Casual Friday Presents

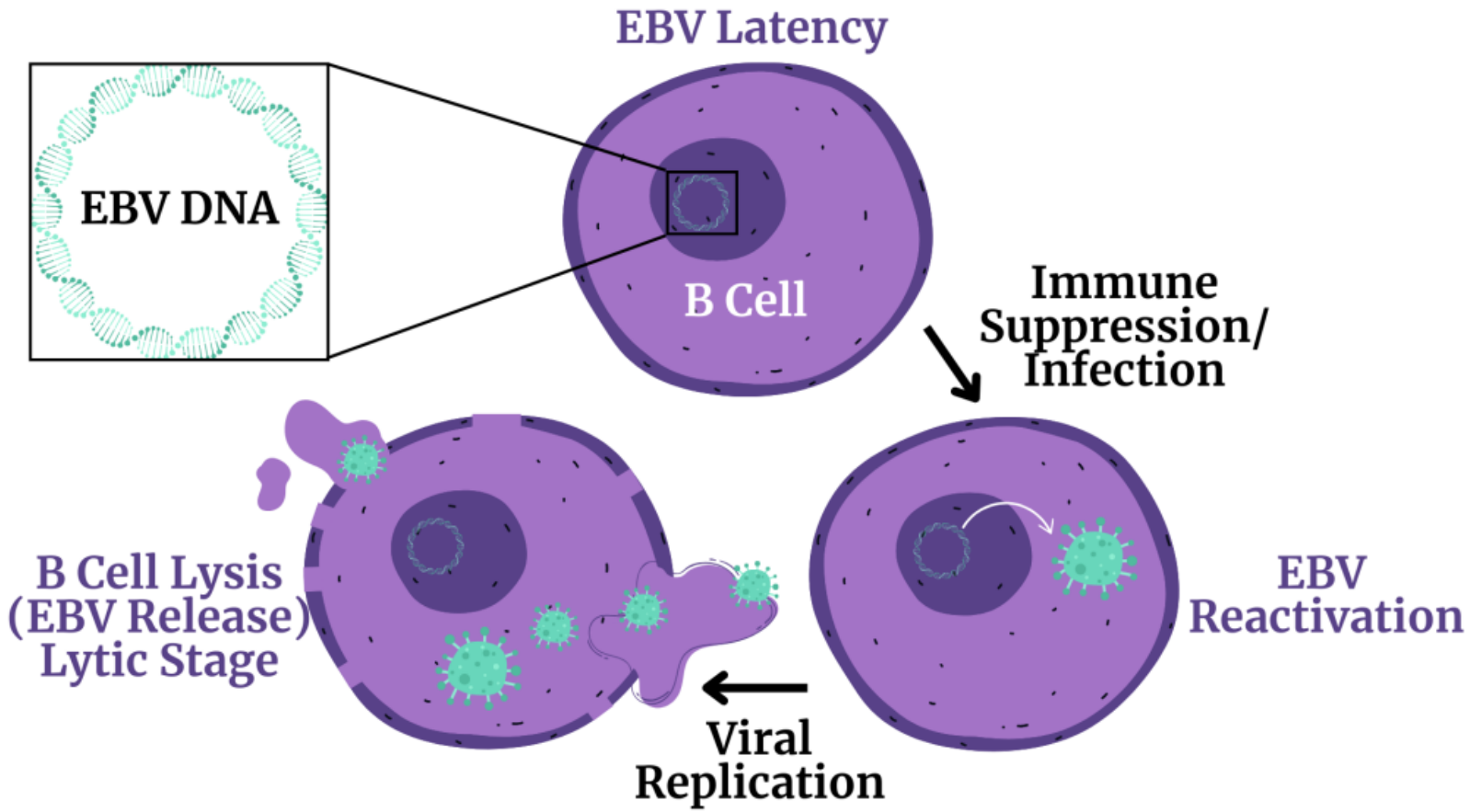
Epstein-Barr Virus Chronic and Reactivation IV

FM Strategies: Physiology, Pathology, Interventions.

A BIOGENETIX CLINICAL PRESENTATION

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EBV Latency
EBV DNA
B Cell
Immune
Suppression/
Infection
EBV
Reactivation
Viral
Replication
B Cell Lysis
(EBV Release)
Lytic Stage

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Sample Case:

14 yo male, 6’2” 155lbs.

Fatigue, all day, everyday.

Tall and thin, hypoglycemic and orthostatic hypotension symptoms.

Brain fog, heart palpitations, sinus concerns.

History of EBV – can feel it “coming on again.”

No Rx.

Diet: SAD – energy drinks – chips and soda.

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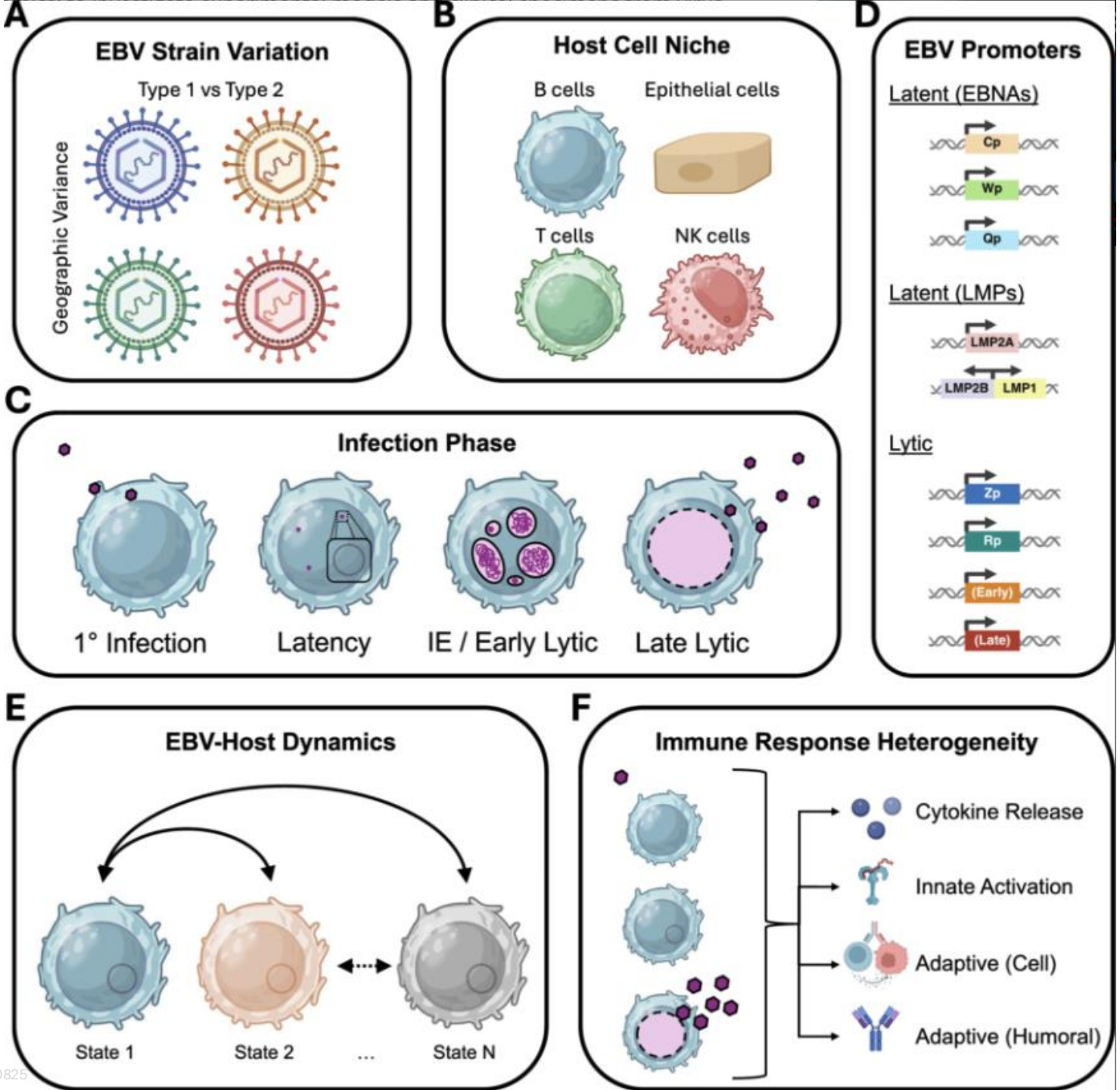
Fe+TIBC+Fer

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Iron Bind.Cap.(TIBC)	342		ug/dL	250-450
UIBC [01]	257		ug/dL	148-395
Iron [01]	85		ug/dL	26-169
Ferritin [01]	84		ng/mL	16-124

CBC With Differential/Platelet

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
WBC [01]	5.3		x10E3/uL	3.4-10.8
RBC [01]	5.06		x10E6/uL	4.14-5.80
Hemoglobin [01]	15.2		g/dL	12.6-17.7
Hematocrit [01]	46.4		%	37.5-51.0
MCV [01]	92		fL	79-97
MCH [01]	30.0		pg	26.6-33.0
MCHC [01]	32.8		g/dL	31.5-35.7
RDW [01]	13.0		%	11.6-15.4
Platelets [01]	208		x10E3/uL	150-450
Neutrophils [01]	39		%	Not Estab.
Lymphs [01]	51		%	Not Estab.
Monocytes [01]	7		%	Not Estab.
Eos [01]	3		%	Not Estab.
Basos [01]	0		%	Not Estab.
Neutrophils (Absolute) [01]	2.1		x10E3/uL	1.4-7.0
Lymphs (Absolute) [01]	2.6		x10E3/uL	0.7-3.1
Monocytes(Absolute) [01]	0.4		x10E3/uL	0.1-0.9
Eos (Absolute) [01]	0.2		x10E3/uL	0.0-0.4
Baso (Absolute) [01]	0.0		x10E3/uL	0.0-0.3
Immature Granulocytes [01]	0		%	Not Estab.
Immature Grans (Abs) [01]	0.0		x10E3/uL	0.0-0.1

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Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Glucose [01]	87		mg/dL	70-99
BUN [01]	12		mg/dL	5-18
Creatinine [01]	0.75		mg/dL	0.49-0.90
eGFR	Unable to calculate GFR. Age and/or gender not provided or age <18 years old.			>59
BUN/Creatinine Ratio	16			10-22
Sodium [01]	141		mmol/L	134-144
Potassium [01]	4.6		mmol/L	3.5-5.2
Chloride [01]	105		mmol/L	96-106
▼ **Carbon Dioxide, Total** [01]	**19**	**Low**	mmol/L	20-29
Calcium [01]	9.6		mg/dL	8.9-10.4
Protein, Total [01]	6.9		g/dL	6.0-8.5
Albumin [01]	4.8		g/dL	4.3-5.2
Globulin, Total	2.1		g/dL	1.5-4.5
▲ **A/G Ratio**	**2.3**	**High**		1.2-2.2
Bilirubin, Total [01]	0.3		mg/dL	0.0-1.2
Alkaline Phosphatase [01]	226		IU/L	114-375
AST (SGOT) [01]	18		IU/L	0-40
ALT (SGPT) [01]	23		IU/L	0-30

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Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Cholesterol, Total [01]	166		mg/dL	100-169
Triglycerides [01]	60		mg/dL	0-89
HDL Cholesterol [01]	53		mg/dL	>39
VLDL Cholesterol Cal	12		mg/dL	5-40
LDL Chol Calc (NIH)	101		mg/dL	0-109
T. Chol/HDL Ratio	3.1		ratio	0.0-5.0
Please Note: [01]				

T. Chol/HDL Ratio

	Men	Women
1/2 Avg.Risk	3.4	3.3
Avg.Risk	5.0	4.4
2X Avg.Risk	9.6	7.1
3X Avg.Risk	23.4	11.0

Non-HDL Cholesterol	113		mg/dL	0-119

Thyroid Panel With TSH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
TSH [01]	2.370		uIU/mL	0.450-4.500
Thyroxine (T4) [01]	6.7		ug/dL	4.5-12.0
T3 Uptake [01]	28		%	25-37
Free Thyroxine Index	1.9			1.2-4.9

Hgb A1c with eAG Estimation

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Hemoglobin A1c [01]	5.1		%	4.8-5.6
Please Note: [01]				

Prediabetes: 5.7 - 6.4
Diabetes: >6.4

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Hgb A1c with eAG Estimation (Cont.)

Glycemic control for adults with diabetes: <7.0

Estim. Avg Glu (eAG)	100	mg/dL	

Vitamin D, 25-Hydroxy

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Vitamin D, 25-Hydroxy [01]	39.5		ng/mL	30.0-100.0

Vitamin D deficiency has been defined by the Institute of Medicine and an Endocrine Society practice guideline as a level of serum 25-OH vitamin D less than 20 ng/mL (1,2). The Endocrine Society went on to further define vitamin D insufficiency as a level between 21 and 29 ng/mL (2).

1. IOM (Institute of Medicine). 2010. Dietary reference intakes for calcium and D. Washington DC: The National Academies Press.
2. Holick MF, Binkley NC, Bischoff-Ferrari HA, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. JCEM. 2011 Jul; 96(7):1911-30.

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Homocyst(e)ine

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Homocyst(e)ine [01]	6.6		umol/L	0.0-11.0

Phosphorus

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Phosphorus [01]	3.9		mg/dL	3.4-5.5

LDH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
LDH [01]	165		IU/L	126-244

GGT

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
GGT [01]	13		IU/L	0-65

Triiodothyronine (T3)

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3) [01]	114		ng/dL	71-180

Thyroid Antibodies

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Thyroid Peroxidase (TPO) Ab [01]	<9		IU/mL	0-26
Thyroglobulin Antibody [01]	<1.0		IU/mL	0.0-0.9

Thyroglobulin Antibody measured by Beckman Coulter Methodology
It should be noted that the presence of thyroglobulin antibodies
may not be pathogenic nor diagnostic, especially at very low

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EBV Antibody Profile

	Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
	EBV Ab VCA, IgM [01]	<36.0			U/mL	0.0-35.9
				Negative <36.0 Equivocal 36.0 - 43.9 Positive >43.9		
▲	**EBV Ab VCA, IgG** [01]	**78.3**	**High**		U/mL	0.0-17.9
				Negative <18.0 Equivocal 18.0 - 21.9 Positive >21.9		
	EBV Nuclear Antigen Ab, IgG [01]	<18.0			U/mL	0.0-17.9
				Negative <18.0 Equivocal 18.0 - 21.9 Positive >21.9		
	Interpretation: [01]					

EBV Interpretation Chart

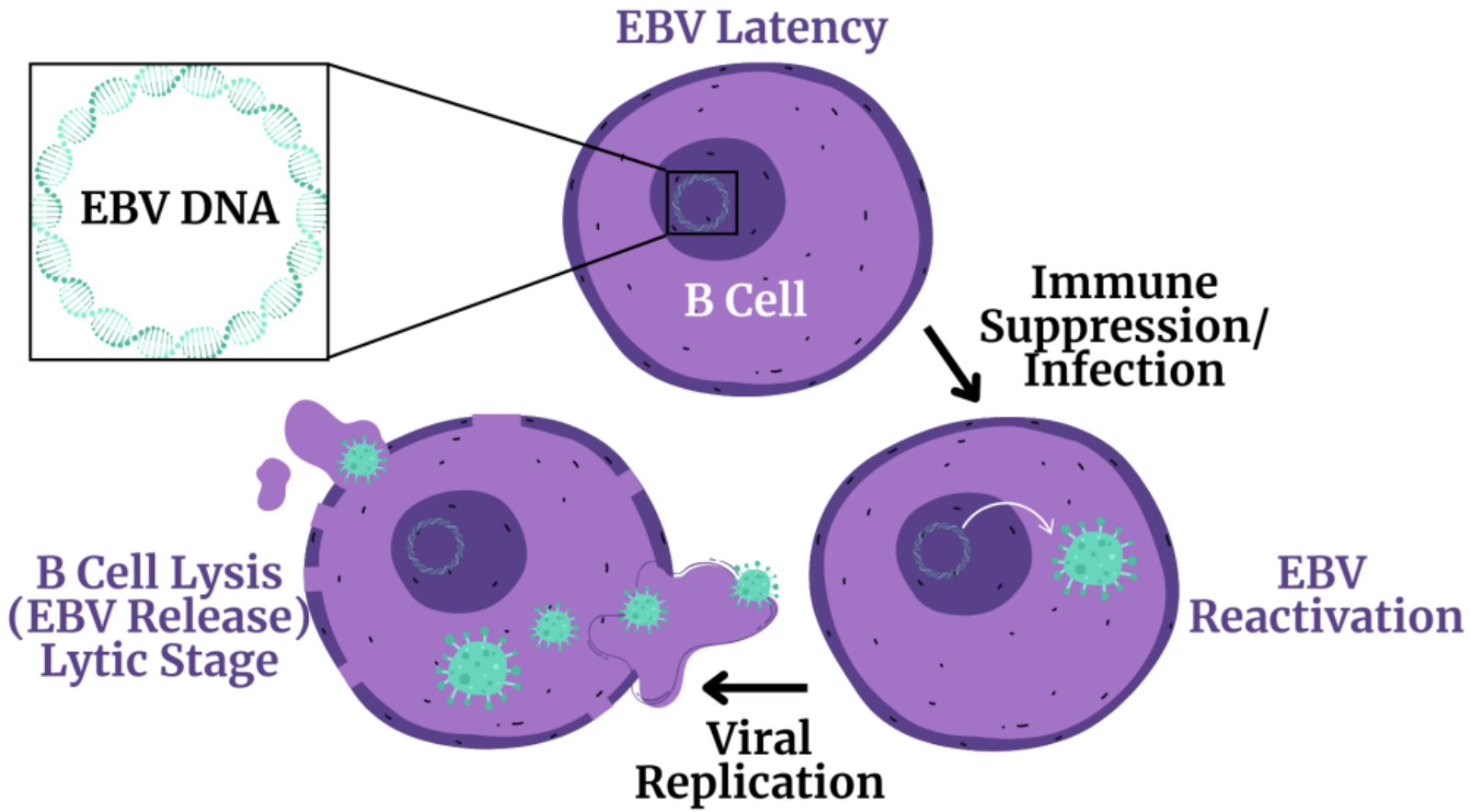
Key: Antibody Present +	Antibody Absent -		
Interpretation	VCA-IgM	VCA-IgG	EBNA-IgG
No previous infection/ Susceptible	-	-	-
Primary infection (new or recent)	+	+	-
Past Infection	+or-	+	+
See comment below*	+	-	-

*Results indicate infection with EBV at some time however cannot predict the timing of the infection since antibodies to EBNA usually develop after primary infection or, alternatively, approximately 5-10% of patients with EBV never develop antibodies to EBNA.

DHEA-Sulfate

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
DHEA-Sulfate [01]	181.0		ug/dL	49.5-270.5

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EBV Latency
EBV DNA
B Cell
Immune
Suppression/
Infection
EBV
Reactivation
Viral
Replication
B Cell Lysis
(EBV Release)
Lytic Stage

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INFLAMMATION MARKERS

Test Name	Current	Previous	Result	Reference
MMP 9 (ng/mL)	0.5			≤0.2

MMP-9 is an important marker of intestinal inflammation. It has been shown to be significantly increased in the stool of UC patients compared with healthy controls and patients with IBS, and was found to correlate with the clinical and endoscopic activity of UC.

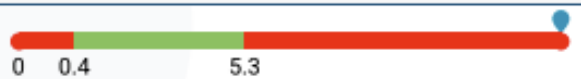
Beta defensin 2 (ng/mL)	59.1			≤34.9

Beta-defensin 2 is an antibiotic peptide locally regulated by inflammation in humans. It is produced by a number of epithelial cells and exhibits potent antimicrobial activity against Gram-negative bacteria and Candida, but not Gram-positive bacteria. It has been speculated that beta-defensin 2 may contribute to the infrequency of Gram-negative infections on skin and lung tissue.

DIGESTIVE INSUFFICIENCY AND MALABSORPTION MARKERS

FAT MALABSORPTION	Current	Previous	Result	Reference
Total Fecal Fat (mg/g)	50.4			2.9-37.5

This test measures the amount of fat in a stool sample. Excess fecal fat (termed steatorrhea) in stool is indicative of malabsorption disorder. The absorption of fat can be varied by production of bile in the gallbladder or liver, production of digestive enzymes in the pancreas, and normal functioning of the intestines. Decreased absorption of fat can be a sign of many different illnesses, including celiac disease, crohn's disease, cystic fibrosis, pancreatitis, etc.

Total Cholesterol (mg/g)	18.5			0.5-5.3

Total Cholestrol subfraction

Total Phospholipids (mg/g)	14.7			0.3-6.4

Total Phospholipid subfraction

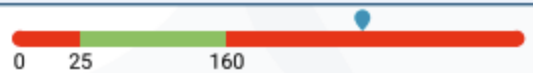
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GUT METABOLITES

SHORT CHAIN FATTY ACIDS	Current	Previous	Result	Reference
Total Short chain fatty acids (micromol/g)	24.7			45.4-210.1

SCFA supplements are most commonly found as butyric acid salts. Herbal medicines that can affect SCFA levels include berberine, passiflora edulis, Chinese Yam, trametes versicolor extract, lotus seed resistant starch, xylooligosaccharides from corn cobs, coptis chinensis, Reishi mushroom, Poria mushroom, Lingzhi mushroom, Daikenchuto.

OTHER MARKERS

Test Name	Current	Previous	Result	Reference
Fecal Zonulin (ng/mL)	310.7			25.1-160.8

Fecal zonulin measurement may be advantageous, compared to serum zonulin when assessing intestinal permeability, as serum zonulin may constitute secretion not only from intestinal cells, but also from extraintestinal tissues such as the liver, heart and brain. Stool may therefore present a more appropriate specimen for analyzing only intestinal production of zonulin. Elevated fecal levels of zonulin have been associated with metabolic syndrome, obesity, and healthy cigarette smokers. High fecal zonulin levels in smokers irrespective of IBD point to the significant and undesirable up-regulation of gut permeability in cigarette smokers.

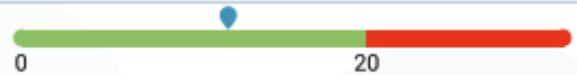
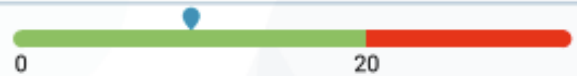
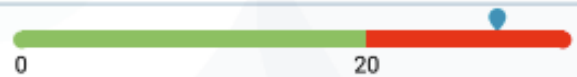
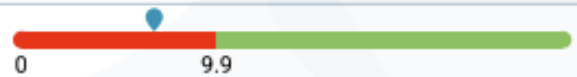
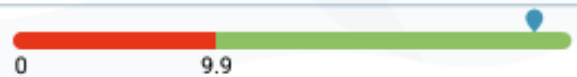
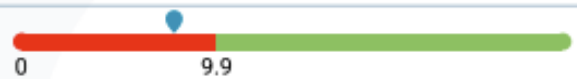
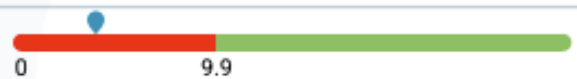
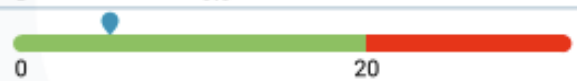
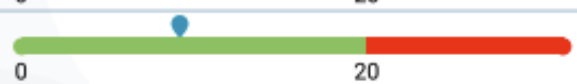
sIgA (mcg/g)	2466.4			426.0-1450.0

Secretory IgA is the primary antibody that is protecting us from pathogens and toxins from penetrating mucosal surfaces. Its role is crucial in protecting the integrity of the intestinal epithelium. The antibody blocks the access to the epithelial receptors and traps pathogens and toxins in the mucus which are then excreated by peristaltic movements. SIgA has been identified to potentially neutralize virulence factors, modulate intestinal microbiota by Fab-dependent and -independent mechanisms, promote dendritic cell (DC) recruitement across the epithelial barrier and also down-regulate pro-inflammatory responses normally associated with the uptake of highly pathogenic bacteria and potentially allergenic antigens. Multiple cytokines, including IL-4, TGF-β, IL-5, IL-6, IL-10 are instrumental in intestinal stimulating SIgA production. A subset of these cytokines, notably TGF-β and IL-10, are also required for maintaining mucosal tolerance, thus establishing one of the many links between SIgA production, immunity and intestinal homeostasis.

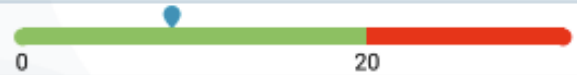
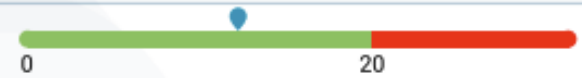
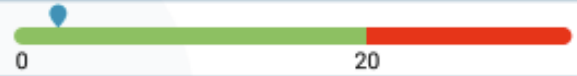
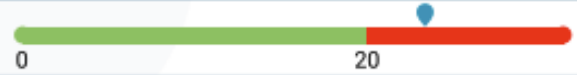
GUT PATHOGENS

Bacteria	Current	Previous	Reference
Klebsiella pneumoniae	1.5e4		≤3.5e3

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Bacillus subtilis	15.6		≥10.0
Bacteroidales	12.3		≤20.0
Bacteroides	14.7		≤20.0
Bacteroides caccae	9.8		≤20.0
Bacteroides vulgatus	27.2		≤20.0
Bifidobacterium	7.3		≥10.0
Bifidobacterium adolescentis	29.4		≥10.0
Bifidobacterium animalis	12.8		≥10.0
Bifidobacterium animalis subspecies lactis	8.6		≥10.0
Bifidobacterium catenulatum	3.4		≥10.0
Blautia	4.4		≤20.0
Blautia hydrogenotorophica	9.1		≤20.0

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Staphylococcaceae	8.5		≤20.0
Staphylococcus epidermidis	12.6		≤20.0
Staphylococcus pasteuri	0.9		≤20.0
Staphylococcus species	13.6		≤20.0
Streptococci	22.4		≤20.0
Streptococcus species	20.9		≤20.0
Tyzzerella	5.0		≤20.0
Tyzzerella 4	7.7		≤20.0
Veillonella	20.1		≤20.0
Veillonellaceae	12.7		≥10.0

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Sample Nutritional Support Across the Stages of EBV

Targeting viral entry, lytic replication, and latency

Early Stage

Viral entry / acute infection

Vitamin C

BioG-Max C with R-Lipoic Acid

Higher levels linked to lower acute EBV antibodies (VCA IgM).

Quercetin

QuercenX

Interferes with EBV receptor recognition (CD21, CD35, HLA II).

Licorice

Whole root with glycyrrhizic acid

Blocks an early step of EBV replication.

Lytic Stage

Active replication / reactivation

Vitamin C

BioG-Max C with R-Lipoic Acid

High-dose use linked to falling early antigen (EA IgG) levels.

Resveratrol

BioG-Max Resveratrol

Inhibits lytic proteins Rta, Zta, and EA-D.

Astragalus

ViraX Plus

Astragalus polysaccharide inhibits the EBV lytic cycle.

Licorice

Whole root with glycyrrhizic acid

Glycyrrhizic acid inhibits EBV replication in vitro.

Latent Stage

Dormant virus in memory B cells

Vitamin D

Liquid D 2000 or D3K2

Trials found lower EBNA-1 antibody levels with D3.

Quercetin

QuercenX

Reduces EBNA-1 expression in infected cells.

Berberine

Berberine X

Acts through an EBNA-1-dependent mechanism.

Gut Support Protocol

GI ResQ+ and UltraBiotix

Supports the microbiome and gut barrier to aid immune control.

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We Want to Hear from You!

Give us your Casual Friday feedback
with this short 5-question survey.

biogenetix.com/survey

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