DIYgenomics Athletic Performance Report

Interpretation: green indicates the favorable genotype for athletics, red is the normal genotype

Some athletes work to improve areas of predisposed excellence, others tailor workouts to improve areas of lower inherent ability

Sample data is blank when the variant is not present in the underlying genotyping data file

NOTE: This information is a compilation of available genome-wide association studies by non-medical professionals. Please consult a doctor for advice.

<table>
<thead>
<tr>
<th>Category</th>
<th>Locus</th>
<th>Gene</th>
<th>Variant</th>
<th>23andMe</th>
<th>DIYgenomics</th>
<th>dbSNP Values</th>
<th>Sample data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Power and speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Endurance is important to any athlete but especially for those training for marathons triathlons and any distance sport. Top-performance athletes often have what are called the Marathon genes.</td>
<td>5q32</td>
<td>ADRB2</td>
<td>rs1042713</td>
<td>1,3,19</td>
<td>G/A</td>
<td>AG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8p12</td>
<td>ADRB3</td>
<td>rs4994</td>
<td>1,17</td>
<td>T/C</td>
<td>AA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9q34.3</td>
<td>COL5A1</td>
<td>rs12722</td>
<td>15</td>
<td>T/C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11q13.2</td>
<td>ACTN3</td>
<td>rs1815739</td>
<td>2,6,7,8,9,10,11,13,18,20,21</td>
<td>C/T</td>
<td>CC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12p13.31</td>
<td>GNB3</td>
<td>rs4445</td>
<td>1,4</td>
<td>C/T</td>
<td>CC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14q32.2</td>
<td>BDKR2</td>
<td>rs1799722</td>
<td>19</td>
<td>C/T</td>
<td>CT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17q23.3</td>
<td>ACE</td>
<td>rs1799752</td>
<td>5,12,14,16</td>
<td>I/D</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>1.2 Energy is the body’s regulation of energy metabolism mitochondrial biogenesis and skeletal muscle fiber-type conversion to help achieve peak performance.</td>
<td>4p15.2</td>
<td>PPARGC1A</td>
<td>rs8192678</td>
<td>4,6,7,8,9</td>
<td>G/A</td>
<td>CT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14q23.2</td>
<td>HIF1A</td>
<td>rs11549456</td>
<td>1,3,5</td>
<td>C/T</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14q23.2</td>
<td>HIF1A</td>
<td>rs17099205</td>
<td>2</td>
<td>A/G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Power is about the ability to exert maximum muscular contraction instantly in an explosive burst of movement kind of like a rocket taking off into space. The two components of power in terms of athletics are strength and speed. Power athletes are physically different in their abilities from endurance athletes and genes are partially involved in this difference.</td>
<td>1q42.2</td>
<td>AGT</td>
<td>rs699</td>
<td>1,3</td>
<td>T/C</td>
<td>AG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11q13.2</td>
<td>ACTN3</td>
<td>rs1615739</td>
<td>2,4,5,6,7,8,9,11,13,14,15,16</td>
<td>I/D</td>
<td>CT</td>
<td>CC</td>
</tr>
<tr>
<td></td>
<td>17q23.3</td>
<td>ACE</td>
<td>rs1799752</td>
<td>3,10,12,13</td>
<td>I/D</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>2. Musculature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Delayed onset muscle soreness (DOMS) describes a phenomenon of muscle pain muscle soreness or muscle stiffness that is felt 12-48 hours after exercise particularly at the beginning of a new an exercise program after a change in sports activities or after a dramatic increase in the duration or intensity of exercise.</td>
<td>8p22</td>
<td>NAT2</td>
<td>rs1208</td>
<td>1</td>
<td>A/G</td>
<td>AG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>HNF4A</td>
<td>rs1885088</td>
<td>2</td>
<td>G/A</td>
<td>GG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>HNF4A</td>
<td>rs745975</td>
<td>2</td>
<td>G/A</td>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>2.2 Muscles are important to all aspects of exercise and fitness. After exercise a muscle needs anywhere from 24 to 48 hours to repair and rebuild and working it again too soon simply leads to tissue breakdown instead of building.</td>
<td>2q13</td>
<td>IL1B</td>
<td>rs1143634</td>
<td>1,2</td>
<td>C/T</td>
<td>GG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2q13</td>
<td>IL1B</td>
<td>rs16944</td>
<td>1,2</td>
<td>G/A</td>
<td>GG</td>
<td></td>
</tr>
<tr>
<td>2.3 Strength includes strength exercise selection frequency of strength training sessions the number of sets performed and the number of repetitions performed per set.</td>
<td>6p22.2</td>
<td>HFE</td>
<td>rs1799945</td>
<td>2,9,10,11</td>
<td>G/C</td>
<td>CC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6p22.2</td>
<td>HFE</td>
<td>rs1800562</td>
<td>2,9</td>
<td>G/A</td>
<td>GG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12q23.2</td>
<td>IGFI</td>
<td>rs35767</td>
<td>5,12</td>
<td>C/T</td>
<td>AG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14q23.2</td>
<td>HIF1A</td>
<td>rs11549465</td>
<td>1,3,4,8</td>
<td>C/T</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>chr2</td>
<td>MISTN GDF-8</td>
<td>rs1805086</td>
<td>6,7,10,11</td>
<td>AG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Heart and lung capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Heart function directly impacts exercise and vice-versa. While research has proven that regular exercise enlarges the heart and strengthens the chambers some individuals may have genes that give them better heart capacity allowing for better endurance and strength in exercise. Heart capacity diminishes as our body ages so it is especially important to maintain and monitor our heart’s condition.</td>
<td>2q33.3</td>
<td>CREB1</td>
<td>rs2253206</td>
<td>5</td>
<td>G/A</td>
<td>AG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7p15.3</td>
<td>NPY</td>
<td>rs16139</td>
<td>2,3</td>
<td>A/G</td>
<td>TT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7q36.1</td>
<td>NOS3</td>
<td>rs2070474</td>
<td>2,4</td>
<td>C/T</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Heart capacity 10p11.22 KIF5B rs211302 1.5 C/G

3.2 The intake of oxygen is important during exercise. Lung capacity affects the body's ability to take in oxygen and distribute it to cells providing energy for exercise and training.

Lung capacity 7q32.2 NRF1 rs2402970 3.4 C/T CC
Lung capacity 7q32.2 NRF1 rs949152 3.4 A/G AA
Lung capacity 10q25.3 ADRB1 rs181253 1.2 C/G CC
Lung capacity 19q13.2 APOE rs429358 1.5,6 T/C CC
Lung capacity 19q13.32 APOE rs7412 1.5,6 C/T CC

4. Metabolism, recovery, and other

4.1 Metabolism involves a complex set of enzymes and hormones that convert food into fuel. Individuals with higher metabolisms often burn fuel more efficiently. Many factors affect metabolism including: diet exercise age and genetic code.

Metabolism 1p13.1 AMPD1 rs17602729 5.7 G/A GG
Metabolism 1p13.1 AMPD1 rs993157 3.8 A/G TT
Metabolism 1p13.1 AMPD1 rs2297686 6.7 A/G AA
Metabolism 11q23.3 APOA1 rs5070 2 G/G GG
Metabolism 22q13.31 PPARG rs283778 1.4,7 C/G

4.2 How our muscles and bodies heal and recover after workouts is as important as how our bodies react during workouts. Genes too are involved in the body's ability to recover.

Recovery 7p15.3 IL6 rs1800795 1.2 C/G CC
Recovery 19q13.32 C9M1/CKM rs1803285 3.4,5 A/G

4.3 Propensity to exercise is the motivation that drive us to exercise - something that gets us moving. This can be a combination of genetic environmental physiological and mental factors.

Propensity to exercise 2q33.1 DNAPTP6 rs12612420 1.2 G/A GG
Propensity to exercise 10q23.2 PAPSS2 rs1087741 1.2 T/C CC
Propensity to exercise 19p11.32 C1orf2 rs8097348 1.2 A/G

5. Ligaments and tendons

5.1 The Achilles tendon is the largest tendon in the body. It connects the calf muscle to the heel bone and is used for walking running or jumping. An Achilles heel injury can be an incredible hindrance to any athlete's performance and can often take months to heal.

Achilles tendon strength 9q34.3 COL5A1 rs3196378 3.5 A/C
Achilles tendon strength 11q22.2 MMP3 rs591058 4 C/T TT
Achilles tendon strength 11q22.2 MMP3 rs650108 4 G/A GG
Achilles tendon strength 17q21.33 MMP3 rs579620 4 A/G TT
Achilles tendon strength 17q21.33 COL5A1 rs12722 3.5 G/T CC
Achilles tendon strength 17q21.33 COL5A1 rs1800012 1 C/T AC
Achilles tendon strength 20q11.22 SDF3 rs143383 2 T/C AA

5.2 Ligaments are designed to passively stabilize joints. Strong tendons and ligaments promote healthier joints and minimizes injuries. Those with the favorable allele may have stronger ligaments than the general population allowing for better performance and less risk of injury.

Ligament strength 7p15.3 NPY rs16139 1 A/G TT
Ligament strength 7q36.1 NOS3 rs2070744 1 C/T
Ligament strength 17q21.33 COL5A1 rs13946 4 C/T
Ligament strength 17q21.33 COL5A1 rs1800012 2,3 G/T AC

Research references:
Endurance


7. MacArthur DG et al.; Variants within the MMP3 gene are associated with Achilles tendinopathy: Possible interaction with the COL5A1 gene; Br J Sports Med; 2009 May;43(5):32.

6. Stefan N et al; Genetic variations in PPARD and PPARGC1A determine mitochondrial function and change in aerobic physical fitness and insulin sensitivity during lifestyle intervention; J Clin Endocrinol Metab; 2007 May;92(5):1827-33.


Lung capacity

Ligament strength

Muscle fatigue

Muscle repair

Energy


Power


6. Stefan N et al; Genetic variations in PPARD and PPARGC1A determine mitochondrial function and change in aerobic physical fitness and insulin sensitivity during lifestyle intervention; J Clin Endocrinol Metab; 2007 May;92(5):1827-33.