0000000509660

Name:		**Age/Gender**	41 years 1 month 6 days/Female
Referred By	N.A	**Client Name**	
Collection Date:	28-02-2018 00:00:00	**Report Release Time**	10-03-2018 11:15:59

Section	Details	Section Id
Section 1	Vitamin B12 and folic acid metabolism	R1
Section 2	Vitamin Metabolism	R2
Section 3	Fatty Acid Metabolism	R3
Section 4	Carbohydrate Metabolism	R4
Section 5	Gut Dysbiosis	R5
Section 6	Detoxification Health	R6
Section 7	Energy Production Metabolism	R7
Section 8	Protein Intake, Muscle Catabolism and Oxalate metabolism	R8
Section 9	Mineral Sufficiency	R9
Section 10	Amino Acid Sufficiency	R10

* The analyte is not in the lab scope.
CRM No :509660
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Report Release Date :10-03-2018 11:15:59
Patient Name :
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0000050966O

Name:	Grethel Marie Samudio Gonzalez	**Age/Gender**	41 years 1 month 6 days/Female
Referred By	N.A	**Client Name**	Global Biotech Solutions - Panama
Collection Date:	28-02-2018 00:00:00	**Report Release Time**	10-03-2018 11:15:59

Report Summary

Sr.No	CONDITION	STATUS					
R.8 1	Kidney Stone Risk	○	Absent	●	Mild	○	Severe

Mild hyperoxaluria may be due to excess intake of tea, spinach or vitamin C supplements. Low calcium diet may promote hyperoxaluria as less calcium is available to bind dietary oxalate which is left free for absorption. Pyroxine supplements, enough water intake and dietary changes like salt restriction and avoiding food items containing oxalates.

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Interpretation R.1 -Vitamin B12 and folic acid metabolism

Sr.No	CONDITION	STATUS		
R.1 1	Vitamin B12	● Sufficient	○ BorderLine	○ Deficient
R.1 2	Folate	● Sufficient	○ BorderLine	○ Deficient

Section R.1-Vitamin B12 and folic acid metabolism

B-vitamins improve/manage the nervous system and brain functions. Optimizing folic acid and vitamin B12 intake is of profound benefit to cognitive ability as well as help maintain optimal function of nerves at every age. These nutrients are crucial for the proper function of various metabolic pathways, especially those involved with the healthy function of nerves. Folic acid is needed to metabolize homocysteine. B12 is needed to metabolize methylmalonic acid. It is important to monitor Folic acid and B12 during aging, as elevations in either homocysteine or methylmalonic acid are known to impair brain function and lead to age related cognitive decline.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Vitamin B12 and folic acid metabolism

Blood Markers		Unit - nmol/ml		
1	Glycine	269.4319	126.00 - 490.00	
2	Beta-AminoIsoButyric Acid	0.6956	0.00 - 5.00	
3	Sarcosine	4.2680	0.00 - 5.00	
4	Histidine	47.09	39.00 - 123.00	

Urinary Markers		Unit - mmol/mol Cr		
1	MMA	0	0.0 - 10.41	
2	Uracil	0.01	0.0 - 4.06	
3	Formiminoglutamate	55.71	1.1 - 208.08	

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Interpretation R.2 -Vitamin Metabolism

Sr.No	CONDITION	STATUS		
R.2 1	Vitamin B1	● Sufficient	○ BorderLine	○ Deficient
R.2 2	Vitamin B3	● Sufficient	○ BorderLine	○ Deficient
R.2 3	Vitamin B5	● Sufficient	○ BorderLine	○ Deficient
R.2 4	Vitamin B6	● Sufficient	○ BorderLine	○ Deficient
R.2 5	Vitamin E	● Sufficient	○ BorderLine	○ Deficient
R.2 6	Vitamin K	● Sufficient	○ BorderLine	○ Deficient
R.2 7	Biotin	● Sufficient	○ BorderLine	○ Deficient

Section R.2-Vitamin Metabolism

Vitamin B12 is a water-soluble vitamin which plays a key role in the normal functioning of the brain, nervous system, and formation of blood. Vitamin B12 deficiency is highly prevalent among patients with type 1 and type 2 diabetes mellitus and may lead to ipaired memory, dementia, peripheral neuropathy and similar complications. There is a specific panel of metabolic markers indicates Vitamin B12 deficiency and helps alter the drug regime for the diabetic. Similarly, there are markers studies for Manganisium deficiency. Manganisium helps regulate blood sugar levels, promotes normal blood pressure, and hence is an important mineral to be maintained in appropriate levels in a diabetic.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Vitamin Metabolism

Blood Markers		Unit - nmol/ml		
1	Serine	114.85	63.00 - 187.00	
2	Sarcosine	4.2680	0.00 - 5.00	
3	Carnosine	0.1200	0.00 - 1.00	
4	Beta-AminoIsoButyric Acid	0.6956	0.00 - 5.00	
5	beta-Alanine	1.9853	0.00 - 29.00	
6	Threonine	212.66	85.00 - 231.00	

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Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Vitamin Metabolism

Urinary Markers		Unit - mmol/mol Cr		
1	Suberate	0.01	0.0 - 2.33	
2	Gln	0	0.0 - 4.54	
3	HMG2	1.25	0.06 - 3.79	
4	EMA	0	0.0 - 7.68	
5	Leu	0	0.0 - 2.98	
6	Pyruvate	0.02	0.0 - 4.24	
7	Succinate	2.51	0.03 - 2.68	
8	isoLeu	0	0.0 - 4.28	
9	Adipate	0.29	0.11 - 2.76	
10	3HIV	0.05	0.0 - 4.48	
11	PyroGlu	1.49	0.66 - 8.56	
12	Malate	0.51	0.03 - 6.09	
13	Glutarate	0	0.0 - 14.15	
14	Xanthurenic acid	82	1.1 - 208.08	

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Interpretation R.3 -Fatty Acid Metabolism

Sr.No	CONDITION	STATUS					
R.3 1	Fatty Acid - Omega Oxidation	●	Normal	○	Impaired	○	Severe
R.3 2	Carnitine Status	●	Sufficient	○	BorderLine	○	Deficient
R.3 3	Mitochondial Dysfunction	●	Normal	○	Impaired	○	Severe

Section R.3-Fatty Acid Metabolism

Carnitine helps our body use fatty acids. The body makes small amounts of carnitine. However, if minimum requirements are not met, carnitine dependent functions fail to proceed normally. Long-chain fatty acids go through beta-oxidation in the mitochondria, which is a carnitine dependent step.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph
	Fatty Acid Metabolism			
	Blood Markers	Unit - nmol/ml		
1	C0	46.33	11.00 - 49.00	
	Urinary Markers	Unit - mmol/mol Cr		
1	Me-succinate	0	0.0 - 0.1	
2	Adipate	0.29	0.11 - 2.76	
3	Suberate	0.01	0.0 - 2.33	
4	EMA	0	0.0 - 7.68	
5	sebacate	0	0.0 - 0.1	

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Interpretation R.4 -Carbohydrate Metabolism

Sr.No	CONDITION	STATUS					
R.4 1	Carbohydrate Metabolism	●	Normal	○	Impaired	○	Severe
R.4 2	Chromium picolinate	●	Sufficient	○	BorderLine	○	Deficient
R.4 3	Glucose oxidation Impairment	●	Normal	○	Impaired	○	Severe

Section R.4-Carbohydrate Metabolism

Lactate and Pyruvate elevates when there is deficiency in Krebs Cycle. When carbohydrate are available because of fasting or low carbohydate diet, ketones bodies are formed.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph
	Carbohydrate Metabolism			
	Urinary Markers	Unit - mmol/mol Cr		
1	Pyruvate	0.02	0.0 - 4.24	
2	Lactate	66.69	1.1 - 208.08	
3	2KG	0	0.0 - 0.1	
4	3HB	0	0.0 - 0.1	

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Interpretation R.5 -Gut Dysbiosis

Sr.No	CONDITION	STATUS		
R.5 1	Dysbiosis Markers	● Absent	○ Mild	○ Severe
R.5 2	Dysbiosis Risk	● Absent	○ Mild	○ Severe
R.5 3	Gut Permeability	● Absent	○ Mild	○ Severe
R.5 4	Intestinal malabsorption	● Absent	○ Mild	○ Severe
R.5 5	Clostridia Bacterial Overgrowth	● Absent	○ Mild	○ Severe
R.5 6	Yeast and Fungal Infection	● Absent	○ Mild	○ Severe
R.5 7	Bacterial Overgrowth	● Absent	○ Mild	○ Severe

Section R.5-Gut Dysbiosis

A leaky gut is a situation when spaces form between the cells in the small intestinal wall allow large molecules (Eg. food, bacteria, heavy metals, toxins, and allergens) sneak through to blood stream, thereby triggering a response by body's immune system. Type 2 Diabetes is commonly associated with poor diet and inactivity, which could be an outcome of a leaky gut. Predominance of bad types of bacteria the digestive system is called as Dysbiosis. Type 2 diabetes is almost always associated with colonic dysbiosis and it is important to check whether there is a dysbiosis situation with a diabetic.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Gut Dysbiosis

Blood Markers		Unit - nmol/ml		
1	beta-Alanine	1.9853	0.00 - 29.00	
2	Valine	155.13	136.00 - 309.00	
3	Threonine	212.66	85.00 - 231.00	
Urinary Markers		Unit - mmol/mol Cr		
1	Benzonate	0	0.0 - 3.78	

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Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Gut Dysbiosis

Urinary Markers

2	4HPA	2.49	0.13 - 8.66	
3	2HIC	0	0.0 - 0.1	
4	Indole3AA	0	0.0 - 0.1	
5	3HP3HP	0.02	0.0 - 4.35	
6	4HBA	0	0.0 - 3.63	
7	2Hhippurate	0	0.0 - 4.81	
8	5HM2F	0	0.0 - 4.36	
9	tartarate	0	0.0 - 0.1	
10	4HPL	0	0.0 - 0.1	
11	2HPA	0	0.0 - 0.1	
12	hippurate1	0	0.0 - 13.81	
13	4Hhippurate	0	0.0 - 10.1	

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Interpretation R.6 -Detoxification Health

Sr.No	CONDITION		STATUS		
R.6 1	Ammonia Detoxification	Normal	Impaired	Severe
R.6 2	Hepatic detoxication	Normal	Impaired	Severe
R.6 3	Glutathione Status	Normal	Impaired	Severe

Section R.6-Detoxification Health

Orotate is sensitive to anything that increases ammonia, including a high protein diet, intestinal dysbiosis, or arginine deficiency. This leads to increased orotate urinary values. Glutathione is an important antioxidant that helps protect against reactive oxygen species such as free radicals. Glutathione is constantly used up in the removal of toxic molecules and prevention of oxidative damage.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Detoxification Health

Blood Markers		Unit - nmol/ml		
1	Taurine	140.81	46.00 - 146.00	
2	beta-Alanine	1.9853	0.00 - 29.00	
3	Glutamine	574.85	428.00 - 747.00	

Urinary Markers		Unit - mmol/mol Cr		
1	PyroGlu	1.49	0.66 - 8.56	
2	Mandelate	0	0.0 - 16.06	
3	Orotate	0	0.0 - 19.3	

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Interpretation R.7 -Energy Production Metabolism

Sr.No	CONDITION	STATUS		
R.7 1	Coenzyme Q10	● Sufficient	○ BorderLine	○ Deficient
R.7 2	Lipoic Acid	● Sufficient	○ BorderLine	○ Deficient

Section R.7-Energy Production Metabolism

Coenzyme Q10 and Lipoic modulates the Krebb cycle to use energy inside the cells. Impairment can lead to fatigue and impaired glucose homeostasis.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Energy Production Metabolism

	Blood Markers	Unit - nmol/ml		
1	Valine	155.13	136.00 - 309.00	
2	C0	46.33	11.00 - 49.00	

	Urinary Markers	Unit - mmol/mol Cr		
1	Analog Cit	0	0.0 - 4.74	
2	Citrate	0	0.0 - 4.12	
3	HMG2	1.25	0.06 - 3.79	
4	Malate	0.51	0.03 - 6.09	
5	Succinate	2.51	0.03 - 2.68	
6	Cisaconate	0.01	0.0 - 2.95	

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Interpretation R.8 -Protein Intake, Muscle Catabolism and Oxalate metabolism

Sr.No	CONDITION	STATUS					
R.8 1	Kidney Stone Risk	○	Absent	●	Mild	○	Severe
R.8 2	Muscles Turnover	●	Sufficient	○	BorderLine	○	Deficient
R.8 3	Protein Intake Status	●	Sufficient	○	BorderLine	○	Deficient

Section R.8-Protein Intake, Muscle Catabolism and Oxalate metabolism

Amino acids levels in plasma indicates long term protein intake status. Oxalate and methyl-histidine in urine are markers of muscle catabolism and Kidney stone risk.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Protein Intake, Muscle Catabolism and Oxalate metabolism

Blood Markers		Unit - nmol/ml	
1	Histidine	47.09	39.00 - 123.00
2	Glycine	269.4319	126.00 - 490.00
3	1- Methyl-histidine	7.46	3.00 - 9.00
4	Cysteine	268.64	100.00 - 300.00
5	Lysine	165.05	152.00 - 247.00
6	Proline	154.15	97.00 - 368.00

Urinary Markers		Unit - mmol/mol Cr	
1	Oxalate	58.21	0.0 - 54.0

Interpretation R.9 -Mineral Sufficiency

Sr.No	CONDITION	STATUS		
R.9 1	Magnesium	● Sufficient	○ BorderLine	○ Deficient
R.9 2	Selenium	● Sufficient	○ BorderLine	○ Deficient
R.9 3	Carnitine	● Sufficient	○ BorderLine	○ Deficient
R.9 4	N-Acetylcysteine	● Sufficient	○ BorderLine	○ Deficient
R.9 5	Iron	● Sufficient	○ BorderLine	○ Deficient
R.9 6	Zinc	● Sufficient	○ BorderLine	○ Deficient

Section R.9-Mineral Sufficiency

Minerals are crucial elements of the biological processes that are required for well-being of the body. Mineral deficiencies lead to a weakened ability to regulate glucose levels, detoxification and mental well-being. Supplementing with high quality, bioavailable minerals improves the body's ability to regulate body detoxification, protein, fat and carbohydrate metabolism. To reduce inflammation and oxidative damage, key antioxidants and minerals are key to fighting these inflammatory and destructive reactions.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph
Mineral Sufficiency				
Blood Markers		Unit - nmol/ml		
1	Lysine	165.05	152.00 - 247.00	
2	Histidine	47.09	39.00 - 123.00	
3	Glycine	269.4319	126.00 - 490.00	
4	beta-Alanine	1.9853	0.00 - 29.00	
5	Threonine	212.66	85.00 - 231.00	
Urinary Markers		Unit - mmol/mol Cr		
1	b-Ala	0	0.0 - 11.31	
2	Leu	0	0.0 - 2.98	

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Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Mineral Sufficiency

Urinary Markers

3	Ser1	0	0.0 - 5.28	
4	isoLeu	0	0.0 - 4.28	
5	Thr	0	0.0 - 4.53	
6	His	0	0.0 - 7.1	
7	Gly1	5.76	0.12 - 7.72	
8	Phe1	0	0.0 - 7.91	
9	Lys1	0	0.0 - 3.88	

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Interpretation R.10 -Amino Acid Sufficiency

Sr.No	CONDITION	STATUS		
R.10 1	Arginine	● Sufficient	○ BorderLine	○ Deficient
R.10 2	Tyrosine	● Sufficient	○ BorderLine	○ Deficient
R.10 3	TryptoPhan	● Sufficient	○ BorderLine	○ Deficient
R.10 4	Threonine	● Sufficient	○ BorderLine	○ Deficient
R.10 5	Histidine	● Sufficient	○ BorderLine	○ Deficient
R.10 6	Phenylalanine	● Sufficient	○ BorderLine	○ Deficient
R.10 7	Valine	● Sufficient	○ BorderLine	○ Deficient
R.10 8	Methionine	● Sufficient	○ BorderLine	○ Deficient
R.10 9	Leucine	● Sufficient	○ BorderLine	○ Deficient
R.10 10	Lysine	● Sufficient	○ BorderLine	○ Deficient

Section R.10-Amino Acid Sufficiency

Amino acids are the building blocks of proteins and modulate enregy production, detoxification and other essential functions in the body. Optimum levels of essential amino acids are required for a health body.

Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Amino Acid Sufficiency

Blood Markers		Unit - nmol/ml		
1	Histidine	47.09	39.00 - 123.00	
2	Lysine	165.05	152.00 - 247.00	
3	Arginine	69.92	32.00 - 120.00	
4	Phenylalanine	44.0201	33.00 - 97.00	
5	Methionine	21.7141	11.00 - 44.00	
6	Valine	155.13	136.00 - 309.00	
7	Tyrosine	81.4750	0.00 - 90.00	

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Sr.No	Investigation	Observed Value	Reference Range	Risk Graph

Amino Acid Sufficiency

Blood Markers

8	Tryptophan	49.29	29.00 - 77.00	
9	Threonine	212.66	85.00 - 231.00	
10	Leucine	78.7552	68.00 - 183.00	

End Of Report

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Understanding your report

In the technical report section, you will see the graphic representation of all metabolic markers in the scope of the test conducted on your sample(s) and interpreted by our metabolic experts. The metabolic markers have been clubbed under various classes like - Carbohydrate Metabolism, Fatty Acid Metabolism, Vitamins Metabolism, Muscles Catabolism etc.

Definitions

Metabolites - Metabolites in your blood/urine samples are the Markers of Metabolism and act as the ' health indicators'. They characterize your state of metabolism and help make inferences in case of non-specific health conditions which can be an outcome of problems with your metabolism. Tracking the levels of these metabolites is important to ensure that early signals of diabetes related complications can be picked up.

Control Values - The 'Normal Limit' within which the value of a metabolic marker should ideally fall.

Observed *(your)* Value - The 'Actual Value' of a Metabolic Marker in your sample.

Understanding the Risk-Bar

Risk Bar - The horizontal bar as a pictorial representation of the observed values of the metabolic markers against the control values.

Safe Zone *(Green Color)*- If the value of markers measured in your sample fall in this region *(signified by the green zone)*, you can relax and maintain the lifestyle you have.

Risk Zone *(Red Color)* - If the value of marker(s) measured in your sample falls in this region *(signified by the red zone)*, it will be a matter of concern. You must consult your family physician or a metabolism expert.

Medium Zone *(color transition zone)* - If the value of a marker measured in your sample falls in this region *(signified by the color transition from green to red)*, you may need to bring in changes in your lifestyle, diet or medication, depending on the particular case. Any modifications, however, have to be routed through a medical practitioner.

ND - Non Detected. This implies that the marker was not detected; and hence not to be considered in the Risk Zone.

Pointer - The 'blue dot' on the risk bar. It represents the actual value of a particular metabolic marker found in your sample.

Metabolite	Control Value	Observed Value	Representation
Phenylalanine	0.000 - 4.934	1.23	Safe Zone / Medium Zone / Risk Zone

Observed value

Metabolite	Control Value	Observed Value	Representation
Leucine	48.00 - 324	1.23	Risk Zone / Safe Zone / Risk Zone

The "Risk-Bars" have multiple color codes.
A. Green *(safe)* Zone on left and Red *(Risk)* Zone on right end implies that the normal values of your metabolic marker should be on left side of the risk bar. Higher values imply risk.
B. Red *(Risk)* Zone on both ends imply that the normal value of your metabolic marker should be in the middle part of risk bar. Lower than control value or higher than control value, will both imply a risk.

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Notes:

* The analyte is not in the lab scope.
CRM No :509660
Sample Received Time:05-03-2018 18:20:52
Report Release Date :10-03-2018 11:16:02
Patient Name :
Patient ID : 509660

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