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# LABS Live 2021

The future of diagnostics

## Lab Bio Markers to evaluate Metaflammation and Inflammaging: Looking at Lab Biomarkers through the lens of trend analysis

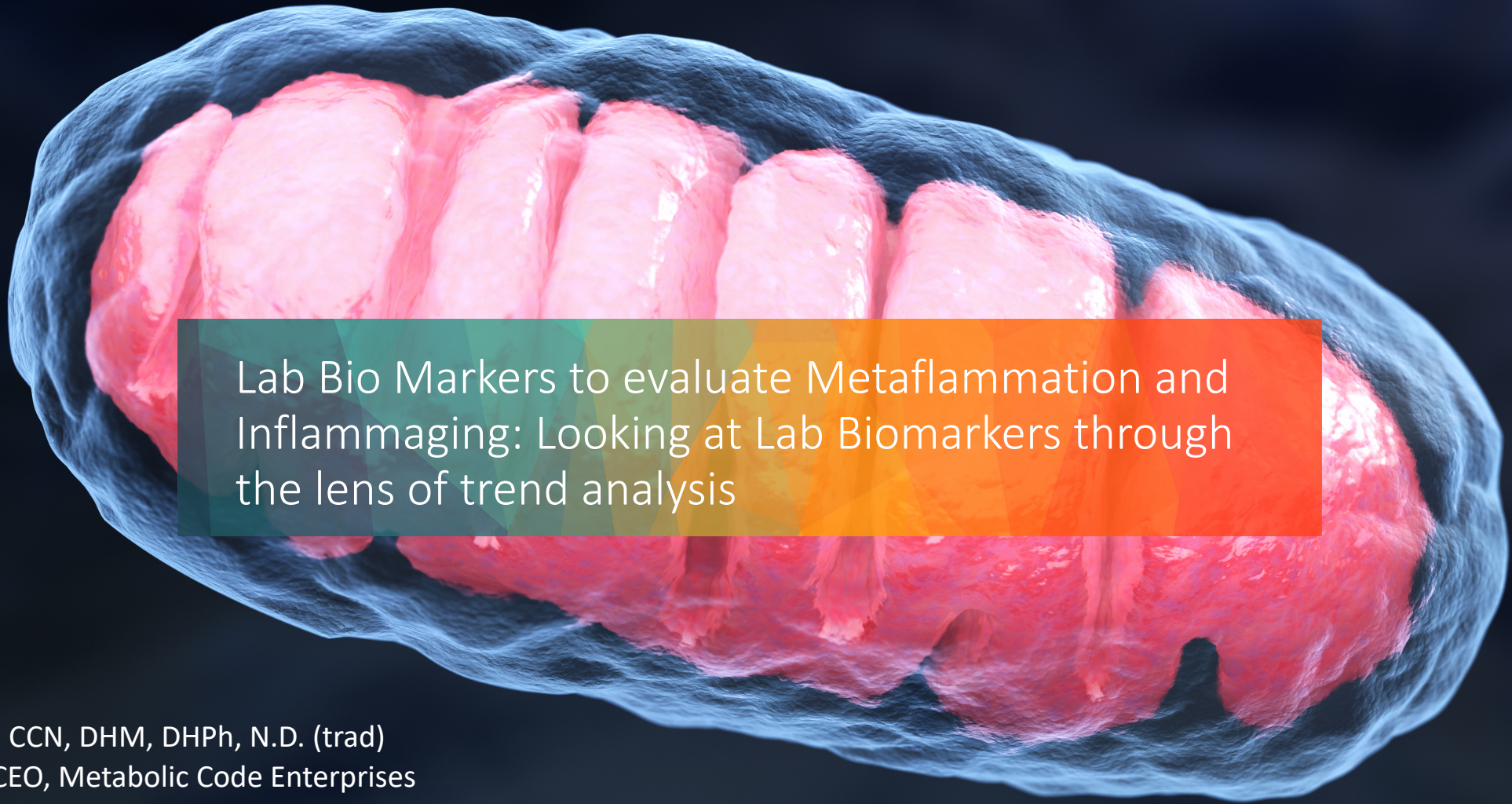


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### **Jim LaValle**

RPh, CCN, MT

James LaValle is an internationally recognized clinical pharmacist, author, board-certified clinical nutritionist, and expert and educator in integrative and precision health. James is best known for his expertise in personalized integrative therapies uncovering the underlying metabolic issues that keep people from feeling healthy and vital.



## Lab Bio Markers to evaluate Metaflammation and Inflammaging: Looking at Lab Biomarkers through the lens of trend analysis

Jim LaValle, RPh, CCN, DHM, DPh, N.D. (trad)

- Founder and CEO, Metabolic Code Enterprises
- Clinical Director Pro Football Hall of Fame Performance Health
- Academic Co-Chair A4M

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# METABOLISM

The sum total of all the chemical reactions **driving how you feel today** and creating the chemistry **moving you toward future health.**



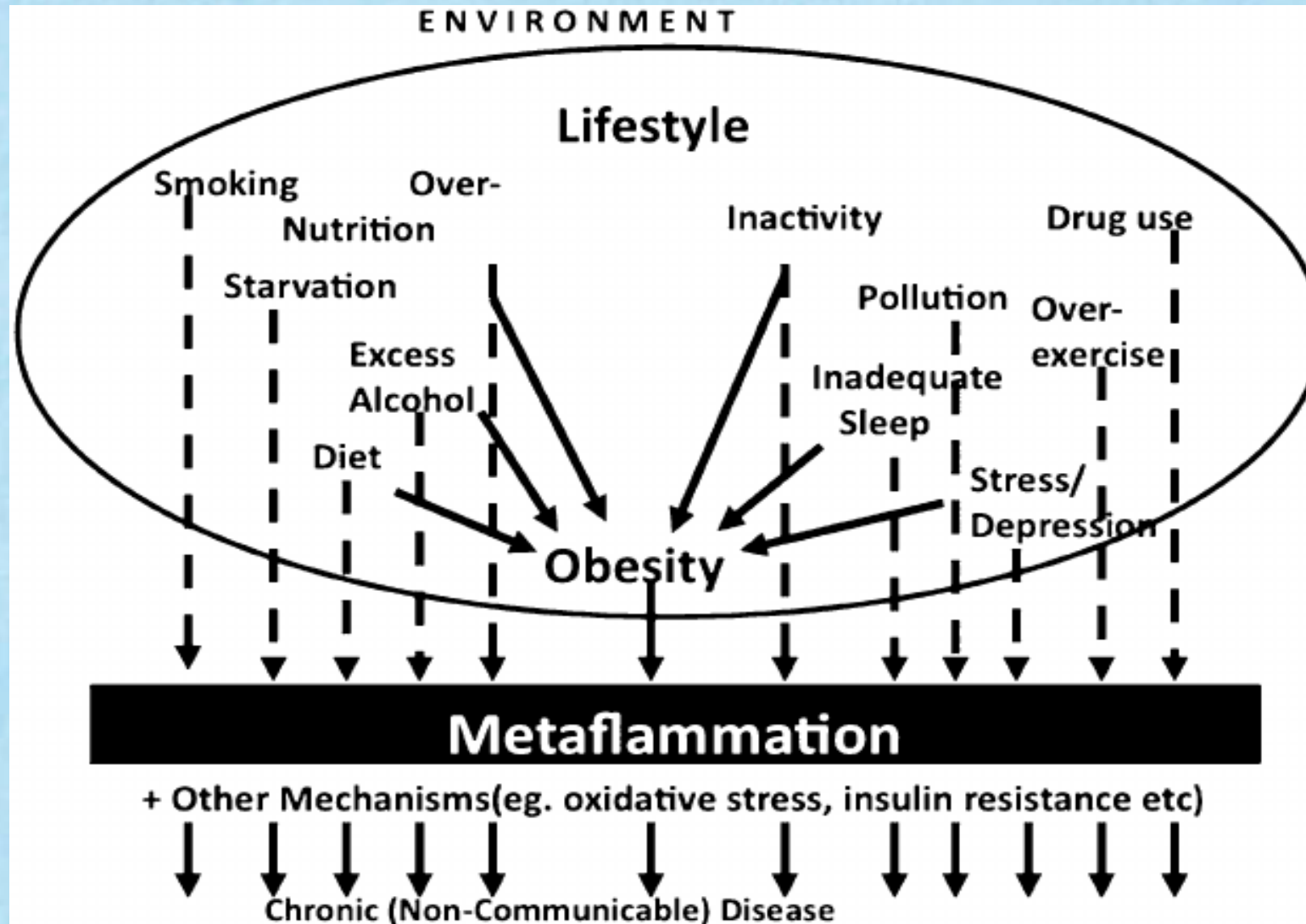
# METABOLISM

Directly under the influence of  
Global Metabolic Inflammatory  
Signaling =

**Metaflammation drives  
Metabolic Dysregulation**



# Metaflammation Constructs



Key Tenants of  
Aging,  
Performance and  
Vitality

 Oxidative Stress / Inflammation

 Hormonal Balance

 Stress Hormones

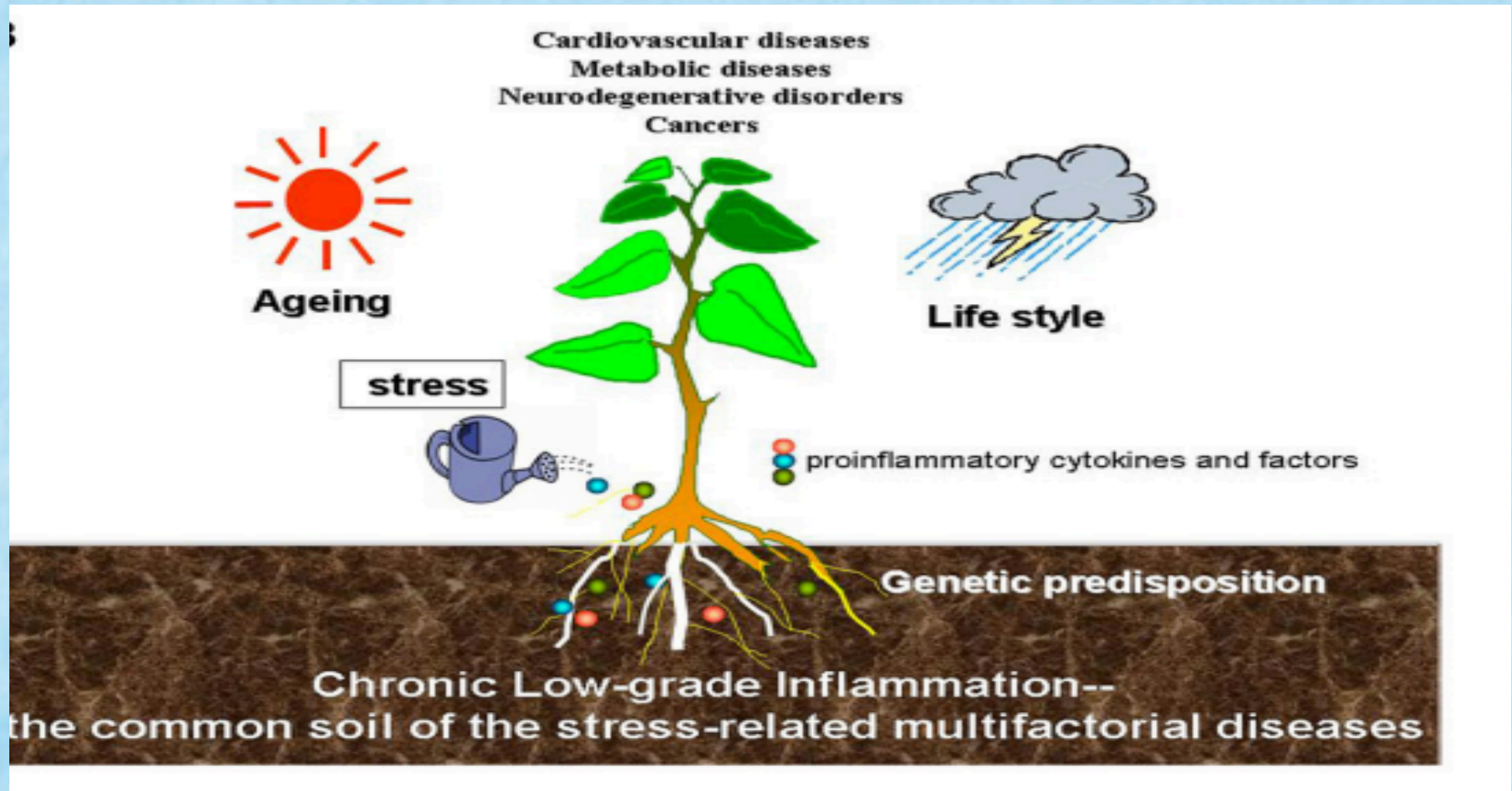
 Glucose / Insulin Regulation

 GUT integrity and microbiome diversity

 Immune Balance

 Environmental Burden

 Individuality



Liu YZ, et al. Inflammation: the common pathway of stress-related diseases. *Front Human Neurosci.* 2017;2017:00316.



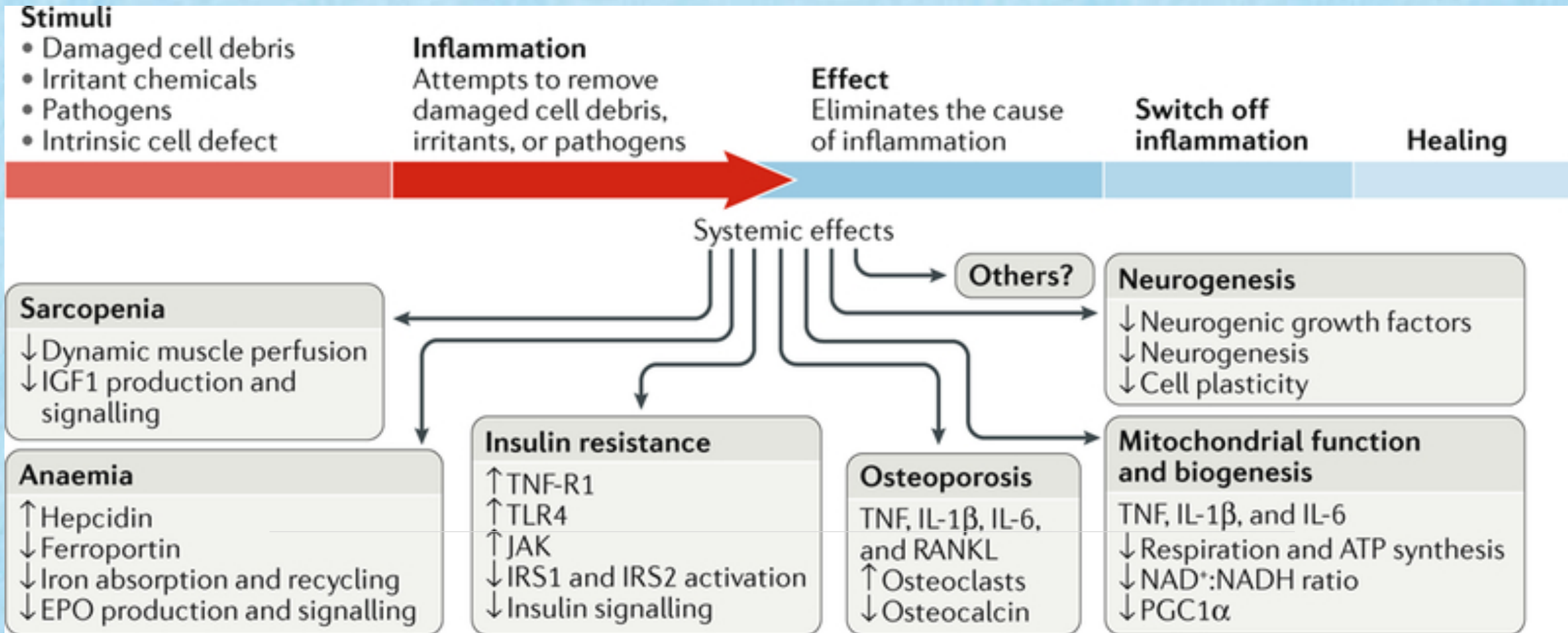
A microscopic view of several cells, likely yeast or bacteria, with a blue overlay. The cells are spherical and have a textured, bumpy surface. The background is a light blue gradient. A semi-transparent blue rectangle is overlaid on the center of the image, containing text.

# Metabolic Networks

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Understanding the “disruptors” to your current metabolic performance leads to **strategies to cut off excessive inflammatory signals and rejuvenate health on a cellular level.**

# Metaflammation Induces a Catabolic State



# Metaflammation

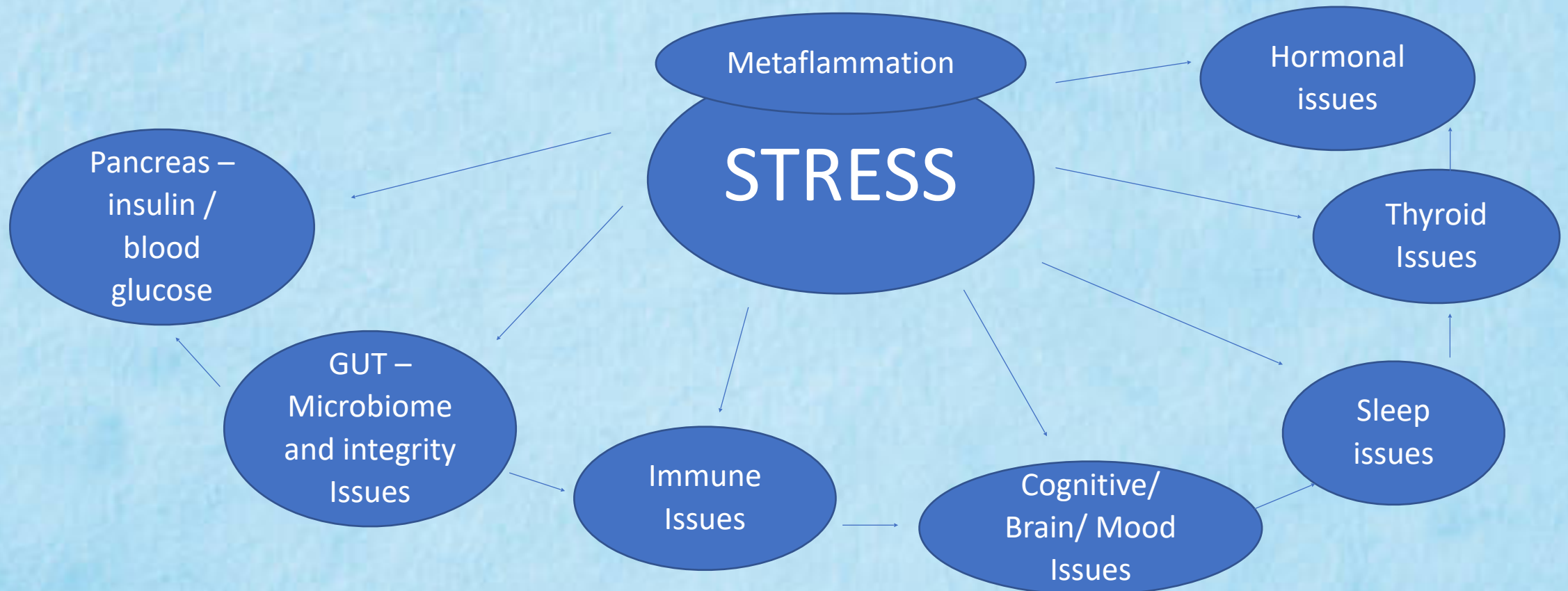
- Also known as “Inflammaging” and metabolism induced inflammation
- Chronic low-grade inflammatory sequelae
- Increases aging processes and metabolic signaling issues
- Increased **peripheral and central** inflammation

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Prattichizzo F, et al. Inflammaging and metaflammation: the yin and yang of type 2 diabetes. Ageing Res Rev. 2018;41:1-17.

# Systems Biology Approach to Metaflammation

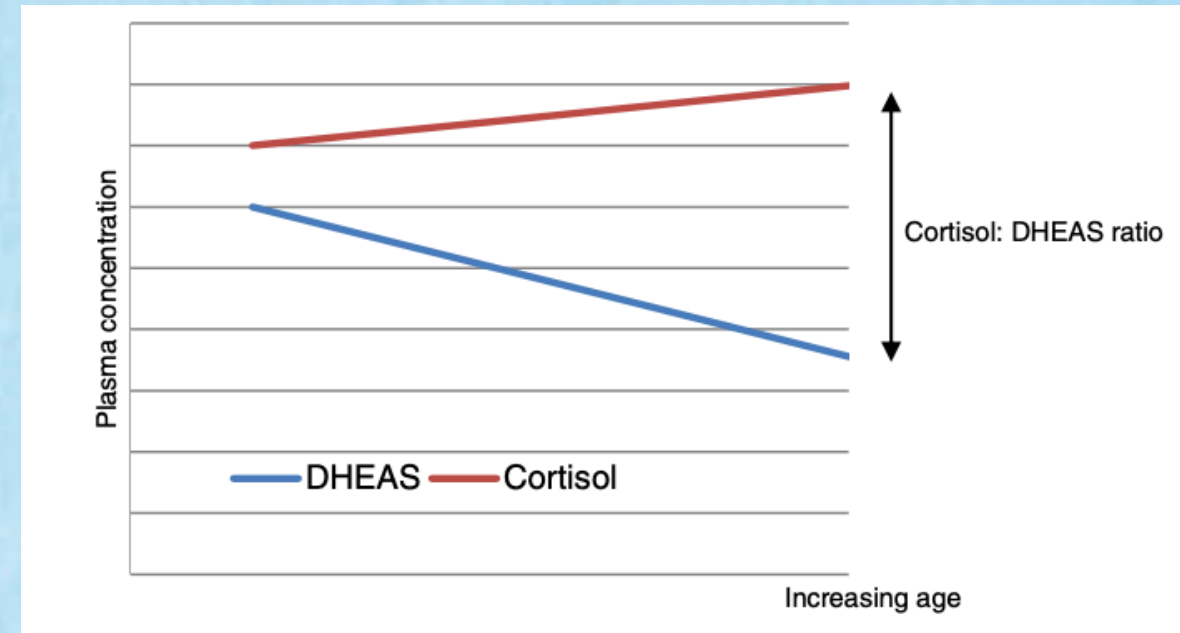
- Optimizing Inter-relationship of organ systems important in treatment



# Stress/Cortisol Gets the Metaflammation Ball Rolling

- Stress causes cravings, sleep disturbance and weight gain
- Cortisol – DHEA ratio
- Insulin resistance follows
- Weight gain leads to adiponectin alterations and loss of AMPK in the cell

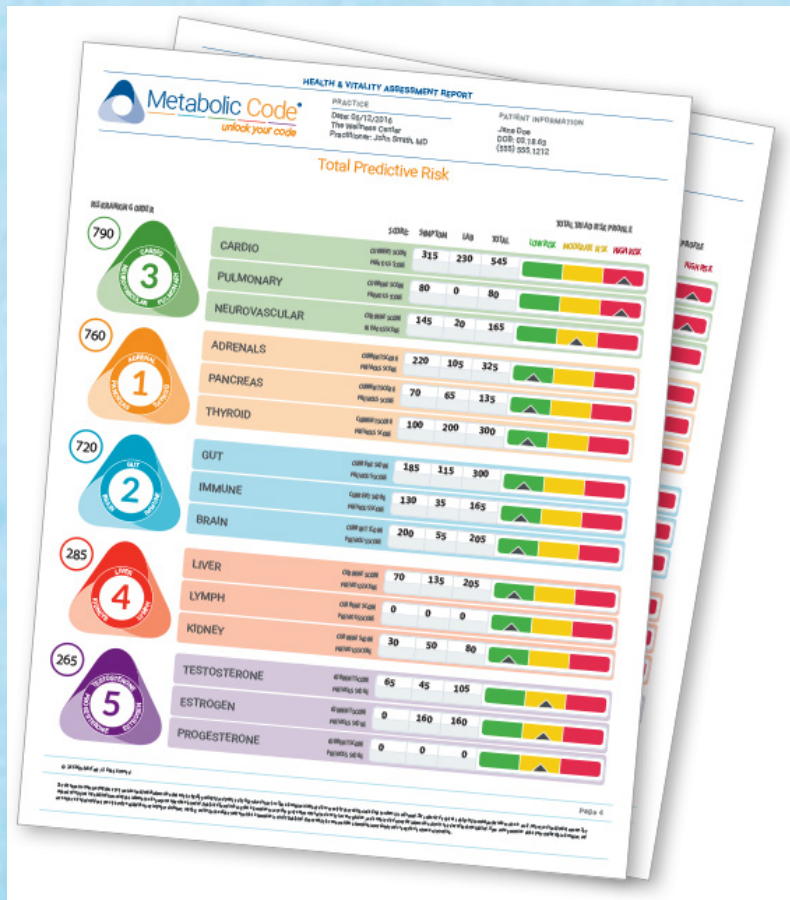
. . . the inflammatory cycle begins . . .



Baylis D, et al. Understanding how we age: insights into inflammaging. Long Healthspan. 2013;2(8):1-8






# Unlock Your Healthiest You™

Metabolic Code® is the complete solution to managing your health, lifestyle and metabolism.



# How the Metabolic Code Works

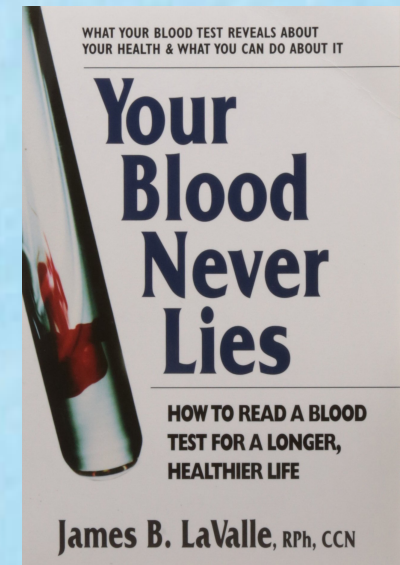
## Metabotypes

				
Adrenal glands	GUT ( <u>gastrointestinal</u> system or digestive tract)	Cardiovascular	Liver	Testosterone
Thyroid gland	Immune system	Pulmonary	Lymph	Estrogen
Pancreas	Brain (Central Nervous System)	Neurovascular	Kidneys	Progesterone

# MC Laboratory Testing – The Basics



- Properly functioning metabolic pathways depend on balancing all aspects of body chemistry
- Can be done through MC Questionnaire and adding laboratory testing parameters including blood, urine and saliva
- MC has 3 panels + additional add-on labs which adds more weight to the MC report
- Uses "trends" - not just "high" or "low" in an accelerated model
- Thousands of algorithms calculations to target where to start with a person to target a quick "win" as well as roadmap





# Initial Lab Testing

- Biometrics
  - BP, UpH, BMI, % body fat
- CBC and CMP
  - Includes MEB %
- Fasting glucose
- Hemoglobin A1c
- Insulin
- Thyroid panel – TPO/ThyAb, free T3, free T4, TSH, rT3
- Homocysteine
- Hs-CRP
- Estradiol, estrone, progesterone, DHT,SHGB
- Urinary estrogen metabolites optional
- Cortisol serum(urinary,salivary optional)
- DHEA-s
- Comprehensive Vitamin D Test
- Testosterone – free and total
- CRP
- Vitamin B12
- RBC Magnesium
- Iron/Ferritin/% sat/TIBC
- PSA and %free PSA

# Initial Lab Testing – Add-Ons

- 8-OHdG
- F2 isoprostanes
- Glutathione – total and reduced
- Adiponectin/Leptin
- TNF alpha / IL-6
- Lpa
- Lp-PLA2
- ApoB
- LDP-P
- oxLDL
- VEGF – vascular endothelial growth factor
- Vitamin B12
- MMA – methylmalonic acid
- MSH – melanocyte stimulating hormone
- MMP9 – matrix metalloproteinase-9
- MPO – Myeloperoxidase
- RBC Zinc
- Zonulin/histamine/LPS

# Metaflammation Labs

Group labs based on systems biology effects

- Which "TRIAD" based on labs/biometrics and symptoms has greatest effect on disrupting metabolic homeostasis.

Metaflammation

- Overt – hsCRP, homocysteine, ox LDL, RBC Mag, MPV, IRON/TIBC/Ferritin

Also consider

- T1 Cortisol/Cortisone, thyroid and blood glucose/insulin
- T2 – Gut/Immune/Brain. %MEB's Neutrophils, Lymphocytes
- T3 – lipids, fibrinogen, Lpa, ApoB, LDLP, Lp-PLA2, Trigs
- T4 – Liver/Lymph/Kidney. AS,ALT, Alk Phos., RDW H&H RDW, MPV
- T5 – hormonal axis – Testosterone/Estrogens/Progesterone/DHT

## Total Predictive Risk

**Ranking Order**


	CURRENT RANGE	PREVIOUS RANGE	SYMPTOM SCORE	LAB SCORE	TOTAL	TOTAL TRIAD RISK PROFILE		
						LOW RISK	MODERATE RISK	HIGH RISK
ADRENAL			110	45	155			
THYROID			95	185	280			
PANCREAS			215	345	560			



TESTOSTERONE			215	260	475			
ESTROGEN			125	80	205			
PROGESTERONE			10	0	10			



GUT			105	110	215			
IMMUNE			85	170	255			
BRAIN			70	105	175			

# Total Predictive Risk

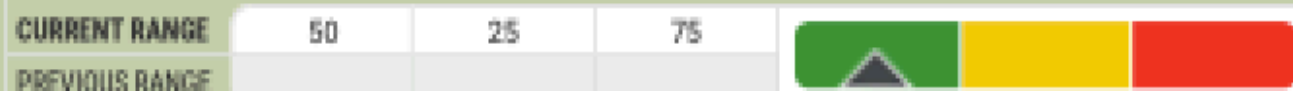
640



CARDIO



PULMONARY



NEURO-VASCULAR



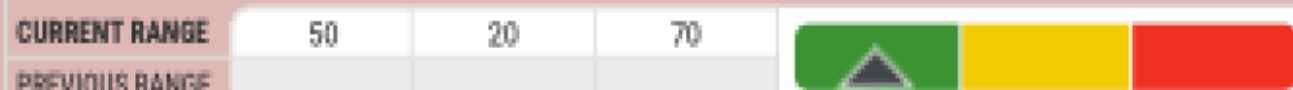
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LIVER



LYMPH



KIDNEY



# T1: Adrenal Thyroid

## Lab Results



A.M. Cortisol is normal but given Thyroid numbers & history and report result suggest Salivary or Urinary Cortisol



Adrenal				T1 LAB VALUES
	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	
Cortisol (serum)	5.5-19.8	14.4		
DHEA-S serum	75-350	100		
pH (salivary)	5.0-8.0			
Sodium	133-145	141		

Thyroid				T1 LAB VALUES
	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	
T3 Free	2.0-4.4	3.2		
T4 Free	0.93-1.7	0.99		
T3 Total	80-200	112		
T4 Total	4.5-11.7	5.8		
Reverse T3	8-24	9		
Thyroid Antibodies	<30	< 10		
Thyroid Peroxidase	<34	< 10		
TSH	0.27-4.2	3.54		

# T1: Pancreas

## Lab Results



BG 95= 60% risk of being diabetic in the next decade

Risk is accelerating through related numbers

Pancreas	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	MY CURRENT LAB VALUES				
				ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
BMI	18-35	33.47						
Adiponectin	>16	10						
Ferritin	30-400	285						
Glucose (fasting)	65-99	95						
Hemoglobin A1c	<5.6	5.5						
HDL	>39	38						
Insulin	3-9	19						
Leptin	< 43	14						
Potassium	3.5-5.3	3.9						
RBC Magnesium	4.2-6.8	5.3						

T1 LAB VALUES

# T2: GUT IMMUNE BRAIN Lab Results



%MEB=16

Vitamin D low

Insulin resistance  
influencing Triad 2  
(stacking)

ApoE3,4 low sat fat  
MC Phase 1 diet  
Homocysteine=  
metaflammation

Consider Food  
Allergy testing



## Gut T2 LAB VALUES

Test	Normal Range	My Lab Values	My Previous Lab Values	Alert Low	Low Normal	Optimal Normal	High Normal	Alert High
CRP-hs	<1	1.4		[Visual bar chart showing value 1.4 in the High Normal range]				
Eosinophils %	0-7	4		[Visual bar chart showing value 4 in the High Normal range]				
Monocytes %	4-13	11		[Visual bar chart showing value 11 in the High Normal range]				
Vitamin D	30-100	27		[Visual bar chart showing value 27 in the Alert Low range]				

## Immune T2 LAB VALUES

Albumin/Globulin Ratio	1.15-2.5	1.72		[Visual bar chart showing value 1.72 in the Optimal Normal range]				
Basophils %	0-3	1		[Visual bar chart showing value 1 in the High Normal range]				
Globulin	1.9-3.5	2.5		[Visual bar chart showing value 2.5 in the Optimal Normal range]				

## Brain T2 LAB VALUES

Apolipoprotein E		3/4		[Visual bar chart showing value 3/4 in the Alert High range]				
Homocysteine	<11	12		[Visual bar chart showing value 12 in the Alert High range]				
Vitamin B12	>400	430		[Visual bar chart showing value 430 in the Low Normal range]				



# T3: Cardio Pulmonary NeuroVascular



Insulin resistance  
+ ApoE status  
loading into Triad  
3

Dyslipidemia from  
metaflammation:  
Fibrinogen, LPA,  
Myeloper. OxLDL

Check Toxic  
Metals in future

## Lab Results

	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	MY CURRENT LAB VALUES				
				ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
<b>Cardio</b>				<b>T3 LAB VALUES</b>				
ApoB	<80	97						
Calcium	8.8-10.5	9.8						
Cholesterol (total)	125-200	196						
CoQ10	< 2	1.06						
Fibrinogen	126-437	466						
Galectin-3	< 25.9	11.1						
oxLDL	< 70	74						
LDL	<130	125						
Lpa	<75	284						
Lp-PLA2	<383	229						
Myeloperoxidase	<254.9	253						
<b>Pulmonary</b>				<b>T3 LAB VALUES</b>				
Carbon Dioxide	19-31	27						
<b>Neuro-Vascular</b>				<b>T3 LAB VALUES</b>				
BP (diastolic)	40-100							
BP (systolic)	80-145							
Pulse	40-80							

# T4: Liver Lymph



Insulin  
Resistance  
loading into  
liver function

## Lab Results

	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	MY CURRENT LAB VALUES				
				ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
<b>Liver</b>				<b>T4 LAB VALUES</b>				
Albumin	3.7-5.1	4.3				▲		
ALP	45-129	87				▲		
ALT	<42	25				▲		
AST	<41	15				▲		
Hematocrit	36-50	45				▲		
Hemoglobin	12.5-17	15.2				▲		
Iron	59-158	95				▲		
MCH	27-34	30				▲		
MCHC	32-36	34				▲		
MCV	80-98	88				▲		
Platelets	140-415	257				▲		
RBC	4.1-5.6	5.1				▲		
RDW	11.7-15	13.6				▲		
Triglycerides	<150	327						▲
<b>Lymph</b>				<b>T4 LAB VALUES</b>				
GGT	8-61	27				▲		
WBC	4-10.5	8.1				▲		

# T4: Kidney

## HEALTH & VITALITY ASSESSMENT REPORT



### PRACTICE

Date: 8/29/2019  
 Metabolic Code Enterprise  
 Practitioner: [REDACTED]

### PATIENT INFORMATION



## Lab Results



### Kidney

T4 LAB VALUES

Lab Test	Normal Range	My Lab Value	My Previous Lab Value	Alert Low	Low Normal	Optimal Normal	High Normal	Alert High
Bilirubin	<1.2	0.5		Red	Yellow	Green (▲)	Yellow	Red
BUN	6-20	17		Red	Yellow	Green (▲)	Yellow	Red
Chloride	98-110	106		Red	Yellow	Green	Yellow (▲)	Red
Creatinine	0.7-1.2	1.0		Red	Yellow	Green (▲)	Yellow	Red
GFR	>=60	90		Red	Yellow	Green (▲)	Yellow	Red
Protein	6.1-8	6.9		Red	Yellow	Green (▲)	Yellow	Red
Uric Acid	2-6.9	6.1		Red	Yellow	Green	Yellow (●)	Red



Insulin  
 resistance  
 loading Uric  
 Acid

# T5 Hormonal Axis

## Lab Results



### Testosterone T5 LAB VALUES

Testosterone	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	MY CURRENT LAB VALUES
DHT serum	30-85	31		Alert Low
Prolactin	4.04-15.2	18.10		Alert High
PSA (total)	<4	2.09		Optimal Normal
SHBG	10-80	37		Optimal Normal
Testosterone (free) serum	4.7-24.4	6.21		Alert Low
Testosterone (total) serum	348-1197	332		Alert Low

### Estrogen T5 LAB VALUES

Estradiol serum	25.8-60.7	26.90		Alert Low
Estrone serum	13-58	27.99		Optimal Normal
LH serum	1.7-8.6	3.7		Optimal Normal

### Progesterone T5 LAB VALUES

Progesterone serum				Alert Low
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## Lab Analysis

### Ranking Order



### TRIAD1: ADRENAL - THYROID - PANCREAS

BMI ↑ ↑	Adiponectin ↓ ↓ ↓	Cholesterol (total) ↑	CRP-hs ↑
DHEA-S serum ↓ ↓ ↓	Ferritin ↑ ↑ ↑	Glucose (fasting) ↑ ↑	Hemoglobin A1c ↑
Homocysteine ↑ ↑	HDL ↓	Insulin ↑ ↑ ↑	LDL ↑
Monocytes % ↑ ↑	Potassium ↓ ↓ ↓ ↓	Prolactin ↑ ↑	RBC Magnesium ↓ ↓ ↓
T4 Free ↓ ↓ ↓	T3 Total ↓ ↓ ↓ ↓	T4 Total ↓ ↓ ↓	Testosterone (free) serum ↓ ↓
Testosterone (total) serum ↓ ↓	Triglycerides ↑ ↑	TSH ↑ ↑	Vitamin D ↓ ↓
Uric Acid ↑			

Triad 1 encompasses the relationship between 3 important hormones - cortisol, insulin and thyroid hormones. These hormones reflect the state of stress, sugar metabolism and total efficiency of your metabolism. In their most basic function, each is responsible for the production of energy in the body. More generally, when these hormones are in balance, the individual feels vital and healthy.

# Lab Analysis

## Ranking Order



495



### TRIAD3: CARDIOVASCULAR - PULMONARY - NEUROVASCULAR

ApoB ↑ ↑ ↑	Cholesterol (total) ↑ ↑	Carbon Dioxide ↑	CRP-hs ↑ ↑
Fibrinogen ↑ ↑ ↑	Homocysteine ↑ ↑ ↑	LDL ↑	Lpa ↑ ↑ ↑
Potassium ↓ ↓	RBC Magnesium ↓ ↓ ↓	T4 Free ↓	T3 Total ↓
T4 Total ↓	Testosterone (free) serum ↓	Testosterone (total) serum ↓ ↓ ↓	Vitamin D ↓ ↓ ↓

Triad3 includes the cardiopulmonary unit, autonomic and central nervous system and vascular tree. This triad reflects the relationship of cardiovascular health, cognition and mood, and stress. When in balance, the individual has plenty of metabolic resiliency and strength to meet life's challenges.



385



### TRIAD2: GUT - IMMUNE - BRAIN

Adiponectin ↓ ↓	CRP-hs ↑	Eosinophils % ↑ ↑ ↑	Ferritin ↑ ↑
Homocysteine ↑ ↑ ↑	Monocytes % ↑ ↑ ↑	RBC Magnesium ↓	T4 Free ↓
T3 Total ↓	T4 Total ↓	Vitamin D ↓ ↓ ↓ ↓	

Triad2 is comprised of three important body systems - digestive tract, immune system and central nervous system. Together, these intelligent body functions make moment to moment decisions with regard to absorption and assimilation, self/non-self, and setting key boundaries physically immunologically and emotionally. When working well, the individual is safe and secure themselves and the world around them.

## Lab Analysis



### TRIAD5: TESTOSTERONE - ESTROGEN - PROGESTERONE



Adiponectin ↓	DHEA-S serum ↓	Prolactin ↑	RBC Magnesium ↓ ↓
Testosterone (free) serum ↓ ↓	Testosterone (total) serum ↓ ↓ ↓		

Triad 5 includes the sex hormones estrogen, progesterone and testosterone that play a central role in the human life cycle. These hormones play an important role in either metabolic or global health. More fundamentally, they confer a sense of potency and power to the individual when in balance for both women and men

### Ranking Order



### TRIAD4: LIVER - LYMPH - KIDNEY



Adiponectin ↓ ↓	Chloride ↑	Cholesterol (total) ↑	CRP-hs ↑ ↑
Ferritin ↑ ↑	Homocysteine ↑ ↑	LDL ↑	Monocytes % ↑ ↑
Potassium ↓	RBC Magnesium ↓	Triglycerides ↑ ↑	Uric Acid ↑ ↑

Triad4 contains the detoxification systems of the liver, lymph and kidney. These form a functional unit to ensure adequate metabolism, shuttling removal of both internally derived and external toxins. Detoxification is an ongoing process that requires efficiency in order to maintain health.

# Sex Hormones Kidneys

- Gonadal dysfunction is a common occurrence in patients with CKD
- Estrogens play a role in the reducing progression of some chronic renal diseases
- Testosterone
  - Low T linked to increased risk of death in CKD
  - Males have higher predominance of CKD

Gluhovsky GH, et al. Chronic kidney disease and the involvement of estrogen hormones in its pathogenesis and progression. Rom J Intern Med. 2012;50(2):135-44,

Yeo JK, et al. Effects of testosterone treatment on quality of life in patients with Chronic kidney disease. Am J Mens Health. 2020;14(3):1557988320917258.



# Exogenous Testosterone Effects

- 2017 cohort study analysis
- 2 groups – veterans diagnosed with Low T
  - 38,708 men treated w/ test. and resulting normalized T
  - 9755 men not treated and with low T
- Follow up was 6.1 and 5.1 years respectively
- Treated group showed significant delay in progression of CKD
- Treated men had a 24% decreased risk of ESRD and 25% decreased risk of death when compared w/ untreated men

Goel A, et al. Testosterone replacement therapy (TRT) delays progression of CKD and ESRD. Poster presented at the National Kidney Foundation's 2017 Spring Clinical Meetings in Orlando, Florida. Poster 239.

# Testosterone Deficiency

- 2008 Endocrine Society report studied 2000 German men aged 20 to 79 and found that those with low testosterone had a 2.5 times greater risk of dying over the next 10 years - all cause mortality

Schneider HJ, et al. Prevalence of low male testosterone levels in primary care in Germany: cross-sectional results from the DETECT study. *Clin Endocrinol (Oxf)*. 2009;70(3):446-54.

- 2006 study reported in JAMA showed that of 858 men over the age of 40, followed for 4 to 8 years, those with low testosterone had 88% increased risk of death in that time frame.

Shores MM, et al. Low serum testosterone and mortality in male veterans. *Arch Intern Med*. 2006;166(15):1660-5.

# Testosterone Deficiency

2014 meta-analysis of 20 observational studies

- Men with low total testosterone, low SHBG OR low free testosterone significantly more likely to have MetS

Brand JS, et al. Testosterone, sex-hormone binding globulin and the metabolic syndrome in men: an individual participant data meta-analysis of observational studies. PLoS One. 2014;9(7):e100409.

# Estrogen Effects Kidneys

- Both estrogen alpha and beta receptors present in the nephron – more alpha
- Estrogen hormones act upon the nephron component cells
- Estrogens regulate several processes
  - Nephroprotective
  - Attenuate glomerulosclerosis and tubulo-interstitial fibrosis
  - Estradiol reverses TGF-beta-1 induced mesangial cell apoptosis
  - Estrogens play an important part in disturbances of the phosphorus-calcium metabolism - exert favorable effects on renal osteodystrophy

Gluhovschi GH, et al. Chronic kidney disease and the involvement of estrogen hormones in its pathogenesis and progression. Rom J Intern Med. 2012;50(2):135-44.

# RBC Magnesium

- RBC Mg more important clinically than serum Mg
- Low mag levels directly correlated with increased HOMA-IR
- Higher risk for cardiovascular diseases
- RBC mag Ranges: (4-6.4 mg/dL)
  - Alert Low = <4
  - Trending Low = 4-5.6
  - OPTIMAL = 5.7-6.2
  - Trending high = 6.3-6.4
  - Alert High = >6.2

Laires MJ, et al. Magnesium insulin resistance and body composition in healthy postmenopausal women. *J A coll Nutr.* 2004;23(5):510S-513S.

# MPV – Mean Platelet Volume

- Platelet size demonstrated to reflect platelet activity
- METAFInflammation marker
- Useful predictive and prognostic biomarker of cardiovascular events
- Associated with prothrombotic and proinflammatory events
- Changes in MPV reported to be important biomarker for inflammatory processes
- Also neoplastic diseases

Korniluk A, et al. Mean platelet volume (MPV): New perspectives for an old marker in the course and prognosis of inflammatory conditions. *Mediat Inflamm.* 2019;2019:9213074/

# Adiponectin

- Increases insulin receptor sensitivity – low levels associated with IR
- Elevates AMP kinase which  $\uparrow$  glucose transport into skeletal muscle and burning of fat (fatty acid oxidation)
- Current top target for glucose control along with incretins (GIP, GLP-1).
- Antiathrogenic properties
- IL-6, TNF $\alpha$  inhibit adiponectin release
- High levels adiponectin  $\downarrow$  risk of MI

Achari AE, et al. Adiponectin, a therapeutic target for obesity, diabetes, and endothelial dysfunction. *Int J Mol Sci.* 2017;18(6):1321.

# Adiponectin

- Ranges based on gender and BMI (kg/m<sup>2</sup>)
- Female BMI <25
  - Range 5-37 mcg/ml
- Female BMI 25-30
  - Range 5-28
- Female BMI >30
  - Range 4-22
- Male BMI <25
  - Range 4-26 mcg/ml
- Male BMI 25-30
  - Range 4-20
- Male BMI >30
  - Range 2-20

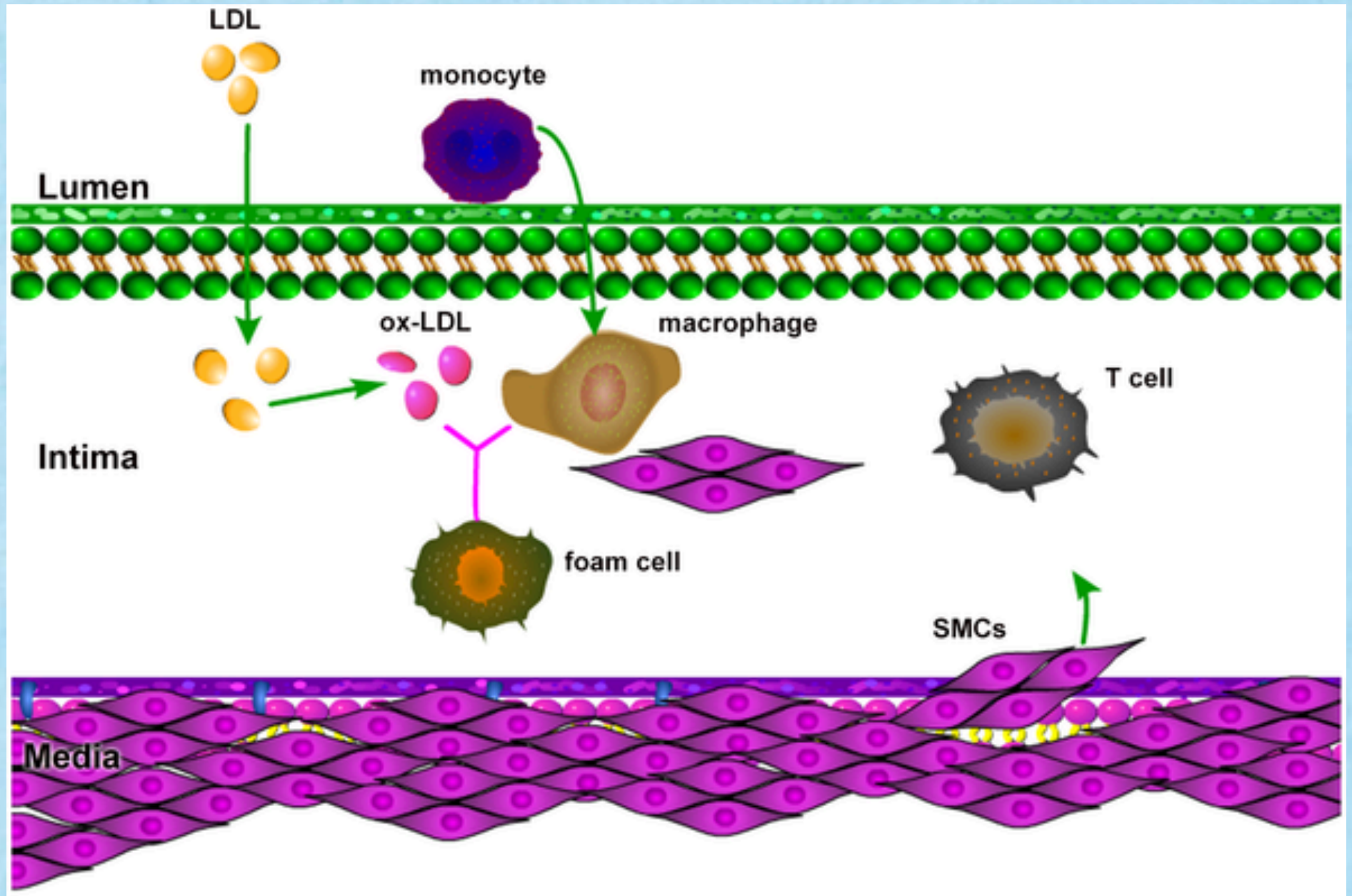


# oxLDL

- Proinflammatory
- More important than LDL alone
- Transforms macrophages into foam cells
  - Major constituent of arterial plaque
- Increased levels correlate with increased risk of coronary artery disease (CAD)
- MetS risk increased 4x w/ increase LDLox
- Levels increase as CAD severity increases
- Range < 60 U/L

Holvoet P, et al. Association between circulating oxidized low-density lipoprotein and incidence of the metabolic syndrome. JAMA. 2008;299:2287-93.

# oxLDL



# LDL-P

- LDL-Particle number - nmol/L
- Lower the value, less risk for cardiovascular disease
- Stronger correlation to CVD than LDL-C

## Reference Values

### LDL Particle Number

LDL-P <1000 nmol/L

Low:	<1000 nmol/L
Moderate:	1000 - 1299
Borderline-High:	1300 - 1599
High:	1600 - 2000
Very High:	>2000

# Urinary and Saliva pH

- pH critical in determining biochemical balance
- Optimal pH salivary = 7 - 7.2  
(trending low 6.1-6.9, trending hi 7.3-7.8)
- Optimal pH urinary = 6.5-7 (trending low 6-6.49, trending hi <7.1)
- The more acidic (lower pH) = more inflammation
- More lactic acid produced at lower pH
- Mitochondria less efficient
- Joints and tissues stressed



# pH

- A trending high or high pH means body too alkaline
  - Digestive issues (hypochlorhydria)
  - Detoxification and drainage problems (liver , lymph, kidney)
- Use digestive enzymes (with HCL if no problems with gastric pain), 2 tabs with each meal
- Probiotics, anti-candida (cat's claw + berberine)
- Kidney, lymph drainage support

# CIRS Panel through Wellavate Labs

Test Code	Test Name
004440	<a href="#">Adrenocorticotrophic Hormone (ACTH), Plasma</a>
161950	<a href="#">Anticardiolipin Antibodies (ACA), IgA, IgG, IgM, Quantitative</a>
010447	<a href="#">Antidiuretic Hormone (ADH), Plasma</a>
004051	<a href="#">Cortisol</a>
115188	<a href="#">D-Dimer</a>
163402	<a href="#">Deaminated Gliadin Antibodies, IgA and IgG</a>
167120	<a href="#">HLA DR1/3/4/5, DQ Intermediate Resolution</a>
821342	<a href="#">Human Transforming Growth Factor beta 1 (TGF-b1)</a>
146712	<a href="#">Leptin, Serum or Plasma</a>
010421	<a href="#">Melanocyte-stimulating Hormone (MSH) (010421)</a>
500124	<a href="#">MMP-9 (Matrix Metalloproteinase-9)</a>
002071	<a href="#">Osmolality</a>
117006	<a href="#">Vascular Endothelial Growth Factor (VEGF), Plasma</a>
164509	<a href="#">von Willebrand Factor (vWF) Activity (Ristocetin Cofactor)</a>

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