



Internal Fitness™ Results

— for —

JANE DOE

Sample and Analysis Information

This test was analyzed at Ixcela, 135 South Rd.,
Bedford, MA 01730

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Client Name

Jane Doe

Client Email

jane.doe@company.com

Ixcela Product

Ixcela Complete

Data Sample Taken

March 1, 2018

Date Sample Received by Lab

March 3, 2018

Sample Received

Dried Blood Spot (DBS)

Welcome to the Ixcela Family

Dear Jane,

Welcome to the Ixcela Family! By taking this test, you are starting to take control of your internal health. We are excited to be your partner on this journey!

In this report you will find the results of your blood sample analysis along with information about your Internal Fitness™ score based on the five dimensions of internal health. These include:



Gastrointestinal Fitness



Immuno Fitness



Emotional Balance



Cognitive Acuity



Energetic Efficiency

In addition, we have provided a personalized eating program and a strength and conditioning program that is custom tailored for you. These have been developed by our team of world-class scientists, nutritionists, and performance coaches. You are receiving the best evidence-based, personalized recommendations available for improving your internal health.

Each of the metabolites Ixcela tests for plays a vital role in determining the levels of the five health categories listed above. A summary of your results, including your overall Internal Fitness™ score and levels of the five categories, can be found in **Your Results** portion of the report on page 1. Additional data and recommendations are included on subsequent pages. You will see your levels of the five health dimensions listed along with the various metabolites that were measured to obtain your score for each category. The ranges for each dimension were determined by using clinical and research-based published data. To get your specific range of values, we cross-compare your results with healthy control samples. If your levels in any of the five categories are out of normal range, please read the attached descriptions of the specific categories and suggestions for nutritional strategies, supplementation, exercise, and beneficial lifestyle modifications that could help to bring your levels back into normal range.

After familiarizing yourself with the five health categories and recommendations in **Your Results**, you will find your personalized eating plan and training programs in **Your Personalized Plans** section of the report. It is important to remember that the nutrition and training recommendations are directed at improving the function of the gut, which will also help to improve your overall health. Ixcela believes that we can get you healthy inside and out. By reducing body fat, increasing your lean muscle and lung capacity, and improving your cardiac function, you will help your body holistically.

We encourage you to take your results to your physician to discuss additional tests that could be performed based on your results. Thank you for being part of the Ixcela family. If you need further assistance in interpreting your results, please email us at support@ixcela.com and one of our scientists will get in touch with you.

Internally yours,



ERIKA EBBEL ANGLE, PH.D.

Dr. Erika Ebbel Angle is the CEO and Co-founder of Ixcela. She is a graduate of M.I.T. and received her Ph.D. in Biochemistry from Boston University School of Medicine.

† Before starting any supplement, dietary, or exercise program, including this one, you should consult your doctor.

Table of Contents



QUICK TIP!
Print out pages
that have this
blue circle.

INTRODUCTION

Welcome to the Ixcela Family	i
Table of Contents	ii

YOUR RESULTS

Your Internal Fitness™ Results Overview	1
Simple Steps to Improve	2
Your Gastrointestinal Fitness Results	3
Your Immuno Fitness Results	5
Your Emotional Balance Results	5
Your Cognitive Acuity Results	7
Your Energetic Efficiency Results	7

YOUR PERSONALIZED PLANS

Overview of Your Personalized Fitness Plan	9
How to Use Your PRT Program	10
Your PRT – Total Body 1 (Weeks 1–4)	13-2
Your PRT – Total Body 2 (Weeks 1–4)	13-2
Your PRT – Total Body 1 (Weeks 5–8)	13-4
Your PRT – Total Body 2 (Weeks 5–8)	13-4
VIIT Conditioning Options	15
HIIT Conditioning Options	15
Work-on Options	16
Overview of Your Personalized Eating Plan	17
Consume These Foods Regularly	18
Consume in Moderation or Avoid	19
Your Personalized Daily Eating Plan	20

IN-DEPTH LOOK AT MINDFULNESS

The Importance of Mindfulness	22
How Your Mind Impacts Gut Health	23
How Sleep Affects Your Overall Health	24
Sleep Hygiene Recommendations	25

IN-DEPTH LOOK AT FITNESS

The Importance of Fitness & Training	27
Conditioning Systems—VIITs & HIITs	28
Training Intensity Guidelines	29
Benefits of Training	30

IN-DEPTH LOOK AT NUTRITION

Macronutrient Groups: Proteins	32
Macronutrient Groups: Fats	34
Macronutrient Groups: Carbohydrates	36

ABOUT THIS TEST & THE METABOLITES

About This Test	40
Learn About the Metabolites	41
References	45

NOTE: Not all the pages are included in this sample report. To view the entire Internal Fitness™ report, click the **Join Now** button at **ixcela.com** to start your new wellness lifestyle!

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INTERNAL FITNESS™

Results

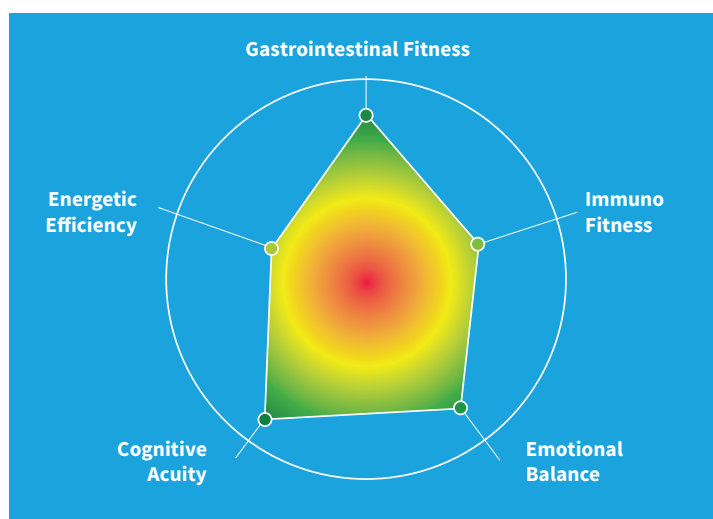
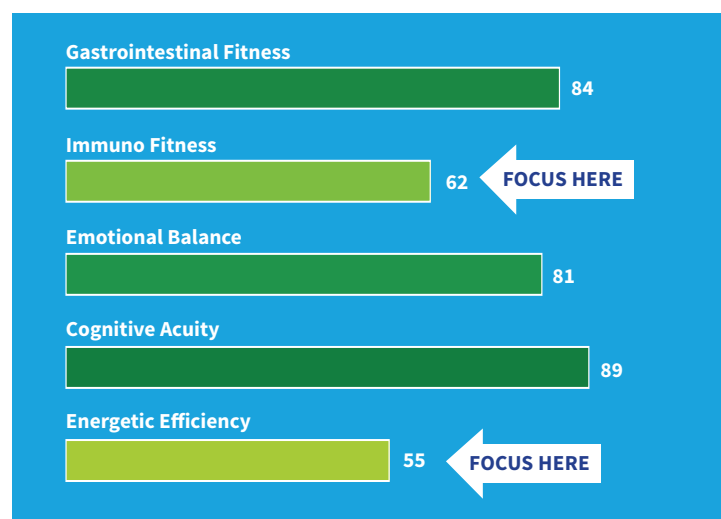
Your Internal Fitness™ Results

PERSONALIZED

Overall Internal Fitness™ Score

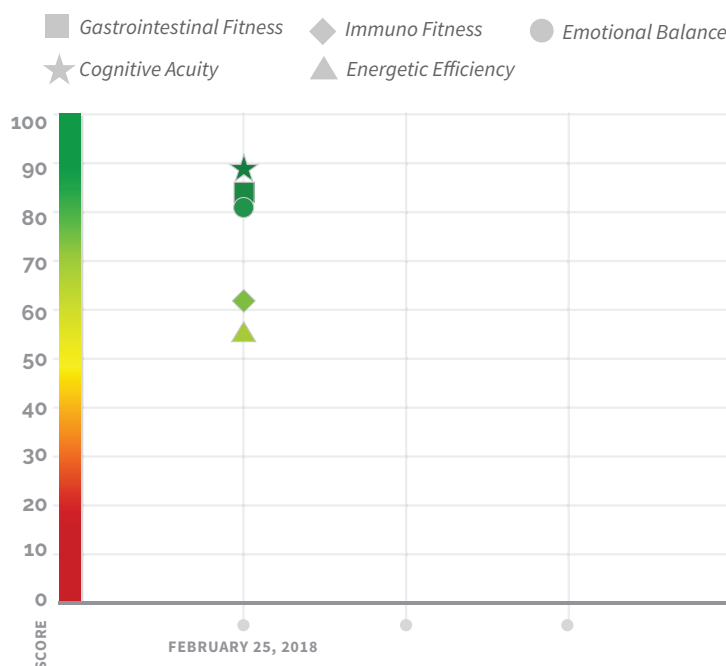


Your **Overall Internal Fitness™** Score is a composite of your five categorical scores: Gastrointestinal Fitness, Immuno Fitness, Emotional Balance, Cognitive Acuity, and Energetic Efficiency, which are all critical to determining your total internal health score. The scoring methodology is based on reviewed literature and data collected here at Ixcela.



- A score above 80 indicates **Excellent** internal health, and your goal should be to **maintain** a score in this range.
- A score of 60–80 is considered **Good**, and suggests generally healthy diet and lifestyle practices with **potential to improve**.
- A score of 40–60 is considered **Moderate**. Your goals should be to improve your internal health and **take active measures** to avoid lowering your score.
- A score of 20–40 is characterized by **Borderline** internal health. We recommend actions that could help **raise your fitness score**, such as modifying diet and lifestyle habits, and participating in physical activities.
- The **Low** category covers scores under 20, and suggests a need to significantly **improve your internal health**. We encourage you to go through the recommendations to increase your scores for each category and monitor your progress through the Ixcela Complete program.

Ixcela Profile History Tracker



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Simple Steps to Improve Your Test Results



Print and display on
your refrigerator.

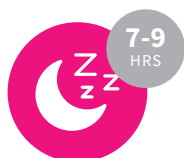
PERSONALIZED

An Overview of Your Eating and Fitness Plans

MIND Focus on daily mental awareness and practice good sleep hygiene.



Meditate
10 minutes
each day



Set sleeping
room temperature
to 64–69°F
(17.8° - 20.6° C)



Minimize
caffeinated
products after
noon



Increase daily
water and fluid
intake depending
on thirst

BODY This is an overview of your weekly schedule for the next 8 weeks. Be sure to print out your PRT program (pages 13-1 – 13-4) to track your performance at the gym. Please refer to pages 14–16 for HIIT, VIIT, and work-on exercises.



Progressive
Resistance
Training (PRT)
twice per week



High-Intensity
Interval Training
(HIIT) once per
week



Varied-Intensity
Interval Training
(VIIT) once per week



Stay active!

MON	TUE	WED	THUR	FRI	SAT	SUN
PRT	HIIT	LIFE	PRT	VIIT	LIFE	RESTORATION
Total body + Work-on 40–60 minutes	High-intensity intervals 20–25 minutes	Walk, hike, golf, cycle 1–4 hours	Total body + Work-on 40–60 minutes	Mod-high-intensity intervals 20–40 minutes	Walk, hike, golf, cycle 1–4 hours	Eat well, repair growth, low stress, low activity

NUTRITION This is an overview of your daily eating schedule for the next 8 weeks. A more detailed version of your personal eating guide is on page 8.



Proteins
3.5 Hands
per day



Fat
6 Thumbs
per day



Low Carbs
6 Fists
per day



High Carbs
2 Cupped-hands
per day

3 MAIN MEALS PER DAY		1 SNACK PER DAY	
	1 Hand = 40 g Protein		1/2 Hand = 20 g Protein
	2 Thumbs = 20 g Fat		0 Thumbs = 0 g Fat
	2 Fists = 30 g Low Carbs		2 Cupped-hands = 40 g High Carbs
	2 Cupped-hands = 0g High Carbs	TOTAL ENERGY = 1620 Kcal/DAY	

SUPPLEMENTS	
A.M.	Ixcela Biome Support x1 per day
	Fish Oil x 4 per day
	Defend x1 per day
	Vitamin D3 per week
P.M.	Night x1 per night
	Rest x1 per night

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Your Gastrointestinal Fitness Results

PERSONALIZED

YOUR SCORE

79 out of 100

PREVIOUS SCORE: NONE

METABOLITES INVOLVED

- 3-Methylxanthine (3MXAN)
- Uric Acid (UA)
- Indole-3-Acetic Acid (IAA)
- Tyrosine (TYR)

To view the entire Internal Fitness™ report,

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What is Gastrointestinal Fitness?

The gastrointestinal (GI) tract is an organ system comprising the esophagus, stomach, and the large and small intestines. The GI tract is responsible for the swallowing and digestion of food, absorption of nutrients, and generation of waste. The GI tract is also home to trillions of microbes known as the gut microbiome, which has been found to play a role in the health of the immune system and regulation of brain function.¹⁻³ GI health and fitness revolves around maintaining the structural integrity of the intestinal wall and maintaining optimal levels of biochemicals and gut microbes. A number of metabolites associated with gut health are measured using the Ixcela Internal Fitness™ test kit, resulting in your *Gastrointestinal Fitness* score.

How to Improve Your Score

MIND

These are recommendations to improve your gut biome and reduce stress which may have a positive impact on your microbiome.

- Meditate for a minimum 10 minutes per day—morning recommended
- Sleep in room 64°–69° F (17.8°–20.6° C)
- Minimize alcohol to two to three times per week

BODY

Focus on doing a consistent exercise program combining both PRT and VIIT.

- **VIIT (Varied-Intensity Interval Training):** Interval based cardiovascular training has been shown to improve bacterial diversity in the gut. A higher diversity of healthy bacteria is directly related to a healthier functioning gut.
- VIIT Example: Exercise at 2–6 minutes at moderate-intensity (can barely hold a conversation) interspersed with 60–90 seconds low-intensity blocks (conversational pace). Two to three times per week for 20–40 minutes.
- **PRT (Progressive Resistance Training):** Following a consistent weekly PRT routine has been shown to significantly reduce external stress such as depression and anxiety. Stress reduction will have a positive effect on your gut and overall health.
- Integrate PRT Two to three times per week with exercises that focus on large muscle groups such as deadlifts, pull ups, shoulder press.

NUTRITION

Aim to consume these foods based on your personalized eating plan macronutrient quantities.

- Purine-rich food sources (e.g., sprouts, broccoli, peppers, liver, anchovies, sardines, scallops, mussels, herring, tuna, peas, mackerel, dried beans, lean wild game meats, animal organs, turkey, poultry, cod, haddock)
- Dairy and eggs
- Fermented foods
- Minimize consumption of standard cut red meats—focus on ends or organs if you desire red meat

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INTERNAL FITNESS™

Personalized Plans

Overview of Your Personalized Fitness Plan



Achieving Your Goals

Your plan is based on the individual fitness profile you completed and the results from your pinprick blood test. Together with the nutritional plan, the fitness plan will help you achieve your fitness goals and **optimize your gut health**.

To make changes in body composition (body fat loss and improved lean muscle mass), you need to commit to a minimum of four key training days per week. The weekly plan covers both progressive resistance training (PRT) sessions and interval-based conditioning sessions (HIIT and VIIT).

Your personalized fitness plan is designed as a two-month training plan. For example, you'll notice that the PRT programs are labeled Weeks 1–4 and Weeks 5–8 (month two training builds on the previous month). We give you the flexibility to choose which VIIT and HIIT exercises you prefer (view the options listed in this report).

YOUR FITNESS PLAN INCLUDES

- A weekly schedule (as shown in the Simple Steps to Improve Your Test Results—page 2)
- PRT programs
- Conditioning programs (VIIT and HIIT)
- Specific work for targeted body areas (Work-ons)



Tip! The fitness programs are most helpful when you take them to the gym to reference during your training session. Be sure to write in your load (weight lifted) and rounds completed so that you can track your performance as you progress through the plan.

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How to Use Your PRT Program

PRT Program Instructions

Your customized progressive resistance training (PRT) plan is divided into four parts. The snapshot of an example PRT program to the right shows these sections. Work your way from the top to the bottom in this order:

- 1 **Preparation:** Complete the *Mobility* exercises and then move on to the *Activation* exercises.
- 2 **Main:** Complete *Couplet #1* and then move on to *Couplet #2*.
- 3 **Work-on:** Complete from top to bottom in order.
- 4 **Finisher:** Complete from top to bottom in order.

1 Preparation

MOBILIZE AND ACTIVATE MUSCLES

Prepare properly before your main strength exercises. It is important to get your body in a state of readiness before lifting. Mobility will release any neural tension from your spine and allow for greater range of motion throughout the dynamic movement patterns. *Activation* means activating the muscles and areas you are about to work-on.



Log into your Ixcela account to see video demonstrations of exercises.

STEP 1: PREPARATION (MOBILIZE AND ACTIVATE MUSCLES)

MOBILITY	ACTIVATION
Cobra x 6 • Open-Close Book x 5 E/S • Cat-Cow x 8 • Thread the Needle x 6 E/S • High Lunge Rotations x 5 Breaths E/S • 4 Point Hip Thrusts x 8	SL BAND Glute Bridge x 12 E/S • DL BAND Glute Bridge x 15 • BAND Sumo Walk x 10 E/S (x2) • SL KB Pick Ups (Ankle) x 8 E/S

STEP 2: MAIN (STRENGTH TRAINING SECTION)

Date: _____											
Body weights											
EXERCISE		REST	SET	REPS	LOAD	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
COUPLET #1	BB Back Squat	0 min	1	10			10		10		10
			2	8			8		8		8
			3	6			6		6		6
			4	4			4		4		4
COUPLET #2	Walking Lunge (Weighted)	2 min	1	20		20		20		20	
			2	20		20		20		20	
			3	20		20		20		20	
			4	20		20		20		20	
Upper Mobility											
COUPLET #3	BB Incline Bench Press	0 min	1	10			10		10		10
			2	8			8		8		8
			3	6			6		6		6
			4	4			4		4		4
COUPLET #4	DB SA Bent Over Row	0 min	1	10			10		10		10
			2	8			8		8		8
			3	6			6		6		6
			4	4			4		4		4
Lower Stability											

STEP 3: WORK ON (TARGETED BODY PART)

GLUTE CIRCUIT #1 - (BAND + BODYWEIGHT EXERCISES)											
20 x DL Band Hip Thrusts Floor											
10/20 x Band Crab Walks L/R (x2)											
20 x Walking Lunges											
10/10 x Band Monster Walks FB (x2)											
20 x DL Band Hip Thrusts Floor											
30 sec REST											
x 2-3 Rounds											
WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12

STEP 4: FINISHER (CARDIO BLAST)

HIIT CIRCUIT #1 - 2 MINUTE ROUNDS											
2 min Run (or other Cardio option) Hard on Treadmill (RPE 7-8)											
30 sec KB Swings											
30 sec REST											
x 2-3 Rounds (Begin rounds every 2 minutes)											
WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12

PREPARATION EXERCISES

MOBILITY	ACTIVATION
Cobra x 6	SL BAND Glute Bridge x 12 E/S
Open-Close Book x 5 E/S	DL BAND Glute Bridge x 15
Cat-Cow x 8	BAND Sumo Walk x 10 E/S (x2)
Thread The Needle x 6 E/S	SL KB Pick Ups (Ankle) x 8 E/S
Yoga Lunge-Rotation x 5 Breaths E/S	
4 Point Hip Thrusts x 8	

TERMINOLOGY AND ABBREVIATIONS USED IN TRAINING PLANS

BB	Barbell	SET	Groups reps together	SA	Single arm	L/R	Left/right
DB	Dumbbell	REP	Number of movements	DA	Double arm	F/B	Forward/back
KB	Kettlebell	REST	Recovery between sets	DL	Double leg	E/S	Each side
MB	Medicine ball	LOAD	Actual weight lifted	SL	Single leg	E/L	Each leg
GB	Gym ball	ISO	Static hold	ALT	Alternating legs or arms	T2B	Toe to bar
WB	Wall ball	BAND	Resistance bands	SPM	Strikes per minute	BOR	Bent over row

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About the PRT Main Section

2 MAIN

STRENGTH TRAINING SECTION

This is a quick overview of how to interpret the MAIN section of the PRT program.

SETS

A set is how many times you complete each exercise. **Barbell back squat** has four sets and **walking lunge** only has three sets. Complete Set 1 of the barbell back squat, Set 1 of the walking lunge, and then rest. After resting for two minutes, complete Set 2 of the barbell back squat, Set 2 of the walking lunge, and then rest for two minutes. Repeat.

REPS & LOAD

The PRT program is a four-week program. Under each week, you will see categories for reps and load. These correlate to how many times you repeat the exercise listed (reps) and how much weight you lift for one rep (load).

The reps are indicated in your program for each set. Be as accurate as possible with the reps and load selection. These numbers affect how your PRT program progresses over your training block. Remember: trust the plan!

COUPLETS

In the PRT Main Section, there are two exercises together. This is called a couplet. In the example on the right, this couplet is barbell back squat and walking lunge.

Complete the first exercise listed (barbell back squat) and then go immediately into the walking lunge. Rest for the time indicated after the last exercise (two minutes) before repeating the couplet for the second set.

UPPER MOBILITY AND LOWER STABILITY

Make constructive use of the rest period by working on any mobility issues or imbalances you may have by stretching.



Your program is also your recording sheet. Under the **LOAD** column, record the weight that you are lifting for each completed set/reps. For example, SET 1 of BB Back Squat, 135lbs was lifted 10 times.

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Overview of Your Personalized Eating Plan



About Your Eating Plan

This is not a diet program. This plan will help you shift your approach to food. You will learn an evidence-based approach to nutrition that is backed by science. By knowing and understanding why, what, how, and when the various components of nutrition work, you will succeed in changing your gut profile, waistline, and, most importantly, your overall health. It is critical to grasp the basics of nutrition and the science behind the principles of Ixcela that are outlined here.

Your eating plan is based on your test results and the individual health profile that you completed. This forms the basis for food recommendations and the total energy intake you require.

If you need clarification about this information, just email us (nutrition@ixcela.com). We are available to answer any questions you may have.

What's the Best Nutrition Plan for *You*?

The recommendations we provide for your diet are related to the metabolites we have analyzed in your blood and information from scientific, evidence-based studies. This information allows us to provide the best approach to your nutrition. From epidemiological studies, controlled trials, and case reports it is just as important to include as it is to exclude certain aspects of nutrition in order to improve your health.

Our modern way of life has resulted in reduced intake of vegetables and high-quality fats and protein. Modern diet presents us with large quantities of foods containing refined carbohydrates, sugars, heavy processing, chemicals, and additives that are harmful not only to your waistline but also your gut. The goal is to change your habits, which will work to improve your gut function and general health while also improving your body composition.

DAILY



WEEKLY



MODERATION



AVOID



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CONSUME DAILY

The following types of food should be consumed on a regular basis. Choose at least one option from each column (protein/fats/low carb/high carb/others) for each meal every day. Individuals should avoid foods to which they are allergic or intolerant.



CONSUME AT LEAST ONE OPTION FROM EACH COLUMN IN EACH MEAL EVERY DAY				
PROTEINS	FATS	LOW CARB	HIGH CARB	OTHERS

CONSUME WEEKLY

It is also important to include the following types of foods in your weekly routine. These **do not have to be consumed every day**. Aim for two–four times per week. Use your personalized eating plan to determine amounts of protein/fats/low carb/high carb/others you require based on your hand, thumb, cupped hand, and fist sizing guide.



CONSUME IN MEALS 2–4 TIMES PER WEEK				
PROTEINS	FATS	LOW CARB	HIGH CARB	OTHERS

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IN-DEPTH LOOK AT

Mindfulness

The Importance of Mindfulness



Lifestyle and Mindfulness Background

The mind plays an important role in your overall health. Ultimately, the mind controls many of the fundamental processes critical to internal health. Our goal is to help you learn how to harness and build some of the mental skills that will allow you to get the most benefit from our lifestyle modification recommendations. Lifestyle encompasses exercise, nutrition, stress management, sleep, and mindfulness. The information below explains these interactions and provides you with practical ways in which to make positive change.

The Gut-Brain Axis

The gut-brain axis (GBA) has recently gained more attention due to its emerging importance in health. The GBA is a complex set of interconnected pathways that link the gut to the nervous system. It is now clear that the brain receives continual messages from the gut, processes this information along with information received from the environment, and then sends messages back to the gut.

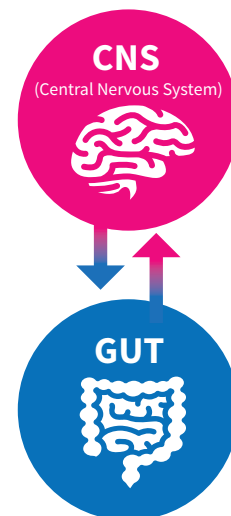
For most people, these messages are undetectable. However, for people with gut disorders, this communication can result in recurrent discomfort such as that experienced with irritable bowel syndrome (IBS), autoimmune-related changes in celiac disease, and the inflammation associated with inflammatory bowel disease (e.g., Crohn's disease and ulcerative colitis)⁵⁴. These are just a few examples of gut dysbiosis. The consequences are very similar, with the result being significant negative psychological and social dysfunction. This all results in a negative impact on an individual's life.

Regardless of whether you are affected by a GI disorder, the GBA plays an important role in your health. A growing body of evidence supports the concept that gut microbiota influences emotional behavior along with cognition, and that its products (metabolites) promote metabolic effects such as reduced body weight, reduced adiposity, and improved glucose control^{55, 56}.

HOW THE GUT AND BRAIN ARE CONNECTED

Neural Communication

Vagus, DRG, ENS-Sympathetic, Parasympathetic



Bacterial Factors, Cytokines, Hormones

Humoral Communication

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Emotional Behavior and Cognition (Memory & Learning)

Emotional behavior and cognition can be influenced by the gut through serotonin, tryptophan, and kynureline. A lesser-known fact is that serotonin is produced primarily in the gut, not in the brain.⁵⁶ It accounts for the majority of the body's serotonin.⁵⁷ Tryptophan is an essential amino acid found in many protein-based foods and dietary proteins including meats, dairy, fruits, and seeds.⁵⁸ Tryptophan has been shown to have a direct effect on sleep quality, producing an increase in rated subjective sleepiness, and a decrease in total wakefulness. This improved quality of sleep is associated with an improvement in cognitive acuity, improved morning alertness, and improved attention.⁵⁹⁻⁶¹ Maintaining adequate tryptophan levels are important to follow the dietary and sleep hygiene recommendations to increase this particular metabolite.

Another interesting and recent discovery about our gut has revealed that bacteria play a role in our cravings for particular foods. The foods we eat provide certain bacteria with specific fuel that they require. These foods can either enhance the growth of specific bacterial species or suppress their competition. This explains why we tend to eat certain foods that we are used to eating, whether they are good for us or not. The exciting news for you is that your gut bacteria are easily manipulated through prebiotics (indigestible fibers), probiotics, exercise, and alterations to your diet. It is important to remember that you are ultimately in control of your gut bacteria.^{62,63}

Meditation

It is now widely recognized that stress can adversely affect your gut microbiome. Normal, healthy gut bacteria produce molecules called *short-chain fatty acids* (SCFAs) that exert anti-inflammatory and anti-tumor effects on the body. When chronic stress is exerted on the body, it results in an altered gut function that affects the regulation of these molecules. Evidence now supports meditation/yoga as a means to regulate this stress response and assist in suppressing chronic inflammation.^{64,65} If we have recommended meditation as part of your program, we suggest starting with ten minutes every day. You may find it useful to use an app to guide you through the practice too. We recommend the apps Holistrio, Headspace, or Simply Being. It is important to remember that it is called *meditation practice* and not *meditation perfect* because it is all about improving. It may seem awkward at first, but stick with it!

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IN-DEPTH LOOK AT

Fitness

The Importance of Fitness & Training



To view the entire
Internal Fitness™ report,

Your Fitness Journey

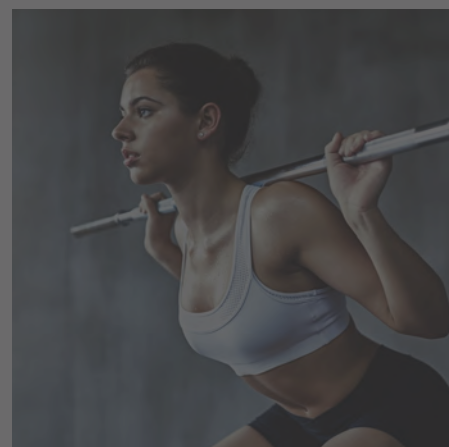
Starting on page 16-1, we provided you with your personalized fitness plan. We encourage you to treat this not just as a stand-alone exercise, but as part of your journey. Your training plan, nutritional plan, and lifestyle recommendations, will empower you to begin optimizing your internal health. These three pillars—mind, body, and nutrition—are the foundation on which you will build strong internal health.

A progressive resistance training plan is a key component of this plan. This plan will help you develop consistent habits by achieving goals and milestones along the way. The bigger picture is helping you to improve your overall lifestyle. You know what they say: health is wealth! Your goals should be to lose weight, gain muscle, or improve your endurance. These are by-products of having a plan to start a long-term lifestyle journey.

Along your journey you will learn:

- The art of progressive resistance training, and how functional strength training translates to movements in everyday life
- Exercises, movement skill, and how to improve imbalances
- Progressive Resistance Training (PRT) is not just about being strong. It is one of the best training systems to make positive body composition changes.
- Short- and higher-intensity interval training is the most effective and efficient way to strip body fat and improve cardiovascular fitness.

Ultimately, you will learn **consistency**. To make positive changes to your habits, achieve your goals, and optimize your lifestyle, you must consistently follow a progressive training and nutritional plan. Trusting Ixcela's personalized nutrition, fitness, and lifestyle plan will empower you!



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Learn About the Ixcela Supplements



Ixcela Biome Support *Probiotic + Prebiotic (FOS and Inulin)*

OUR PROBIOTIC (Dosage = x1/day in a.m.)

Internal Health Benefits: Probiotics consist of live, beneficial bacterial microorganisms that can help repopulate the gut microbiome, especially after insult from antibiotics, stress, or poor diet. Ideally, probiotics consist of a variety of different families (strains) of bacteria and/or yeasts. It is also important to have enough of these bacteria, at least 25 billion colony forming units (CFU) is recommended.

OUR PREBIOTIC (FOS AND INULIN)

Internal Health Benefits: Prebiotics serve as a “food” for bacteria and can help them to grow and thrive. The human body is not capable of digesting these fibers; however, bacteria can use the fibers as a substrate (food source) to live on. These same fibers can also assist in keeping bowels regular.



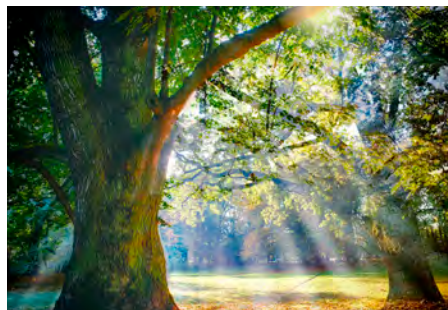
Ixcela Balance *5-HTP + Vitamin B6*

5-HTP (Dosage = x1/night in p.m.)

Internal Health Benefits: 5-Hydroxytryptophan (5-HTP) may assist with emotional health, occasional sleep disturbances, and muscle aggravation. 5-HTP is an amino acid that converts to serotonin in the human body. Serotonin acts as a neurotransmitter, which assists to relay signals from one part of the brain to another.

VITAMIN B6

Internal Health Benefits: Vitamin B6 is necessary for the proper function of the nervous system and immune health. It is involved in the formation of hemoglobin in red blood cells. Studies have shown vitamin B6 supports synthesis of neurotransmitters such as dopamine and serotonin, and is critical to myelin formation. Vitamin B6 assists in the conversion of tryptophan to niacin.



Ixcela Rest

L-TRYPTOPHAN (Dosage = x1/night in p.m.)

Internal Health Benefits: L-Tryptophan can help to support relaxation and restful sleep. L-Tryptophan plays a role in the synthesis of serotonin and melatonin, as well as in hormones involved with mood, stress response, and sleep. L-Tryptophan is also a precursor to kynurenine, which plays a role in raising general immunity.



Ixcela Night

MELATONIN (Dosage = x1/night in p.m.)

Internal Health Benefits: Melatonin is well documented to be involved in the body's circadian rhythm and sleep cycle, as well as regulating a variety of body functions. Melatonin is secreted by the pineal gland in response to darkness. It helps tell the brain when to sleep, but does not increase the need for sleep. Normal production peaks around midnight and gradually tapers off by morning. Natural production of melatonin decreases with age.

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Learn About the Ixcela Supplements



Ixcela Protect *NAC (N-Acetyl-L-Cysteine) + L-Methionine + Selenium*

NAC (N-ACETYL-L-CYSTEINE) (Dosage = x1/day in a.m.)

Internal Health Benefits: NAC is a powerful antioxidant used by the liver and lymphocytes to help detoxify the body. NAC also boosts protective enzymes in the body. NAC is also known to inhibit the growth of H. pylori.

L-METHIONINE

Internal Health Benefits: L-Methionine may promote healthy growth and metabolism. It also supports the creation of certain neurotransmitters (dopamine, serotonin, and melatonin). L-Methionine is an essential amino acid, which means that it cannot be manufactured by the body. It must be obtained through diet or supplementation. L-Methionine supports the production of the cellular antioxidant, glutathione, and thereby assists in the detoxification processes.

SELENIUM

Internal Health Benefits: Selenium is an important free-radical scavenger. It supports the health of the thyroid gland and helps a number of antioxidant enzyme systems in the body. Selenium is a trace mineral found in soil and water. It is also found in certain foods like Brazil nuts, yeast, whole grains, and seafood.



Ixcela Defend *Vitamin C + Zinc*

VITAMIN C (Dosage = x1/day in a.m.)

Internal Health Benefits: Vitamin C is a strong antioxidant that is believed to support immune system health. We need vitamin C (a strong antioxidant) for the growth and repair of tissues. It is involved in the absorption of iron and the formation of collagen. It also assists in the maintenance of cartilage, bones, and teeth.

ZINC

Internal Health Benefits: It supports normal growth and development, is required in the catalytic activity of dozens of enzymes, and plays a role in wound healing, cell division, protein and DNA synthesis, and immune function. Zinc is an essential trace mineral that is naturally present in some foods



Ixcela Power

VITAMIN B COMPLEX (Dosage = x1/day in a.m.)

Internal Health Benefits: B vitamins are essential vitamins needed for the conversion of cellular energy, the manufacturing of hormones and proteins, and the repair and maintenance of nerve structures.



Ixcela Build

BRANCH CHAIN AMINO ACIDS (BCAA) + LEUCINE + ISOLEUCINE + VALINE (Dosage = x1/day in a.m.)

Internal Health Benefits: These three BCAA are among the nine essential amino acids necessary for humans. These three amino acids account for 35% of the essential amino acids in muscle proteins and 40% of the amino acids required by mammals. The three BCAA may help counterbalance excessively high tryptophan and tyrosine diets. They may also assist in building muscle mass and increasing energy.

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IN-DEPTH LOOK AT

Nutrition

Macronutrient Groups: Proteins

Proteins

WHAT KINDS AND HOW MUCH SHOULD I EAT?

To view the entire Internal Fitness™ report, click the **Join Now** button at **ixcela.com** to start your new wellness lifestyle!

EXCELLENT	GREAT	IF YOU MUST	NO GO/CHEAT
Skinless chicken	Lean ground beef	Spiced ribs	Ground beef
Turkey	Pork chops	Lean ground beef	Fried chicken
Skinless whitefish	Shellfish	Pork (fatty cuts)	Hamburgers
Game	Bacon medallions/back	Streaky bacon	
Bison/buffalo	Beef (lean, trimmed)	Minced beef/turkey/chicken <75% lean	
Protein supplements: whey isolate/casein	Minced beef/turkey/chicken >= 85% lean	Pork ribs	
Low-fat dairy	Pork (rindless bacon)	Flavored milk	
Egg whites	Protein supplements: soy protein isolate	Protein supplements: pea/hemp	
Whole eggs, ideally free-range/omega-3 eggs	Beef (marbled)	Quinoa	
Oily fish: Salmon, sardines, herring, kipper (*with or without skin)	Lamb	Buckwheat	
Greek yogurt 0% fat (check sugar content)	Full-fat dairy	Peanut butter	
	Chicken/turkey		
	Shish kebab		
	Whitefish with skin		
	Beef ribs		

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ABOUT THIS TEST & THE

Metabolites

About This Test



Sample and Analysis Information

Test was analyzed at Ixcela, 135 South Rd., Bedford, MA 01730.

About this Test

Maintaining a healthy gut microbial population is critical for staying healthy. We call this **internal health**. Imbalance in the gut microbial population is called **dysbiosis**. Maintaining a healthy balance in the gut is a sophisticated approach to wellness that has recently been bolstered by novel research and diagnostic tools. Ixcela has identified important gut microbial metabolites that are detectable in blood. The tests we have developed to assess these metabolites can help to describe an individual's **Gastrointestinal Fitness, Immuno Fitness, Emotional Balance, Cognitive Acuity, and Energetic Efficiency**.

We use our proprietary method combined with highly sensitive detection protocols to analyze samples. This allows us to provide a unique snapshot of the health of an individual by examining specific metabolite levels in the blood samples provided.

Your Ixcela Internal Fitness™ Profile provides you with actionable information about the status of your gut microbiome and, by extension, your internal health.



Overview of the Test Procedure

1. Blood sample is received at the lab and logged.
2. Ixcela calculates the volume of the sample using specially developed imaging technology.
3. The sample is processed using Ixcela proprietary procedures to extract the metabolites.
4. The sample is analyzed on a 16-channel electrochemical platform (modified CoulArray™) that was developed by scientists at Ixcela.
5. We use specialized data-analysis software to get the most accurate results, requiring a small drop of blood.
6. The results are available through an online portal.



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Learn About the Metabolites

Indole-3-Propionic Acid (IPA)

- Indole-3-Propionic Acid (IPA) has been associated with brain, kidney, and heart health.*
- IPA is produced in the human gut exclusively by one particular species of gut bacteria (*Clostridium sporogenes*) from tryptophan.²⁷ Thus, IPA is a critical marker for a healthy gut microbiome.
- IPA is considered one of the strongest antioxidants identified.* IPA has been shown to play an important role in brain health.²⁸
- IPA plays a crucial role in maintaining a healthy gut by strengthening the tight junctions (contact) between cells lining the gut.²⁸ This is important for maintaining intestinal structural integrity, and decreasing intestinal permeability.
- IPA can be found in some sprouted seeds, such as mung beans and chickpeas.



Indole-3-Lactic Acid (ILA)

- Indole-3-lactic acid (ILA) is linked with the formation of downstream metabolites such as indole-3-propionic acid (IPA).
- ILA is a tryptophan metabolite and precursor to indole-3-propionic acid (IPA).²⁹
- The tryptophan pathway is heavily involved in the creation of neurotransmitters and antioxidants that are important to healthy brain and gut function.
- ILA is found in fermented veggies such as kimchi, sauerkraut, pickles, and kefir.



Indole-3-Acetic Acid (IAA)

- Indole-3-acetic acid (IAA) is a precursor to other metabolites in the tryptophan branch, specifically indole-3-propionic acid (IPA). The tryptophan pathway is heavily involved in the creation of neurotransmitters (such as serotonin) and antioxidants that are important for healthy brain and intestinal function.*
- Proper levels of IAA maintain healthy levels of the beneficial *Lactobacillus* species of gut bacteria, which converts sugars such as glucose and fructose to lactic acid.³⁰
- IAA can be produced from indole-3 pyruvate, which is a precursor to indole-3-propionic acid.
- IAA is an auxin (growth hormone) produced in plants.
- IAA has been shown to possess antioxidant activity.³¹



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About the Metabolites (Continued)

Tryptophan (TRP)

- Tryptophan levels are linked to the ability to fall asleep and to muscle health. Tryptophan has been linked to mood and is important for emotional well-being.*
- Tryptophan is obtained mainly through one's diet. Certain gut bacteria are also capable of making tryptophan.
- Tryptophan is an amino acid. Amino acids are building blocks for proteins that are essential for maintaining a healthy body.*
- Tryptophan is the precursor to many important metabolites: kynurenine, serotonin, and indole-3-propionic acid.
- Tryptophan can cross the blood-brain barrier, making it available to produce important neurotransmitters like serotonin³² which are essential for normal brain processes that affect mood, behavior, memory, and learning.*³³
- Tryptophan is found in foods such as cruciferous vegetables, bananas, eggs, and meat.



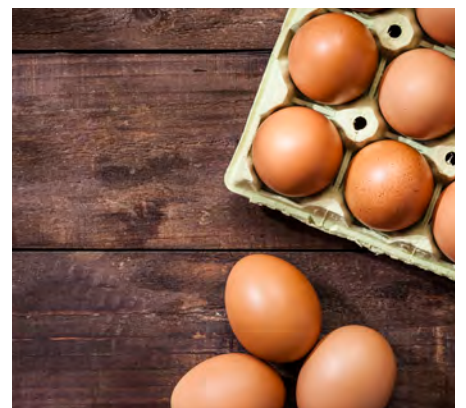
Serotonin (SER)

- Serotonin is linked to the ability to fall asleep, muscle health, brain health, and gut health.³⁴
- Serotonin is a tryptophan metabolite. Serotonin synthesis is facilitated by the adequate presence of vitamins B1, B3, B6, and folic acid. The tryptophan pathway is heavily involved in the creation of neurotransmitters (such as serotonin) and antioxidants that are important to healthy brain and gut function.*
- Serotonin is one of the most important signaling molecules within the gut, where it plays a pivotal role in initiating secretions (mucosal) and motor reflexes (the movement of the intestine),³⁵ and is crucial for normal functionality of the central nervous system.*



Kynurenine (KYN)

- Kynurenine is linked with levels of downstream metabolites (kynurenic acid) and vitamin B3. Kynurenine has been linked with energy levels and gut health. Kynurenine production is mediated by vitamin B6, selenium and sulfur amino acids.
- Kynurenine is used in the production of niacin (vitamin B3). Niacin is considered to be one of the essential human nutrients where it helps maintain integrity of DNA.*
- Kynurenine is a metabolite of tryptophan. Its primary function is to dilate blood vessels.* It is also a regulator of the immune system.*³⁶⁻³⁷
- Kynurenine is utilized by the endocrine system to produce certain hormones.*
- Kynurenic acid, a metabolite of kynurenine, is a neuroprotective agent in the brain.*³⁸
- Kynurenine in the eye filters UV radiation.*
- Kynurenine can be found in meat, cheese, cruciferous vegetables, bananas, plums, and kiwi.



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About the Metabolites (Continued)

Total Indoxyl Sulfate (IDS)

- Indoxyl sulfate (IDS) is linked to oxidative stress in numerous cell types including: vascular smooth muscle cells, endothelial cells, and bone cells.³⁹
- IDS is a metabolite of tryptophan and is absorbed into the blood from the liver. IDS has been associated with kidney and heart health.³⁹



Tyrosine (TYR)

- Tyrosine is linked to gut and brain health.^{5,40,41}
- Tyrosine is a nonessential amino acid, which means that an individual can synthesize it from another amino acid, phenylalanine.
- Tyrosine functions as a building block for several important neurotransmitters, such as dopamine, epinephrine, and norepinephrine. Neurotransmitters regulate mood, behavior, and general feelings of well-being.*
- Tyrosine is essential for the thyroid gland to produce hormones T3 and T4 (which regulate growth, metabolism, body temperature, and heart rate).^{*41,42}
- Tyrosine is also an important amino acid for the pituitary gland. The pituitary gland, like the thyroid gland, controls metabolism and growth; additionally, it regulates sexual maturation, reproduction, blood pressure, and many other vital physical processes.^{*41,43}
- Tyrosine is also necessary for cell division.^{*44,45}
- Tyrosine is present in almost every protein in the body.⁴¹
- Tyrosine can be found in soy, meat, cheese, nuts, and seeds.



Xanthine (XAN)

- Xanthine plays a role in inducing digestive enzymes. Xanthine levels are linked to heart rate and heart health.⁴⁶
- Xanthine is a metabolite of the purine pathway and functions in the digestive tract to induce hydrochloric acid production and promote secretion of pepsin from cells lining the stomach. Both of these processes help to break down consumed food.^{*47}
- Xanthine is a mild stimulant and is found in coffee, cola, and green tea.*



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About the Metabolites (Continued)

3-Methylxanthine (3MXAN)

- Metabolites of the purine pathway are significant because they affect both the gut and the brain. In the gut, 3-Methylxanthine (3MXAN) increases hydrochloric acid and pepsin secretion, which aid in digestion.* Purines are key components of cellular energy systems (e.g., ATP and NAD), cellular signaling, and, along with pyrimidines, are involved in RNA and DNA production.*⁴⁷
- 3MXAN levels are linked to caffeine intake.
- 3MXAN is a purine metabolism-breakdown product in caffeine and theophylline.⁴⁹



Uric Acid (UA)

- Uric acid is a final product of purine metabolism. Metabolites of the purine pathway are important because they affect both the gut and the brain. In the gut, uric acid increases hydrochloric acid and pepsin secretion, aiding in digestion.* Purines are key components of cellular energy systems (e.g., ATP and NAD), cellular signaling, and, along with pyrimidines, are involved in RNA and DNA production.*⁴⁸
- Uric acid levels are correlated with hydration and purine levels in the diet. Approximately 1/3 of purines are derived from food. The majority of uric acid is dissolved in the blood, filtered through the kidneys, and expelled in the urine.
- Fructose tolerance is linked to uric acid levels.
- Uric acid may be a marker of oxidative stress.⁵⁰
- Uric Acid is found in cherries, blueberries, and apple cider vinegar.



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* These statements have not been evaluated by the FDA. These products are not intended to diagnose, treat, cure, or prevent any disease.

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