

TEST REPORT

8605 SW Creekside Place
Beaverton, OR 97008
Phone: 503-466-2445 Fax: 503-466-1636



2019 04 18 001 U

Ordering Provider:
Dr Feelbetter

Samples Received
04/18/2019
Report Date
04/24/2019

Samples Collected
Urine - 04/15/19 05:03
Urine - 04/15/19 07:03
Urine - 04/14/19 17:49
Urine - 04/14/19 22:02

Patient Name: Advanced Neurotransmitters
Patient Phone Number: 555 555 5555

Gender Female	Last Menses 04/06/2019	Height 5 ft 7 in	Waist 26 in
DOB 3/19/1981 (38 yrs)	Menses Status Pre-Menopausal	Weight 138 lb	BMI 21.6

TEST NAME	RESULTS 04/14/19	RANGE
Urinary Inhibitory Neurotransmitters		
Serotonin	61.2	47.6-140.3 µg/g Cr (Optimal 61.0-103.2)
5-HIAA	4880	2205-11816 µg/g Cr (Optimal 2988-5850)
GABA	205	167-463 µg/g Cr (Optimal 193-367)
Glycine	37 L	41-295 mg/g Cr (Optimal 61-159)
Urinary Excitatory Neurotransmitters		
Glutamate	1494	1213-4246 µg/g Cr (Optimal 1515-2710)
Histamine	9.1	3.6-44.3 µg/g Cr (Optimal 5.2-15.3)
PEA	3.5 L	3.6-38.8 µg/g Cr (Optimal 5.3-16.1)
Dopamine	155	103-282 µg/g Cr (Optimal 144-240)
DOPAC	1357	495-2456 µg/g Cr (Optimal 658-1449)
HVA	5927	3025-9654 µg/g Cr (Optimal 3737-7048)
Norepinephrine (pooled)	18.2	10.0-35.7 µg/g Cr (Optimal 15.0-28.1)
Normetanephrine	21.8	13.4-44.8 µg/g Cr (Optimal 17.9-31.7)
Epinephrine (pooled)	1.4	0.8-6.2 µg/g Cr (Optimal 1.4-4.2)
Ratio: Norepi/Epi	13	2.9-25.2 (Optimal 5.2-13.7)
VMA	2636	1996-5939 µg/g Cr (Optimal 2580-4766)
Urinary Creatinine		
Creatinine (pooled)	1.69	0.3-2.0 mg/mL

<DL = Less than the detectable limit of the lab. N/A = Not applicable; 1 or more values used in this calculation is less than the detectable limit. H = High. L = Low.

CLIA Lic # 38D0960950
9/24/2019 12:31:55 PM

The above results and comments are for informational purposes only and are not to be construed as medical advice. Please consult your healthcare practitioner for diagnosis and treatment.

David T. Zava

David T. Zava, Ph.D.
Laboratory Director

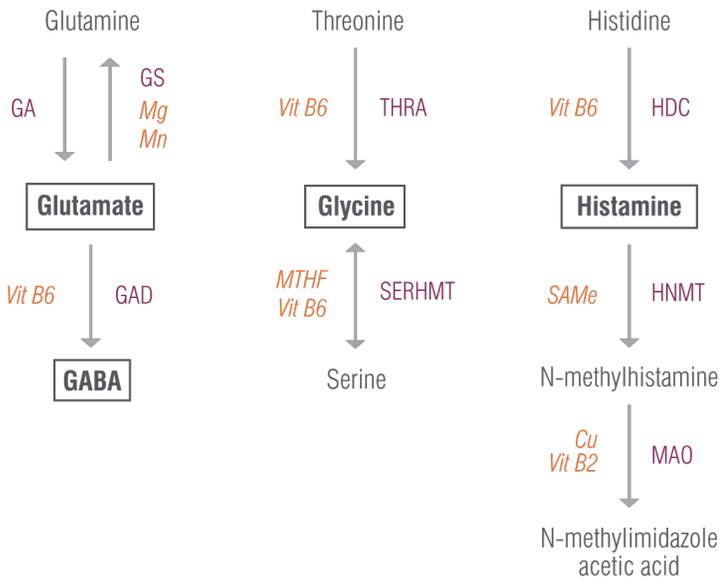
Alison McAllister, ND

Alison McAllister, ND.
(Ordering Provider unless otherwise specified on page 1)

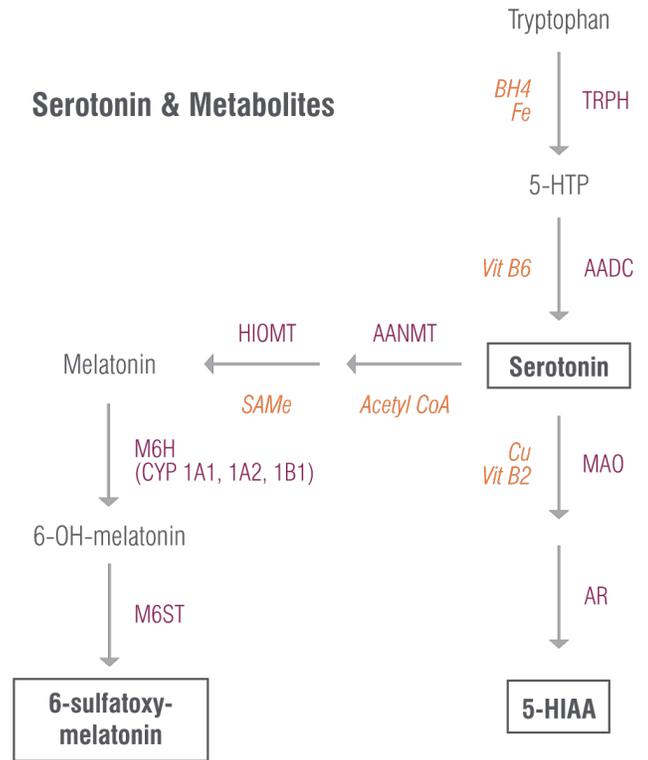
Therapies

40mg oral Vyvanse (Pharmaceutical) (22 Hours Last Used)

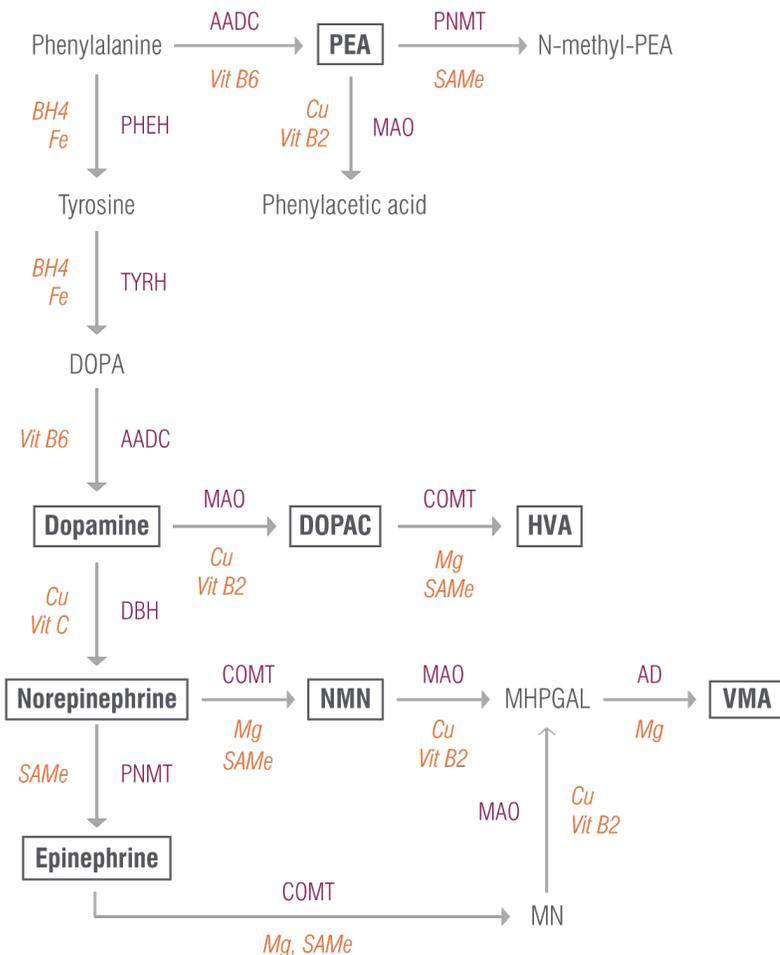
Glutamate/GABA, Glycine & Histamine



Serotonin & Metabolites



Catecholamines & Metabolites



Neurotransmitters
& Metabolites:

HVA	homovanillic acid
NMN	normetanephrine
PEA	phenethylamine
VMA	vanillylmandelic acid
5-HIAA	5-hydroxyindole 3-acetic acid

Enzymes:

AADC	aromatic L-amino acid decarboxylase
AANMT	arylalkylamine N-methyltransferase
AD	aldehyde dehydrogenase
AR	aldehyde reductase
COMT	catechol-O-methyltransferase
DBH	dopamine beta hydroxylase
GA	glutaminase
GAD	glutamate decarboxylase
GS	glutamine synthetase
HDC	histidine decarboxylase
HIOMT	hydroxyindole-O-methyltransferase
HNMT	histamine N-methyltransferase
MAO	monoamine oxidase
M6H	melatonin 6 hydroxylase
M6ST	melatonin 6 sulfotransferase
PHEH	phenylalanine hydroxylase
PNMT	phenylethanolamine N-methyltransferase
SERHMT	serine hydroxymethyltransferase
THRA	threonine aldolase
TRPH	tryptophan hydroxylase
TYRH	tyrosine hydroxylase

Cofactors:

BH4	tetrahydrobiopterine
Cu	copper
Fe	iron
Mg	magnesium
Mn	manganese
MTHF	methyltetrahydrofolate
SAMe	S-adenosyl methionine

Disclaimer: Symptom Categories below show percent of symptoms self-reported by the patient compared to total available symptoms for each category. For detailed information on category breakdowns, go to www.zrtlab.com/patient-symptoms.

SYMPTOM CATEGORIES	RESULTS 04/14/19
Estrogen / Progesterone Deficiency	42%
Estrogen Dominance / Progesterone Deficiency	34%
Low Androgens (DHEA/Testosterone)	28%
High Androgens (DHEA/Testosterone)	14%
Low Cortisol	26%
High Cortisol	35%
Hypometabolism	21%
Metabolic Syndrome	11%

SYMPTOM CHECKLIST	MILD	MODERATE	SEVERE
Aches and Pains			
Acne			
ADD/ADHD			
Addictive Behaviors			
Allergies			
Anxious			
Autism Spectrum Disorder			
Bleeding Changes			
Blood Pressure High			
Blood Pressure Low			
Blood Sugar Low			
Body Temperature Cold			
Bone Loss			
Breast Cancer			
Breasts - Fibrocystic			
Breasts - Tender			
Chemical Sensitivity			
Cholesterol High			
Constipation			
Depressed			
Developmental Delays			
Eating Disorders			
Fatigue - Evening			
Fatigue - Morning			
Fibromyalgia			
Foggy Thinking			
Goiter			
Hair - Dry or Brittle			
Hair - Increased Facial or Body			
Hair - Scalp Loss			
Headaches			
Hearing Loss			
Heart Palpitations			
Hoarseness			
Hot Flashes			
Incontinence			
Infertility			
Irritable			
Libido Decreased			
Mania			

(Diaz-Flores, et. al. 2013; Perez-Torres, et. al. 2017). Additionally, vitamin B6, serine support, and MTHF may all support the production of glycine.

EXCITATORY NEUROTRANSMITTERS

GLUTAMATE

Glutamate is low-normal (< 20th percentile). The brain's major excitatory neurotransmitter glutamate functions as the "on" switch in the brain. Glutamate regulates appetite, thinking, increases gut motility, optimizes learning, modulates memory, improves libido, and decreases sleep. Low urinary glutamate levels have been reported in patients with migraines (Ragginer et al., 2012). Clinically, lower glutamate levels may contribute to agitation, depression, chronic fatigue, lack of concentration, low energy levels, and sleep difficulties.

THERAPEUTIC CONSIDERATIONS: L-glutamine may be beneficial to restore glutamate to normal values.

HISTAMINE

Histamine is within reference range. Histamine plays a dual role in the body as a neurotransmitter and a modulator of the immune system. Histamine has anti-pain properties, plays a neuroprotective role in the brain, and contributes to optimal maintenance of cognition and memory. Histamine stimulates wakefulness and decreases sleep, stimulates gastric acid production, increases metabolism, suppresses appetite, and prevents weight gain. Histamine is a potent vasodilator and a pro-inflammatory agent.

PEA

Phenethylamine or PEA is below the optimal range. Low PEA may contribute to fatigue, depression and decreased attention span. PEA acts as a "neuro-amplifier" - increasing the actions of dopamine (for wellbeing and feeling pleasure), norepinephrine (the brain's stimulant for wakefulness, alertness and higher performance), acetylcholine (for improving memory and mental activity), and serotonin (for better mood emotion and impulse control) (Paterson, et. al. 1990).

Recently, PEA has been recognized as a biomarker in ADHD and research shows that urinary levels of PEA are low in patients with ADHD (Irsfeld, et. al. 2013). Patients whose symptoms improve in response to treatment, typically show higher PEA levels than patients who do not experience an improvement in the condition.

Additionally, low PEA has been implicated in a number of psychological disorders, such as depression (Sabelli and Mosnaim, 1974), eating disorders (bulimia nervosa) (Davis et al., 1994), inattentiveness (Faraone et al., 2014), Parkinson's disease (Wolf and Mosnaim, 1983), and Tourette's syndrome (Bornstein et al., 1990)

THERAPEUTIC CONSIDERATIONS: when PEA is low, supplementation with vitamin B6 (cofactor) and phenylalanine (precursor) to promote biosynthesis may be beneficial. Exercise helps increase PEA levels (Szabo, et a. 2001). Additionally, curcumin and passionflower, botanical MAO inhibitors, may help by preventing rapid PEA metabolism.

DOPAMINE

Dopamine is within reference range. Dopamine improves attention, focus, and motivation, helps with decision making, modulates movement control, promotes lactation, increases blood pressure, urine output and sodium excretion, and allows for feelings of reward and pleasure. Additionally, dopamine plays a central role in the etiology of addiction. Dopamine also serves as the parent precursor to norepinephrine and epinephrine.

DOPAC

DOPAC is within reference range. DOPAC is the primary metabolite of dopamine formed via the actions of monoamine oxidase.

HVA

Homovanillic acid (HVA) is within reference range. HVA is a dopamine metabolite.

NOREPINEPHRINE

Norepinephrine is within reference range. Norepinephrine functions both as a neurotransmitter and a hormone, participating in the body's "fight or flight" response. Norepinephrine increases alertness, focuses attention, fine-tunes vigilance, increases blood pressure, heart rate, and blood sugar, reduces digestive activity, pain, and sleep, prevents bladder emptying, and regulates body temperature. Norepinephrine is very similar in structure and physiological effects to epinephrine. The adrenal gland produces approximately 20% of the total output with 80% produced by the sympathetic nerve fibers.

NORMETANEPHRINE

Normetanephrine is within reference range. Normetanephrine is a norepinephrine metabolite formed via the actions of catechol-O-methyl (COMT) transferase enzyme in response to stress.

EPINEPHRINE

Epinephrine is below the optimal range. Produced by the adrenal medulla, epinephrine regulates the "fight or flight" response to increase alertness and focus attention. Clinically, low levels of epinephrine are implicated in attention impairment, low mood, and fatigue. Research shows that patients with ADHD (self-reported) excrete lower epinephrine levels than controls (Anderson, et. al. 2000), suggesting that altered adrenal function in ADHD may contribute to the etiology of the disorder. However, the observed lower catecholamine output by the adrenal system may

be a consequence, rather than a cause, of reduced attention.

THERAPEUTIC CONSIDERATIONS: Adrenal support may be beneficial to increase epinephrine levels.

VMA

Vanillylmandelic acid (VMA) is within reference range. VMA is a norepinephrine and epinephrine metabolite formed via the actions of monoamine oxidase, catechol-O-methyl transferase (COMT), and aldehyde dehydrogenase.

Creatinine is within range showing normal concentration of urine.