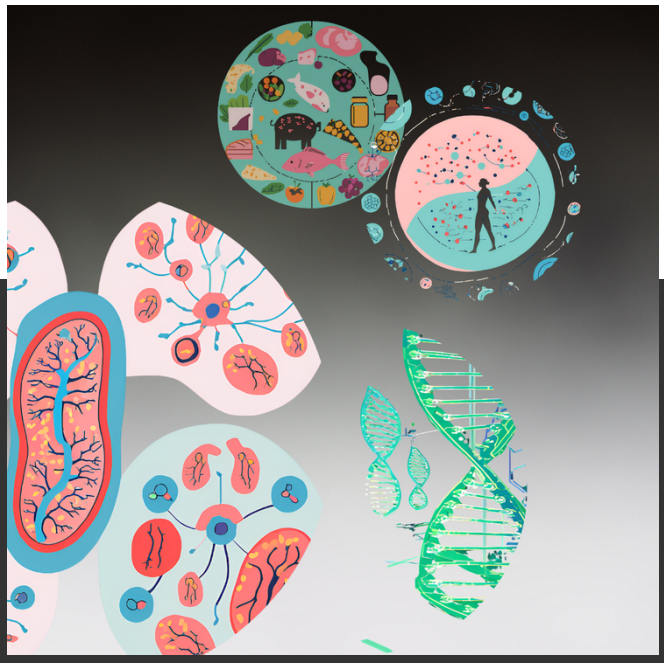
Metabolic Archetype™

Labs

Hormesis Health & Fitness
Evolutionary Vitality



Comprehensive Metabolic Health Panel: Integrating Functional Labs, Genetic Testing & Metabolic Archetypes™

This lab panel provides a functional, real-time snapshot of metabolic health, offering insights that complement genetic predispositions and biological fitness. By analyzing insulin sensitivity, lipid metabolism, inflammation, oxidative stress, liver function, mitochondrial efficiency, renal function, and metabolic rate, it enables precise identification of Metabolic Archetypes™ and their degradation pathways.

Key Functional Areas Assessed

1. Insulin Sensitivity & Glucose Handling

• **Triglycerides** – Elevated triglycerides indicate poor lipid clearance, excessive carbohydrate intake, and metabolic inflexibility.

• **Glucose** – Fasting glucose trends reflect insulin regulation and glucose homeostasis.

• **TyG Index (Triglyceride-Glucose Index)** – A robust marker of hepatic insulin resistance and metabolic inflexibility.

• **HDL (High-Density Lipoprotein)** – Low HDL suggests impaired lipid transport and increased inflammation.

• **Triglyceride-to-HDL Ratio (Tri/HDL)** – A direct proxy for insulin resistance. Ratios >2 indicate degradation, while >3 confirms significant metabolic dysfunction.

• **Triglyceride-HDL Atherogenic Index of Plasma (AIP)** – A logarithmic marker of atherogenic risk and lipoprotein particle size. Higher values indicate small, dense LDL particles prone to oxidation, which drive cardiovascular disease and metabolic syndrome.

Metabolic Archetype™ Insights:

• **Carb-Sensitive Fat Storers™ & Hyper-Metabolic Outliers™:** High TyG, high Tri/HDL, and elevated AIP, suggesting insulin resistance and metabolic inflexibility.

• **Fat-Adapted Metabolizers™ & Dual-Fuel Metabolizers™:** Lower triglycerides, improved TyG, and low AIP, reflecting better lipid metabolism and insulin sensitivity.

2. Lipid Oxidation, Cardiovascular & Inflammatory Stress

• **LDL (Low-Density Lipoprotein)** – Not all LDL is inherently harmful, but small, dense LDL (sdLDL) and oxidized LDL (oxLDL) are highly atherogenic.

• **oxLDL (Oxidized LDL)** – A critical marker of endothelial damage, oxidative stress, and metabolic degradation.

• **hsCRP (High-Sensitivity C-Reactive Protein)** – A systemic inflammation marker, correlated with insulin resistance, visceral fat accumulation, and cardiovascular ris

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Metabolic Archetype™ Insights:

• **Carb-Sensitive Fat Storers™:** High oxLDL and hsCRP, signaling systemic inflammation and lipid oxidation.

• **Fat-Adapted Metabolizers™:** Lower inflammation, reduced LDL oxidation, and improved cardiovascular resilience.

3. Liver Function & Detoxification

• **GGT (Gamma-Glutamyl Transferase)** – Highly sensitive to oxidative stress and liver function, particularly fatty liver disease (NAFLD) and poor detoxification.

• **AST (Aspartate Aminotransferase) & ALT (Alanine Aminotransferase)** – Elevated levels suggest hepatic stress from metabolic dysfunction, excessive fat storage, or poor nutrient partitioning.

• **ALP (Alkaline Phosphatase)** – A marker of biliary function and low-grade inflammation.

• **Bilirubin** – Functions as an endogenous antioxidant; optimal levels suggest better oxidative stress handling.

Metabolic Archetype™ Insights:

• **Carb-Sensitive Fat Storers™:** Elevated GGT, AST, and ALT, suggesting liver congestion and metabolic overload.

• **Fat-Adapted Metabolizers™:** Efficient hepatic function, lower oxidative burden.

4. Kidney Function & Metabolic Clearance

• **eGFR (Estimated Glomerular Filtration Rate)** – A measure of renal filtration efficiency. Declining eGFR suggests poor metabolic clearance, chronic inflammation, and potential early-stage kidney stress due to metabolic dysfunction.

Metabolic Archetype™ Insights:

• **Carb-Sensitive Fat Storers™:** Tend to experience lower eGFR due to higher uric acid, oxidative stress, and insulin resistance affecting kidney function.

• **Fat-Adapted Metabolizers & Dual-Fuel Metabolizers™:** Typically maintain better eGFR, reflecting lower metabolic burden and improved clearanc

5. Mitochondrial Efficiency, Oxidative Stress & Metabolic Flexibility

• **Uric Acid** – Elevated levels signal fructose overload, metabolic inflexibility, and oxidative stress, frequently linked to hyperinsulinemia and obesity.

• **Homocysteine** – Elevated levels indicate poor methylation, cardiovascular risk, and mitochondrial dysfunction.

• **Adiponectin** – A protective adipokine; higher levels suggest better insulin sensitivity and fat oxidation efficiency.

Metabolic Archetype™ Insights:

• **Hyper-Metabolic Outliers™:** Low uric acid, but high homocysteine, reflecting oxidative turnover.

• **Carb-Sensitive Fat Storers™:** High uric acid, low adiponectin, suggesting metabolic rigidity.

6. Thyroid Function & Metabolic Rate

• **Free T3 (Triiodothyronine)** – A marker of mitochondrial energy production and metabolic rate. Lower levels indicate metabolic slowdown, often due to caloric restriction or chronic stress.

• **Indirect Calorimetry** – Measures resting metabolic rate (RMR) and fuel oxidation patterns, providing real-time metabolic flexibility data.

Metabolic Archetype™ Insights:

• **Fat-Adapted Metabolizers & Dual-Fuel Metabolizers™:** Higher Free T3, better fat oxidation efficiency.

• **Carb-Sensitive Fat Storers™:** Low Free T3, impaired fat oxidation, indicating sluggish metabolism.

Synthesis: Defining Metabolic Archetypes™ with These Markers

Metabolic Archetype	Key Lab Features
Carb-Efficient Metabolizer	Low Trig, High HDL, Low TyG, Low AIP, Stable glucose
Fat-Adapted Metabolizer	Higher LDL (Pattern A), Low hsCRP, Low GGT, Good T3 function
Dual-Fuel Metabolizer	Balanced triglycerides and glucose, good oxidative markers
Carb-Sensitive Fat Storer	High Trig, Low HDL, High AIP, High TyG, High Uric Acid
Hyper-Metabolic Outlier	High Free T3, Fast metabolism, Elevated LDL with low inflammation

	Carb-Sensitive Fat Storers	Fat-Adapted Metabolizers	Dual-Fuel Metabolizers	Hyper-Metabolic Outliers
Insulin Sensitivity & Glucose Handling	High TyG, high Tri/HDL, elevated AIP ,significant insulin resistance and metabolic inflexibility.	Lower triglycerides, improved TyG, low AIP , better lipid metabolism and insulin sensitivity.	Moderate Tri/HDL, balanced glucose metabolism , able to switch between carb and fat oxidation.	Variable TyG, higher glucose turnover , increased metabolic rate but susceptible to oxidative stress.
Lipid Oxidation, Cardiovascular & Inflammatory Stress	High oxLDL and hsCRP , systemic inflammation and lipid oxidation.	Lower inflammation, reduced LDL oxidation , improved cardiovascular resilience.	Moderate oxLDL, balanced lipid oxidation , stable inflammation control.	Fluctuating hsCRP , higher inflammatory turnover due to high metabolic activity.
Liver Function & Detoxification	Elevated GGT, AST, ALT , liver congestion and metabolic overload.	Efficient hepatic function, lower oxidative burden.	Balanced liver enzyme function , moderate detoxification demands.	Slightly elevated liver markers , high metabolic demand increasing liver workload.
Kidney Function & Metabolic Clearance	Lower eGFR, higher uric acid , metabolic stress affecting renal function.	Higher eGFR, lower uric acid , efficient renal clearance and metabolic processing.	Moderate eGFR, balanced uric acid , adaptable kidney function.	Variable eGFR, lower uric acid , rapid metabolic turnover but susceptible to dehydration stress.
Mitochondrial Efficiency, Oxidative Stress & Metabolic Flexibility	High uric acid, low adiponectin , poor mitochondrial efficiency and metabolic rigidity.	Higher adiponectin, lower oxidative stress , efficient mitochondrial function.	Moderate uric acid, adaptable oxidative metabolism , able to shift between fuel sources.	Low uric acid, high homocysteine , high oxidative turnover, prone to mitochondrial stress.
Thyroid Function & Metabolic Rate	Low Free T3, impaired fat oxidation , sluggish metabolism.	Higher Free T3, better fat oxidation efficiency , stable metabolic rate.	Balanced Free T3, adaptable metabolic rate , can adjust energy production efficiently.	Fluctuating Free T3, high metabolic demand , increased energy output but risk of catabolic stress.

How This Complements Genetic Testing & Biological Fitness

1. Bridges Genetic Potential with Real-Time Function

• Genetic markers (e.g., PPARG for fat metabolism, APOE for lipid handling, and FTO for obesity risk) indicate predisposition, but this lab panel confirms whether these tendencies have manifested.

2. Identifies Functional Degradation

• Metabolic Archetypes™are influenced by diet and training, and these markers quantify actual degradation versus genetic resilience.

3. Guides Personalized Interventions

• By cross-referencing genetics with current metabolic function, targeted interventions (diet, training, supplementation) can be fine-tuned for each archetype.

4. Tracks Biological Fitness Improvements

• Functional markers like TyG, AIP, hsCRP, adiponectin, eGFR, and indirect calorimetry allow for real-time tracking of metabolic adaptation and fitness progress.

Final Summary

• Genetic testing provides a blueprint of predispositions, but these lab markers reveal real-time metabolic expression.

• Biological fitness (strength, VO2 max, body composition) interacts with these markers to modify or override genetic tendencies.

• Together, these tests allow a precise classification into a metabolic archetype, informing the best dietary and training strategies.

This comprehensive metabolic panel enables precise categorization of Metabolic Archetypes™, offering a real-time view of insulin sensitivity, lipid oxidation, inflammation, oxidative stress, liver function, mitochondrial efficiency, and metabolic rate. By integrating functional markers, genetic predispositions, and biological fitness data, it provides a high-resolution roadmap for metabolic health optimization.