ICEBERG IN THE TRANSFORMATION OF  
HEALTHCARE AND WELLNESS. THE KEY  
TO MOVING FORWARD IS CONTINUING  
TO ASSIMILATE THE CONSTANT FLOW OF  
INCOMING INFORMATION, WHILE  
EMBRACING OUR OWN UNIQUE  
POTENTIAL AND PERSONAL POWER.

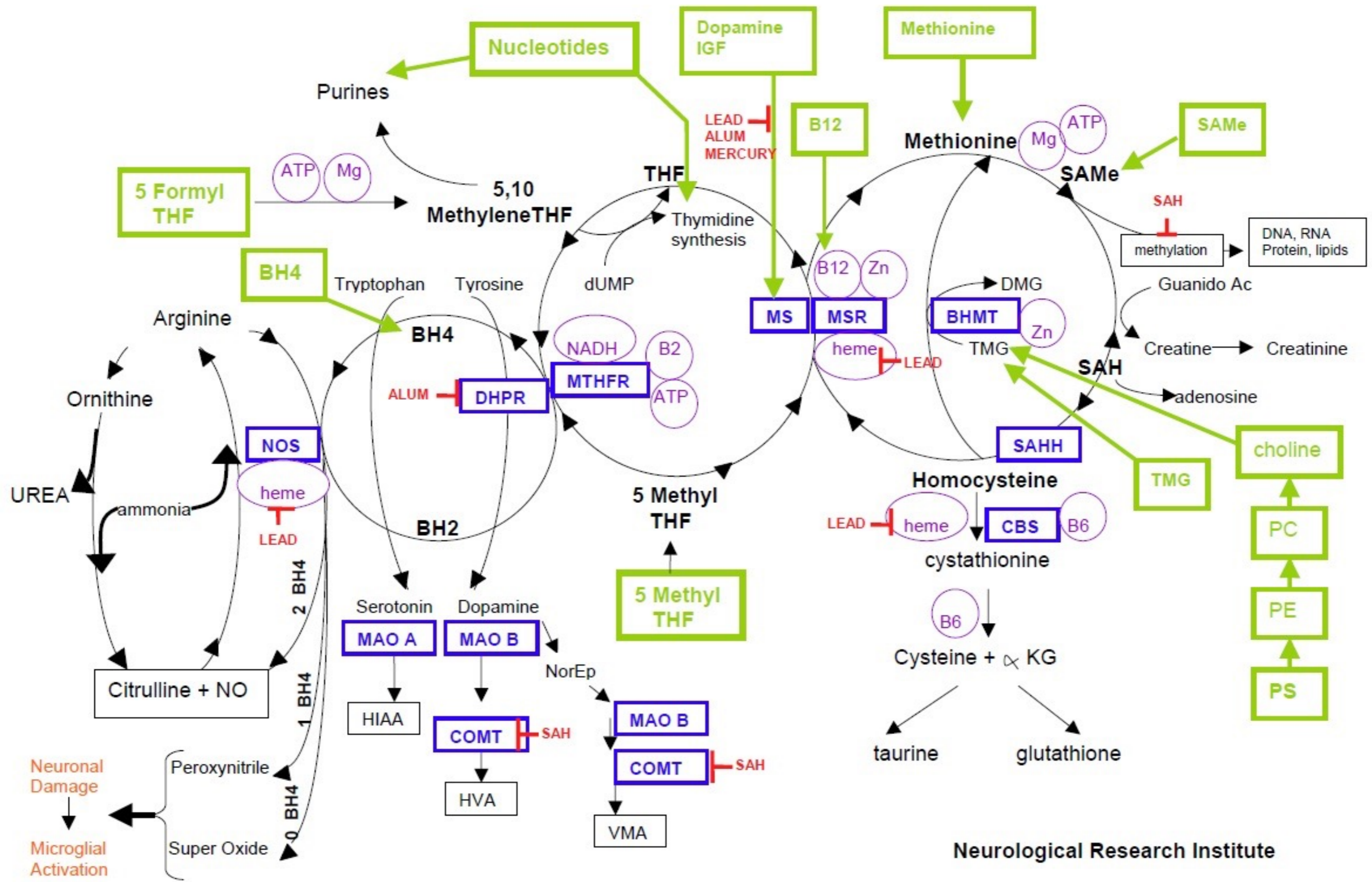
**DR JENNIFER STAGG**

*-Author, Unzip Your Genes*

# Objectives

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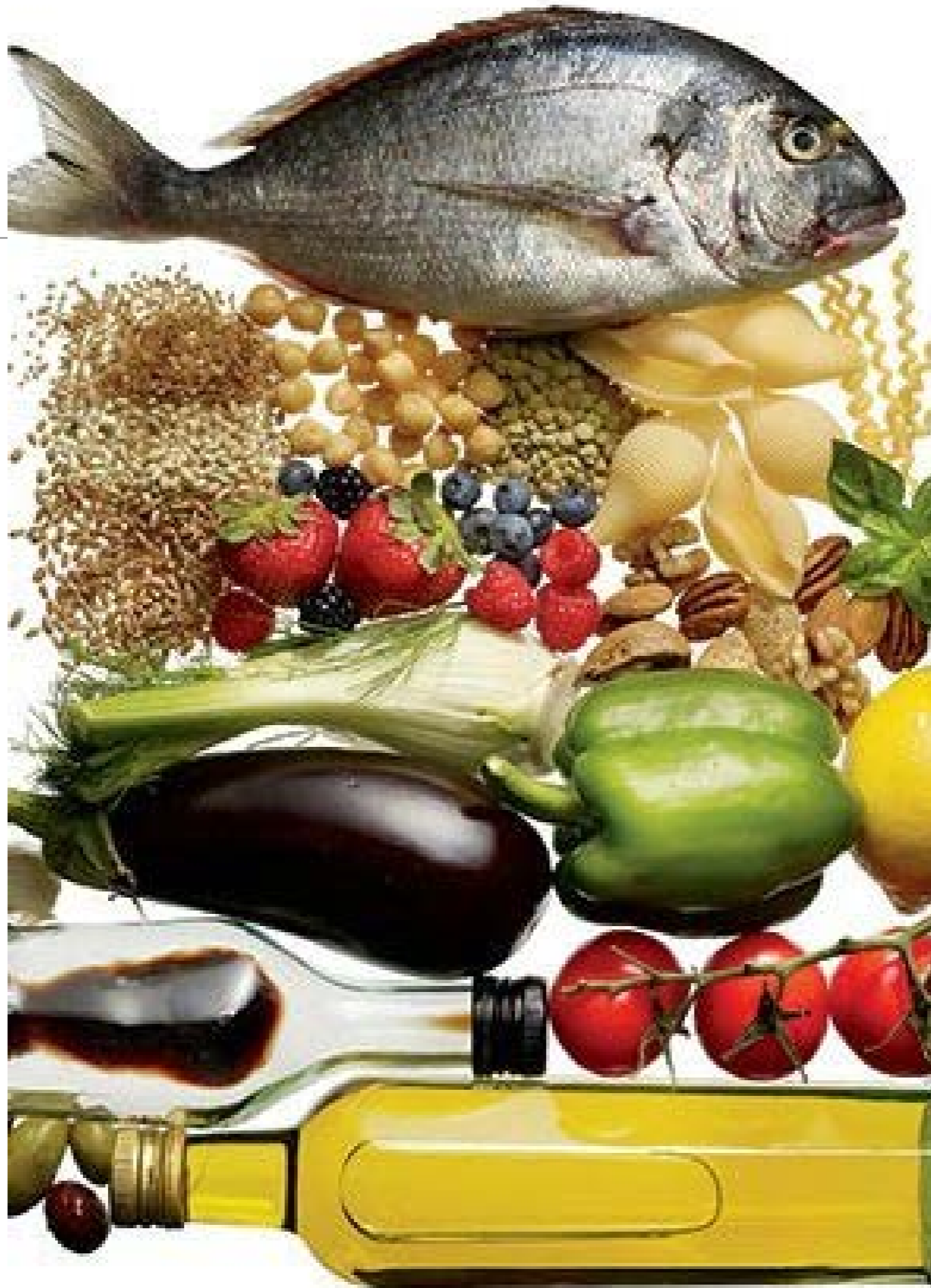
- Understand how **precision medicine** can be applied in integrative healthcare settings
- **Paradigm Shift**- emphasize health promotion/preventative care, utilizing advances in genomics and epigenetics
- Precision Medicine **Tools**- beyond pharmacogenomics and oncogenomics
- Review a clinical **case study** incorporating genomic wellness testing.



# Using Precision Medicine in Integrative Healthcare

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- Look beyond targeting disease and dysfunction
- **Resilience** genes—keys to longer health span
- **Epigenetics**: turning genes on and off through one's interactions with the environment
  - DNA Methylation
  - Histone Modification
- **Paradigm Shift**: Use genomic testing for health promotion



## Using Genomics as a Guide to Epigenetics

7000 subjects with FTO and MC4R SNPs (which predispose to type 2 diabetes)

Results showed these polymorphisms were ‘turned off’ by following mediterranean diet

***“high adherence to the Med Diet counteracts the genetic predisposition”***

Ortega-Azorin C.*et.al.* *Cardiovasc Diabetol* 11 (2012):137. doi: 10.1186/1475-2840-11-37.

# DNA Expression Must be Considered When Providing Lifestyle Advice

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## **Epigenetic modifiers**—discounting the ‘calories in vs. calories out’ theory

- Molasses-sugar content is 4g/tsp (same as white sugar). Animal study: 4% molasses solution was added to an unaltered high fat diet, led to decreased body weight after 12 weeks. molasses group had increased gene expression for several liver and fat cell biomarkers of energy metabolism
  - decreased blood levels of leptin (hormone produced in adipose tissue)
  - higher energy excretion in stool (reduction in calories absorbed)

# Advantages of Applied Precision Medicine

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- **Clinician Benefits:**

- Removes some of the guesswork
- High quality care, enhances referrals and increases the number of people you can help

- **Patient Benefits:**

- Saves time, money
- Effective treatment



# Genomic Wellness Testing

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- Pathway Fit Test
  - Analyzes 79 SNPs related to diet, exercise and metabolism
  - Saliva sample to collect DNA
  - Turn around time is 2-3 weeks
  - Electronic delivery of customized report and diet plan



# New Test Options

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- **Telomere Length Testing**
  - Assessment of Cellular Aging
  - T-lymphocytes
- **Global DNA Methylation**
  - Assessment of cellular health status
  - Varies based on cell type: white blood cell, adipose cells
  - Not commercially available



# Case Study

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- 42 yo Caucasian stay at home mom
- Hypothyroidism, IBS, Depression/Anxiety, Seasonal Allergies, Recurrent Sinusitis, Obesity
- Presents with concerns of difficulty with weight management following paleo diet X 6 months. Cites afternoon cravings for sweets
- Meds: Armour 15mg, Zoloft 125mg, Nasocort-PRN
- Supplements: Wellness Essentials for Women, Folapro, Slow release Mag, Ultraflora Balance



# Genomic Wellness Profile: 7 Categories

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- Matching diet type
- Eating behavior traits
- Nutritional Needs
- Food Reactions
- Exercise
- Body and Weight
- Metabolic Health Factors



# Satiety- Feeling FULL



## EATING BEHAVIOR TRAITS SATIETY - FEELING FULL

Satiety can be described as the feeling of fullness after you eat. The FTO (fat mass and obesity-associated) gene is known to be an important factor that predisposes a person to a healthy or unhealthy level of body weight<sup>19</sup>. The two possible outcomes in this report are "Difficulty in Feeling Full" and "Typical." People who experience "Difficulty in Feeling Full" tend to eat more without feeling satisfied. To help manage this outcome, you could increase the amount of fiber in your diet and balance meals and snacks throughout the day. Examples of foods high in fiber include whole wheat bread, oatmeal, barley, lentils, black beans, artichokes, raspberries, and peas. In a 2008 study, the A/A genotype at rs9939609 in the FTO gene was associated with "Difficulty in Feeling Full"<sup>20</sup>. Although this study was done in children, there is preliminary data to support that the association also holds true in adults<sup>21</sup>.

### ▶ YOUR RESULT ◀

#### TYPICAL

People with your genotype tend to feel full after a meal.

### 🧬 YOUR RELATED GENES

Gene Tested	Your Genotype	Scientific Strength
FTO-rs9939609	T/T	★★★★☆

# Case Study: Genomic Test Results

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- **Dietary:**
  - Low carb genetic matching diet (Protein 30:Fat 30: Carbohydrate 40)
  - Monounsaturated fat
- **Behavioral Traits:** Eating disinhibition
- **Food Reactions:** Slow caffeine metabolizer, Bitter taster
- **Vitamin Needs:** B12, MTHFR, Vitamin A

# Case Study: Genomic Test Results

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- **Exercise:** Enhanced Endurance, Strength Training Impaired, Sprinter Gene, Enhanced Insulin Sensitivity
- **Weight and Metabolism:**
  - Weight Loss-regain
  - ‘Normal Metabolism’
  - Did not have Obesity Genes
- **Cardio-lipid:** prone to low HDL cholesterol



# Case Study:

## Response to Precision Lifestyle Medicine Program

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- Initial response to test results (11/29/16): excited and motivated to have a personalized program
- 4 week office visit on 12/27/16 (during holidays!!)
  - appetite is decreased, less snacking
  - eats carbs at noon, no cravings in afternoon
  - 9 lb weight loss
  - taking antibiotic for acute sinus infection



<b>INBODY RESULTS</b>	11/29/16	12/13/16	12/27/16	1/26/17
Weight (lb)	180.5	176.5	171.1	169.8
BMI (kg/m <sup>2</sup> )	31.0	30.3	29.4	29.1
Percent Body Fat (%)	43.0	41.5	41.6	40.2
Body Fat Mass to Lose (lb)	47.0	42.6	41.4	37.9

# Personalized Medicine: Measuring Outcomes

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- In functional medicine we often talk about need to observe  $n=1$
- 2010 Stanford University Study with Interleukin Genomics:
  - women on genotype appropriate diets lost significantly more weight
  - people on genetically appropriate diets lose twice (2x) the number of inches in waist circumference over 12 months ( $p=0.01$ )
- Secondary outcomes: improved cholesterol levels



## Summary

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- Using Precision Medicine in your integrative medicine practice ***enhances patient care***, efficacy of treatment and saves time and money
- Genomic testing can provide ***actionable data*** for lifestyle changes that can have a positive epigenetic impact
- Paradigm shift from disease care to ***true 'health' care***, incorporating tools that assess cellular health

## Connect with me!

I want to hear from you.  
How are you using  
Precision Medicine in your  
practice?

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