

# Genetic Addiction Risk Score<sup>®</sup> (GARS<sup>®</sup>) Test

We are learning more and more about epigenetics; that is the science that studies how lifestyle and environmental experiences exert a significant influence on gene expression and how that affects our behaviors. Nutrigenomics is a sub-category of epigenetics that studies how nutrition affects gene expression.

## INTRODUCING

The Genetic Addiction Risk Score<sup>®</sup> (GARS<sup>®</sup>); A Patented Breakthrough Analysis of Genetic Factors Addressed by VNI's RestoreGen<sup>™</sup>, the Patented, Prodosomed<sup>®</sup> DNA-Designed Precision Nutrition<sup>™</sup> 'Reward Deficiency Solution'.

The GARS test can test for genes in the Brain Reward Cascade that can identify individuals (i.e. children, adolescents or adults) at risk for development of excessive reward-seeking/reward deficiency behaviors. One measure of the importance of technology is the issuance of a US patent. The GARS commercial test received a patent, issued on September 11, 2018, from the United States Patent and Trademark Office (USPTO #10,072,289).



# RestoreGen™: A Disruptive Technological Breakthrough in Nutritional Support for Your Brain.

## The State of the Technology NOW!

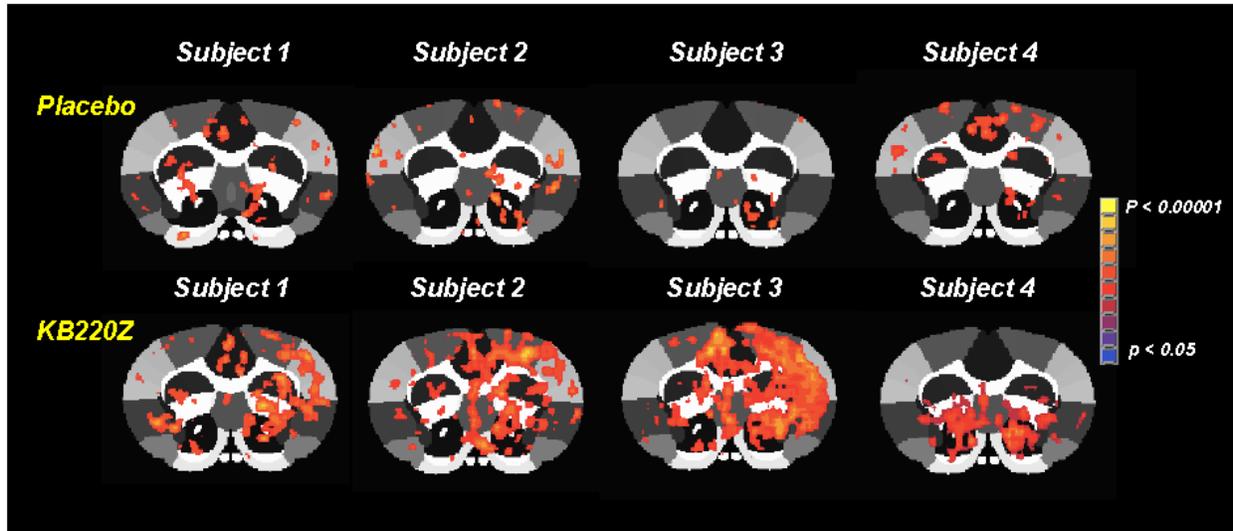
Patented Brain Reward® nutritionally supports a sharper mind and the ability to experience reward benefits from normal activities, especially in people with Reward Deficiencies who have greater difficulty achieving satisfaction from normally rewarding thoughts, experiences, behaviors, and foods and beverages. Brain Reward nutritionally supports the Brain Reward Cascade (BRC) (i.e. neurotransmitters from serotonin down to dopamine) with a genetically-based nutritional formula of specific vitamins, minerals, amino acids, and botanicals as a complete formula that has been shown in a multitude of published clinical studies to improve gene expression and rebalance the neurochemistry in the BRC. The scientifically validated nutritional benefits include:

- Support Focus, Concentration, Cognition And Mental Sharpness \*
- Relieve Stress \*
- Help Regulate Cravings \*
- Promotes Easier Recovery \*
- Promote Energy And Detox \*
- Support Optimal Brain Health, Elevated Mood, Weight Management, Overall Wellness And Vitality \*
- Support Dopamine Sensitivity And Function \*

The 'one-size' formula of Brain Reward is designed to address the greatest nutritional benefits to the largest group of people. While the evidence-based benefits of Brain Reward alone are significant and undeniable, the degree and range of results can vary between people. This is because people have different genetic profiles and nutritional needs to optimize the expression of all the genes in their BRC.

For example, one person can take Brain Reward and achieve a profound improvement in some type of benefit, while another person might have only a modest improvement in that benefit but experience a significant benefit in some other area. People are different and have different needs.

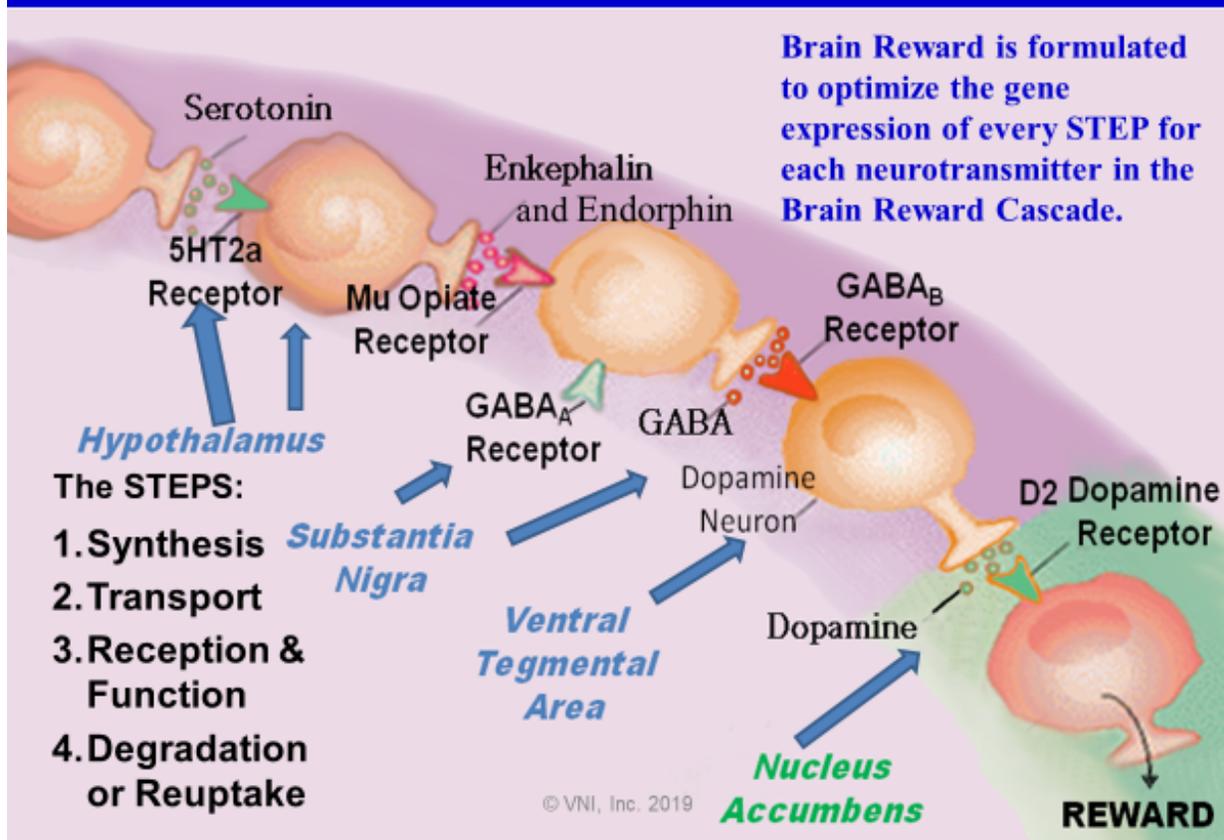
As you can see from the 4 different test subjects below, the same dose of Brain Reward (KB220Z) exerts different benefits, affecting the brain differently for each person.



## The Symphony of Neurochemistry

Neurotransmitters communicate with each other to achieve optimal system function, called neurotransmitter-interconnectivity. All of the neurotransmitters must be able to achieve their optimal functions in order to optimize the interconnective communications between different compartments of the brain AND the other tissues in the body (GI Tract, lymph tissues, glands, etc.). Impairment in the function of any one of the neurotransmitters impairs the effective function of the systems they either regulate or in which they are involved. Individuals have different nutritional needs to optimize neurotransmitter interconnectivity!

## Dynamics of the Brain Reward Cascade (The Symphony of Neurochemistry)



### Function Of Neurotransmitters in the Brain Reward Cascade

#### 1. Serotonin is involved in:

- a. Modulating cognition, reward, learning, memory, and other numerous and important physiological processes.
- b. 90% of the human body's total serotonin is located in the GI tract, where it also regulates intestinal movements.
- c. Serotonin is also stored in blood platelets and is released during agitation and vasoconstriction, where it then promotes the activity of other platelets.
  - platelets help heal the lining of damaged blood vessels & control bleeding.
- d. Serotonin is also important for the regulation of mood, appetite, and sleep.
- e. Serotonin triggers the sequence of cascading events that influence dopamine production; i.e. the “Brain Reward Cascade.”

## **2. Enkephalin Function is involved in:**

- a. Regulating the sensory nervous system's response to certain harmful, potentially harmful, or traumatic stimuli. (i.e. pain, toxic fumes, traumatic sights and/or sounds, etc.)
- b. Enkephalins are small molecules that bind to your opiate receptors and have 'pain-killing' activity; they inhibit pain sensations.
- c. Enkephalins also have a regulatory effect on endorphins (your body's own morphine).
- d. Enkephalins have an effect on norepinephrine (aka 'nor-adrenaline') that stimulates the 'get up and go' effect on the body.
- e. Enkephalins also have an impact on digestive system motility, gastric as well as pancreatic secretions and metabolism of carbohydrates.

## **3. Norepinephrine (the next step after dopamine) function is involved in:**

- a. Mobilizing the brain and body for action.
- b. Attentiveness, emotions, sleeping, dreaming, and learning.
- c. Norepinephrine is also released as a hormone into the blood, where it causes blood vessels to contract and heart rate to increase.
- d. Sub-optimal Norepinephrine plays a role in mood disorders such as manic depression.
- e. Naturally Boosting Norepinephrine can increase energy especially during energy-draining stressful events.

## **4. Endorphins Benefits include:**

- a. Inhibit the communication of pain signals.
- b. Produce a feeling of euphoria very similar to that produced by other opioids.
- c. The word Endorphin is a combination of Endogenous (meaning inside the body) and morphine.
- d. It's the body's own morphine-like substance.
- e. Endorphins also bind to your body's opiate receptors.
- f. Inhibits the release of the neurotransmitter GABA which, in turn, increases the production and release of dopamine, the neurotransmitter associated with pleasure.

- g. A genetic limitation or inability to produce sufficient endorphins is associated with anxiety and depression; low endorphins generally results in low dopamine function.

**5. GABA Functions Include:**

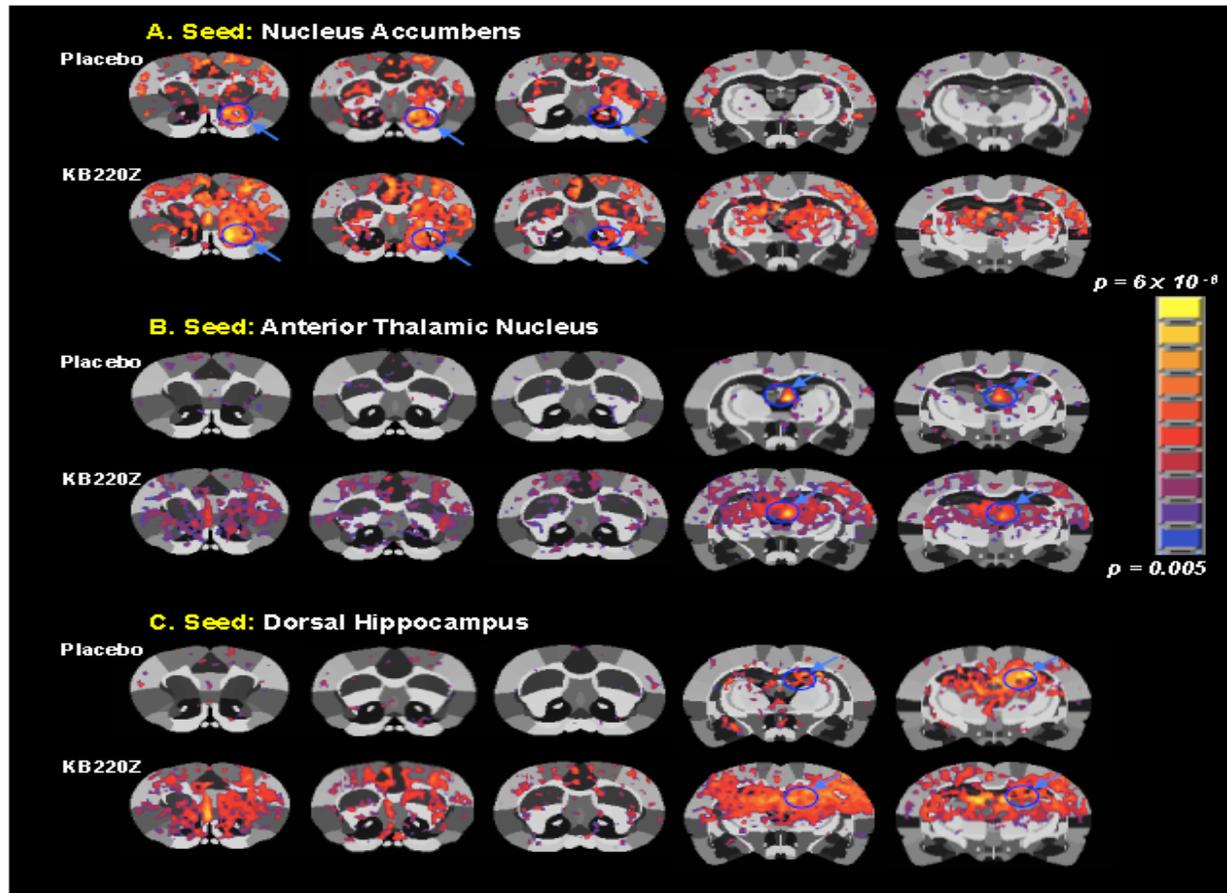
- a. GABA is made in brain cells and functions as an inhibitory neurotransmitter – meaning that it blocks nerve impulses.
- b. Its principal role is reducing neuronal excitability throughout the nervous system.
- c. GABA is a dopamine antagonist.
- d. Impairment in gene expression of serotonin, enkephalin and/or endorphin enable an over-expression and over-production of GABA, which inhibits or antagonizes dopamine production, impairing happiness, mental sharpness, cognition, stress management and many others.

**6. Dopamine Functions Include:**

- a. Responsible for Reward-Motivated Behavior.
  - b. Promotes greater motivational salience (i.e. risk vs. reward).
    - Regulates the intensity of behaviors involving the time and energy spent and the risk involved in attaining a particular goal.
  - c. Promotes dilation of blood vessels (improves circulation).
  - d. Regulates the release of other neurotransmitters (neuromodulation).
  - e. Regulates cravings and recovery.
  - f. Enhances focus, concentration, cognition, stress management, energy, mood elevation, and mental sharpness.
  - g. Dopamine is the 'pot of gold' reward satisfaction and happiness payoff at the end of the Brain Reward Rainbow.
7. Impaired expression of dopamine genes can cause inhibition of the synthesis, transport, reception and/or degradation or reuptake of dopamine and impair any or ALL of the beneficial effects.

## The Brain Must Communicate with Itself – The Importance of ‘Interconnectivity’

An examination of the effects of the Brain Reward (KB220Z) on **B**lood **O**xxygen **L**evel **D**ependent (BOLD) correlations between the reward regions of the brain and the rest of the brain confirm both the necessity of interconnectivity between different brain compartments (i.e. regions) and the variation of effects of a standard dose of Brain Reward (KB220Z) between different individuals. (See FMRI Results Below)



As you can once again see, the same dose of Brain Reward (KB220Z) exerts different benefits and different intensities of benefits, affecting the brain differently for each individual. The interconnecting communications' relationships in the brain downstream, cross stream, and upstream (via Feedback) between neurotransmitters is extremely complex. The **ONLY WAY** to **KNOW** the exact amount of nutritional resources **NEEDED** to ensure optimal accurate and competent compartmental interconnective communications

and brain function is through a Gene Test!!! A gene test can determine the exact nutrients and amounts needed to optimize neurotransmitter activity and compartmental interconnectivity, optimizing brain function.

## **Epigenetics and Nutrigenomics**

We are learning more and more about epigenetics; that is the science that studies how lifestyle and environmental experiences exert a significant influence on gene expression and how that affects our behaviors. Nutrigenomics is a sub-category of epigenetics that studies how nutrition effects gene expression.

**INTRODUCING THE Genetic Addiction Risk Score<sup>®</sup> (GARS<sup>®</sup>); A Patented Breakthrough Analysis of Genetic Factors Addressed by VNI's RestoreGen<sup>™</sup>, the Patented, Prodosomed<sup>®</sup> DNA-Designed Precision Nutrition<sup>™</sup> 'Reward Deficiency Solution'.**



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As of March 2019, the Genetic Addiction Risk Score<sup>®</sup> (GARS<sup>®</sup>) and the DNA-Designed Precision Nutrition<sup>™</sup> Reward Deficiency Solution (available as VNI's 'RestoreGen<sup>™</sup>'), has been validated in no less than 1850 cases worldwide. The genes selected for testing were

based on accumulated results from extensive and rigorous scientific studies of the neurobiology and genetics of reward deficiency.

The GARS test reports whether a person has variants associated with a high, medium or low risk for excessive reward-seeking thoughts and/or behaviors. This test is most relevant for people of all races and ethnic groups. The GARS test has been developed and described in the scientific literature. [Blum K, Gondre-Lewis MC, Baron D, et al. (2018). Introducing Precision Addiction Management of Reward Deficiency Syndrome, the Construct That Underpins All Addictive Behaviors. *Front Psychiatry*. 9:548; Blum K, Modestino EJ, Neary J, et al. (2018). Promoting Precision Addiction Management (PAM) to Combat the Global Opioid Crisis. *Biomed J Sci Tech Res*. 2(2):1-4.]

Based on original published clinical research and an extensive review of the scientific literature, the risk index for excessive reward-seeking behaviors has been determined to consist of 11 polymorphisms in 10 genes involved in the neurological processing of reward. The resulting GARS score includes six single-nucleotide polymorphisms (SNPs) in the DRD1, DRD2, DRD3, DRD4, COMT, and OPRM1 genes; four simple sequence repeats (SSRs) in the DAT1, DRD4, MAO-A, and 5HTT transporter genes; and a dinucleotide polymorphism in the GABRA3 gene. When suboptimal nutrigenomic support is available, optimal gene expression in any one of these genes can be reduced resulting in excessive self-medicating, pleasure or reward seeking thoughts and behaviors. In this case, some or all of these polymorphisms contribute to low dopamine function ('hypodopaminergic' traits).

Description of the VNI GARS Test Kit

Simply purchase the VNI GARS Test Kit. [\(Add to Shopping Cart\)](#)

The Genetic Addiction Risk Score (GARS) test is a USPTO patented non-diagnostic, DNA genetic testing kit. The Genetic Addiction Risk Score (GARS) is based on a qualitative genetic test for single nucleotide polymorphism detection affecting the Brain Reward Cascade and reward deficiency behaviors.

### **The Gene Collection Process**

The **GARS Collection Kit** requires individuals to swab cheeks with a Copan 4N6FLOQSwabs™ (4504C) Regular size tip, in 109 mm long tube with Active Drying System.



### Sample Collection and Processing Utilized to Obtain Individual's Genetic Information

Cells from inside the cheeks (i.e. 'Buccal Cells') are collected from each subject using an established minimally invasive collection kit provided by Geneus Health Laboratories of San Antonio, Texas. Sterile Copan 4N6FLOQ Swabs (Regular Size Tip In 109MM Long Dry Tube with Active Drying System) are utilized for sample collection. Individuals collect cells from both cheeks (i.e. 'Buccal Cells') by rubbing the swab at least 25 times on each side of their mouth, and then return the swab to the specimen tube. Following this collection, the specimen tube, labeled with a pre-defined bar-coded ID, is sent for genotyping in a pre-addressed and pre-stamped envelope to Geneus Health's Genomic Testing Center, an on-site College of Pathology-certified lab, in accordance with Clinical Laboratory Improvement Amendments (CLIA).

You should receive your GARS Test results in about 7 – 10 days business days. Results of this test will indicate which of the six RestoreGen™ Formulas is the ideal companion to Brain Reward® to optimize **YOUR** Gene Expression and rebalance the neurotransmitters in the Reward Pathways of **YOUR** brain.\*



RestoreGen™, THE DNA-Designed Precision Nutritional™ Reward Deficiency Solution supports an increased ability to Promote Dopamine Sensitivity and Function; Reduce Cravings; and Enhance Focus, Concentration, Cognition, Energy, Recovery, Stress Relief, Mental Sharpness And Mood Elevation, based on an individual's DNA result.\*

**\*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.**