

Mindful DNA

# Embrace transformation

Personalized wellness through genetic testing.  
Bridging the gap between mind and body.



# Inspired by systems biology

The complexity of biological systems is astounding, but what does that mean for your patients? To us, it means understanding and treating the whole person as something much greater than the sum of its parts.

Mindful DNA™ is a genetic test that uses systems biology and our Philosophy of Domains to identify variation in gene networks that influence health and wellness. The test is grounded in Genomind's expertise in brain health and core belief in the importance of the mind-body connection.

# Philosophy of domains

Mindful DNA identifies unique genetic variations and polymorphisms across six functional domains which influence interconnected molecular pathways critical to overall health and wellness. This systems approach avoids the shortcomings of reductionist thinking in health genetics, allowing you to craft unique wellness plans for every patient.

## Cognition & Mental Acuity

Memory, focus, perception and mood form a system that influences executive function. Variability in the gene network underlying this system is linked to cognitive clouding and decline.



## Stress & Emotional Well-being

The "fight or flight" response is modulated by hormonal signaling. Genetic variation in the components of this signaling pathway can influence risk of physical and psychological morbidities, such as PTSD.



## Cardiometabolic

Genetic polymorphisms in lipid metabolism, regulatory proteins and inflammation can modulate risk of heart disease, stroke and hypertension.



## Inflammation

Deregulation of immunity, tissue repair and regeneration systems due to genetic variation can play a role in infection, neurodegeneration, obesity and atherosclerosis.



## Gastrointestinal (GI) & Immune

Genetic variability in components of the GI tract's immune system can perturb the microbiome (dysbiosis), affect nutrient absorption and metabolism and may increase risk of inflammatory disorders.



## Sleep

Variations in genes influencing circadian rhythms and excitatory neurosignaling can impact sleep patterns and other functions such as neuroplasticity, hormonal balance, tissue regeneration, mood stability, executive function and overall well-being.



# Thinking in systems

Mindful DNA harnesses progressive thinking about the connections between genes, molecular pathways and physiology. The six domains anchor the complex biological system that influences overall health.

Several major molecular pathways that regulate important biological responses affect one or more of the six domains. Mindful DNA's systems approach identifies genetic variation in key genes that influence these pathways to reveal different aspects of a patient's overall health profile and inform clinical decisions.

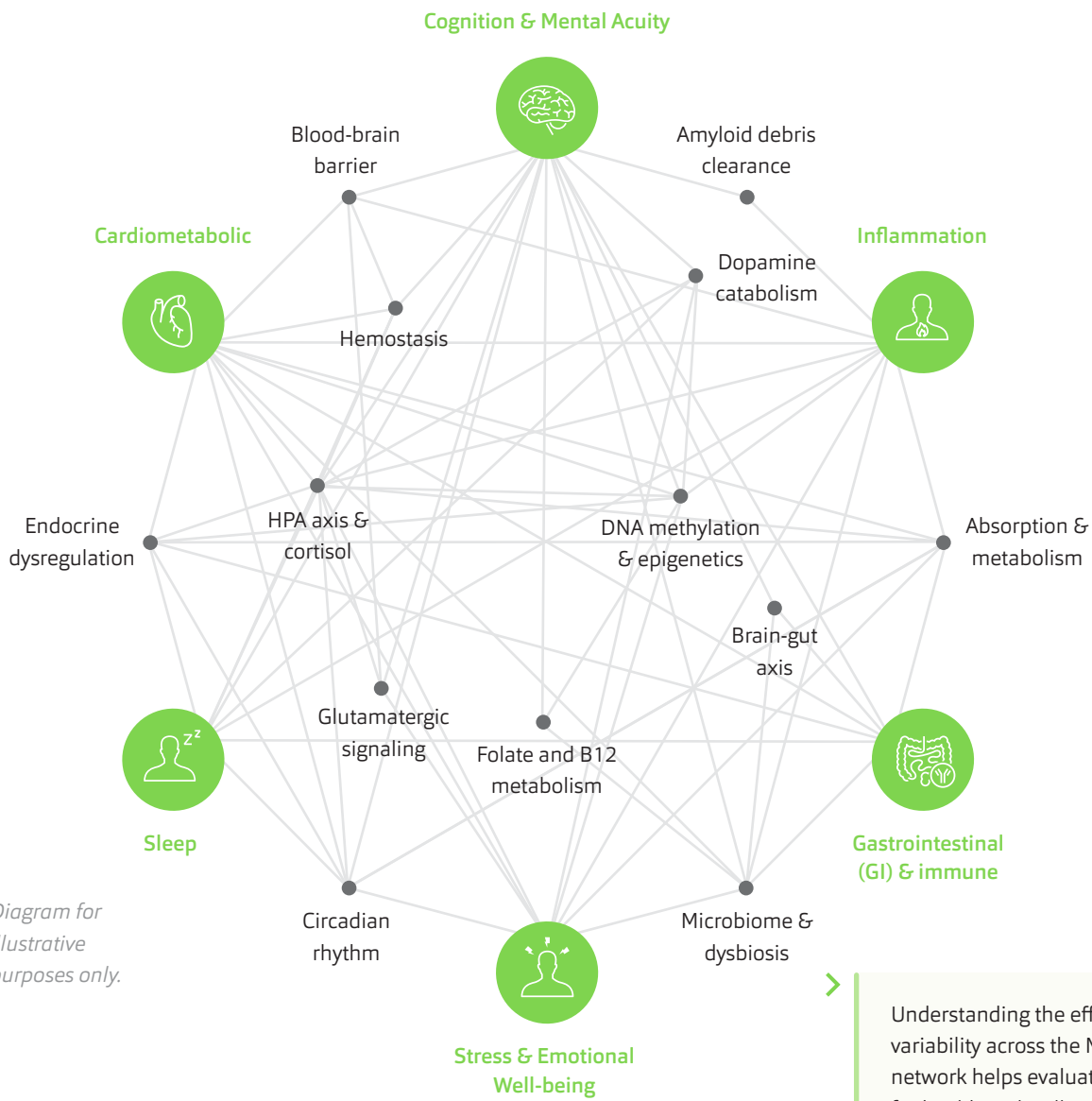


Diagram for illustrative purposes only.

Understanding the effects of genomic variability across the Mindful DNA network helps evaluate individual risk for health and wellness issues, and lets you be proactive about disease management and prevention.

# Illuminating a network

Mindful DNA's systems approach to health and wellness can be understood through the DNA methylation and epigenetics network found within the domain system.

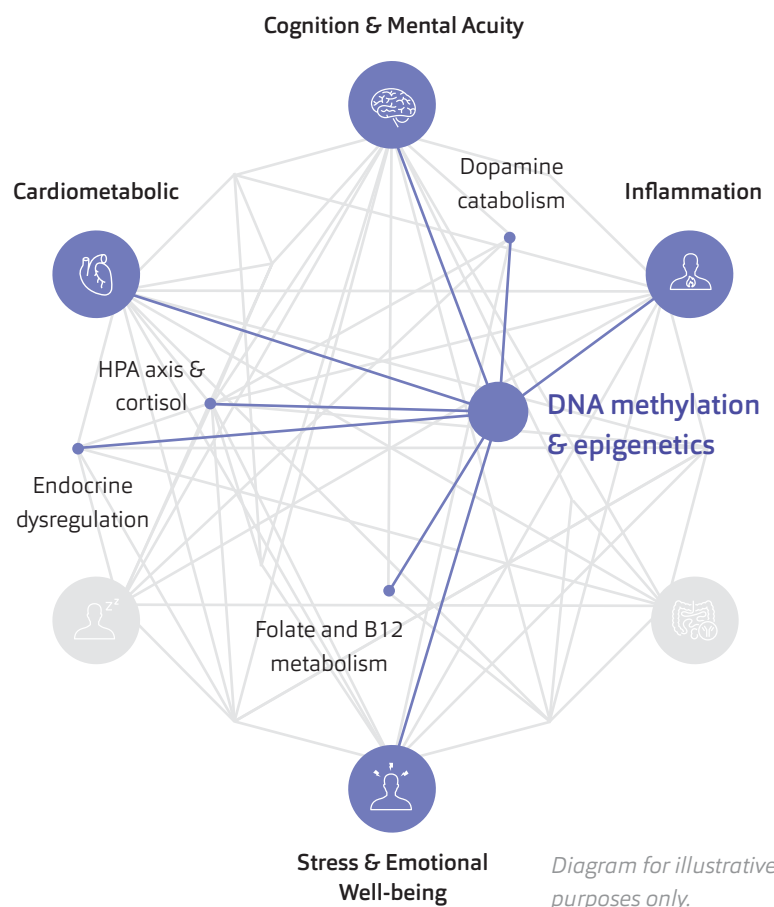
Understanding the effects of individual variability in this network and others can give you a richer understanding of your patients' unique health profiles.

## Epigenetics Reconsidered

The metabolic interface between folate and vitamin B12 is the conversion of homocysteine to methionine, an important intermediary in DNA methylation. Methionine is further converted into S-adenosylmethionine (SAMe), an essential mediator of epigenetic regulation and monoamine metabolism.

## So What?

Several genes analyzed by Mindful DNA have been shown to impact these pathways. Variability in these genes can result in dysregulation of critical processes, leading to physical or neurological disturbances.



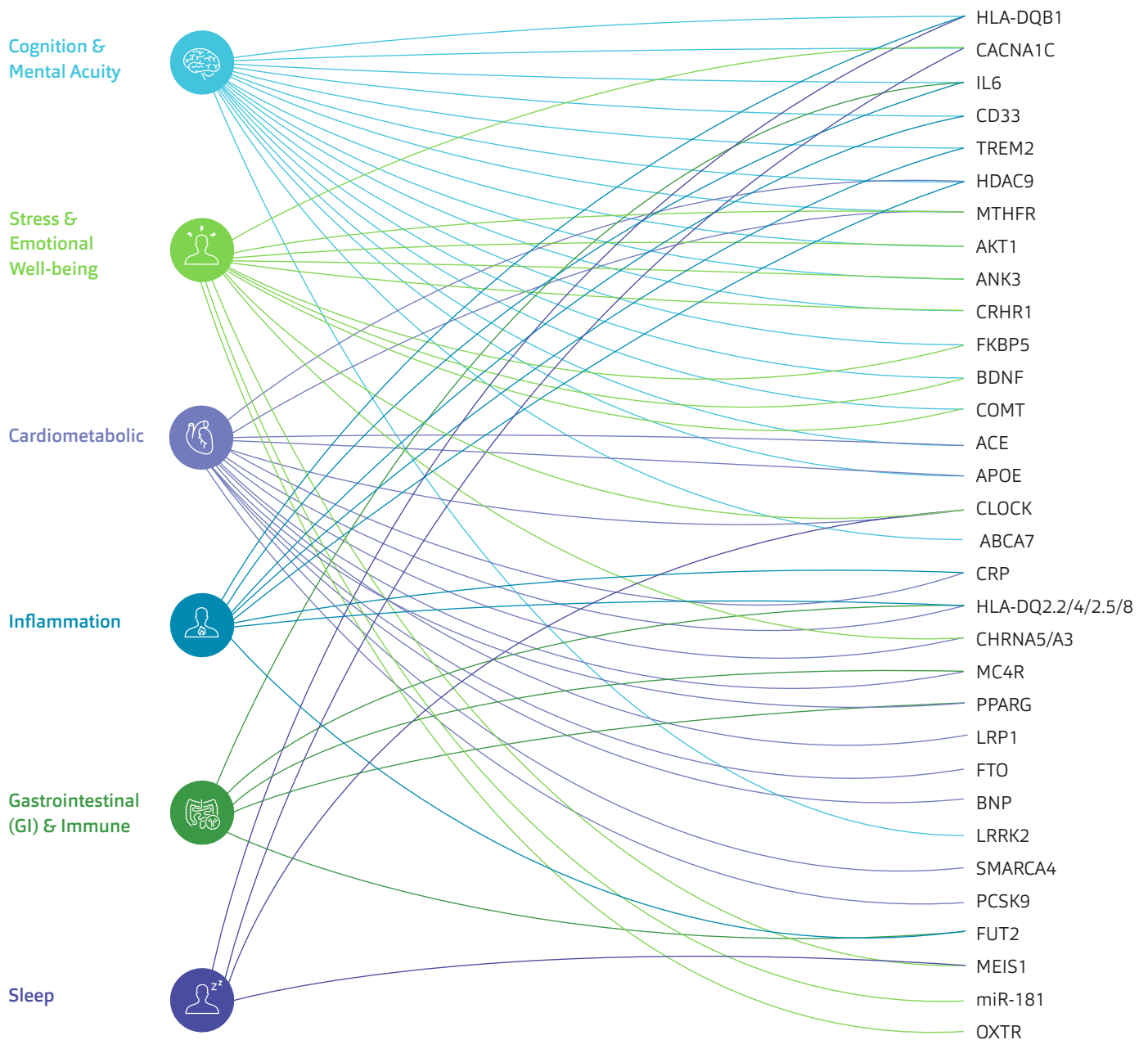
# Finding connections

Mindful DNA tests for variation in 32 genes across its six domains. Nearly every gene plays a role across multiple domains, constituting a comprehensive, personalized genomic profile designed to inform clinical decision making.

Explore the relations between the domains and the genes tested by Mindful DNA below, and refer to the table that follows to learn about their significance.

## Domain

## Gene



Gene & Protein	Variant Impact
<b>ABCA7</b> ATP-binding cassette	Variants in ABCA7 are associated with dysregulated lipid transport and clearance of amyloid $\beta$ , increasing the risk of cognitive decline and late-onset Alzheimer's disease.
<b>ACE</b> Angiotensin I converting enzyme	Variants that induce increased expression of ACE are associated with increased risk of hypertension, metabolic syndrome and stroke.
<b>AKT1</b> AKT serine/threonine kinase 1	Studies suggest a strong correlation between psychotic disorders and cannabis use in patients with a polymorphism in AKT1, which affects dopamine signaling.
<b>ANK3</b> Ankyrin G	ANK3 encodes ankyrin G, a protein that binds to several ion channels to assemble and stabilize voltage-gated sodium channels in neuronal membranes. Alterations in this protein may disrupt neuronal excitation and may affect mood, attention or working memory.
<b>APOE</b> Apolipoprotein E	A large body of evidence implicates alterations in this gene as significant risk factors for late-onset Alzheimer's disease and atherosclerosis, with possible links to inflammatory etiology.
<b>BDNF</b> Brain derived neurotrophic factor	Reduced cleavage of the ProBDNF protein domain due to genetic variability is associated with impaired working memory, mood lability, dysregulated stress response and reduced neuroplasticity after traumatic brain injury.
<b>BNP</b> B-type natriuretic peptide	Variants of BNP and NT-proBNP disrupt systemic hemodynamic and metabolic functions, increasing the risk of hypertension, type II diabetes and all-cause mortality.
<b>CACNA1C</b> Cav1.2 voltage-dependent L-type calcium channel $\alpha$ 1C subunit	Genetic variation in CACNA1C has been associated with depression, schizophrenia, autism spectrum disorders and changes in brain function and structure.
<b>CD33</b> Sialic acid binding Ig-like lectin 3	CD33 modulates monocyte-derived inflammatory processes. Increased cell surface expression of CD33 down-regulates myeloid and glial cell clearance of amyloid $\beta$ , and increases the risk of developing late-onset Alzheimer's disease.

Gene & Protein	Variant Impact
<b>CHRNA5/A3</b> Cholinergic receptor, nicotinic, alpha 5, & alpha 3, beta 5 subunits	Certain variations in this gene cluster alter sensitivity to nicotine, and are strongly associated with nicotine dependence and difficulty with smoking cessation.
<b>CLOCK</b> Circadian locomotor output cycles kaput	Dysregulation of the circadian rhythm due to altered CLOCK expression may be associated with increased risk of metabolic syndrome, likely due to disrupted sleeping patterns, mood and appetite.
<b>COMT</b> Catechol-O-methyltransferase	Lower COMT activity leads to increased dopaminergic tone in the frontal cortex, which is associated with increased executive function, as well as anxiety and cognitive perseveration. Conversely, increased activity of COMT leads to decreased dopaminergic tone and may be associated with poor working memory and focus.
<b>CRHR1</b> Corticotropin-releasing hormone receptor	Dysregulation of CRH is associated with altered cortisol response, impaired working memory and increased risk of developing psychiatric disorders following severe trauma.
<b>CRP</b> C-Reactive protein	Polymorphisms associated with increased serum CRP, an acute phase reactant to inflammation and tissue damage, are a significant risk factor for heart disease.
<b>FKBP5</b> FK506-binding protein 5	Polymorphisms of FKBP5 are associated with altered cortisol levels in the context of stress, impaired working memory, cognitive decline and increased risk of developing psychiatric disorders following severe trauma.
<b>FTO</b> Alpha-ketoglutarate-dependent dioxygenase	FTO variants are associated with metabolic syndrome presenting with obesity, elevations in fasting insulin, fasting glucose and elevated serum lipids.
<b>FUT2</b> Fucosyltransferase 2	Reduced activity of FUT2 may facilitate overproliferation of harmful flora, and increase the risk of certain inflammatory GI conditions.

Gene & Protein	Variant Impact
<b>HDAC9</b> Histone deacetylase 9	Overexpression of HDAC9 has been associated with increased carotid artery intima-media thickness and presence of plaque, leading to increased risk of stroke.
<b>HLA-DQ2.2/4/2.5/8</b> Celiac risk haplotype	A large body of evidence identifies this combination of variants, or haplotype, as being a risk factor for developing celiac disease.
<b>HLA-DQB1</b> Human leukocyte antigen, class II, DQβ1	This variant may increase the risk of autoimmune pathology linked to narcolepsy and multiple sclerosis.
<b>IL6</b> Interleukin-6	Polymorphisms in this gene significantly impact IL6 expression and are associated with increased risk of developing inflammatory conditions.
<b>LRP1</b> Low density lipoprotein receptor-related protein 1	This protein regulates glucose metabolism in the brain, signaling of NMDA (glutamate) receptors and may play a role in vascular homeostasis. Variants are correlated with risk of migraine.
<b>LRRK2</b> Leucin-rich repeat kinase 2	Mutations in LRRK2 exacerbate oxidative stress-induced mutations in neuronal death. This variant has been associated with an increased risk of familial and sporadic Parkinson's disease.
<b>MC4R</b> Melanocortin 4 receptor	Altered MC4R signaling results in dysregulation of satiety and metabolism with a corresponding risk of metabolic syndrome.
<b>MEIS1</b> Meis homeobox 1	Altered MEIS1 expression is strongly linked to restless leg syndrome, which may be due to its role in iron metabolism and transport.

Gene & Protein	Variant Impact
<b>miR-181</b> Non-coding mRNA	miR-181 has been shown to impact the development of neurons and anti-inflammatory signaling via IL10. Altered expression of miR-181 impacts resilience to environmental stress and general positive affect.
<b>MTHFR</b> 5,10-methylenetetrahydrofolate reductase	Variants that reduce this enzyme's activity result in elevated levels of homocysteine and increased risk of multiple pathologies including depression and mood instability.
<b>OXTR</b> Oxytocin receptor	Polymorphisms are associated with modulation of the stress response and decreased prosocial behavior. These variants also seem to impact resilience to social adversity (eg, negative social pressure or childhood maltreatment).
<b>PCSK9</b> Proprotein convertase subtilisin/kexin type 9	This enzyme is involved with low density lipoprotein (LDL) processing. Disruptions in this process are associated with an increased risk of dyslipidemia and myocardial infarction.
<b>PPARG</b> Peroxisome proliferator-activated receptor gamma	Variants in this gene may alter fatty acid oxidation and are associated with increased risk of dyslipidemia, obesity and type II diabetes.
<b>SMARCA4</b> Catalytic subunit of the SWI/SNF chromatin-remodeling complex	Alterations in SMARCA4 influence expression of nearby genes encoding lipid receptors, and have been shown to increase risk of hyperlipidemia, atherosclerosis and myocardial infarction.
<b>TREM2</b> Triggering receptor expressed on monocytes 2	Variants of this gene are associated with a 3-to 5-fold increased risk of Alzheimer's disease due to decreased clearance of neural debris.

## Simple test, fast results

Our testing process is simple and efficient. All you need is a test kit, and our laboratory delivers the results report to you quickly.

1

### Collect

Perform an in-office cheek swab after filling out and reviewing the Consent Form with your patient.

2

### Ship

Send the completed Consent Form and collected sample with the included prepaid return envelope.

3

### Interpret

Our CLIA and CAP-certified lab performs the testing and returns the report via a secured portal within 8-10 days.

4

### Review

Discuss Mindful DNA results with your patient and craft a personalized treatment plan.

# Discover the possibilities

Add genetics to your clinical approach and care for your patients like never before

## Think differently with Mindful DNA

- Uncover potential variations in pathways critical to health and wellness
- Identify health risks that may only be detectable with genetic testing
- Deliver deeply personalized, integrative care to every patient
- Empower patients to see their health holistically and take action to improve it
- **Testing is simple and quick.** Sample collection in your office by cheek swab and results in 10 days or less.

## How to order

Mindful DNA is paid for by patients. Here's how to get started:

### Through a Representative

Contact your Genomind Representative to learn more.

### Online

Complete our order form to receive test kits at: [genomind.com/orderMindfulDNA](http://genomind.com/orderMindfulDNA)

### By Email

[customerservice@genomind.com](mailto:customerservice@genomind.com)

### By Phone

(877) 895-8658



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Genomind is a unique personalized medicine company that brings innovation to healthcare around the world. Comprised of pioneering scientists and thought leaders in brain health and genetics, Genomind delivers actionable insights to clinicians, healthcare partners and individuals to improve the quality of human life.