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Your genetic guide to

GOOD SLEEP



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This is a sample report

Introduction

Have you ever wondered why certain people sleep more when compared to others? And why some people enjoy working late into the night instead of working early morning? Do you want to know what your innate sleep rhythm is? The answer lies in your genes.

Why is sleep so important? Good sleep is extremely vital for optimal health and is associated with mood, hormone levels, and weight maintenance. Sleep has different stages of unconsciousness and is necessary for consolidating information and for reinforcing memories. The body also undergoes a renewal and rejuvenation procedure, wherein the daily wear and tear of muscles and tissues are set right by repair enzymes. This makes adequate sleep critical to maintaining good health.

The amount of sleep required differs from one individual to another. Similar to characteristics like hair or eye color, sleep characteristics may also be associated with genetics.

The genetic basis of sleep helps highlight certain factors that could affect the quality and quantity of sleep. A considerable part of life is spent in this state, and lack of sleep or sleep disturbances have been associated with harmful effects on health and performance.

The heritability of sleep has been studied extensively on monozygotic twins, as they share a similar genetic make-up and have similar sleep patterns like sleep cycle periods, rapid eye movement (REM) and sleep latency times.

- **Twin studies have shown that there is 50% heritability in diurnal preference**
- **Family studies have shown that there is 20 to 25% heritability in habitual bedtime**
- **Linkowski et al. have shown that there is 90% heritability in the REM (Rapid eye movement) density**
- **Twin and genome-wide association studies have shown that there is 49% to 90% heritability in sleep duration**

Apart from genetic factors, environmental, behavioral, and cultural factors influence how much and when we sleep. People living in hot climates enjoy an afternoon nap to avoid stepping out during the hot mid-day sun. Other factors that could influence the quality and quantity of sleep are medications.

Genes share a complex relationship with the environment, and understanding the effect of genetic variants will help in tailoring the environment to optimize sleep. This genetic report will help in identifying how your genetic variants are likely to influence your sleep pattern, sleep quality and your predisposition for sleep-related conditions.

Introduction

Sleep is a complex interplay between genetics and the environment (lifestyle, diet, activity, stress, etc.). Your genes, training, and diet, all play a vital role in your well-being.

This report is presented in a user-friendly language and format. The following tips will help you get the best information value out of the report.

1. The word “likely” is used often in the report. What does it mean?

People generally know that high cholesterol can lead to heart conditions. However, there are individuals with high cholesterol who do not develop heart disease. Similarly, smoking can lead to lung disease, but not always. Hence, certain genetic parameters can lead to certain outcomes, but other factors may modify the outcome. “Likely” means it is more likely that one will see the outcome, but other factors may modify it.

2. What does the term “normal” mean in the report?

Normal implies an average outcome. For example, normal tendency for insomnia risk is the average genetic likelihood of developing insomnia.

3. How do I know which result is applicable to me?

Only results with a checkmark (✓) or exclamation (!) are applicable to you, the others are not applicable. All possible outcomes are provided in the table to provide a context to your outcome.




4. Where did the information contained in the report come from?

The genetic markers that are used in this report are based on scientific studies published in international journals. A list of references is available for you to read on our web blog.

5. Some sentences are colored in green and others in red, why?

Attributes that are advantageous in sleep well-being are indicated in green, and those that are not advantageous are in red. Moderate or Neutral outcomes are indicated in black.

YOUR SUMMARY RESULTS

Trait Name	Your Result	Your Outcomes
Tendency to be an Early Riser or a Night Owl People with certain genetic types have a higher tendency of being an early riser or a night owl. Learn More		<div><div>Early Riser</div><div>People with certain genetic types have a higher tendency of being an early riser.</div></div> <div><div>Night Owl</div><div>People with certain genetic types have a higher tendency of being a night owl.</div></div>
Sleep Duration People with certain genetic types are at a higher risk of shorter sleep duration. Learn More		<div><div>Shorter Sleep Duration</div><div>People with certain genetic types are at a higher risk of shorter sleep duration.</div></div> <div><div>Longer Sleep Duration</div><div>People with certain genetic types are at a higher risk of longer sleep duration.</div></div>
Snoring Tendency People with certain genetic types have a higher risk of snoring. Learn More		<div><div>Snoring</div><div>People with certain genetic types have a higher risk of snoring.</div></div> <div><div>No Snoring</div><div>People with certain genetic types have a higher risk of no snoring.</div></div>

Risk of Insomnia People with certain genetic types have a higher risk of developing insomnia. Learn More		
	✓	
Risk of Caffeine Induced Insomnia People with certain genetic types have a higher risk of developing insomnia on caffeine consumption. Learn More		
	✓	
Risk of Obstructive Sleep Apnea People with certain genetic types have a higher risk of developing OSA. Learn More		
	✓	
Risk of Excessive Daytime Sleepiness People with certain genetic types have a higher risk of developing EDS. Learn More	⚠	

<p>Risk of Narcolepsy People with certain genetic types have a higher risk of developing narcolepsy. Learn More</p>	<div></div> <div>✓</div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>
<p>Sleep Efficiency People with certain genetic types have a higher risk of poor sleep efficiency. Learn More</p>	<div></div> <div>✓</div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>
<p>Sleep Latency People with certain genetic types may have shorter sleep latency. Learn More</p>	<div></div> <div></div> <div>⚠</div>	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>
<p>Risk of Restless Leg Syndrome People with certain genetic types have a higher risk of developing RLS. Learn More</p>	<div></div> <div>✓</div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>

<p>Risk of Bruxism People with certain genetic types have a higher risk of developing sleep bruxism. Learn More</p>	<div></div> <div>✓</div> <div></div>	<div></div> <div></div> <div></div>
<p>Risk of Frequent Daytime Napping People with certain genetic types have a higher risk for frequent daytime napping. Learn More</p>	<div></div> <div>✓</div> <div></div>	<div></div> <div></div> <div></div>



TENDENCY TO BE AN EARLY RISER OR A NIGHT OWL

Higher: Tendency to be an early riser

Circadian rhythm refers to a fundamental 24-hour physiological cycle, which is essential for various molecular and behavioral processes. It mainly aids in regulating sleep patterns. The timing of circadian rhythms varies across individuals and is influenced by both environmental and genetic factors. People with earlier rhythms tend to rise early in the

Recommendations:

- Allow yourself to sleep earlier: Set a specific bedtime for yourself and stick to it every night. Listening to jarring music or completing work-related tasks close to bedtime can be counterproductive. Instead, you can read a book or listen to soothing music.

Genes Analyzed: TSHZ1, SMIM21, ACYP2, DUS3L, NRTN, MACROD2, KIF16B, CLN5, FRK, PDE10A, LINC00473, DOCK1, NPS, PER3 (VAMP3), PCSK2, DDI2, LPHN2, CCRN4L, EHMT2, CNTN5, OGFRL1, RIMS1, LOC105378808, RASD1, RGS16 (RNASEL), SOX2, ATP11B, NRXN3, CADM2, MAGI2, MRAS, ESYT3, NEAR RGS16, MYO16, BTBD9, ZNF365, HCRTR2, LOC105378065, ARGLU1, FAM155A, KANSL1, TEX14, EXD3, COPZ2, ZBTB16, FBXL4, FAXC, FAM155B, DLX5 (SHFM1), PLCL1, CACNG3, RBBP6, FTO, FANCL, SEMA6A, MADD, ZNF462, RAD23B, BLID, UBASH3B, SLC27A3, GATAD2B, LRRTM4, AK5, PRIM2, GUSBP4, PCYOX1, TFAP2B, PKHD1, ZFAT, KHDRBS3, GOSR2, RPRML, NONE, NOL4, PMFBP1, ZFH3, KCNT2, CA14, C1QL1, DCAKD, MCM5, RASD2, C4ORF33, CALB1, TMEM64, PATJ, RBMS1, TANK, RGS16, DIP2C, LARP4B, HNRNPD, TRIM33, BCAS2

Number of Gene Markers Found: 85

Number of Gene Markers Analyzed:373



SLEEP DURATION

Normal: Likely to have a normal sleep duration

Sleep duration refers to the total amount of sleep obtained either during the nighttime sleep event or across the 24-hr period. Sleep duration is associated with cardiovascular diseases, type 2 diabetes, depression, automobile and workplace accidents, learning and memory problems, and prospective mortality. Certain risk factors such as smoking, alcohol

Recommendations:

- Increase your sunlight exposure during the day and avoid bright screens or late-night television before bedtime. Blue light exposure affects circadian rhythm and reduces melatonin levels, the secretion of which is required for relaxation. Smartphones and laptops

Genes Analyzed: LOC101927400, DRD2, LOC105377632, LINC01122, NONE, PAX8

Number of Gene Markers Found: 8

Number of Gene Markers Analyzed:8



SNORING TENDENCY

Normal: Likely to have a normal tendency to snore

Snoring is the loud or harsh sound from the nose or mouth that occurs when breathing is partially obstructed. The sound is produced when the soft palate and other soft tissues (such as uvula, tonsils, nasal turbinates, and others) in the upper airway vibrate. Snoring is caused

Recommendations:

- **Maintain a healthy weight:** If you are obese or overweight, take active measures to lose weight. This will help reduce the amount of tissue in the throat that might be causing your snoring.
- **Raise the head of your bed:** Using pillows to elevate the head may help to reduce snoring by keeping airways open. Sleeping on the side can prevent the squeezing of the airway by the excess fatty tissue.

Genes Analyzed: POC5, AC105242.1 (MIRNA), DLEU7, AC002539.2 (MIRNA), TRAM1, MSRB3, RP11-42L9.2, ANAPC4, UBE2WP1, BCL11B, LINC02210-CRHR1

Number of Gene Markers Found: 11

Number of Gene Markers Analyzed:15



RISK OF INSOMNIA

Normal: Likely to have a normal risk of insomnia

Insomnia (also known as Sleeplessness) is a common sleep disorder characterized by the inability to fall asleep or stay asleep at night, resulting in tired or unrefreshing sleep. These symptoms can be caused by variations in biological, psychological, and social factors,

Recommendations:

- Follow a standard sleep-wake cycle: Wake up and go to sleep at the same time each day. This can significantly improve the quality of sleep.
- Increase your sunlight exposure during the day and avoid bright screens or late-night television before bedtime. Blue light exposure affects circadian rhythm and reduces melatonin levels, the secretion of which is required for relaxation. Smartphones and laptops emit blue light. Either avoid using them at night or wear glasses that block blue light from

Genes Analyzed: DIAPH3, PCDH1, TRPS1, MLLT10, CYCL1, LOC100507477, DNAH11, GLIS3, SNX29, LRMDA, SERPINC1, FAM172A, TNNT3K, KDM4B, GRIA1, MED27, AGAP1, CNTN5, PRICKLE4, ZMYND8, LOC730100, CCDC148, ARHGAP10, LOC105372666, ASXL3, NMT1, MAP2, TET2-AS1, LOC107984340, SALL1, HS6ST3, SYT14, DUPD1, GRM5, TRPC7, ATP2B2, EXD3, SLC39A8, TCF12, HTR1F, LOC105369333, PLCH1, ITPR3, SDK1, PLCL1, DLG2, PIK3C2A, VWC2, NPAS3, NOL4L, IGF2BP1, NEGR1, PCDH15, FAM198A, SOX2-OT, FAM180B, NLGN1, LRRTM4, SPAG5-AS1, SLC35B4, FOXP2, RARB, LOC107986022, FOXP1, BAZ2B, MIR9-3HG, LOC101927400, PDE2A, MDGA1, FBXL17

Number of Gene Markers Found: 158

Number of Gene Markers Analyzed:207



RISK OF CAFFEINE INDUCED INSOMNIA

Lower: Likely to have a lower risk of CII

Caffeine is a central nervous system stimulant, which is widely used for its psychoactive effects. It is commonly used to alleviate behavioral, cognitive, and emotional deficits caused by sleep deprivation. Regardless of its beneficial effects, caffeine may have adverse sleep-related consequences that might lead to sleep disruption and insomnia symptoms.

Recommendations:

- Although you may have a lower risk of caffeine-induced insomnia, try to moderate your consumption of caffeine. Do not drink caffeinated beverages post 5:00 pm or 5-6 hours

Genes Analyzed: ADORA2A, ADORA2A-AS1

Number of Gene Markers Found: 2

Number of Gene Markers Analyzed:2



RISK OF OBSTRUCTIVE SLEEP APNEA

Normal: Likely to have a normal risk of OSA

Obstructive Sleep Apnea (OSA) is a common, serious, and potentially life-threatening sleep disorder. It is characterized by frequent episodes of partial or complete upper airway obstruction during sleep, resulting in intermittent hypoxemia and arousal. People with OSA

Recommendations:

- Avoid excess alcohol: Consumption of excess alcohol could result in obstructive sleep apnea. Drink alcohol in moderation and restrict consumption for a few hours before bedtime.

Genes Analyzed: GDNF, CRP, TNFA, PTGER3, HTR2A, PLEK

Number of Gene Markers Found: 6

Number of Gene Markers Analyzed:7

Disclaimer

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Only full genome sequences are exhaustive. All other forms of genetic tests only provide a limited subset of genetic information relevant to specific conditions. Since this report is not generated by conducting a whole genome sequence test, the results reported are limited to a specific set of mutations known to be associated with specific conditions. Genetic information is also subject to revision based on the latest advances in scientific research. Therefore the interpretation of results reported herein may vary or be altered subject to ongoing research. Sometimes, the interpretations may vary from company to company based on which studies are being given a higher preference compared to others.

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