

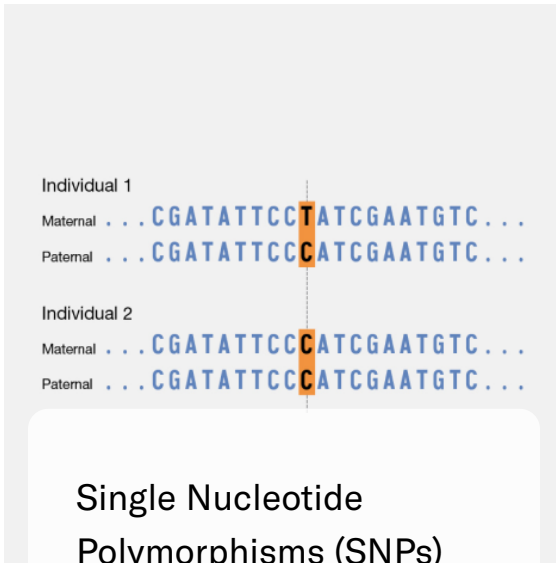


# What are genetic fitness traits?



Genetics influence metabolic rate, fitness potential, athletic performance, injury risk, and muscle soreness, affecting weight management, muscle composition, endurance, and post-exercise recovery. Tailoring strategies based on genetic insights optimizes fitness outcomes and minimizes risks, enabling personalized fitness plans that promote better health, weight loss, and longevity.

# LifeNome's Genomic Process



Individual 1  
Maternal . . . CGATATTCC**T**ATCGAATGTC . . .  
Paternal . . . CGATATTCC**C**ATCGAATGTC . . .

Individual 2  
Maternal . . . CGATATTCC**C**ATCGAATGTC . . .  
Paternal . . . CGATATTCC**C**ATCGAATGTC . . .

**Single Nucleotide Polymorphisms (SNPs)**

SNPs are a type of genetic variation that occurs when a single nucleotide (A, T, C, or G) in the DNA sequence is different between individuals in a population. SNPs are the most common type of genetic variation in the human genome.



SNPs can be used as genetic markers to identify and study the relationship between genetic variation and traits or diseases. This association can be established by analyzing large datasets of genetic and phenotypic information from individuals with and without the trait of interest.



**You Vs. The Population**

Your likelihood of trait expression is the cumulative effect of multiple genetic and non-genetic factors compared to the average risk in the population. Combining polygenic risk assessment with population nutritional assessment can provide valuable insights into the genetic and environmental factors that contribute to nutritional health.

SNP Image Source: <https://www.genome.gov/genetics-glossary/Single-Nucleotide-Polymorphisms>

# How to read your reports

## Trait Name:

Name of the Genetic Trait

## Assessment:

The assessment shows the genetic predisposition likelihood for this trait. A Low assessment means you are unlikely to have a predisposition for this trait. A Moderate assessment means you have a somewhat higher than average predisposition likelihood for this trait. A High assessment means you have a significantly higher likelihood of this trait than the average person in the reference population.

The screenshot shows a report page with a green header. The main text describes elite endurance athletes and their genetic traits. Below the text are four data points: 'Your Genetic Strength: High', 'Your Rank: 70th Percentile', '8 / 13 Predisposing Variations', and '100% Coverage'. A 'Your Recommendations' section follows, and the page number 'Page 8 of 66' is at the bottom.

## Recommendations:

Here are some general recommendations based on your assessment. Remember your health care provider's advice always overrules what is written here.

## Percentile score:

The population percentile shows where your genetic predisposition likelihood for this trait places you compared to the reference population.

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The population percentile shows where your genetic predisposition likelihood for this trait places you compared to the reference population.

## Predisposing Variants:

Total predisposing genetic variants show the total number of genetic variants in your DNA sample that affect your predisposition likelihood for the trait.

## Coverage:

The coverage reliability score shows what percentage of the target genetic variants for the trait were tested in your DNA sample. Ideally, the number should be closest to 100% to provide the best accuracy. Coverage reliability lower than 65% can mean that your assessment may not be as reliable because not enough genetic variants were present or correctly measured in the tested sample to provide an accurate result.

# Traits to Prioritize

Here is a summary of your genetically-influenced traits that have a moderate or high likelihood of affecting your fitness choices. Explore the detailed report for each to understand why these traits deserve your attention and learn how to personalize your fitness choices and lifestyle for the best results.

Aerobic Performance

High

Overall Fitness Benefits

High

Anterior Cruciate Ligament Injury Risk

High

Muscle Power Advantage

High

Exercise Benefits for Blood Pressure

Medium

Slow Muscle Repair

High

Exercise Benefits for Max VO2 Uptake

Medium

Bone Stress Fracture Risk

Medium

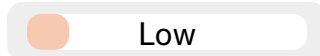
Lean Body Mass Potential

High

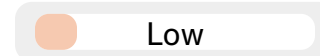
# Traits without Significant Risk/Advantage

Here is a summary of fitness characteristics we've tested, and we've found no reason to believe your genetics would adversely affect them. Enjoy the peace of mind, knowing you don't need to worry about these aspects beyond your typical fitness routine.

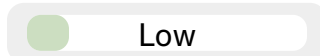
Achilles Tendon Injury Risk



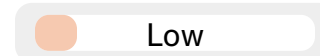
Muscle Cramping



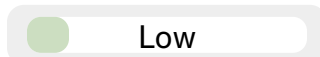
Elite Endurance Athletes



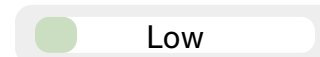
Muscle Injury Risk



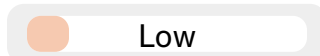
Endurance Advantage



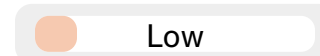
Muscle Response to Resistance Training



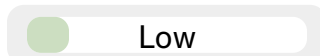
Exercise Aversion



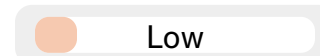
Muscle Soreness After Exercise



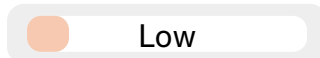
Exercise Benefits for Lowering Cholesterol



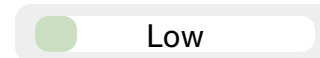
Muscle Strength Loss



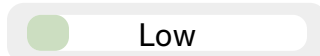
Heartbeat Reduction Difficulty



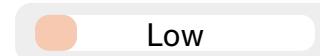
Muscular Strength



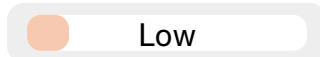
Joint Flexibility



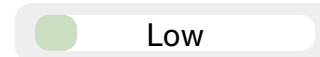
Overall Tendon and Ligament Injury Risk



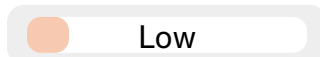
Joint Injury Risk



Skeletal Muscle Performance



Lower Health Benefits of Cardio Exercises



# Exercise Benefits for Max VO2 Uptake

VO2 max (also maximal oxygen consumption, maximal oxygen uptake, peak oxygen uptake or maximal aerobic capacity) is the maximum rate of oxygen consumption as measured during incremental exercise, most typically on a motorized treadmill. When you exercise your muscles are working harder than normal and, as a result, they require more energy than normal. Therefore, increased exercise intensity ultimately corresponds to an increased VO2. This is the reason that your breathing gets progressively faster and deeper as your exercise intensity increases, your body is trying to provide more oxygen to your working muscles. People with differences in genetics, gender, age and fitness state respond differently to the same exercise training program. At least 50% of these differences have been found to be due to genetic variations.

Your Genetic Strength:

Medium

Your Rank:  
70th Percentile

13/28  
Predisposing  
Variations

87%  
Coverage

## Your Recommendations

Try to take advantage of your heightened aerobic capacity by working out in your target heart rate zone. Remember to gradually increase the intensity and duration of your exercises over time, instead of all at once. Consider doing interval training, which can significantly improve your VO2 max. Examples of interval training include walking, running, biking or swimming. Remember that your goal is to do more strenuous activities without feeling more strained by them.



# Exercise Benefits for Lowering Cholesterol

Research has shown that exercise stimulates enzymes that help move bad cholesterol from the blood to the liver, allowing it to be excreted as bile. It is also stipulated that exercise increases the size of the protein particles that carry cholesterol through the blood, reducing the possibility that smaller particles may clog arteries. People with some genetic variants will have good results at increasing levels of good cholesterol by exercise alone, while carriers of other genetic variants are less likely to succeed by exercise alone.

Your Genetic  
Strength:



Low

Your Rank:  
55th Percentile

3/4  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Aerobic exercises can further lower cholesterol. Finding an exercise buddy or group can keep you motivated to keep working out. A food diary helps you keep track of what you eat, which can aid in correcting your diet.





# Heartbeat Reduction Difficulty

Heart rate response is commonly used as a measurable marker to guide exercise intensity and to monitor progress with the expectation that the heart rate at a given intensity and load will decrease substantially with regular exercise. Exercise training improves cardiac function and several cardiovascular risk factors, including ability to perform physical tasks at a given workload with a lower heart rate. If you have higher predisposition to reduced heart response to exercise, the expected decrease in exercise heart rate may not occur. You or your fitness specialist may (falsely) assume that the exercise prescription was insufficient and may try to increase the exercise training load. Genetic variation explains large proportion of this difference. It is important to know this to make sure that the exercise does not cause undue heart strain.

Your Genetic Risk:



Your Rank:

30th Percentile

7/16

Predisposing  
Variations

94%

Coverage

## Your Recommendations

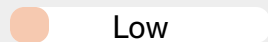
As a rule of thumb, the highest your heart rate should go can be calculated by subtracting your age from 220. For moderate exercise, your heart rate should be between fifty to seventy percent of your maximum heart rate. For vigorous exercise, it should be between seventy to eighty five percent.



# Lower Health Benefits of Cardio Exercises

Cardiac output is the volume of blood being pumped by the heart in a minute. It is equal to the heart rate multiplied by the stroke volume. When you exercise, the cardiac output is usually improved, and the heart needs to beat less to provide the same amount of blood. Carriers of a genetic variant in the kinesin heavy chain (KIF5B) gene had a lower positive cardiac outcome response than carriers of the more common allele.

Your Genetic Risk:



Your Rank:

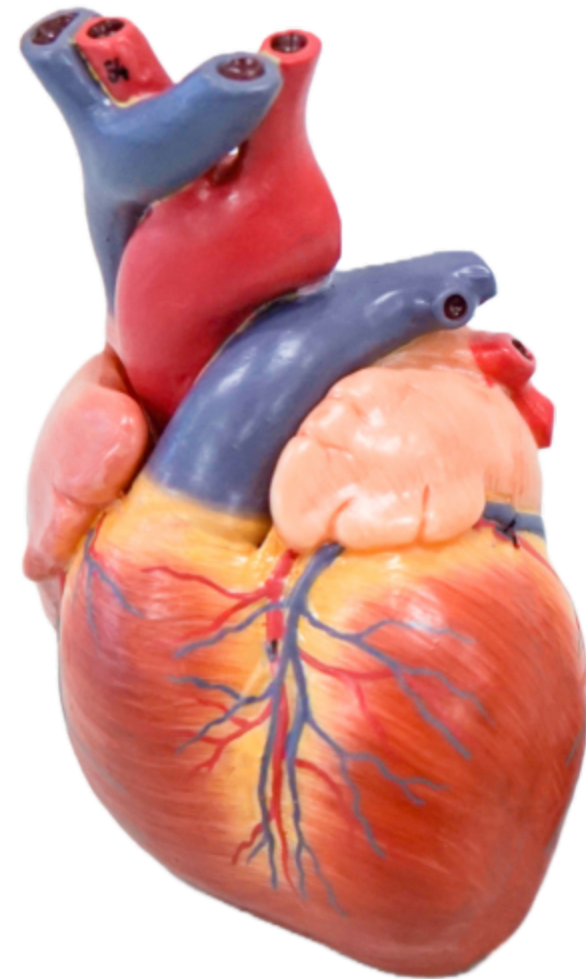
65th Percentile

0/1  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Aerobic exercises - such as running, rowing, interval training, and swimming - all serve to increase your cardiac output. Taking a leisurely walk doesn't do much for your cardio- try taking brisk walks or hikes instead. Cycling is a great way to boost your cardio.



# Exercise Benefits for Blood Pressure

For most people, moderate-intensity exercise has been shown to lower blood pressure. In fact, aerobic exercise training is generally recommended as lifestyle therapy to prevent, treat and control hypertension. General guidelines call for at least half an hour of low intensity aerobic exercises, which helps to decrease blood pressure. There is large variability in the individual response to the anti-hypertensive effect of exercise, and much of it is explained by genetic variations.

Your Genetic Strength:

Medium

Your Rank:  
85th Percentile

3/4  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

You should consider including aerobic exercises - such as rowing, climbing stairs, cycling, running, or swimming - into your routines to further lower your blood pressure. Try to get at least half an hour of aerobic activity in a day, even if it just means taking a walk around the park. Take a break from sitting - evidence finds that a five-minute walk every hour is crucial in lowering your high blood pressure. Try to keep a balance between low energy and high energy aerobic activities. Keep a food diary: taking stock of what you eat is a great first step in fixing your diet.



# Overall Fitness Benefits

The health benefits of regular exercise and physical activity are hard to ignore. Everyone benefits from exercise, regardless of age, sex or physical ability. Exercise can help prevent excess weight gain or help maintain weight loss. Regular exercise helps prevent or manage a wide range of health problems and concerns, including stroke, metabolic syndrome, type 2 diabetes, depression, a number of types of cancer, arthritis and falls. Some people show quick and strong benefits, while others need more exercise and changes to their diets too. For people with some genetic variants, active lifestyle was shown to produce quick results to lower levels of cholesterol, triglycerides, and blood pressure.

Your Genetic Strength:

High

Your Rank:  
80th Percentile

6/8  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Do aerobic exercises to improve your fitness. These include brisk walking, running, rowing, interval training, cycling, and swimming. Exercise at least half an hour a day to maintain overall fitness. As a baseline minimum, always get at least 150 minutes of moderate aerobic activity, or 75 minutes of vigorous aerobic activity, every week. Combine a healthy diet with regular exercise to see a significant impact on your cholesterol, triglycerides, and blood pressure levels. . Set goals that you can achieve, and build on them each time.



# Endurance Advantage

Your muscle endurance measures your ability to repeat an activity for an extended period of time without getting tired. If your muscle structure favors endurance, you have the potential to thrive in exercises that leverage your endurance. Cross-country skiing and push-ups are examples of endurance exercises. Studies have identified several genetic variants associated with a higher proportion of slow-twitch fibers and higher oxygen supplies to muscle tissues.

Your Genetic Strength:



Low

Your Rank:  
35th Percentile

8/12  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Aerobic exercises can boost endurance. Interval training is shown to improve endurance levels significantly. Yoga and meditation can help with your ability to handle stress, which can help you exercise longer.



# Aerobic Performance

VO2 max (maximal aerobic capacity) is the maximum oxygen uptake rate measured during incremental exercise, most typically on a motorized treadmill. Maximal oxygen uptake reflects the aerobic physical fitness of the individual and is an essential determinant of their endurance capacity during prolonged, submaximal exercise. The benefits of aerobic fitness are lower blood pressure, lower cholesterol, and less risk of obesity, Type II diabetes, and heart disease.

Your Genetic Strength:

High

Your Rank:  
90th Percentile

3/7  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Work out in your target heart rate zone to make the most of your aerobic capacity. Always gradually increase the intensity and duration of your exercises over time. Do interval training to significantly improve your VO2 max. Run faster than you usually do if you want to train your aerobic capacity. Ideally, you should be cutting down your normal mile time by 10 to 30 seconds. Remember that your goal is to do more strenuous exercises with the same amount of oxygen uptake capacity. Incorporate aerobic exercises such as rowing, climbing stairs, cycling, elliptical, walking, running, or swimming into your daily routine.



# Elite Endurance Athletes

Elite endurance athletes, such as distance runners, road cyclists and triathletes, excel in aerobic performance. They are more likely to have higher proportion of slow-twitch (type I) muscle fibers. In addition, elite endurance athletes have a superior cardiovascular system that maintains optimal control of heart rate, stroke volume, and blood pressure. Elite athletes are likely to have increased fat oxidation capacity and higher lactate threshold that ensures their muscles can function for longer periods of time. Lifenome computes genetic predisposition likelihood for elite endurance based on 23 genetic variants, taking into account genetics-based endurance and aerobic performance scores.

Your Genetic  
Strength:



Low

Your Rank:  
35th Percentile

12/23  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Working out in your target heart rate zone will increase your aerobic capacity. Gradually increasing the intensity and duration of your exercises over time can help you avoid injury. Examples of aerobic exercises that you can include in your daily routine are climbing stairs, speed walking, cycling, and running.



# Muscle Power Advantage

Your muscle power measures the maximum amount of force you can exert in a limited period of time. When your muscle structure favors power exercises, you have the potential to exert substantial force in a short period of time. The heritability of power/strength has been estimated to be up to 80%, depending on the specific muscle type (isometric knee strength, handgrip strength, elbow flexion). There are several highly influential genetic biomarkers that have been found to be associated with power/strength-related sports.

Your Genetic Strength:

High

Your Rank:  
75th Percentile

6/11  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Incorporate activities that take advantage of your heightened strength and power - including kickboxing, weight lifting, martial arts, tennis, and downhill skiing - into your life. Plyometrics are a great non-traditional way to work with your power. If you want to try explosive training, ensure that you're maintaining a proper form to avoid hurting yourself. To focus on power, increase the weight, decrease the number of reps, and rest for longer between sets. Consult a fitness professional on how to best take advantage of your heightened power, and design your program accordingly.

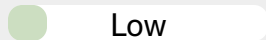




# Joint Flexibility

While flexibility and range of motion can be improved with regular stretching, some people have inherent joint flexibility, which is a highly heritable trait. Genetic variants in several collagen genes alter the amino acid sequence and change the amount of collagen proteins being produced, affecting the architecture and biomechanical properties of some tissues, including ligaments. Therefore, people with these genetic variants generally have a higher range of motion and better joint laxity and flexibility.

Your Genetic Strength:



Your Rank:  
35th Percentile

1/2  
Predisposing  
Variations

66%  
Coverage

## Your Recommendations

Yoga and stretching are both great ways to take advantage of better joint flexibility. Just like any other exercise, increasing flexibility takes time - don't be discouraged if you don't start seeing improvements right away. Be sure to stretch before and after an exercise in order to keep your joints limber.



# Exercise Aversion

Your motivation for physical activity is partly influenced by your genetics. How your body feels during a workout (e.g oxygen transportation and lung capacity), and how you are predisposed to respond mentally to the challenge all come down to your genetic makeup. Studies indicate that up to 50% of your like or dislike for exercise comes down to your DNA. There is a difference between exercise aversion and a lack of motivation, where the former is a stronger inhibition factor. If you have specific genetic variations, it may result in a lower biological desire to engage in physical activity making exercise your least favorite activity.

Your Genetic Risk:



Your Rank:

10th Percentile

8/16  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

The gym isn't the only way to work out - you can also practice yoga, take a dance class, go roller skating, take the dog on a hike or just dance in your living room to your favorite music. An exercise partner can hold you accountable and make workouts more fun. Working out at the same time every day or week can help solidify it into a habit.



# Lean Body Mass Potential

Your lean body mass is the portion of your weight that is not fat. Your lean body mass is actually composed of your muscle and bone tissue as well as the water in your body and your organs, everything except the fat beneath the surface of your skin. Leaner body mass has a strong genetic component. If you are predisposed to having a higher lean body mass, you have a better chance of attaining a muscular body through fitness exercises than the average population.

Your Genetic Strength:

High

Your Rank:  
80th Percentile

5/16  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Use yoga and meditation to lower your stress levels, as evidence shows that people with less stress tend to have a leaner body mass. Get more high quality sleep to achieve a leaner body mass. Develop an exercise routine - more frequent exercise is more effective at reducing fat. Have four to five smaller meals throughout the day instead of two to three larger ones, as this will help you reduce fat. Consult a dietician that specializes in sports medicine to build a diet plan that works for you.



# Achilles Tendon Injury Risk

Achilles tendon injury includes degenerative and painful conditions that affect athletes in various sports, including up to 20% of runners. This is a multifactorial condition for which various genetic risk factors have been identified. Genetic variants in the FBGN2, TNC, and ADAMTS14 (metallopeptidase with thrombospondin) gene contribute to the risk of achilles tendinopathy, while genetic variants in the MMP3 have been found to be protective.

Your Genetic Risk:



Your Rank:

70th Percentile

4/5

Predisposing  
Variations

62%

Coverage

## Your Recommendations

Improper footwear when training or exercising can increase the risk of an injury. Hard or sloped surfaces are more dangerous to exercise on. Exercising in cold weather can exacerbate the risk of an Achilles tendon injury.



# Anterior Cruciate Ligament Injury Risk

Anterior cruciate ligament (ACL) ruptures are considered the most severe joint injury in sports and are very common in a sporting population. Athletes who participate in high-demand sports like soccer, football, and basketball are more likely to injure their anterior cruciate ligaments. Athletes playing sports with a sudden deceleration of the body from jumping and forward running while the knee is in a shallow flexion angle are more likely to get injured. ACL injuries are not common among athletes involved in endurance sports, such as running, swimming, and biking.

Your Genetic Risk:

High

Your Rank:

95th Percentile

5/8

Predisposing  
Variations

100%

Coverage

## Your Recommendations

Exercise your balance, agility, and strength to minimize the risk of an ACL injury. Always warm-up before you play to get your blood flowing to your joints, reducing the risk of strain. Wear proper footwear and padding to avoid potential injuries. Stretch your legs, specifically the rotation of your ankles and the fronts and backs of your thighs, to reduce the risk of rupturing your ACL. Jump exercises, also known as plyometrics or plyos, reduce the risk of a torn ACL by strengthening the muscles associated with them. If you experience an ACL rupture, meet with a sports medicine specialist immediately.



# Bone Stress Fracture Risk

Stress fractures are small cracks in a bone. Stress fractures are caused by repetitive movements or the application of force. Anyone can experience a stress fracture, but some people have a higher predisposition, which is associated with lower bone mass density. The major determinant of stress fracture risk is bone mineral density, that has a large genetic component. Up to 85% of bone mineral density variability is explained by genetic variations.

Your Genetic Risk:

Medium

Your Rank:

70th Percentile

9/15  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

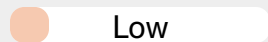
Try to balance your diet with a variety of nutrients, including calcium, magnesium, and vitamin D, to prevent stress fractures. Consider cross-training: adding variation to your exercise routine will prevent the risk associated with overworking a muscle group. Try to avoid intensifying a routine too quickly, as it can cause stress fractures. Make sure your footwear fits well and is appropriate for the activity you're doing. Consider consulting a fitness professional on how to best strengthen your bones and work to design your training program accordingly.



# Joint Injury Risk

Many sports-related injuries involve damage to the joints. Common joint injuries include a twisted ankle, sprained wrist, overextended elbow, and damaged knee ligaments. When exercising, you can be more at risk for overuse injuries. The risk of joint injury is associated with a higher genetic predisposition to osteoarthritis. Your risk for joint injury is computed based on 13 genetic variations that were found to be associated with joint problems.

Your Genetic Risk:



Your Rank:

10th Percentile

3/12  
Predisposing  
Variations

92%  
Coverage

## Your Recommendations

Any workout with repeated motions can cause joint injury if done with improper technique. Exercising unstretched muscles is more likely to cause joint injury. Using improper equipment - such as footwear - can cause joint injury.



# Overall Tendon and Ligament Injury Risk

Non-contact tendon or ligament injury is an overuse injury associated with sports and is a common cause of disability. Most major tendons, such as the Achilles, patellar, rotator cuff, and forearm extensor tendons (amongst others), are vulnerable to overuse, which induces pathological changes in the tendon. For individuals who have risk profile genotypes for susceptibility to ligament injury choosing the right prevention strategies like avoidance of weight-bearing and high-impact sports is very important.

Your Genetic Risk:



Your Rank:

60th Percentile

8/14  
Predisposing  
Variations

82%  
Coverage

## Your Recommendations

High-impact sports are a major risk for tendon and ligament injuries. Strengthening exercises can improve the durability of your tendons and ligaments. Stretching before potentially dangerous activity can lower the risk of injuring your tendons or ligaments.





# Slow Muscle Repair

Prolonged strenuous exercise, like high-intensity weight training, results in the activation of inflammatory factors in your muscles. Genetic variants in several genes enhance the inflammatory response that may slow down the repair of muscle damage following exercise. A person with a higher predisposition to inflammation will benefit from less frequent exercise activities and longer recovery periods. If the body is not fully recovered, it may result in injuries, muscle straining, and over-training. This is particularly important for high-intensity weight training athletes and bodybuilders.

Your Genetic Risk:

High

Your Rank:

75th Percentile

8/13  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Minimize stress, as studies have shown that overtraining has a correlation to slowed muscle repair. Stay hydrated, as it has a correlation to faster muscle repair. Incorporate complete proteins, like quinoa or flaxseed, into your diet - they'll boost muscle repair speed. Whole grains, fruits, vegetables, legumes, and fish are other excellent inclusions to your diet. Make sure you're not skipping rest days - they're essential in providing your muscles with the space they need to start healing. Work with an experienced physical therapist or trainer to develop an exercise plan.



# Muscle Cramping

Muscle cramps can be caused by the overuse of a muscle, dehydration, muscle strain, or bad posture. In addition to potential risk factors such as inadequate blood supply, nerve compression, and mineral depletion, muscle cramps are also influenced to a good extent by genetics. Individuals who have genetic variants in the AMPD1 gene are significantly more likely to get muscle cramps and pains when they exercise.

Your Genetic Risk:



Your Rank:

30th Percentile

0/6  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

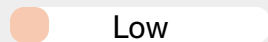
Stretching before and after your exercises can prevent cramping. Staying hydrated can reduce the frequency of muscle cramps. Changing the intensity of your exercise too quickly can lead to cramps.



# Muscle Soreness After Exercise

The delayed onset muscle soreness refers to the feeling of soreness 12-24 hours after heavy exercise. It is commonly understood to be the result of microscopic tears in your muscle tissue. The mild muscle strain injury creates microscopic damage to the muscle fibers and, coupled with the resulting inflammation, causes the pain. Genetic variants in some inflammation-related genes (IGF2) were found to be related to the greatest muscle soreness immediately after exercise and highest post-exercise serum creatine kinase activity.

Your Genetic Risk:



Your Rank:

10th Percentile

3/7  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Stretching before you exercise is a great way to prevent soreness. Studies have found that keeping hydrated can reduce the frequency and intensity of muscle soreness. Massaging muscles can often relieve soreness.



# Muscle Strength Loss

From the time you are born to around the time you turn 30, your muscles grow larger and stronger. But at some point in your 30s, you start to lose muscle mass and function. The cause is age-related sarcopenia. Physically inactive people can lose as much as 3% to 5% of their muscle mass each decade after age 30. Even if you are active, you'll still have some muscle loss. The speed by which we lose muscle strength when we stop exercising, depends on a variety of factors, such as age, diet and the amount of sleep that we get. Sometimes even two weeks of physical inactivity can result in substantial muscle strength loss. Genetic variants in some inflammation-related genes (IGF2) were found to be related to the greatest muscle strength loss after exercise.

Your Genetic Risk:



Your Rank:

15th Percentile

3/5  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

The best way to slow down muscle strength loss is through regular exercise, primarily resistance training. Calcium and vitamin D are both essential in protecting your muscle mass. Increased stress levels are tied to an increased risk of muscle strength loss.



# Muscular Strength

Muscular strength is the amount of force a muscle can exert in a single contraction. Muscles have two types of fibers, fast twitch and slow twitch. Fast twitch provide the explosive bursts of energy required in weight lifting and sprinting. Slow twitch fibers are for longer endurance type activities. Studies have shown that up to 90% of the variance in muscle mass and up to 60% of the variance in muscle strength are heritable. Several genetic variations have been found to be significantly associated with muscular strength.

Your Genetic Strength:



Low

Your Rank:  
30th Percentile

0/2  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Weight training is ideal for this: it not only builds power, but endurance too. Complete proteins (those that contain all eight essential amino acids) are a great addition to your diet if you're focusing on building strength. Other foods that are great for building strength include eggs, salmon, and chicken.



# Skeletal Muscle Performance

Muscles such as biceps, pectorals and quadriceps are called skeletal muscles because they attach to the skeleton to generate motion. Skeletal muscles are composed of very long, thin cells that include the full complement of organelles needed for general cellular functions. Skeletal muscle is one of three major muscle types, the others being cardiac muscle and smooth muscle. Your skeletal muscle can bear a high load at constant length, or shorten rapidly when the load is low. Uncoupling proteins 2 and 3 (UCP2 and UCP3) may negatively regulate mitochondrial ATP synthesis and, through this, influence human physical performance. A study found that genetic variants in the UCP3/2 gene locus are associated with training-related improvements in skeletal muscle performance.

Your Genetic  
Strength:



Low

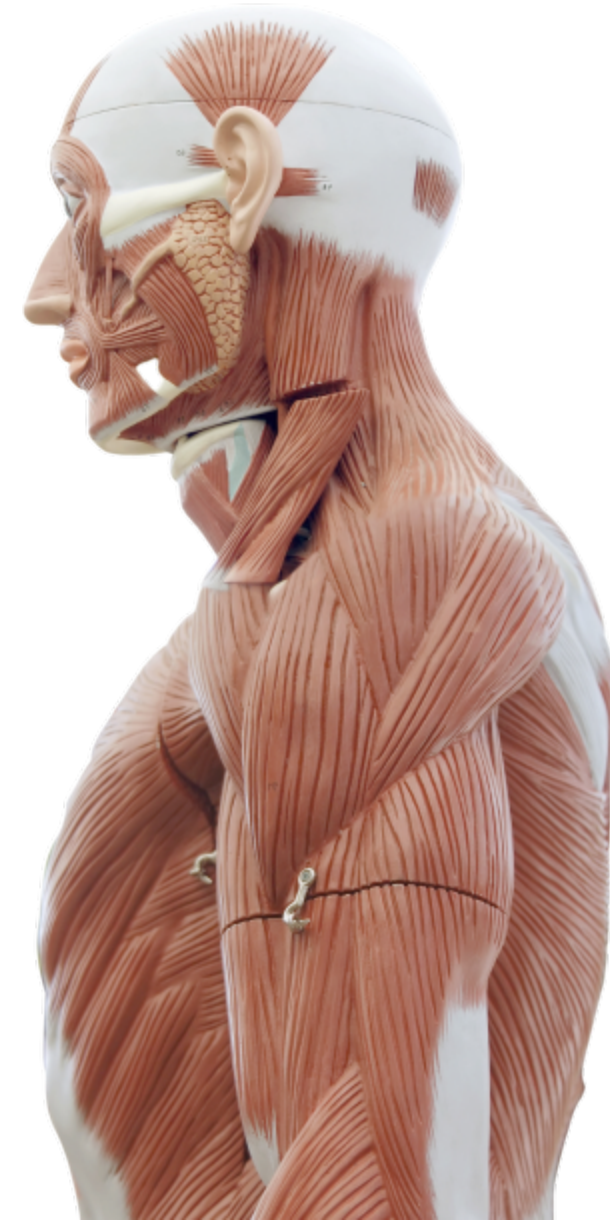
Your Rank:  
30th Percentile

0/2  
Predisposing  
Variations

100%  
Coverage

## Your Recommendations

Whole grains, fruits, vegetables, legumes, and fish can all strengthen your skeletal muscles. Resistance training is one of the best ways to cater to your skeletal muscle growth. Increased stress is correlated to an increased risk of muscle loss.



# Muscle Response to Resistance Training

Muscle-building exercises are usually part of long-term systematic resistance training programs, which increase skeletal muscle size and strength in men and women of different ages. While studies demonstrate that nearly all individuals will get some benefit from resistance training, how fast muscle is built depends on gender, age, general health, nutrition, and genetics. People with some genetic variations gained higher (isometric) muscle strength and biceps size in response to the same resistance training routine.

Your Genetic  
Strength:



Low

Your Rank:  
5th Percentile

4/11  
Predisposing  
Variations

91%  
Coverage

## Your Recommendations

Complete proteins (those that contain all eight essential amino acids) are a great addition to your diet if you're focusing on resistance training. If you want to incorporate resistance training into your workout routine, focus on free weights, bands, and weight machines. Make sure you don't hold your breath - it could end up hurting you.



# Muscle Injury Risk

A muscle strain, or pulled muscle, occurs when your muscle is overstretched or torn. This usually occurs as a result of fatigue, overuse, or improper use of a muscle. Strains can happen in any muscle, but they are most common in the lower back, neck, shoulder, and hamstring. Mutations in some genes in these pathways are associated with a rare condition known as cryptic exercise intolerance. Common genetic variations in the same genes have been found to be associated with an increased risk of muscle injury, muscle cramping, and lactate accumulation in the muscle.

Your Genetic Risk:



Low

Your Rank:

65th Percentile

3/7

Predisposing  
Variations

87%

Coverage

## Your Recommendations

The longer you stay in one position, the more likely it is to lead to muscle damage. Always sitting up perfectly straight may actually damage your muscles by forcing them to stay in one position for too long. Wearing proper footwear when engaged in physical activity can reduce the risk of muscle damage.





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# LEGAL AGREEMENT AND TERMS AND CONDITIONS

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operator has to protect children’s privacy and safety online.

## **Data Usage and Storage**

At LifeNome, you control your data and profile and can delete your data and profile at any time. This will erase your raw genetic data from our databases. The well-being reports generated will be kept for your future reference. LifeNome does not share any personally identifiable genetic information with any other third party entities. You understand that LifeNome may use your genotype and phenotype data as part of an aggregate and anonymous research analysis to improve its genomics algorithm.

## **Data Security**

LifeNome takes the security of your data seriously. We use state-of-the-art security measures and encryption technologies to safeguard your personal information. You will be responsible for safeguarding your login information and should not share your authentication information to any third party. Please notify us of any unauthorized use of your password.

## **Statement of Limitations**

LifeNome provides non-disease wellness information only. The information provided by LifeNome does not constitute medical advice and

is provided solely as complementary insight to assist you, your nutritionist, fitness instructor, and/or health-care provider in making more personalized decisions for your well-being. Genetic predispositions do not mean a condition is actually present. Many environmental and behavioral factors impact the actual presence of a condition.

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