



cardi♥map  
A heart-to-heart with your heart

## Vick Hart

Mapmygenome ID

MMGXXXXXXXXXXXXXXXXXX

Ethnicity/Gender

Not specified / Male

Report Generated on

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Know Yourself



# YOUR **DNA** JOURNEY BEGINS HERE.

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**Dear Vick Hart**

Congratulations on taking the first step to unlock better health. We delved right into your source code (your DNA!) to help you understand key aspects about your cardiovascular health profile.

CardioMap is designed to assess your lifetime risk for 8 different cardiac conditions and predisposition to 8 risk factors for heart disease. When it comes to heart health, it is imperative to formulate a preventive strategy - to keep symptoms at bay. Urbanized, fast-paced lifestyles and/or the presence of a family history of heart disease can further increase risk, which calls for early screening and lifestyle intervention.

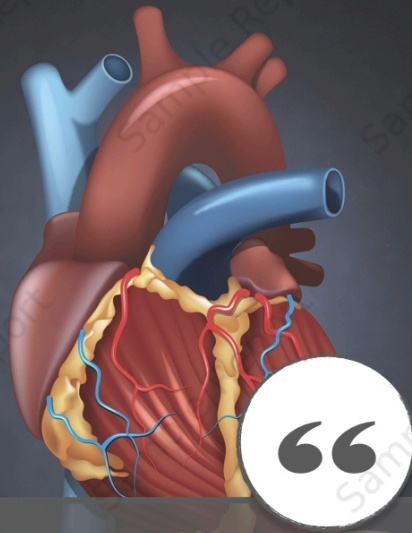
With CardioMap, you can get a glimpse into yourself - identify potential risk, switch to healthy habits tailored to YOU, keep tabs on clinical parameters and reduce overall risk. Our certified counsellors will help you find the right action plan to optimise your health, with personalised recommendations. All you need to do is talk to our counsellor for a comprehensive assessment of genetic risk, personal and family history.

May you remain young (and healthy) at heart, for life. Now that you Know Yourself, it's time to take control - here's to a successful journey and lifelong prevention!

**Anu Acharya,**

Founder, CEO,  
Mapmygenome





# YOUR GENETICS IS NOT YOUR DESTINY

- George M Church

## ABOUT CARDIOMAP™

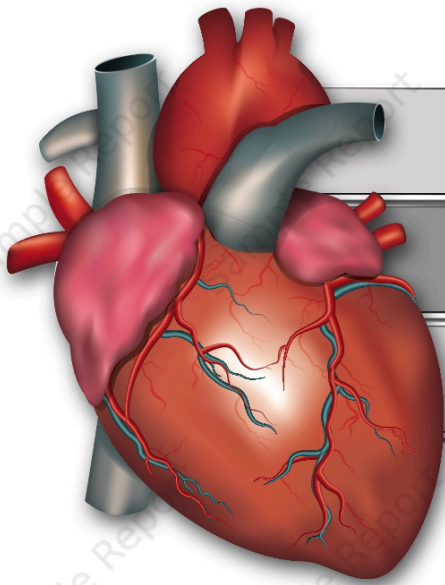
The last few decades witnessed leaps and bounds in the field of genomic research, bringing to light new findings from the human genome. Genome wide association studies have identified several genes which affect many aspects of wellness such as metabolism, nutrition, cardiovascular traits (heart rate and function), lifestyle tendencies, cholesterol levels and more.

Through extensive data mining, bioinformatic studies and statistical validation, Mapmygenome developed Cardiomap™ - a **comprehensive genomic assessment of heart health**, based on **DNA analysis** and interpretation. From homocysteine levels to hypertrophic cardiomyopathy, Cardiomap™ offers a wide scope of testing, by screening over **700000 genetic markers** across the human genome.

According to the WHO, up to **80% of heart disease is preventable**, by managing associated factors such as BMI, blood pressure, triglycerides, diet, etc. CardioMap™ empowers you to take control of your health, by highlighting areas of concern or potential risk that you can mitigate. **Personalised recommendations** from our certified counselors help you formulate the best-suited action plan - so that you stay healthier, for longer.



# CARDIOMAP™ COVERS



**Cardiac Disease Risk**

**Other Cardiovascular Risks**

**Predisposition to Risk Factors**

## Cardiac Disease Risk

Cardiac conditions have a significant genetic component. Based on multi-gene analysis, the report includes lifetime risk assessment for -

- Atrial Fibrillation
- Myocardial Infarction
- Coronary Heart Disease
- Stroke
- Long QT

## Other Cardiovascular Risks

Other conditions like venous thromboembolism, cardiomyopathy, etc are caused by variations in specific genes, and can co-exist with other cardiac anomalies. Genetic risk assessment of these conditions is included in the report, for a better understanding of heart health. Conditions covered -

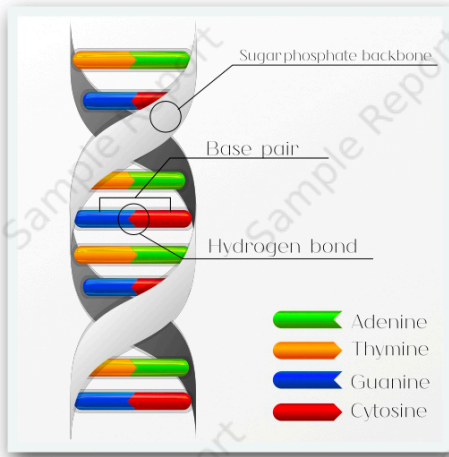
- Hypertrophic Cardiomyopathy
- Venous Thromboembolism
- Sudden Cardiac Arrest

## Predisposition to Risk Factors

Cardiac diseases are multifactorial and complex, with both genes and environment affecting final outcomes. CardioMap™ includes detailed genetic risk analysis of associated risk factors such as hypertension, fat metabolism, lifestyle factors such as smoking and drinking, homocysteine levels, etc, to provide holistic assessment and help you chalk preventive healthcare regimes for your family and you.



# WHAT IS GENETIC INFORMATION?



Genome is the genetic content or hereditary information of an organism, which is made up of DNA in humans and other higher organisms. **DNA is made up of four bases** Adenine, Thymine, Guanine, and Cytosine, designated by four letters **A, T, G, C**, respectively. Although the genome of all humans is almost the same, a minor difference exists among individuals. This difference, which is called **genetic variation** is responsible for **unique phenotype** (appearance, e.g., color of skin/eyes, type of hair [curly, smooth], etc.) and **difference in the health of each individual**. In most of the cases, this difference or variation is **passed on to the next generation** (inheritance), which confers disease susceptibility in the offspring.



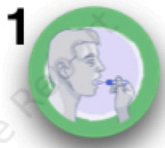
## ABOUT MAPMYGENOME

Being a **key player in the field of Personal Genomics** in India, Mapmygenome has carved out a niche for itself. Founded in January 2013, we started as India's pioneering Genomics Company with a vision to "**Touch 100 million lives** and save a million lives by 2030." Backed by **18+ years of experience** in genomics, Mapmygenome stemmed from Ocimum Biosolutions – it is essentially, a personal genomics and molecular diagnostics company for people who are proactive about their health. We offer **personalized health, fitness and wellness solutions** based on genetic tests that help people know more about themselves.

In September 2015, Mapmygenome made it to the SMARTCEO list of top 50 startups, for its contribution to healthcare. The same year, VCCircle honored us as the 'Innovative Healthcare Startup' of the year. We were awarded the Bio Excellence "Emerging Company of the Year" award by the Government of Karnataka as well. The diversity in our product range got us nominated among the 5 Top Innovators for Jio Economic Times Startup Awards 2015 and our CEO Anu Acharya was awarded the Women Ahead honor. 2016 and 2017 saw Mapmygenome receive recognition, awards and accolades on a global platform, right from the Red Herring award to Wall Street Journal Startup awards. The awards, and recognition continued into 2018 with Mapmygenome receiving the prestigious "Pride of Telangana" award among other laurels.



# WHAT WE DO WITH YOUR DNA



1 You collect the saliva sample, and ship it to us in a safe environment



2 Your DNA is extracted and undergoes quality checks



3 Your DNA undergoes tests in the lab, and gets ready to be read



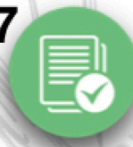
4 Your genetic sequence is subjected to extensive analysis!



5 Voila!! Your DNA has been read, and the report is ready!



6 Our brilliant genetic counsellors discuss your report with you



7 Finally..you get your post counselling report - your cheat code to life!

## DISCLAIMER

This report is only based on your genes and not on any other information you share. The report is not diagnostic in nature and should not be considered as one. What we report is your genetic predisposition towards any particular health condition. If you are reported to be on the higher risk for any of the health condition we cover, it does not mean that you have or you will contract the health condition that is mentioned and the same applies if you are reported to be on the lower risk.

When a person develops a health condition it may be due to their genetic predisposition, lifestyle, exposure to hazardous material, environmental conditions and many more factors. What we provide you should help in assessing your health status on genetic level and making the right choices for leading a healthy lifestyle and to be fit.

**GENETIC PREDISPOSITION DOES NOT MEAN PREDETERMINATION**



# A Quick Peek Into Your DNA



## CARDIOVASCULAR DISEASE RISK

Condition	ALT (Population Risk)	Your Risk (Relative Risk)	Inference
ATRIAL FIBRILLATION	1 in 50	1.96x	High genetic risk
MYOCARDIAL INFARCTION	19 in 10000	1.08x	Baseline genetic risk
CORONARY HEART DISEASE	1 in 125	0.64x	Baseline genetic risk
STROKE	7 in 500	0.98x	Baseline genetic risk
LONG QT INTERVAL	3 in 10000	3.01x	High genetic risk

## OTHER CARDIOVASCULAR RISKS

Condition	Inference	Interpretation
HYPERTROPHIC CARDIOMYOPATHY	NA	Oops! We got some missing data here. These data points did not pass our quality parameters and cannot be used for interpretation.
VENOUS THROMBOEMBOLISM	NA	Oops! We got some missing data here. These data points did not pass our quality parameters and cannot be used for interpretation.
SUDDEN CARDIAC ARREST	Medium genetic risk	You have a slightly increased genetic risk for sudden cardiac arrest.





# PREDISPOSITION TO RISK FACTORS

Condition	Inference	Interpretation
BMI/OBESITY	Medium genetic risk	You have a slightly increased genetic risk for obesity.
BLOOD PRESSURE	High genetic risk	You have an elevated genetic risk for hypertension (high blood pressure).
ADDICTION TO ALCOHOL	Medium genetic risk	You have a slightly increased genetic risk for addiction to alcohol.
HOMOCYSTEINE LEVELS	NA	Oops! We got some missing data here. These data points did not pass our quality parameters and cannot be used for interpretation.
HIGH DENSITY CHOLESTEROL LEVELS	Slightly increased	Great news! You are genetically predisposed to have slightly increased HDL-cholesterol levels.
LOW DENSITY CHOLESTEROL LEVELS	Slightly increased	Uh Oh! You have slightly increased genetic risk for increased LDL-cholesterol.
NICOTINE DEPENDENCE	High genetic risk	You have an elevated genetic risk for nicotine addiction.



# A Journey Through Your DNA







# CARDIOVASCULAR DISEASE RISK

# CORONARY HEART DISEASE

Baseline Genetic Risk

Medium Genetic Risk

High Genetic Risk

**You do not have an elevated genetic risk for coronary heart disease.**

Average Population Risk

1 in 125

Your Genetic Risk

0.64x

**Coronary heart disease or coronary artery disease (CAD)** happens when the supply of blood and oxygen to the heart is reduced, due to narrowing of the blood vessels (coronary arteries) which innervate the heart. This is caused by a waxy substance called plaque, which builds up in the arteries of the heart. Plaque may contain fatty acids, minerals (calcium) and blood cells (macrophages). The most common symptoms of CHD are chest pain or discomfort, shortness of breath, rapid heart rate and lightheadedness.

## Complications of CHD

BRADYCARDIA OR  
TACHYCARDIA

HEART ATTACK

ANGINA  
HEART FAILURE

SUDDEN DEATH

## Did You Know?

- CHD is one of the **leading causes of death**, globally.
- About **50-60% of variations** in CHD have been attributed to genetic factors.
- CHD that occurs before 55 years of age in men, and before 65 years of age in women, is called **premature CHD**. Individuals with a first-degree relative affected with premature CHD are at greater risk for developing CHD.



## Risk Factors for CHD

- Gender (Males are at a greater risk)
- Elevated homocysteine levels
- Hypertension
- Diabetes
- Unhealthy lifestyle - obesity, smoking
- Family history of heart disease
- Genetics





## Genetics of Coronary Heart Disease

One of the strongest genetic associations with atherosclerosis, coronary heart calcification, stroke and aneurysms lies near the **cyclin-dependant kinase inhibitor (CDKN2A/2B)** - 9p21 region. Other genetic risk markers for CHD are present in the **LPA (lipoprotein A)** gene, **MTHFD1L (Methylenetetrahydrofolate Dehydrogenase (NADP+ Dependent) 1 Like)** gene, **PSRC1 (Proline/serine-rich coiled-coil protein 1)** and the **CDH13 (T-cadherin)** gene.

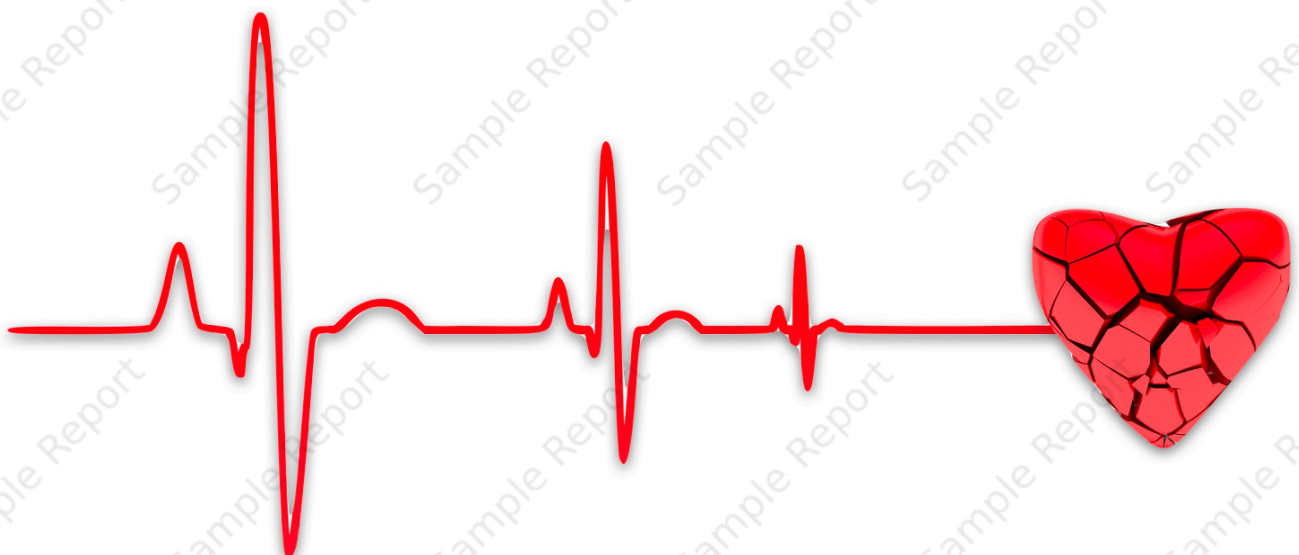
Gene	Chromosome	Risk Allele	Your Genotype
9p21 (CDKN2A/2B)	9	A	AG
PSRC1	1	A	AA
CDH13	16	C	AC
LPA	6	G	AA

**Your Variant Score: 3 out of 4**



## Preventive Measures

- Plate it up! Eat **4-5 servings of fruits** and vegetables every day.
- Maintain a healthy weight. **Exercise for at least 30 minutes** every day.
- **Keep tabs on your lipid profile** (HDL, LDL and triglyceride tests) to reduce risk for heart disease.
- **Get a customised action plan** to manage your health better, in the years to come. Talk to a genetic counselor to get your personal and family history assessed.





# PREDISPOSITION TO RISK FACTORS



# BMI & OBESITY



The World Health Organization (WHO) defines obesity as a condition wherein being **overweight due to excess fat accumulation**, puts an individual's health at risk. **Body Mass Index (BMI)** is a parameter used to evaluate obesity.

## Measuring your BMI

$$\text{BMI} = \frac{\text{Body Weight (in kilograms)}}{[\text{Height (in metres)}]^2}$$

- BMI > 25 - Overweight
- BMI > 30 - Obese



## Your DNA Results

Baseline Genetic Risk

Medium Genetic Risk

High Genetic Risk

**You have a slightly increased genetic risk for obesity.**

The **FTO (Fat mass and obesity associated)** gene regulates lipid/fat storage, transport and metabolism. This gene influences obesity, waist-hip circumference/ratio, adiposity, energy balance, hormone regulation and eating behaviour. The **MC4R -Melanocortin receptor gene** (produced in the brain) affects food-energy signalling, waist-hip ratio and BMI. Genetic variation reduces the amount of this protein, causing excessive hunger and overeating. One such variant is reportedly found in at least 22% of the general population.



## Risk Factors for Obesity

- Lack of physical activity i.e, sedentary lifestyle.
- Unhealthy habits such as excess dietary intake of processed food, sugar, trans fat
- Family history of obesity
- Clinical conditions like Prader-Willi syndrome, Cushing's syndrome
- Hormonal issues like hypothyroidism, PCOS
- Medications such as steroids, antidepressants





## Possible Complications - Obesity

- Type 2 diabetes, gestational diabetes, metabolic syndrome
- Hypertension, heart disease and stroke
- Liver and kidney disease
- Obesity Hypoventilation Syndrome (OHS)
- Osteoarthritis, chronic lower back pain, sleep apnea
- Cancer



## Recommended Plan of Action



**Be consistent** with meal portions and timings - to keep hunger and satiety signals balanced



**Monitor your weight regularly.** Studies show that people who keep regular tabs on their weight are more likely to ward off excess weight gain



**Limit alcohol** intake



**Exercise regularly.** The WHO recommends regular physical activity (60 minutes a day for children and 150 minutes spread through the week for adults) for preventing obesity

### Other Recommendations

- Eat a nutrient-rich diet based on fruits, vegetables, whole grains, pulses, lean meat, etc. Avoid red meat

## DID YOU KNOW?

- Individuals vary in their susceptibility to gain excess weight and become obese. **Up to 40-80% of these variations has been traced to genetic factors.**
- **Your weight fluctuates during the day** and every month, too (especially for women). Weigh yourself first thing in the morning, 1-2 times a week, if you are on a monitoring regime.
- **An elevated BMI does not always mean you are obese.** Other factors like muscle mass and total body fat percentage determine fitness levels. For eg., a sprinter may possess a slimmer build and have a lower BMI when compared to a weightlifter.





# HYPERTENSION (HIGH BP)



**Blood pressure** is the force exerted by blood against the walls of the blood vessels. Hypertension is defined as chronically high blood pressure that is persistently at or **above 140/90 mmHg**. This can cause significant damage to the blood vessels and other organs of the body.



## Your DNA Results

Baseline Genetic Risk

Medium Genetic Risk

High Genetic Risk

**You have an elevated genetic risk for hypertension (high blood pressure).**

The **FGF5 (fibroblast growth factor 5) gene** has a major role in the production, differentiation and repair of cells. It also plays a role in **angiogenesis** (formation of new blood vessels) and **cardiac function**. The **CSK (tyrosine kinase) gene** plays a role in the development of blood vessels and mediates proto-oncogene expression, which **affects blood pressure levels**. Genetic variants in and near these genes **increase risk for hypertension**.



## Risk Factors for hypertension

- Lifestyle factors - excess dietary intake of salt/sodium, obesity, smoking, excess alcohol consumption, high stress levels
- Personal history of sleep apnea, diabetes, hypercholesterolemia
- Family history of hypertension





## Possible Complications - Hypertension

- Stroke
- Coronary heart disease
- Heart attack
- Kidney disease



## Recommended Plan of Action



**Manage your stress levels.**  
Engage in meditation/yoga practice 1x-2x a week.



**Avoid smoking**



**Monitor** your blood pressure regularly.



**Exercise regularly** and maintain a healthy weight.

### Other Recommendations

- If you are at risk for high blood pressure, talk to a clinical nutritionist dietary intervention such as the **D.A.S.H (Dietary Approaches to Stop Hypertension) diet** -which can help prevent or manage hypertension.

## DID YOU KNOW?

- **Secondary hypertension** can be caused by pre-existing medical conditions such as kidney disease.
- Blood pressure that is greater than normal but below 140/90 mm Hg, i.e, between 120/80 and 140/90 mm Hg is defined as **prehypertension**.





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