

★ LDL cholesterol level [Richardson, 2020]

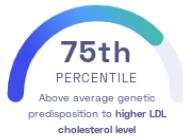
Tom Richardson, et al.
PLOS Medicine

Heart Blood

STUDY SUMMARY

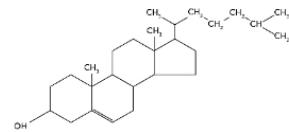
Identification of 220 genetic variants associated with the LDL *cholesterol* level in blood and analysis of its contribution to the risk of coronary heart disease.

YOUR RESULT



STUDY DESCRIPTION

Coronary heart disease (CHD) is a condition that develops when the heart's arteries cannot supply enough oxygen to the heart muscle. Coronary heart disease is the leading cause of death in the United States. It occurs when *plaque* builds up in the heart's arteries and blocks the blood flow to the heart. Arterial *plaque* consists of multiple substances that circulate in the blood. One of the substances that the study examined is LDL (low-density lipoprotein) *cholesterol*, also known as the "bad" *cholesterol*. To this end, this study analyzed genetic data of over 440,000 individuals of European descent to identify genomic regions associated with LDL *cholesterol* levels in the blood. The researchers identified 220 genetic variants, including 123 novel variants, associated with LDL *cholesterol* levels. The analysis showed that a high LDL *cholesterol* level is associated with an increased risk of coronary heart disease. However, this association weakened when the researchers considered all fats and proteins in the study. However, the results still suggest that LDL *cholesterol* plays an important role as a risk factor for heart disease.



The chemical structure of cholesterol resembles steroid hormones, bile acid and vitamin D because it is used for their biosynthesis.

DID YOU KNOW?

Coronary heart disease develops over many decades. A healthy lifestyle can significantly decrease the risk of developing coronary heart disease.

YOUR DETAILED RESULTS

To calculate your genetic predisposition to higher LDL cholesterol level we summed up the effects of genetic variants that were linked to higher LDL cholesterol level in the **study that this report is based on**. These variants can be found in the table below. The variants highlighted in green have **positive effect sizes** and increase your genetic predisposition to higher LDL cholesterol level. The variants highlighted in blue have **negative effect sizes** and decrease your genetic predisposition to higher LDL cholesterol level. Variants that are not highlighted are not found in your genome and do not affect your genetic predisposition to higher LDL cholesterol level. By adding up the effect sizes of the highlighted variants we calculated your polygenic score for higher LDL cholesterol level to be **1.13**. To determine whether your score is high or low, we compared it to the scores of 5,000 other Nebula Genomics users. We found that your polygenic score for higher LDL cholesterol level is in the **76th percentile**. This means that it is higher than the polygenic scores 75% of people. We consider this to be an **above average genetic predisposition to higher LDL cholesterol level**. However, please note that genetic predispositions do not account for important non-genetic factors like lifestyle. Furthermore, the genetics of most traits has not been fully understood yet and many associations between traits and genetic variants remain unknown. For additional explanations, click on the column titles in the table below and visit our [Nebula Library tutorial](#).

VARIANT	YOUR GENOTYPE	EFFECT SIZE	VARIANT FREQUENCY	SIGNIFICANCE
rs6867_C	C / C	-0.16 (↓)	83%	1.30×10^{-711}
rs143020224_C	C / C	0.17 (↑)	88%	8.90×10^{-605}
rs1551891_G	G / G	0.17 (↑)	91%	3.70×10^{-490}
rs11591147_G	G / G	0.35 (↑)	98%	2.20×10^{-421}
rs4452060_C	C / C	-0.08 (↓)	58%	6.90×10^{-343}
rs4970834_C	C / C	0.11 (↑)	81%	2.00×10^{-336}
rs934197_G	G / G	-0.08 (↓)	66%	9.40×10^{-312}
rs12916_T	C / C	-0.06 (-)	60%	2.20×10^{-187}
rs28601761_C	C / C	0.06 (↑)	58%	1.20×10^{-184}
rs8107974_A	A / A	0.11 (↑)	92%	1.80×10^{-168}
rs4299376_G	T / T	0.05 (-)	32%	3.50×10^{-131}
rs430096_A	A / A	0.05 (↑)	78%	2.30×10^{-103}
rs118039278_G	G / G	-0.08 (↓)	92%	2.20×10^{-102}
rs115478735_A	A / T	-0.06 (↓)	82%	9.00×10^{-96}
rs2738447_A	A / C	-0.04 (↓)	41%	3.50×10^{-89}
rs472495_G	T / T	-0.04 (-)	35%	5.50×10^{-86}
rs964184_G	C / C	0.06 (-)	13%	1.60×10^{-78}
rs77542162_A	A / A	-0.13 (↓)	98%	5.50×10^{-74}
rs34042070_C	C / C	-0.05 (↓)	81%	2.20×10^{-73}
rs1168127_C	A / A	-0.04 (-)	35%	1.90×10^{-70}
rs556107_C	C / T	-0.04 (↓)	48%	8.00×10^{-64}
rs1883711_G	G / G	-0.10 (↓)	97%	1.40×10^{-63}
rs1260326_T	T / C	0.03 (↑)	40%	5.60×10^{-60}
rs6874202_T	T / T	-0.03 (↓)	37%	1.20×10^{-50}
rs3764261_C	C / A	0.03 (↑)	68%	1.00×10^{-49}
rs79220007_T	T / C	0.06 (↑)	92%	1.50×10^{-48}
rs174564_A	A / A	0.03 (↑)	65%	3.10×10^{-48}
rs516316_G	C / C	-0.03 (-)	49%	9.50×10^{-47}
rs4738684_A	A / G	0.03 (↑)	34%	3.30×10^{-46}
rs34392107_G	G / A	-0.05 (↓)	88%	5.80×10^{-45}
rs12208357_C	C / C	-0.06 (↓)	93%	3.40×10^{-44}
rs59379014_C	C / C	-0.06 (↓)	93%	3.30×10^{-43}
rs2073547_A	A / A	-0.04 (↓)	82%	2.40×10^{-40}
rs6693893_T	T / T	0.07 (↑)	96%	3.10×10^{-40}
rs6709904_A	A / G	0.04 (↑)	89%	8.70×10^{-40}
rs56130071_G	G / G	-0.03 (↓)	78%	4.70×10^{-39}
rs597808_A	A / G	-0.03 (↓)	48%	2.00×10^{-38}
rs188247550_C	C / C	0.12 (↑)	99%	9.20×10^{-37}

rs36043200_G	G / A	0.03 (↑)	48%	1.20 × 10 ⁻³⁶
rs9987289_A	A / G	-0.05 (↓)	9%	4.80 × 10 ⁻³⁶
rs61776180_C	C / T	0.03 (↑)	58%	1.70 × 10 ⁻³⁵
rs62116889_T	T / T	0.05 (↑)	93%	2.40 × 10 ⁻³³
rs11206617_T	T / T	-0.07 (↓)	97%	5.90 × 10 ⁻³²
rs150262789_C	C / C	0.10 (↑)	98%	2.00 × 10 ⁻³¹
rs2618566_G	G / T	0.02 (↑)	34%	1.20 × 10 ⁻²⁹
rs2642438_A	A / G	-0.03 (↓)	30%	7.60 × 10 ⁻²⁹
rs35081008_C	C / T	0.03 (↑)	85%	1.10 × 10 ⁻²⁷
rs1169294_G	G / A	-0.02 (↓)	69%	2.00 × 10 ⁻²⁷
rs117733303_A	A / A	-0.08 (↓)	98%	2.50 × 10 ⁻²⁷
rs2740488_A	A / C	0.03 (↑)	73%	7.80 × 10 ⁻²⁷
rs7746081_G	G / G	0.02 (↑)	70%	4.60 × 10 ⁻²⁶
rs7202323_T	T / G	0.03 (↑)	77%	7.50 × 10 ⁻²⁵
rs1801689_A	A / A	-0.06 (↓)	97%	1.60 × 10 ⁻²⁴
rs9884390_T	T / T	-0.03 (↓)	77%	7.20 × 10 ⁻²⁴
rs150474434_G	G / G	0.03 (↑)	90%	1.40 × 10 ⁻²³
rs2287622_A	G / G	0.02 (−)	40%	3.20 × 10 ⁻²³
rs55714927_C	C / C	0.03 (↑)	81%	3.70 × 10 ⁻²³
rs1800961_C	C / C	0.06 (↑)	97%	4.00 × 10 ⁻²³
rs6475606_C	C / C	0.02 (↑)	52%	2.00 × 10 ⁻²²
rs17050272_G	G / A	0.02 (↑)	59%	3.10 × 10 ⁻²²
rs6602912_T	T / T	-0.02 (↓)	72%	5.50 × 10 ⁻²²
rs6093446_G	G / A	-0.02 (↓)	71%	7.40 × 10 ⁻²²
rs76079263_G	G / G	0.03 (↑)	91%	3.90 × 10 ⁻²¹
rs72631343_C	C / C	0.03 (↑)	87%	4.90 × 10 ⁻²¹
rs2068888_G	G / A	0.02 (↑)	55%	5.30 × 10 ⁻²⁰
rs11621792_C	C / T	-0.02 (↓)	55%	1.30 × 10 ⁻¹⁹
rs9391803_T	T / T	-0.03 (↓)	85%	1.60 × 10 ⁻¹⁹
rs3179865_G	G / G	-0.02 (↓)	60%	1.90 × 10 ⁻¹⁹
rs7562734_G	G / C	0.02 (↑)	68%	2.20 × 10 ⁻¹⁹
rs116734477_C	C / C	0.05 (↑)	96%	2.80 × 10 ⁻¹⁹
rs7734476_G	A / A	-0.02 (−)	45%	3.90 × 10 ⁻¹⁹
rs9834932_A	A / A	0.03 (↑)	91%	1.10 × 10 ⁻¹⁸
rs113177823_G	G / G	0.04 (↑)	95%	1.20 × 10 ⁻¹⁸
rs2737265_A	A / A	0.02 (↑)	72%	1.90 × 10 ⁻¹⁸
rs233721_T	T / A	-0.02 (↓)	36%	2.30 × 10 ⁻¹⁸
rs13076933_T	T / T	0.02 (↑)	74%	3.00 × 10 ⁻¹⁸
rs12948394_C	T / T	0.02 (−)	52%	5.10 × 10 ⁻¹⁸
rs261334_G	G / C	0.02 (↑)	21%	8.70 × 10 ⁻¹⁸
rs7569317_T	T / T	-0.02 (↓)	47%	8.70 × 10 ⁻¹⁸
rs4722551_T	T / C	-0.02 (↓)	84%	1.30 × 10 ⁻¹⁷
rs76967117_G	G / G	0.03 (↑)	89%	2.10 × 10 ⁻¹⁷
rs3822855_G	G / T	-0.02 (↓)	60%	3.50 × 10 ⁻¹⁷
rs907866_G	G / G	0.02 (↑)	55%	3.70 × 10 ⁻¹⁷
rs2160994_T	T / T	-0.02 (↓)	35%	4.10 × 10 ⁻¹⁷
rs62118464_G	G / G	-0.03 (↓)	88%	4.90 × 10 ⁻¹⁷
rs1229984_T	NA	-0.05 (−)	3%	7.40 × 10 ⁻¹⁷
rs13108218_A	A / G	0.02 (↑)	39%	2.10 × 10 ⁻¹⁶
rs224424_A	G / A	0.02 (↑)	79%	2.60 × 10 ⁻¹⁶
rs8101801_C	C / C	0.05 (↑)	96%	6.20 × 10 ⁻¹⁶
rs1458038_C	T / T	0.02 (−)	71%	6.90 × 10 ⁻¹⁶
rs114165349_G	G / G	-0.06 (↓)	98%	8.00 × 10 ⁻¹⁶
rs1532085_A	G / G	0.02 (−)	39%	8.90 × 10 ⁻¹⁶
rs11601507_C	C / C	-0.03 (↓)	93%	1.70 × 10 ⁻¹⁵
rs2238162_C	C / C	0.02 (↑)	48%	3.50 × 10 ⁻¹⁵
rs2260802_G	G / A	0.02 (↑)	28%	6.00 × 10 ⁻¹⁵
rs4782568_C	C / G	0.02 (↑)	55%	6.00 × 10 ⁻¹⁵
rs77960347_A	A / A	-0.07 (↓)	99%	7.50 × 10 ⁻¹⁵
rs9929977_T	T / A	-0.02 (↓)	63%	1.00 × 10 ⁻¹⁴

rs12603885_G	A / A	-0.02 (-)	30%	1.40 × 10 ⁻¹⁴
rs1556662_G	G / T	-0.02 (↓)	21%	2.00 × 10 ⁻¹⁴
rs71311871_A	A / A	0.03 (↑)	92%	6.60 × 10 ⁻¹⁴
rs12246352_A	A / A	-0.03 (↓)	90%	6.80 × 10 ⁻¹⁴
rs146534110_G	G / G	-0.07 (↓)	99%	8.70 × 10 ⁻¹⁴
rs2925677_C	C / C	0.02 (↑)	79%	1.10 × 10 ⁻¹³
rs11789603_C	C / T	-0.02 (↓)	89%	1.20 × 10 ⁻¹³
rs9298506_A	A / A	-0.02 (↓)	79%	2.50 × 10 ⁻¹³
rs10231941_T	T / T	-0.02 (↓)	82%	3.00 × 10 ⁻¹³
rs10832963_T	T / G	-0.02 (↓)	26%	4.10 × 10 ⁻¹³
rs9496567_G	G / G	0.02 (↑)	76%	5.90 × 10 ⁻¹³
rs11786083_G	G / G	-0.02 (↓)	63%	7.10 × 10 ⁻¹³
rs117139027_G	G / G	0.06 (↑)	98%	7.20 × 10 ⁻¹³
rs704_G	A / A	-0.01 (-)	52%	8.60 × 10 ⁻¹³
rs12990177_A	* / T	-0.02 (-)	48%	1.10 × 10 ⁻¹²
rs13283282_C	C / C	0.02 (↑)	85%	2.60 × 10 ⁻¹²
rs74869459_T	T / T	0.02 (↑)	76%	3.00 × 10 ⁻¹²
rs3110609_T	C / C	0.02 (-)	66%	3.10 × 10 ⁻¹²
rs145730801_T	T / T	-0.04 (↓)	98%	3.60 × 10 ⁻¹²
rs1495741_G	G / A	0.02 (↑)	22%	4.60 × 10 ⁻¹²
rs3732359_G	A / A	0.02 (-)	22%	4.70 × 10 ⁻¹²
rs62120394_G	G / G	-0.02 (↓)	71%	5.50 × 10 ⁻¹²
rs72823020_T	T / T	0.02 (↑)	87%	5.60 × 10 ⁻¹²
rs4954192_C	C / C	-0.01 (↓)	63%	5.70 × 10 ⁻¹²
rs880315_T	T / T	0.02 (↑)	66%	6.80 × 10 ⁻¹²
rs7776054_A	A / A	0.02 (↑)	74%	7.00 × 10 ⁻¹²
rs112987086_G	T / T	-0.02 (-)	28%	1.20 × 10 ⁻¹¹
rs62033400_A	A / G	0.01 (↑)	61%	1.20 × 10 ⁻¹¹
rs10448340_T	T / T	0.02 (↑)	68%	1.40 × 10 ⁻¹¹
rs2066714_T	T / T	-0.02 (↓)	87%	1.60 × 10 ⁻¹¹
rs9491699_C	C / T	-0.01 (↓)	52%	1.90 × 10 ⁻¹¹
rs9832727_C	C / G	0.01 (↑)	66%	2.10 × 10 ⁻¹¹
rs67050321_T	T / T	-0.02 (↓)	70%	2.20 × 10 ⁻¹¹
rs6073958_T	T / T	-0.02 (↓)	80%	2.60 × 10 ⁻¹¹
rs3780181_A	A / A	0.03 (↑)	93%	2.90 × 10 ⁻¹¹
rs6090101_G	G / G	-0.02 (↓)	80%	3.10 × 10 ⁻¹¹
rs1016988_T	T / C	0.02 (↑)	81%	5.20 × 10 ⁻¹¹
rs115458560_T	T / T	0.05 (↑)	98%	6.60 × 10 ⁻¹¹
rs6667939_C	T / T	-0.02 (-)	28%	7.10 × 10 ⁻¹¹
rs4818025_A	A / A	-0.01 (↓)	43%	8.70 × 10 ⁻¹¹
rs17476364_T	T / T	0.02 (↑)	89%	9.10 × 10 ⁻¹¹
rs9841897_T	T / T	-0.02 (↓)	84%	1.30 × 10 ⁻¹⁰
rs1350559_C	C / G	-0.01 (↓)	60%	1.50 × 10 ⁻¹⁰
rs549956721_A	A / A	0.04 (↑)	97%	1.80 × 10 ⁻¹⁰
rs56113850_T	C / C	-0.01 (-)	42%	1.80 × 10 ⁻¹⁰
rs11206788_G	G / C	-0.01 (↓)	41%	2.00 × 10 ⁻¹⁰
rs28631087_T	T / T	0.02 (↑)	79%	2.20 × 10 ⁻¹⁰
rs2718717_A	A / A	-0.02 (↓)	86%	2.60 × 10 ⁻¹⁰
rs6573971_G	A / A	0.01 (-)	44%	3.40 × 10 ⁻¹⁰
rs55921103_G	T / T	-0.01 (-)	35%	5.10 × 10 ⁻¹⁰
rs140584594_A	A / A	0.01 (↑)	27%	5.80 × 10 ⁻¹⁰
rs3932048_C	C / G	-0.01 (↓)	68%	5.80 × 10 ⁻¹⁰
rs13107326_C	C / C	0.02 (↑)	93%	6.00 × 10 ⁻¹⁰
rs34568880_C	C / C	-0.06 (↓)	99%	6.10 × 10 ⁻¹⁰
rs541155877_C	C / C	0.07 (↑)	99%	6.30 × 10 ⁻¹⁰
rs6589939_A	A / G	-0.01 (↓)	62%	7.00 × 10 ⁻¹⁰
rs1731243_C	C / T	-0.01 (↓)	39%	7.10 × 10 ⁻¹⁰
rs11568318_C	C / C	-0.03 (↓)	93%	7.40 × 10 ⁻¹⁰
rs4808360_T	T / A	-0.01 (↓)	49%	8.10 × 10 ⁻¹⁰
rs2021092_T	T / T	0.02 (↑)	81%	8.70 × 10 ⁻¹⁰

rs59328596_G	NEW	G / G	0.02 (\uparrow)	85%	8.90×10^{-10}
rs73025516_A		A / A	0.03 (\uparrow)	98%	9.20×10^{-10}
rs12078100_C	NEW	G / G	-0.01 (-)	38%	9.30×10^{-10}
rs191064657_C		C / C	0.04 (\uparrow)	96%	9.30×10^{-10}
rs12197047_G	NEW	G / A	-0.01 (\downarrow)	35%	1.10×10^{-9}
rs9471975_T	NEW	C / C	0.01 (-)	42%	1.10×10^{-9}
rs960596_C	NEW	C / T	-0.01 (\downarrow)	66%	1.30×10^{-9}
rs115739682_T	NEW	T / T	0.02 (\uparrow)	81%	1.40×10^{-9}
rs551473284_T	NEW	T / T	-0.01 (\downarrow)	37%	1.40×10^{-9}
rs9894946_A		A / G	0.02 (\uparrow)	16%	1.50×10^{-9}
rs1127568337_G	NEW	G / G	0.02 (\uparrow)	81%	1.60×10^{-9}
rs56212732_C	NEW	C / C	0.02 (\uparrow)	92%	1.80×10^{-9}
rs6050463_G	NEW	G / A	-0.01 (\downarrow)	51%	1.80×10^{-9}
rs61988566_T	NEW	T / T	0.02 (\uparrow)	91%	2.10×10^{-9}
rs72733928_A	NEW	A / A	-0.03 (\downarrow)	94%	2.30×10^{-9}
rs61778883_T	NEW	T / T	-0.02 (\downarrow)	13%	2.40×10^{-9}
rs12471768_T	NEW	C / C	-0.01 (-)	30%	2.50×10^{-9}
rs576573069_T	NEW	T / T	-0.01 (\downarrow)	33%	2.90×10^{-9}
rs11014204_C	NEW	C / C	-0.01 (\downarrow)	72%	3.30×10^{-9}
rs438568_A		G / G	-0.01 (-)	39%	4.00×10^{-9}
rs10910476_C		C / T	-0.01 (\downarrow)	44%	4.30×10^{-9}
rs12162782_T	NEW	T / G	-0.01 (\downarrow)	66%	4.40×10^{-9}
rs111338114_A	NEW	A / A	0.03 (\uparrow)	94%	4.70×10^{-9}
rs35882350_A	NEW	A / A	-0.01 (\downarrow)	74%	5.00×10^{-9}
rs11227247_A	NEW	A / A	-0.02 (\downarrow)	87%	5.70×10^{-9}
rs10851478_T	NEW	T / C	0.01 (\uparrow)	58%	6.00×10^{-9}
rs4148826_T	NEW	T / T	0.02 (\uparrow)	82%	6.50×10^{-9}
rs2256814_G	NEW	G / G	-0.02 (\downarrow)	80%	6.70×10^{-9}
rs1250258_C		T / T	-0.01 (-)	26%	6.80×10^{-9}
rs56236159_T	NEW	T / T	-0.02 (\downarrow)	87%	7.00×10^{-9}
rs12445804_G	NEW	G / G	-0.02 (\downarrow)	93%	8.00×10^{-9}
rs6560499_G	NEW	A / A	0.01 (-)	42%	8.10×10^{-9}
rs204469_A		NA	-0.03 (-)	4%	8.60×10^{-9}
rs913499_A	NEW	A / G	0.01 (\uparrow)	49%	9.80×10^{-9}
rs9686661_C	NEW	C / C	-0.01 (\downarrow)	80%	1.10×10^{-8}
rs112403212_C	NEW	C / C	-0.02 (\downarrow)	86%	1.20×10^{-8}
rs61754230_C	NEW	C / C	-0.04 (\downarrow)	98%	1.20×10^{-8}
rs7241918_G	NEW	G / T	-0.02 (\downarrow)	18%	1.20×10^{-8}
rs869412_T	NEW	T / T	0.01 (\uparrow)	77%	1.20×10^{-8}
rs1007938_A	NEW	A / G	-0.01 (\downarrow)	59%	1.30×10^{-8}
rs28768427_G	NEW	G / A	-0.01 (\downarrow)	48%	1.30×10^{-8}
rs72638977_A	NEW	A / A	0.03 (\uparrow)	97%	1.30×10^{-8}
rs62011285_T	NEW	C / C	-0.01 (-)	66%	1.60×10^{-8}
rs7090758_T	NEW	T / C	0.01 (\uparrow)	53%	1.60×10^{-8}
rs73075609_C	NEW	C / C	-0.04 (\downarrow)	97%	1.60×10^{-8}
rs77013160_G	NEW	G / G	-0.04 (\downarrow)	98%	1.70×10^{-8}
rs28406917_C		T / T	-0.01 (-)	57%	1.80×10^{-8}
rs7108486_T	NEW	T / T	0.04 (\uparrow)	98%	1.80×10^{-8}
rs990619_C	NEW	C / G	0.01 (\uparrow)	48%	1.90×10^{-8}
rs12936113_T	NEW	T / C	-0.01 (\downarrow)	24%	2.30×10^{-8}
rs56208742_T	NEW	T / T	0.03 (\uparrow)	97%	2.30×10^{-8}
rs79828839_C	NEW	C / T	-0.01 (\downarrow)	80%	2.40×10^{-8}
rs61433703_G		G / G	-0.02 (\downarrow)	84%	2.70×10^{-8}
rs6714750_A	NEW	A / A	-0.01 (\downarrow)	80%	2.70×10^{-8}
rs144984216_C	NEW	C / C	0.04 (\uparrow)	98%	2.80×10^{-8}
rs8008068_A	NEW	A / G	-0.02 (\downarrow)	84%	3.70×10^{-8}
rs77257036_C		* / T	0.01 (-)	65%	3.80×10^{-8}
rs72774870_C	NEW	C / T	0.02 (\uparrow)	93%	3.90×10^{-8}
rs146433259_C	NEW	C / C	0.06 (\uparrow)	99%	4.60×10^{-8}

rs4620269_A		A / A	-0.01 (↓)	81%	4.60 x 10 ⁻⁸
rs836550_A		A / G	-0.01 (↓)	59%	4.60 x 10 ⁻⁸

N/A indicates variants that could not be imputed using the 1000 genomes project datasets and variants that have a frequency of < 5%. Your genome was sequenced at 30x/100x coverage and is not imputed. However, to calculate percentiles, we need to compare your data with other users imputed data. To make the data comparable, we need to exclude some of the variants from your data.