InsideTracker

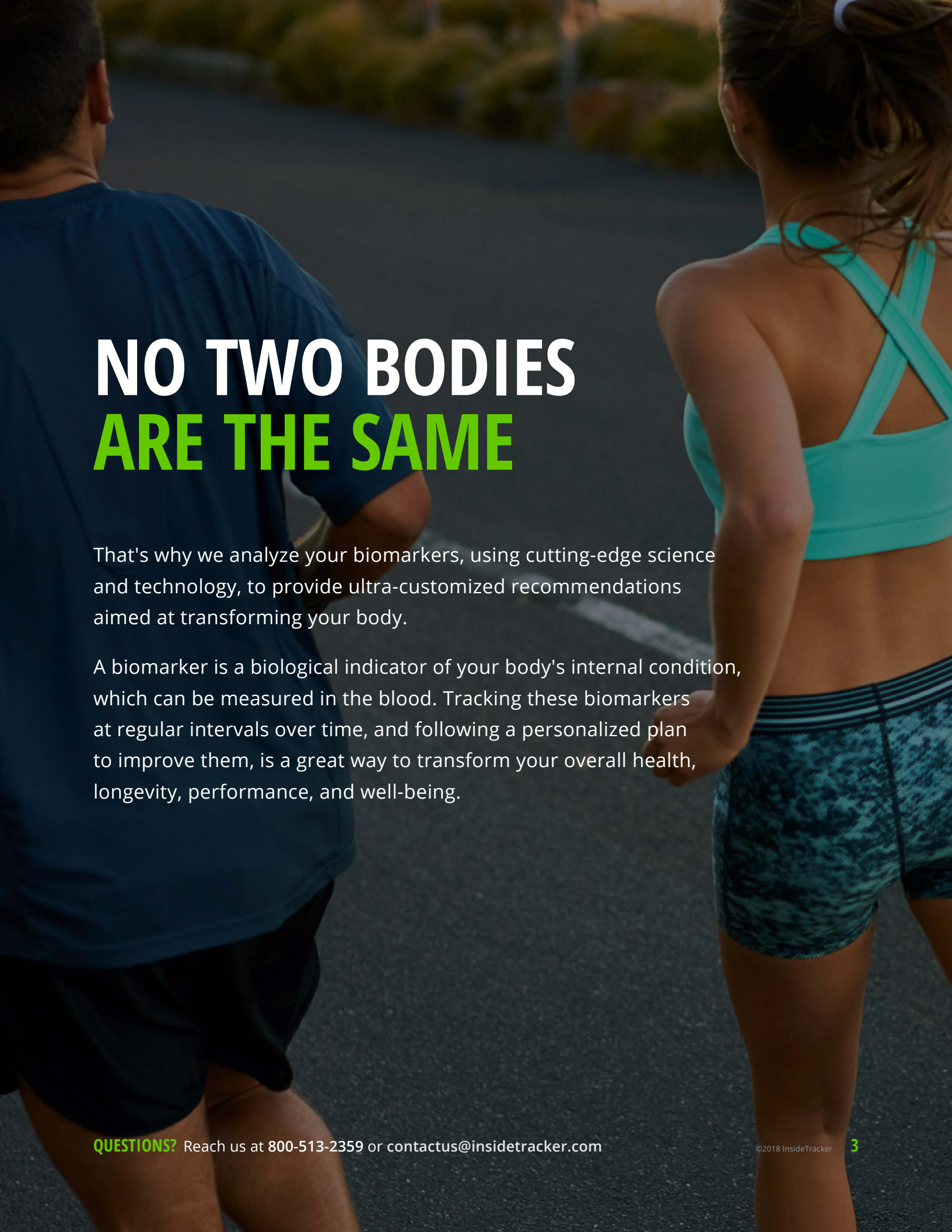
GET TO KNOW YOUR BIOMARKERS

Take a selfie from the inside.

INSIDETRACKER.COM

INSIDETRACKER

We've created this guide for you to use as a handy reference tool, whether you're new to the world of biomarker science or an old pro. The biomarkers we test for are arranged by category based on the systems of the body they affect.



NO TWO BODIES ARE THE SAME

That's why we analyze your biomarkers, using cutting-edge science and technology, to provide ultra-customized recommendations aimed at transforming your body.

A biomarker is a biological indicator of your body's internal condition, which can be measured in the blood. Tracking these biomarkers at regular intervals over time, and following a personalized plan to improve them, is a great way to transform your overall health, longevity, performance, and well-being.

ENERGY & METABOLISM

Boosting your energy levels and managing your metabolism are essential to optimizing overall health and fitness. Key biomarkers provide a snapshot of your metabolism and can give you early warning signs that indicate when your nutrition is not optimal, helping to prevent long-term health risks.

- **Total cholesterol**

  Cholesterol is a waxy, fat-like substance that forms part of every cell in the body. Normal levels of cholesterol are important for maintaining energy, an active metabolism, and a healthy heart and circulatory system. If your body makes more cholesterol than you need, then the excess circulates in the bloodstream and increases your risk of poor cardiovascular health.

- **HDL (high-density lipoproteins)**

  Boosting your energy levels and managing your metabolism are essential to optimizing overall health and fitness. Key biomarkers provide a snapshot of your metabolism and can give you early warning signs that indicate when your nutrition is not optimal, helping to prevent long-term health risks.

- **LDL (low-density lipoproteins)**

  LDL, also known as low-density lipoproteins or "bad" cholesterol, carries cholesterol throughout your body, delivering it to different tissues. Optimal levels of LDL are associated with increased energy, improved metabolism, and better heart health.

ENERGY & METABOLISM

- **Triglycerides**

  Triglycerides are important for maintaining energy, improving metabolism, and promoting heart health. High levels of triglycerides, however, are associated with poor heart health, high fasting glucose, being overweight, and being physically inactive.

- **Glucose**

  Glucose comes from digesting carbohydrates into a chemical that your body can easily convert into energy. Properly regulated glucose gives you more energy, improved blood pressure, and better weight control. If your blood glucose is high, you are more likely to gain weight and your risk of diabetes, high blood pressure, and poor heart health may increase.

"With InsideTracker, I learned which foods help my body prepare for – and recover from – the hardest CrossFit workouts."

JANET SIMMONS, Editor and mom

STRENGTH & ENDURANCE

To perform at your best, both in the gym and at work, you need to have optimal strength and endurance. InsideTracker measures the key biomarkers that contribute to your physical performance.

- **Creatine Kinase (CK)**

  Creatine kinase (CK) is an enzyme in healthy muscle cells that plays a major role in producing energy for the first few seconds of exercise. Strenuous exercise can damage muscle cells, causing CK to leak into the blood. As CK levels increase, the amount of muscle cramping and damage increases. This leads to quicker onset of fatigue, greater injury risk, and slower recovery times.

- **Testosterone**

  Testosterone is a steroid hormone that is essential to health, sexual function, and athletic performance. It's important to have enough testosterone; this hormone helps to build muscle, improves strength, and increases the body's capacity to use oxygen during exercise. Both men and women need testosterone. Women's normal levels are very small, but testosterone is still an important hormone for women.

- **Free Testosterone***

  There are two measures of testosterone: total testosterone, which includes all the testosterone in the body, and free testosterone, which is the testosterone circulating in the blood and available for use. Most of the testosterone in the body is bound to the proteins SHBG and albumin, and is unavailable for use. Higher levels of free testosterone can indicate an increase in metabolism, while lower levels can indicate a decrease in metabolism.

  *This marker is currently measured in men only.

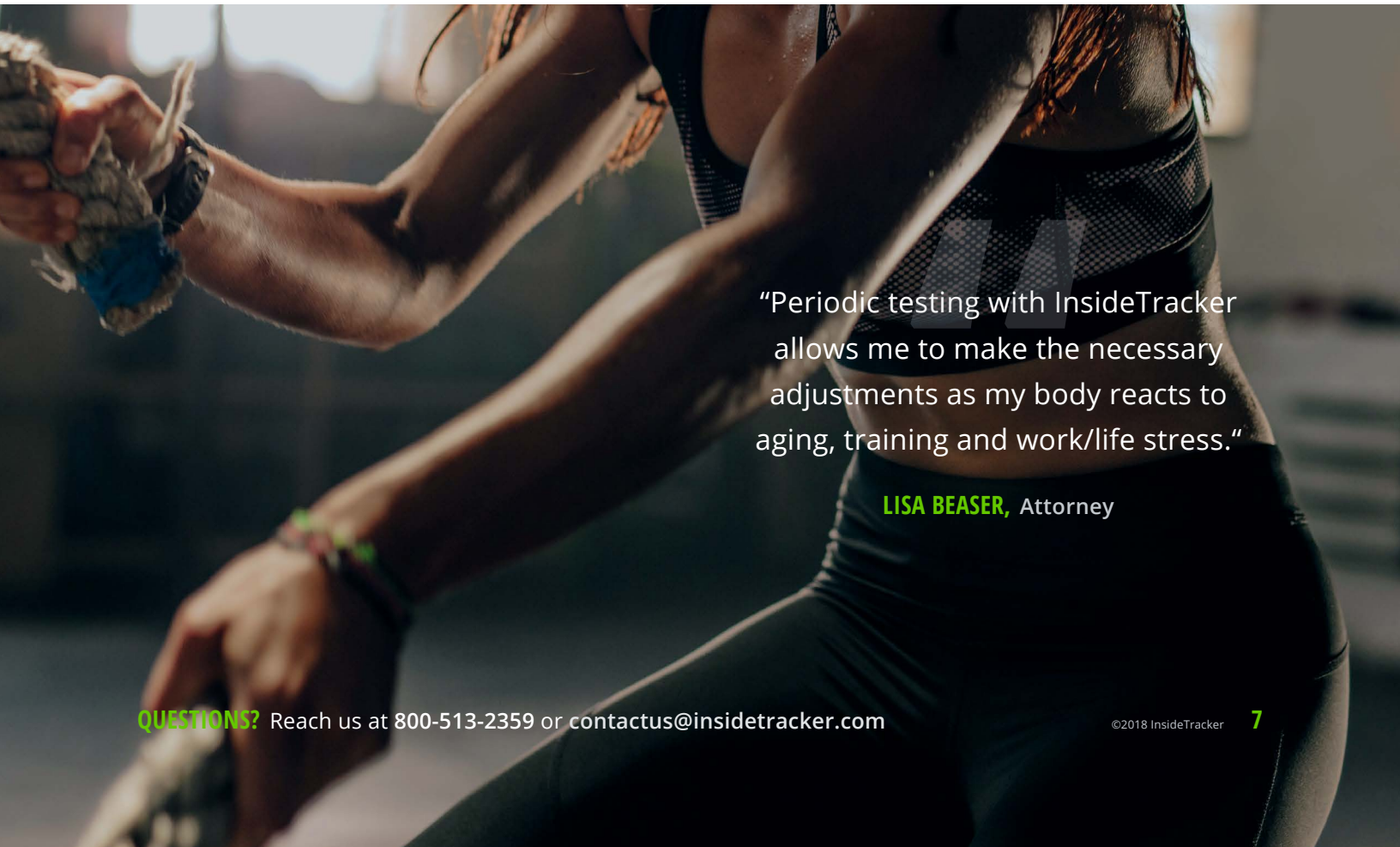
STRENGTH & ENDURANCE

- **Testosterone: Cortisol Ratio**

  This ratio of two key hormones, total testosterone and cortisol, shows whether you are balancing training and recovery to keep your body in an optimal state for increasing muscle mass and strength.

- **Cortisol**

  Cortisol is a steroid hormone that the body releases in response to stress. Your levels of cortisol fluctuate during the day with peak levels in the morning and lower levels at night. Called the stress hormone, cortisol performs important functions such as providing quick spurts of energy, maintaining blood glucose levels, regulating blood pressure, aiding in fat, protein and carbohydrate metabolism, reducing sensitivity to pain, and regulating the immune system.



"Periodic testing with InsideTracker allows me to make the necessary adjustments as my body reacts to aging, training and work/life stress."

LISA BEASER, Attorney

STRENGTH & ENDURANCE

- **SHBG**

  Sex Hormone Binding Globulin (SHBG) is a protein produced primarily in the liver. This protein transports sex hormones, including testosterone, throughout the body. Bioavailability of testosterone is influenced by the level of SHBG. With optimal levels of SHBG, you will have a normal sex drive, strong bones, and a healthy heart.

- **DHEAS**

  Dehydroepiandrosterone-sulfate, or DHEAS, is a hormone precursor made in the adrenal glands from cholesterol. Your body uses DHEAS to make different steroid sex hormones, including estradiol and testosterone. After age 20-30, DHEAS levels decline steadily. Optimal levels of DHEAS are associated with increased energy, better bone and muscle health, a healthier immune system, and good sexual function.

- **Albumin**

  Albumin is a protein made by the liver that transports many molecules through the blood, including testosterone and SHBG. Optimal albumin levels indicate that you're likely consuming a normal amount of protein in your diet and, along with other biomarkers, can provide information on the status of your kidney and/or liver health.

BONE & MUSCLE HEALTH

The strength and health of your bones and muscles depends on two key biomarkers: calcium and Vitamin D. This mineral and vitamin combo work together synergistically to maintain your bone health and build and repair muscle tissue.

- **Vitamin D**

  Vitamin D helps your body to absorb calcium to maintain strong and healthy bones, to fight infections, and to maintain a healthy weight. Your body makes most of the vitamin D you need from sunshine and also absorbs a small amount from food. Low vitamin D can lead to low energy, more stress fractures, increased inflammation, and weaker muscles.

- **Calcium**

  Calcium is essential to your bone health and strength. In addition, you need this mineral for repairing muscle tissue, increasing muscle mass, and maintaining healthy blood pressure. If your calcium is low, you have increased risk of stress fractures and high blood pressure.

"My results over the last 18 months have helped in my rehabilitation from a roadside bomb explosion in Iraq in 2007."

JOSEPH ROBERTS, Retired Master Sergeant, *US Army*

ELECTROLYTE & FLUID BALANCE

Electrolytes are electrically charged ions that perform critical functions in the body. To optimize your fitness and well-being, you need to maintain the balance of electrolytes, including sodium and potassium.

- **Potassium**

  Potassium helps maintain mineral balance in the body. Potassium also plays a critical role in regulating blood pressure, heartbeat, kidney function, calcium levels, and energy use in muscle cells. When potassium is optimal, you will have better endurance, stronger bones, and healthier cholesterol and glucose levels.

- **Sodium**

  Sodium is found in every cell of the body, especially in the fluid outside and between cells. You need sodium to regulate the amount of water both inside and outside cells as well as to maintain mineral balance and blood pressure. If you participate in endurance sports or sweat very heavily during workouts, you need to consume enough sodium to replace the amount you lose through sweat.

"The InsideTracker nutrition suggestions helped me optimize my health and body, and I believe the changes I have made – however slight – will make a notable difference."

BARRY SIFF, President of USA Triathlon

INFLAMMATION

Keeping inflammation low is important for the health of your body. When inflammation is low, you will feel better, stay healthier, improve your performance, and increase your longevity.

- ## hsCRP

  The high sensitivity C-Reactive Protein (hsCRP) test measures CRP, which is a marker of inflammation throughout the body. When the hsCRP test shows optimal levels of CRP, less than 1 mg/dL, the amount of inflammation in the body is very low. Optimal hsCRP levels appear to be an effective predictor of healthy heart, circulatory system, blood pressure, and blood glucose. The hsCRP test is very sensitive to the amount of CRP in the body and therefore a better indicator of inflammation than the ordinary CRP test.

- ## White Blood Cell (WBC) Count

  White blood cells (WBC) are infection fighters in the immune system. Your white blood cell count is an indicator of inflammation throughout the body. The higher your white blood cell count, the more inflammation there is. Knowing your WBC status will help you to maintain your overall health.

- ## CBC White Blood Cell Types

  The CBC, or complete blood count, is a commonly ordered test that can tell you a lot about your overall health and performance. The white blood cell types measured by the CBC are: Neutrophils, lymphocytes, monocytes, basophils, and eosinophils. These white blood cell types play important roles in responding to things like infection, high training loads, emotional or physical stress, as well as allergies. Because they respond to these physical stressors, they also play a role in revealing your overall inflammation levels.

  Learn more about the individual markers in our CBC blog.

OXYGEN & PERFORMANCE

O_2

Iron is an essential component of proteins involved in oxygen transport, and plays a key role in cell growth and differentiation. We measure iron-related biomarkers to give you a comprehensive understanding of the iron in your body, suggesting whether you should adjust your levels for optimal performance and endurance.

- **Hemoglobin**

  Hemoglobin is the iron-containing oxygen-transporter in red blood cells. Its main function is to carry oxygen from the lungs to the muscles and brain. Optimal hemoglobin is critical for peak energy and endurance.

- **Ferritin**

  Ferritin is a protein that stores iron in the body. Iron is essential to produce hemoglobin, the part of your red blood cells that carries oxygen to your muscles and brain. It also plays an important role in the function of your nervous and immune systems.

- **Transferrin Saturation (TS)**

  Transferrin saturation (TS) is your serum iron divided by the total iron-binding capacity, which is the maximum amount of iron that your blood can carry. Transferrin saturation indicates how much iron is actually bound by the protein transferrin. Optimal transferrin saturation is important for maintaining iron balance in your body.

OXYGEN & PERFORMANCE

O_2

- **TIBC**

  Total iron-binding capacity (TIBC) measures the maximum amount of iron your blood can carry. Having optimal TIBC is important for maintaining iron balance in your body.

- **Red Blood Cell (RBC) Count**

  Did you know that red blood cells (RBC) are the most abundant cell type in your blood? They play a critical role in carrying oxygen from your lungs to the tissues throughout your body. A healthy RBC count indicates your body is receiving the oxygen it needs to perform properly.

"At 50, I'm now stronger & more energetic than I was in my 20's. I lift, run and cycle, and InsideTracker is a huge help to keep me on track. I love what you're doing!"

KRISTI WOOD, Retired

OXYGEN & PERFORMANCE

O_2

- ## Serum Iron

  The human body requires iron to perform many vital physiological functions. Iron is the key component of hemoglobin which allows red blood cells to transport oxygen throughout the body. Your body takes in iron from the food you eat so it is important to have good sources of iron in your diet. Only about 10% of the iron you consume is absorbed. The process of iron absorption is tightly regulated because your body does not have any biochemical ways of removing iron. In women, iron is lost through processes such as bleeding, menstruation, and breast-feeding. Additionally, iron within the body is constantly being recycled and reused. When your levels of iron are optimal you will have more energy, be stronger, think better, and have a more resilient immune system.

- ## CBC Red Blood Cell Markers

  The CBC, or complete blood count, is a commonly ordered test that can tell you a lot about your overall health and performance. The red blood cell markers measured by the CBC are: Hematocrit, MCH, MCHC, MCV, RDW, MPV, and platelet count. These markers can provide insight into to your body's ability to properly manage things like oxygen capacity and transportation, physical and cognitive performance, and iron levels.

  Learn more about these individual markers in our CBC blog.

BRAIN & BODY

To perform at your best, your thinking has to be sharp and your memory accurate. By measuring folic acid, magnesium, and vitamin B12, InsideTracker opens a window into your brain function.

- ## Magnesium

  Magnesium plays a role in muscle movement, nerve function, blood pressure regulation, sleep, immunity, and maintaining healthy blood sugar levels. Optimal magnesium also improves muscle strength and increases the time to muscle fatigue during short, intense bursts of exercise. You are likely to sleep better and feel happier when you have optimized magnesium.

- ## RBC Magnesium

  RBC Magnesium measures the amount of magnesium in your red blood cells (RBC). Compared to common method of measuring magnesium in your blood serum, RBC Magnesium is a more sensitive measure of magnesium in the body – because when levels of magnesium in your blood serum decrease, your body compensates by pulling magnesium out of red blood cells to make up for the loss. As a result, magnesium levels will show up as "normal" in your blood serum, even as magnesium levels your the bone and tissue are decreasing. In this way, RBC magnesium is an important and more dynamic indicator of your overall magnesium status.

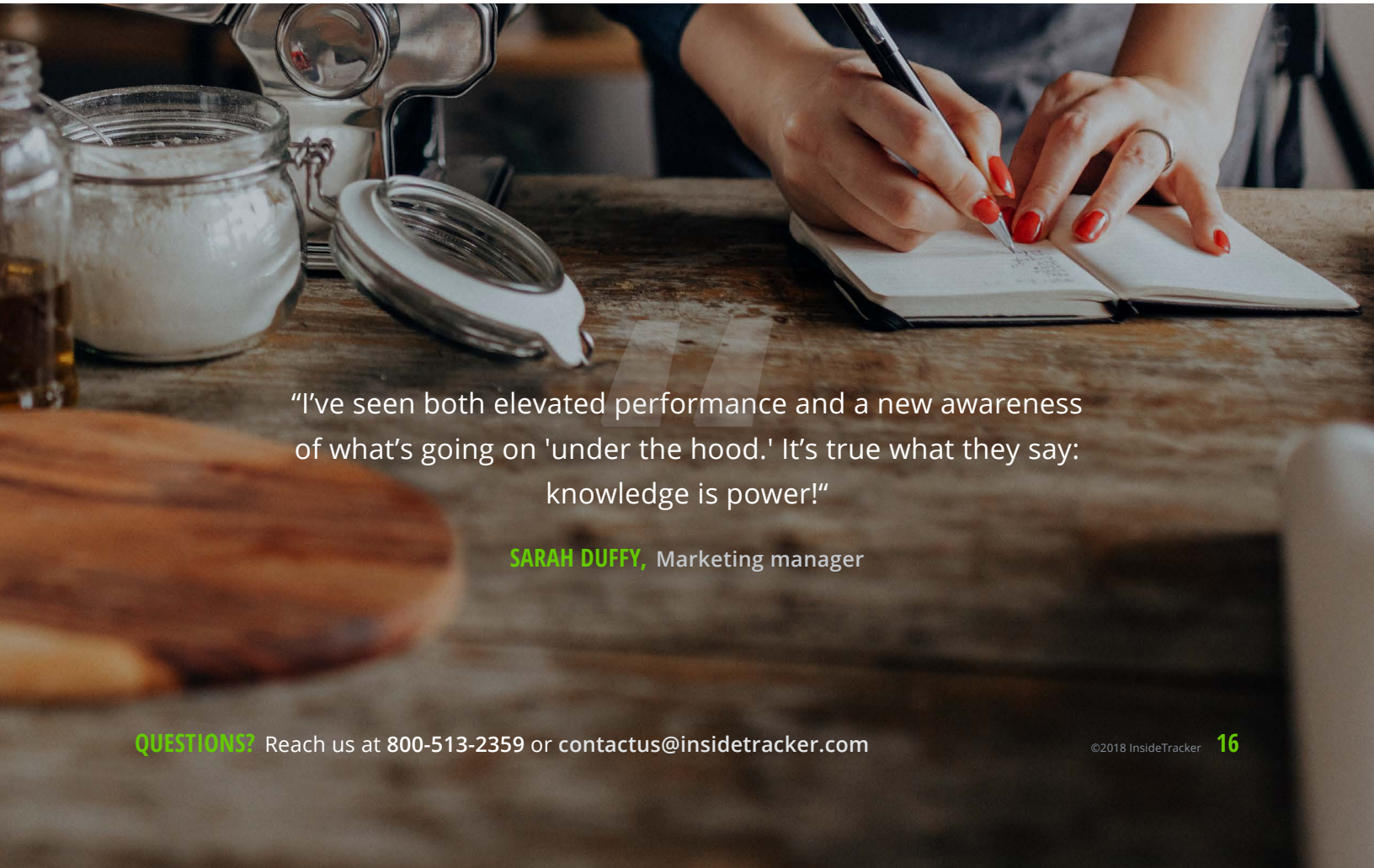
BRAIN & BODY

- ## Vitamin B12

  Vitamin B12 plays a role in the production of red blood cells, as well as in brain and nervous system function. With optimal levels of B12, the brain, heart, and body work at their best. If your vitamin B12 is low, you may become anemic, causing you to feel tired and weak. Low B12 can also cause memory problems. As you age, your body is less effective at absorbing naturally occurring vitamin B12.

- ## Folate (Folic Acid)

  Folate, or folic acid, is a water-soluble vitamin necessary for the production of new red blood cells, as well as making DNA and RNA. It also helps prevent birth defects of a baby's brain and spine. If you don't have enough red blood cells, your body delivers less oxygen to your muscles and is slower to repair muscle tissue after workouts.



"I've seen both elevated performance and a new awareness of what's going on 'under the hood.' It's true what they say: knowledge is power!"

SARAH DUFFY, Marketing manager

LIVER HEALTH

The second-largest organ in your body, your liver filters harmful compounds from your blood, removing fat, alcohol, and other toxins. In addition, the liver controls hormone and blood sugar levels, stores energy from food, and produces proteins, enzymes and bile.

- **ALT**

  ALT is an enzyme primarily found in the liver, that helps chemical reactions occur. It plays a role in changing stored glucose into usable energy. When there is liver damage or disease, then ALT enters the blood stream. There is normally a small amount of ALT in the blood; higher amounts of ALT in the blood typically indicate liver or muscle damage. Your liver processes what you eat and drink into energy and nutrients your body uses and filters out harmful substances from your blood.

- **AST**

  Aspartate Aminotransferase (AST) is an enzyme primarily found in the liver, and also in the heart, muscle tissue, kidneys, brain, and red blood cells. AST helps to metabolize amino acids. While a small amount of AST is normally found in the blood, exercise and liver damage can cause AST elevations. With optimal AST levels you will have more energy, metabolize food more effectively, and recover faster.

- **GGT**

  Gamma-Glutamyl Transpeptidase (GGT) is an enzyme that is concentrated in the liver, and is also found in the bile ducts, pancreas, spleen, and kidneys. GGT helps to transfer amino acids across the cell membrane, and plays an important role in helping the liver metabolize toxins. Elevations of GGT are strongly related to liver damage, much more so than ALT and AST, making it an important biomarker for liver health.

STOP GUESSING.
START IMPROVING.

Put your biomarkers to work. Take your body to the next level with an ultra-personalized nutrition, supplement, and lifestyle plan.

Get started now at InsideTracker.com

InsideTracker

INSIDETRACKER.COM

INSIDETRACKER