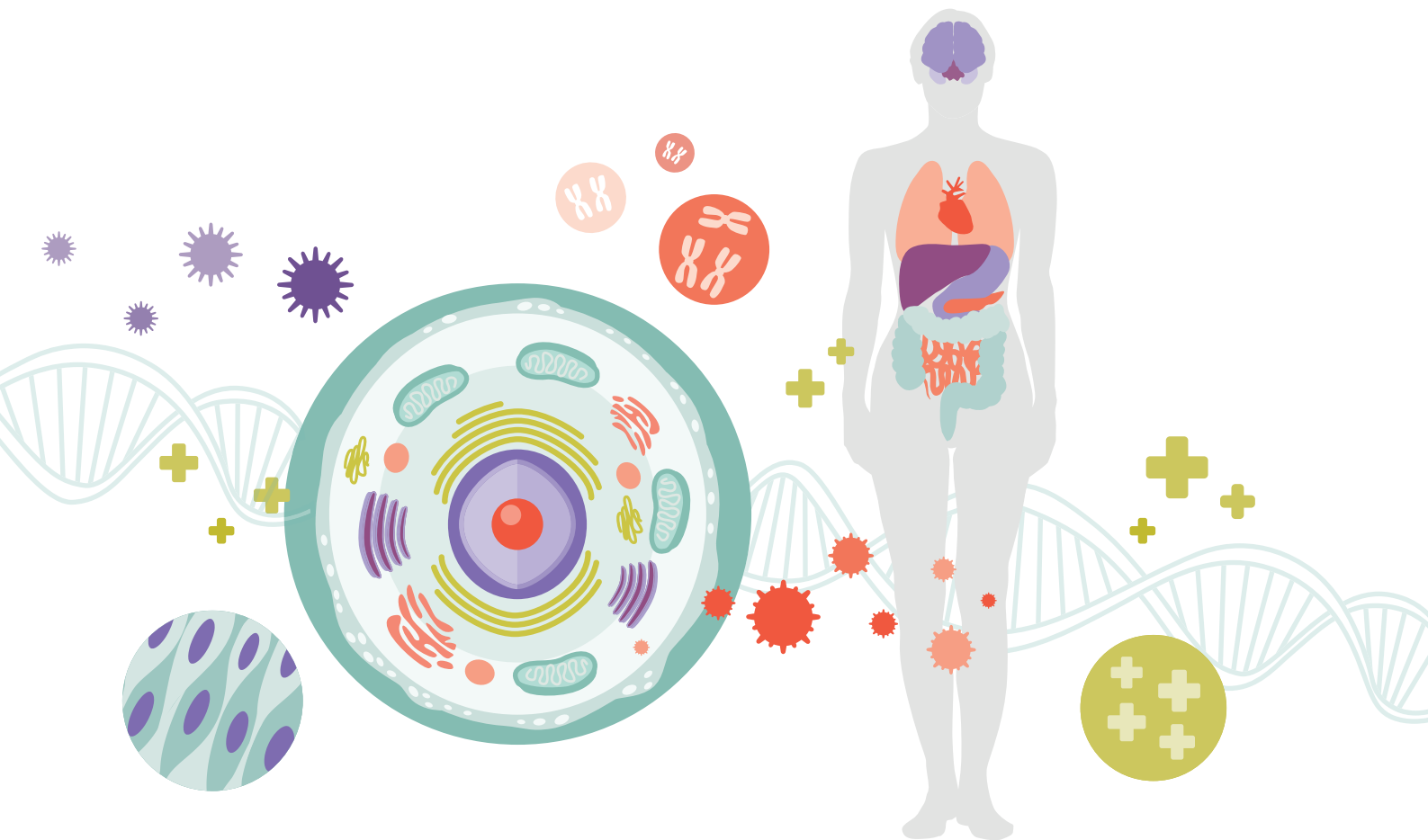




3X4 GENETICS



THE PERSONAL GENETIC STORY OF

FELIX CITED

INTRODUCTION



Why this genetic test?

3X4 makes complex science simple.

Your genes are the instructions for how you build, regulate and maintain your body.

These unique genetic instructions determine the way your body responds to food, exercise, stress and toxins. The 3X4 Genetics test reads your genetic data and translates it into a practical plan of actionable, personalised recommendations for how to positively impact your health. For each major biological category, we give you the 3 metabolic areas that are most affected by your genes:

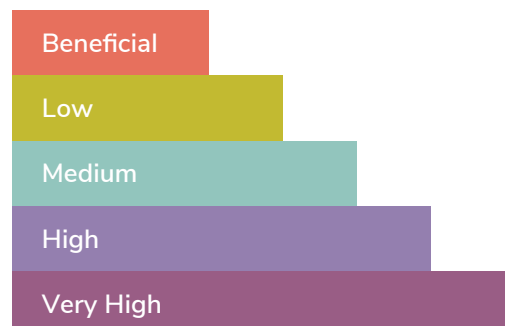
- 3x diet recommendations,
- 3x lifestyle interventions,
- and 3x possible supplements or behaviour suggestions.

Your report focuses on what really matters, providing the answers you need, in the way that you need them, so that you can make the choices that positively impact your health.

Colour Impact

Now that you have access to all this complex genetic code, what do you do with it? Where should you focus your attention?

3X4 translates your genetic results into a clear, universal language of colour. The overall effect of 82 gene variants have been colour-coded from dark purple (highest impact on your health) to light green (lowest impact on your health) to determine which metabolic areas need priority focus. You can follow your colour on each and every page.



CONTENTS

1

Your Genetic Results

Pages 4-5

Your 3X4 report has simplified and colour-classified your genetic information, but we still believe in giving you and your practitioner all your results. The Gene Results page outlines all your single gene variants in detail, which is particularly useful for your practitioner.

2

Pathway-Based Results

Pages 6 - 8

3X4 looks at how genes interact with one another to impact 25 major metabolic pathways in your body (detoxification, inflammation, methylation, glucose balance, etc) that together, determine your overall expression of health. *This is a deviation from conventional thinking in genetic testing, which looks at the impact of single gene variants, independently, regardless of their interaction with other genes or pathways.*

3

Category Infographics

Pages 9 - 18

For each of the 5 major biological categories (Cellular, Systems, Energy, Activity, Nutrients), a graphic has been created that portrays the picture of what's going on for you in this area, allowing you to see at a glance what your most important key metabolic pathways are.

Alongside each infographic you will receive a set of recommendations. For the 3 metabolic areas that are most affected by your genes, we provide:

- 3x diet recommendations,
- 3x lifestyle interventions,
- and 3x possible supplements or behaviour suggestions.

4

The Glossary

Pages 19 - 24

All 25 metabolic processes are broken down, defined and explained for you in the glossary, in simple, easy-to-understand language.

The colour-coded impacts continue here as well, with the most affected pathways highlighted in dark purple, and the less affected pathway lightening in shade with every decreasing impact.

GENE SUMMARY

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Gene	Variant	Result
Beneficial		
CAT	-262 C>T	CC
CETP	279 G>A	AA
FABP2	Ala54Thr G>A	GG
FUT2	Ser258Gly G>A	GA
GPX1	Pro198Leu C>T	CC
GSTM1	INS/DEL	INSERTION
GSTT1	INS/DEL	INSERTION
UCP3	-55 C>T	CT
No Impact		

ACTN3	577 R/X	XX
ADRB3	Trp64Arg T>C	TT
APOA2	-492 T>C	TC
APOE	E2/E3/E4	E3/E3
BDNF	196 G>A	GG
CLOCK	3111 T>C	TT
CYP1A1	Ile462Val A>G	AA
CYP1A1	6235 T>C	TT
CYP1B1	1294 C>G	GG
F2	20210 G>A	GG
F5	1691 G>A	GG
FTO	T>A	TT
HFE	C282Y / H63D	CC/HH
MC4R	T>C	TT
MMP2	Gly226Gly G>C	GG
MNSOD	47 T>C	TC
MTR	2756 A>G	AA
NQO1	609 C>T	CC
NRF2	A>G	AA
PLIN	11482 G>A	GG
PON1	Q192R A>G	AA
SLC2A2	Thr110Ile C>T	CC
SULT1A1	638 G>A	GG
TNFA	-308 G>A	GG
UCP1	-3826 A>G	AA
VDR	Fok1 T>C	CC

Low		
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ADIPOQ -11391 G>A GG

Gene	Variant	Result
Low		
COL5A1	BstUI C>T	CT
CRP	2147 G>A	GA
CYP17A1	34 T>C	TC
CYP1A2	-163 A>C	AC
HO-1	413 A>T	AT
IL-1A	4845 G>T	GT
IL-6	-174 G>C	GG
LEPR	668 A>G	AG
LEPR	1968 G>C	GC
LPL	1595 C>G	CC
TIMP4	-55 T>C	CT

Medium		
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ADRB2	Arg16Gly A>G	AG
ADRB2	Gln27Glu C>G	CG
AGT	M235T A>G	GA
ENOS	984 G>T	GT
EPHX1	113 T>C	TC
GDF5	5' UTR C>T	TT
IL-1B	3954 C>T	TT
IL-1B	-511 A>G	GG
IL-1RN	2018 T>C	TT
IRS1	C>T	CT
LEPR	K109R A>G	AA
MMP1	-1607 1G/2G	1G/2G
MTHFR	1298 A>C	AC
MTRR	66 A>G	AG
OGG1	Ser326Cys C>G	CG
PAI	4G/5G	4G/5G
PPARA	G>C	GG
PPARGC1A	Gly482Ser G>A	GG
TCF7L2	IVS3 C>T	CT
UCP2	866 G>A	GA
VEGF	-634 G>C	CC

High		
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ACE Ins/Del II

GENE SUMMARY

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Gene	Variant	Result
High		

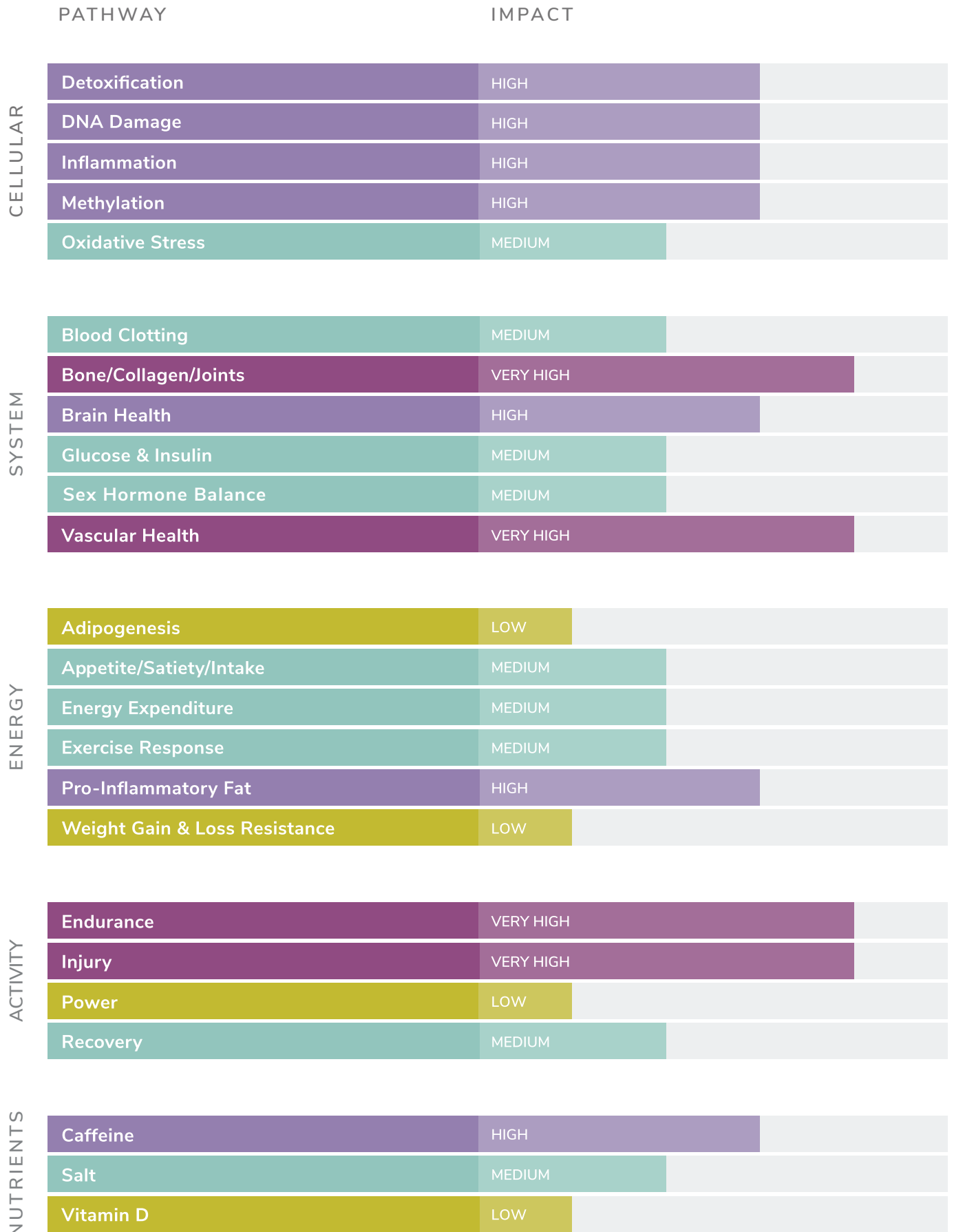
APOA5	-1131 T > C	CC
APOC3	3175 C>G	GG
COL1A1	1546 G>T	GG
DIO2	Thr92Ala T>C	CC
DRD2	TaqIA C>T	CT
GSTP1	313 A>G	GG
IL-6R	48867 A>C	CC
MTHFR	677 C>T	CT
PPARG	Pro12Ala C>G	CC
VDR	Bsm1 G>A	AA

Very High		
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COMT	472 G>A	AA
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PATHWAY-BASED RESULTS

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GENES BY PATHWAY

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CELLULAR

DETOXIFICATION	DNA DAMAGE	INFLAMMATION	METHYLATION	OXIDATIVE STRESS
COMT GSTP1 EPHX1 CYP17A1 CYP1A2 CYP1A1 (Ile462Val A>G) CYP1A1 (6235 T>C) CYP1B1 GSTM1 GSTT1 MNSOD MTHFR (677 C>T) NQO1 PON1 SULT1A1	COMT MTHFR (677 C>T) OGG1 EPHX1 GSTP1 MTHFR (1298 A>C) MTRR CYP17A1 CYP1A1 (6235 T>C) CYP1A1 (Ile462Val A>G) CYP1B1 ENOS GPX1 GSTM1 GSTT1 HO-1 MNSOD MTR NQO1 PON1 SULT1A1 TIMP4	IL-6R IL-1B (3954 C>T) CRP HO-1 IL-1A IL-1B (-511 A>G) IL-1RN TIMP4 APOE CYP1A1 (Ile462Val A>G) CYP1A1 (6235 T>C) CYP1B1 ENOS FUT2 IL-1A IL-6 MNSOD PAI PPARA TNFA	COMT MTHFR (677 C>T) MTRR OGG1 MTHFR (1298 A>C) FUT2 MTR NQO1	ENOS HO-1 OGG1 GSTP1 PPARG APOE GPX1 GSTM1 GSTT1 HFE MNSOD NQO1 PON1 PPARGC1A TNFA UCP1 UCP2 CAT

SYSTEMS

BLOOD CLOTTING	BONE/COLLAGEN/ JOINTS	BRAIN HEALTH	GLUCOSE AND INSULIN	SEX HORMONE BALANCE	VASCULAR HEALTH
PAI ENOS F2 F5	COL1A1 DIO2 GDF5 VDR (Bsm1 G>A) COL5A1 MMP1 MMP2 TIMP4 VDR (Fok1 T>C) VDR (Taq1 T>C)	COMT MTHFR (677 C>T) DRD2 ENOS HO-1 MTHFR (1298 A>C) MTRR OGG1 TIMP4 APOE BDNF MNSOD MTR NQO1	DIO2 PPARG TCF7L2 ADIPOQ APOC3 IRS1 LEPR (K109R A>G) ACE ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) APOA2 CETP FABP2 FTO LEPR (1968 G>C) LEPR (668 A>G) PAI PLIN PPARA SLC2A2 TNFA UCP1 UCP2 UCP3	COMT GSTP1 CYP17A1 EPHX1 CYP1A1 (6235 T>C) CYP1A1 (Ile462Val A>G) CYP1B1 GSTM1 GSTT1 MNSOD NQO1 SULT1A1	ACE ENOS IL-6R MTHFR (677 C>T) PAI VEGF AGT APOA5 APOC3 DIO2 IL-6 LPL OGG1 APOA2 APOE CETP CRP F2 F5 MTHFR (1298 A>C)

GENES BY PATHWAY

Felix Cited

ENERGY

ADIPOGENESIS	APPETITE/ SATIETY/INTAKE	ENERGY EXPENDITURE	EXERCISE RESPONSE	PRO- INFLAMMATORY FAT	WEIGHT GAIN & WEIGHT LOSS RESISTANCE
APOA5 ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) ADRB3 CETP CRP FABP2 IRS1 MMP2 PLIN PPARG PPARGC1A	DRD2 LEPR (K109R A>G) LEPR (668 A>G) LEPR (1968 G>C) APOA2 CLOCK FTO MC4R SLC2A2	UCP2 ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) LEPR (668 A>G) LEPR (1968 G>C) LEPR (K109R A>G) ADRB3 CLOCK FTO MC4R PPARGC1A UCP1 UCP3	ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) LEPR (K109R A>G) LEPR (668 A>G) LEPR (1968 G>C) TCF7L2 ADRB3 APOA2 CLOCK FTO MC4R PLIN	IL-6R IL-1B (3954 C>T) ADIPOQ CRP IL-1A IL-1B (-511 A>G) IL-1RN CYP1A1 (6235 T>C) IL-1A IL-6 TNFA	ADIPOQ ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) APOA5 LEPR (K109R A>G) LEPR (668 A>G) LEPR (1968 G>C) UCP2 ADRB3 APOA2 CLOCK FABP2 FTO MC4R MMP2 PLIN PPARG TCF7L2 UCP1 UCP3

ACTIVITY

ENDURANCE	INJURY	POWER	RECOVERY
ACE PPARA PPARGC1A VEGF ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) NRF2	COL1A1 GDF5 COL5A1 ENOS MMP1 MMP2	VDR (Bsm1 G>A) ACE ACTN3 ADRB2 (Arg16Gly A>G) ADRB2 (Gln27Glu C>G) AGT PPARA PPARGC1A VDR (Taq1 T>C)	IL-6R CRP ENOS IL-1B (3954 C>T) IL-1B (-511 A>G) IL-1RN CAT GPX1 IL-1A IL-1A IL-6 MNSOD TNFA

NUTRIENTS

CAFFEINE	SALT	VITAMIN D
COMT CYP1A2	ACE AGT ENOS	VDR (Bsm1 G>A) VDR (Taq1 T>C) VDR (Fok1 T>C)

CELLULAR OVERVIEW

DNA DAMAGE HIGH

It is critical that our DNA remains stable and protected; damage to our DNA increases ageing and susceptibility to disease.

4



The wear and tear of aging

DNA building blocks

1



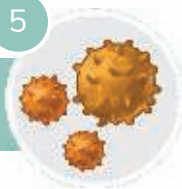
METHYLATION HIGH

Methylation is the biochemical process of repairing and making new DNA, making sure every cell is functioning optimally.

OXIDATIVE STRESS MEDIUM

Certain gene variants, as well as your diet and environment, contribute to the oxidative load on your body.

5



Destructive Oxidisers

Potentially harmful toxins

3



Inflammatory markers

INFLAMMATION HIGH

Chronic inflammatory conditions may result if inflammatory processes do not shut off after an injury or when an infection has been removed.

2



DETOXIFICATION HIGH

Detoxification is the body's way of getting rid of toxins that could otherwise build up and interfere with your health.

CELLULAR 3X4

We are the sum of our cells, and only as healthy as they are. Every cell in your body functions independently - like a small apartment or office space inside a high-rise building - each unit takes care of its own day-to-day maintenance, but ultimately contributes to the overall success and functionality of the building as a whole. Similarly, every cell in your body has its own mechanisms in place to clean and protect it, to maintain health for the whole body and all its organs. Here are 5 key cellular tasks that happen constantly and need to be working optimally.



METHYLATION | HIGH



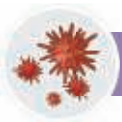
- Increase folate-rich foods (fermented foods, dark leafy greens, asparagus, broccoli, avocado, - citrus fruits)
- Increase choline- and methionine- rich foods (eggs, liver, salmon, chickpeas, beans, brazil nuts, sesame seeds)
- Avoid dietary toxins (alcohol, sugar, pesticides, preservatives, BPAs, GMOs, AGEs from char grilled meats)



- Address and manage stress actively by incorporating mindfulness practices and improve sleep hygiene
- Avoid all active and passive exposure to tobacco smoke
- Avoid external toxins (pesticides, automobile fumes, BPA, phthalates, POPs, arsenic, mercury, lead, cadmium)



- Address all methylated B vitamins
- Methyl donors (choline and methionine)
- Active sulforaphane



DETOXIFICATION | HIGH



- Increase raw cruciferous vegetables (rocket, broccoli, cabbage, cauliflower, kale, bok choy, Brussels sprouts)
- Increase allium vegetables (garlic, onions, leeks), leafy greens, and herbal teas (black, green, dandelion, peppermint)
- Limit alcohol and other dietary toxins (preservatives, pesticides, charred meats, GMOs, artificial additives)



- Avoid external toxins (pesticides, automobile fumes, BPA, phthalates, POPs, arsenic, mercury, lead, cadmium)
- Support lymph drain and toxin elimination (deep tissue massage, yoga, dry-skin brushing, rebounding)
- Address stress and improve sleep hygiene as the brain detoxifies itself at night during sleep



- Active sulforaphane
- Bile binders and taurine
- Zeolite / bentonite



INFLAMMATION | HIGH



- Eliminate common dietary irritants (gluten, cow dairy, soy, eggs, etc.) to determine immune triggers
- Eat a Mediterranean-style diet and enough healthy fats (avoid hydrogenated fats, increase omega-3s)
- Increase fiber and foods that contain beta-glucan (oats, reishi / shitake mushrooms, algae, yeasts)



- Exercise moderately and rest sufficiently to allow the body to recover between workouts
- Use intermittent fasting to reduce inflammatory markers and lower systemic inflammation
- Balance circadian rhythm and sleep disturbances (both stress and poor sleep can sustain inflammation)



- Omega-3 fatty acids (EPA & DHA daily)
- Turmeric (Curcumin)
- Vitamin D

SYSTEMS OVERVIEW

1

VASCULAR HEALTH VERY HIGH

Healthy blood pressure, appropriate blood clotting, clean arteries, and proper blood flow are essential for vascular health.

3

BRAIN HEALTH HIGH

The brain is the control centre of the body; keeping it healthy is very important for overall mental and physical health.

6

BLOOD CLOTTING MEDIUM

Blood clotting is a survival tactic to prevent uncontrolled bleeding; however, it may trigger a stroke or DVT if unchecked.

5

SEX HORMONE BALANCE MEDIUM

Maintaining a favorable hormone metabolism and breaking down excess sex hormones are important for reproduction and cancer prevention.

4

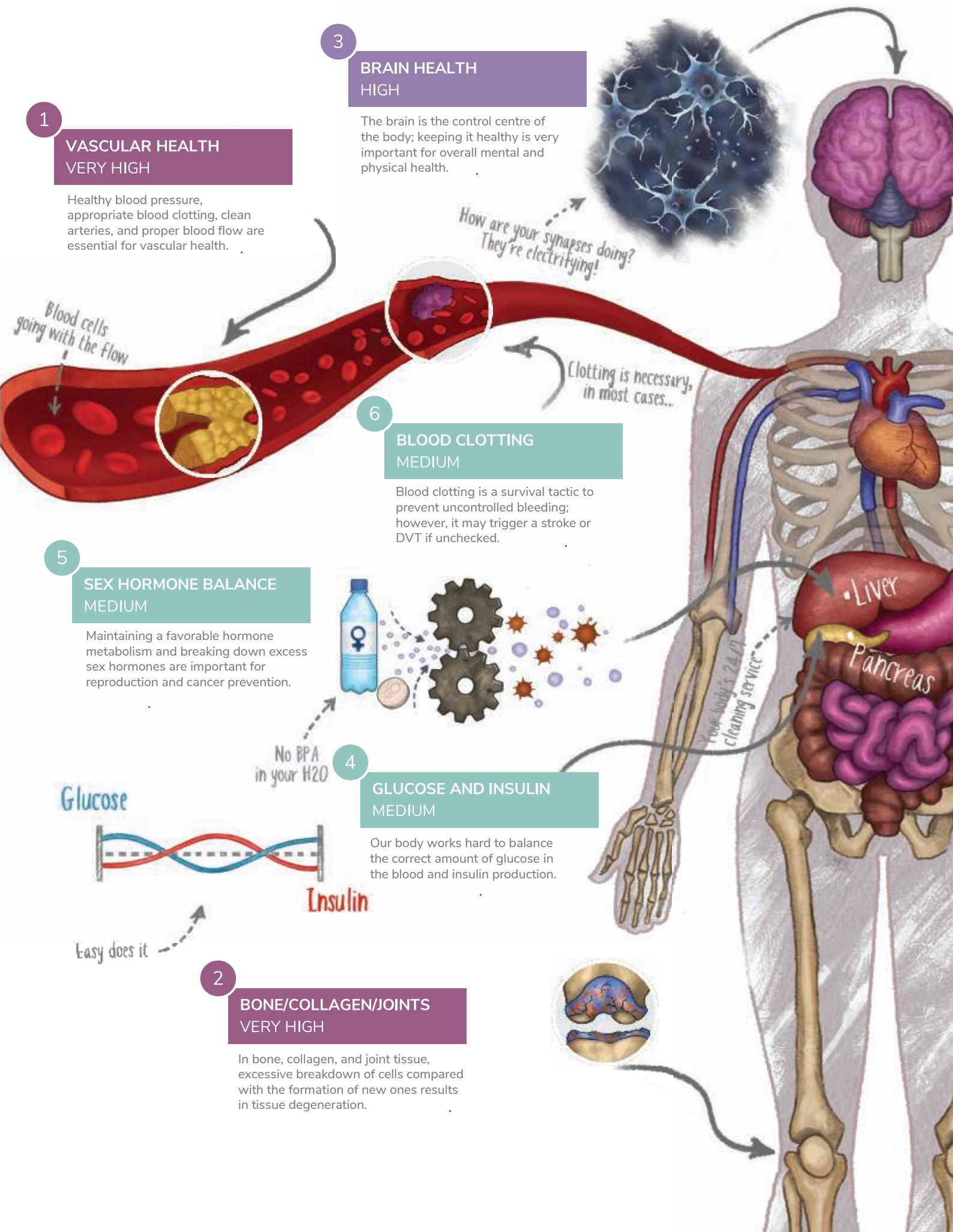
GLUCOSE AND INSULIN MEDIUM

Our body works hard to balance the correct amount of glucose in the blood and insulin production.

2

BONE/COLLAGEN/JOINTS VERY HIGH

In bone, collagen, and joint tissue, excessive breakdown of cells compared with the formation of new ones results in tissue degeneration.



SYSTEMS 3X4

Inside your body at any given moment are several highly-sophisticated systems operating at the same time to keep you alive, healthy and running smoothly. Think of the network inside you as being similar to a complex underground railroad system below a big city, where multiple separate but interconnected parts are meticulously being organized to keep everything on track, on schedule, and safe. If these orderly systems stopped working properly and began crossing-rails, there'd quickly be widespread chaos, delays, and eventually a complete stand-still. These are the 6 major systems that ensure your overall health and vitality.



VASCULAR HEALTH | VERY HIGH



- Eat a range of healthy fats - enough omega-3s, olive oil, avocados, - nuts and seeds
- Increase polyphenols (berries, olive oil, cacao, coffee, green tea) and carotenoid-rich vegetables
- Increase foods that contain B-vitamins including folate rich foods to support healthy methylation



- Exercise regularly and consistently to keep blood vessels strong, benefiting whole-body circulation
- Practice breathing exercises regularly (yoga, meditation, mindfulness) to optimize oxygenation
- Avoid all tobacco smoke (including exposure to second-hand smoke)



- Omega-3's (EPA, DHA)
- Methylated B vitamins
- Coenzyme Q10



BONE/COLLAGEN/JOINTS | VERY HIGH



- Eat collagen-containing foods high in healthy minerals such as bone broth and seaweed stews
- Eat enough high-quality complete proteins that provide the building blocks for all the body's structures
- Eat calcium- and vitamin D- containing foods (dark leafy greens, liver, whole sardines / pilchards)



- Avoid over-training and placing repetitive strain on the same areas / joints in the body
- Do strength and conditioning activities to increase flexibility, improve posture, and support joints
- Engage in regular relaxation, repair, and rejuvenating activities (acupuncture, massage, meditation)



- Collagen
- Vitamin C, D+K2, Biotin and Zinc
- Anti-inflammatory agents (Boswelvia, Curcumin, Omega-3s)



BRAIN HEALTH | HIGH



- Evaluate carbohydrate intake - limit processed carbohydrates and sugary foods that spike blood sugar levels
- Incorporate healthy fats into your daily diet including brain-boosting omega-3s (fatty fish, walnuts, chia seeds)
- Increase B-vitamin rich foods including dark leafy greens to support healthy methylation



- Support and build cognitive function with learning activities, memory games, and brain training exercises
- Keep physically active and engage in a variety of endurance, flexibility, and strengthening exercises
- Optimize nocturnal oxygenation and brain detoxification - improve sleep hygiene, and monitor sleep apnea



- Omega-3 fatty acids
- Vitamins D3 and K2
- Turmeric (Curcumin)

ENERGY OVERVIEW

4

APPETITE/SATIETY/INTAKE MEDIUM

We all experience appetite, hunger, and satiety differently; this can affect our eating patterns and food choices.



1

PRO-INFLAMMATORY FAT HIGH

Excess fat tissue exacerbates chronic inflammation, potentially making it more difficult to lose weight and mobilise fat stores.

Some people have more and bigger fat cells

Fat Cells

Calories in

6

ADIPOGENESIS LOW

The storage and release of energy from fat cells may be responsible for why some people find it harder to lose weight.

Energy out

Inflammatory markers stick to excess fat

How effective is exercise?

2

ENERGY EXPENDITURE MEDIUM

Energy expenditure is the energy needed to carry out important functions such as breathing, digesting, and physical movement.

3

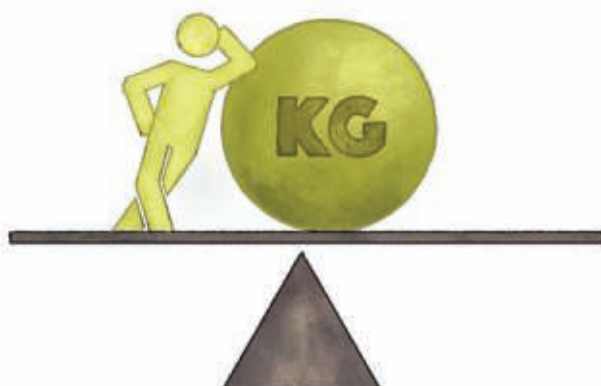
EXERCISE RESPONSE MEDIUM

The ability to mobilize stored energy from fat tissue and burn it as fuel during exercise varies considerably between individuals.

5

WEIGHT GAIN AND WEIGHT LOSS RESISTANCE LOW

There is significant inter-individual variability in our physical ability to lose, gain, or maintain a healthy weight.



ENERGY 3X4

Glucose is our main fuel source and what we make energy from. How we extract, absorb, burn, distribute, store and waste this currency varies between individuals, partly because of genetic variation. People respond very differently to calories, exercise, fasting, fatigue, etc. Hunger is also experienced very personally and with great variability. Knowing how you're hard wired to handle fat, food, and fitness can save you a lot of frustration and, well... energy. These insights can be a powerful tool that enable you to work with your body, not against it, to finally reach your health goals.



PRO-INFLAMMATORY FAT | HIGH



- Optimize the omega-6:3 ratio (limit omega-6-containing foods, saturated animal fats, - and trans fats)
- Increase anti-inflammatory foods and beverages (see inflammation) - flavonoids, polyphenols, and carotenoids
- Limit refined carbohydrates and sweet foods that spike blood sugar and elevate insulin



- Over exercising and inactivity both affect expression of inflammatory genes; try exercising regularly without overtraining
- Ensure good oral health hygiene as ongoing gum infections increase risk for chronic inflammation
- Manage stress to help keep cortisol levels balanced (meditation, massage, yoga, nature walks)



- Use intermittent fasting to reduce inflammatory markers and lower systemic inflammation
- Address sleep disturbances as these worsen stress and are associated with weight gain and inflammation
- Allow for adequate rest and recovery between high intensity workouts to limit stress and oxidation



ENERGY EXPENDITURE | MEDIUM



- Aim for every meal to have a macronutrient composition that favors protein and healthy fats
- Avoid simple and refined carbohydrates and sugar that provides excess calories and minimal nutrients
- Eat enough fibrous plant foods to increase satiety as well as thermogenesis at every meal



- Do resistance and weight training to build lean muscle tissue, thereby increase resting metabolic rate
- Do High Intensity Interval Training (HIIT) to increase post-exercise energy expenditure
- Increase and balance internal energy and heat (yoga, Ujayi breathing, acupuncture, Thai Chi, meditation)



- Keep a food diary to help structure eating habits and record food quality, quantity and mood
- Avoid extended periods of sitting, and plan regular energetic movement every hour for 5-10 minutes
- Establish weight-loss goals that are genetically-realistic and avoid comparing your progress to others



EXERCISE RESPONSE | MEDIUM



- Diet will have a greater impact on weight-loss than exercise, so be aware of portion sizes
- Evaluate carbohydrate intake - avoid processed carbohydrates and sugary foods that spike blood glucose levels
- Eat enough good quality proteins and high-fiber foods to improve satiety and muscle mass

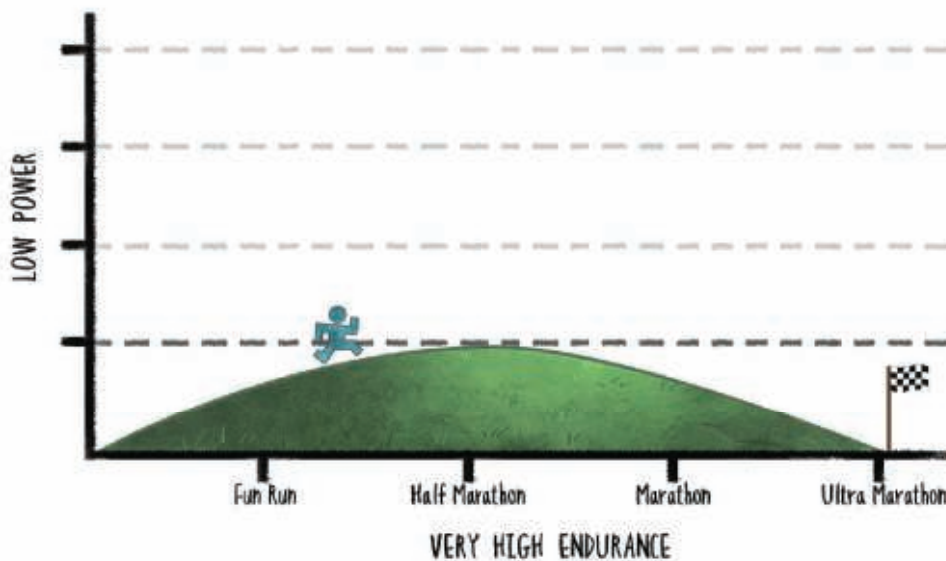


- Use High Intensity Interval Training (HIIT) to increase post-exercise energy expenditure
- Be mindful of rehydration and electrolyte replacement to restore energy resources and support recovery
- Resist the pressure to practice popular exercise workouts, rather find something you enjoy and can sustain



- Do not rely on exercise alone to manage body weight, rather focus your attention on a high-quality diet
- Avoid the temptation of over-eating during and after training, and only eat if required and you are hungry
- Try cold water immersion to increase metabolism of brown adipose tissue (e.g. cold showers)

ACTIVITY OVERVIEW



POWER
LOW

ENDURANCE
VERY HIGH

Your gene results indicate that while you have low power potential, you have excellent endurance potential. Focus on endurance sports that potentially cover long distances. Strength and power training should not be ignored as they will improve overall sport performance.

RECOVERY
MEDIUM

Given the right recovery resources, the body repairs and rebuilds tissues back to a healthy state, ready for the next exertion.



INJURY
VERY HIGH

Knowing your genetic-determined risk for injury can help to manage and mitigate the risk; adjust exercise and recovery routines accordingly.

ACTIVITY 3X4

Activity provides insights into what kind of exercise your body is likely to respond the best to, in terms of overall improvement in fitness, body composition, recovery response, and injury risk. Some people naturally respond better to regular endurance training (distance walking, running, swimming, biking, rowing) while others have a propensity for higher power, shorter duration exercises and high intensity training like body building, weight lifting, running, swimming or cycling sprints etc. Your genetic results holds the clues to what's best for you, and helps you get to your goals in a sustainable way.



INJURY | VERY HIGH

Your genetic results indicate that you have a very high risk for soft tissue sports-related injuries. The risk increases the higher the frequency and intensity of sport-specific activity



- A preventative / rehabilitation program should focus on strengthening susceptible joints - and soft tissues
- Areas of focus: proprioception, neuromuscular education, mobility & stability, isometric strength, and eccentric strength
- Avoid doing more than 2-3 high intensity sport-specific activities / week
- Include pre-workout warm ups and consider strength training without weights, and stretching / realignment exercises
- Follow recovery protocols after intense exercise sessions (massage, stretching, compression garments, sleep)
- Include nutrients needed of collagen remodelling (protein, collagen, calcium, magnesium, zinc, iron, vitamin C)



RECOVERY | MEDIUM

Your genetic results indicate that you may have a slower recovery rate after exercise. This addresses your ability to manage inflammation and oxidative stress during and after exercise



- Allow sufficient time to recover from a sport-specific exercise; try switching up the types of activities you partake in
- Low intensity sessions should be programmed on days preceding and following high intensity sessions
- Improve recovery with passive stretching, foam rolling, quality sleep, breathing, mindfulness, compression garments, etc.
- Avoid doing more than 2-3 high intensity sport-specific activities per week
- Include nutrients needed of collagen remodelling (protein, collagen, calcium, magnesium, zinc, iron, vitamin C)
- Increase polyphenols (berries, olive oil, cacao, coffee, green tea) and carotenoids (orange / yellow fruits and vegetables)



POWER | LOW

ENDURANCE | VERY HIGH

Your gene results indicate that while you have low power potential, you have excellent endurance potential. Focus on endurance sports that potentially cover long distances. Strength and power training should not be ignored as they will improve overall sport performance



- Increase moderate intensity (<75% HR Max) training time interspersed with periods of higher intensities
- Engage in vigorous intensity activities (4-8 on a scale of 10) for 30-90 minutes /session (180 minutes per week)
- Examples: a half or full marathon, 18km trail run, 60km mountain bike race, 1.5km swim
- Focus on lower intensity strength training (30% of 1 Repetition Max) with higher repetitions (15+)
- In order to get the best from your training time, use heart rate as a training tool
- We recommend that you consult with a qualified and experienced exercise practitioner

NUTRIENT OVERVIEW

VITAMIN D LOW

Vitamin D3 is a vital nutrient involved in more than 160 biochemical pathways in the body - it is essential for heart health, bone health, and neurological health.

In most countries (even the sunny ones) the majority of people don't get enough vitamin D.



SALT MEDIUM

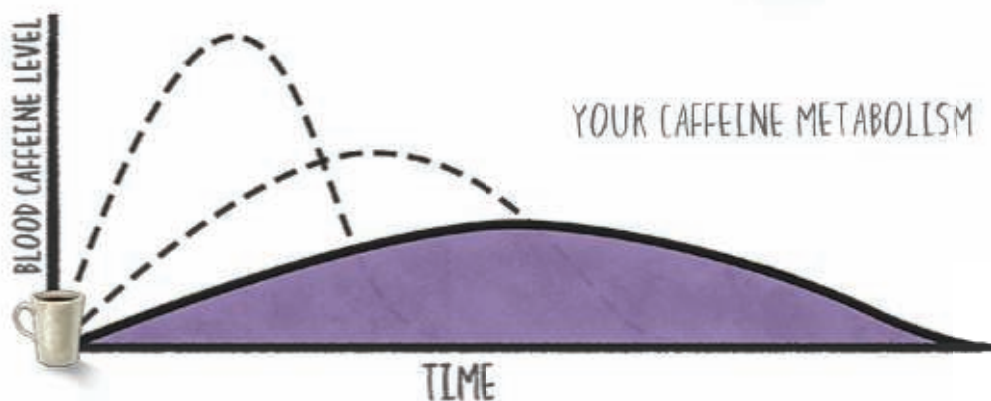
In salt-sensitive individuals and for those with hypertension, excess dietary salt may cause high blood pressure.



50% of the world's population is not salt sensitive.

CAFFEINE HIGH

Caffeine is a stimulant, yet its interindividual effect can vary by up to 40-fold amongst individuals.



NUTRIENTS 3X4

Nutrients provide insights into how you respond to caffeine, salt and Vitamin D. Despite consuming the same amount of a nutrient, how that nutrient is absorbed, metabolized and used by the body varies considerably between individuals. Caffeine is an excellent example of how everyone responds differently. This information can be very useful in making decisions about what type of coffee to drink, what time and how often. Your genetic results provide the answers to these questions.



CAFFEINE | HIGH

Your gene results show higher sensitivity to caffeine and a slower caffeine metabolism



- Drink caffeine 1-2 hours before a sports event in order to get the full - ergogenic effects
- Avoid drinking caffeinated drinks later on in the day to prevent caffeine-induced insomnia
- It is best to avoid coffee consumption, unless used towards a specific training outcome
- Note that a cup of coffee averages 95mg caffeine, while green tea averages 34mg, and espresso averages 100mg
- Consume black and/or green tea, as tea contains the beneficial L-theanine compound
- Avoid 'energy' drinks as they contain caffeine often as a hidden ingredient



SALT | MEDIUM

Your gene results indicate that you may be sensitive to the blood pressure effects of a high sodium diet - this will require some dietary adjustment



- It is advisable for everyone to get their blood pressure checked at least once a year
- Achieving a healthy weight is most effective in reducing blood pressure
- It is the sodium in salt that should be avoided when you are salt sensitive
- Consume less than <2300mg of sodium per day
- Avoid highly processed foods and salted snacks (salted nuts, popcorn, crisps and crackers)
- Replace salt with herbs and spices (pepper, garlic, ginger, rosemary, thyme)



VITAMIN D | LOW

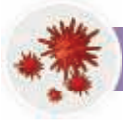


The gene variations in the VDR gene do not appear to be significantly impacting your ability to make, use and manage vitamin D, so no additional specific recommendations are given in this area

- Your low gene score for Vitamin D suggests that you do not require any additional lifestyle recommendations
- Your low gene score for Vitamin D suggests that you do not require any additional diet recommendations

THE GLOSSARY

We are the sum of our cells, and only as healthy as they are. Every cell in your body functions independently - like a small apartment or office space inside a high-rise building - each unit takes care of its own day-to-day maintenance and business, but ultimately contributes to the overall success and functionality of the building as a whole. Similarly, every cell in your body has its own mechanisms in place to clean, protect, and advance it. The 5 key tasks are: Oxidative Stress, Detoxification, Inflammation, DNA damage and Methylation.



DETOXIFICATION | HIGH

Detoxification is the body's way of getting rid of toxins that could otherwise build up and interfere with your health. Signs of poor detoxification include lethargy, fatigue, difficulty concentrating, and unexplained aches and pains in the body. The liver is the main site for whole-body detoxification, but every cell has toxin-eliminating processes to keep them clean, healthy, and working well. If cells do not get rid of toxins fast or often enough, they can become sluggish and less effective at their job, and eventually, DNA could get damaged and express disease instead of health. This can be avoided or delayed by making the right diet and lifestyle changes to support good cellular cleaning processes.



DNA DAMAGE | HIGH

Our DNA is composed of tiny vaults that store our unique genetic code. It is critical that our DNA remains stable because damaged DNA increases disease risk. In the normal day-to-day functioning of human cells, our genetic code is exposed to several threats and insults through normal interactions (such as replication and contact with environmental factors like toxins and UV radiation from the sun). Each cell has many built-in protective mechanisms in place, designed to detect and repair strands of DNA; however, over time (and due to genetic variations), these can become a bit sluggish and slow if not supported by the right diet and lifestyle factors. Diet and lifestyle have been shown to help repair DNA, fight cancer, and prevent premature aging. All the cell's processes - oxidative stress, detox, inflammation, methylation, etc. - are key to protecting DNA.



INFLAMMATION | HIGH

Inflammation is a normal, automatic immune response to injury, irritation, or infection. When you bump your toe and it becomes swollen, hot, and red, that is the inflammatory response working to keep potential germs out and speed up the healing process. Sometimes injuries or irritations are internal - in places like our sinuses, gut, muscles, joints, or blood vessels. Inflammation is protective by design but can become destructive if left unchecked. Long-term, chronic inflammation can eventually lead to or underlie conditions such as arthritis, eczema, IBS, and several diseases.



METHYLATION | HIGH

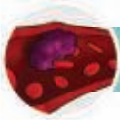
Methylation is the important biochemical process of repairing and making new DNA, making sure every cell is functioning optimally. It is like the annual service for your car but daily! Methylation is not just responsible for how we repair DNA, but also how we make energy, how we respond to stress, how we handle inflammation, how well our cells detoxify, and how our brain chemistry works. Methylation is the biochemical process involved in actually turning genes on or off. We may be able to reduce our risk of developing certain diseases and some types of cancers by optimizing methylation.

THE GLOSSARY



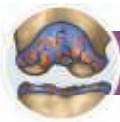
OXIDATIVE STRESS | MEDIUM

Oxidative stress is like human rusting. Cumulative exposure to life's elements (including air) causes damage to our cells over time. If left unchecked, oxidation can lead and contribute to conditions such as fatigue, memory loss, premature aging, and in some cases, cancer. Under normal healthy conditions, our cells make neutralizing antioxidant enzymes to counteract the damaging effects of oxidative stress (similar to anti-rust paint on a boat). Your ability to deal with oxidation is largely determined by certain genes; however, there are things you can do (i.e. diet) to lower the overall load on your body and preserve the health of your cells.



BLOOD CLOTTING | MEDIUM

Our blood's ability to clot when a vessel is cut or damaged is an essential survival tactic to prevent uncontrolled bleeding. However, the presence of certain genetic variants as well as acquired diet and lifestyle factors can contribute significantly to the formation of unwanted clots in undesired places, such as the brain where clots can trigger stroke, a coronary artery near the heart, or veins in our arms and legs whereby lack of circulation induced by prolonged travel or pregnancy can trigger DVT (Deep Vein Thrombosis).



BONE / COLLAGEN / JOINTS | VERY HIGH

All our cells are continuously being renewed - they break down and are replaced by new ones, identical in structure and function, but they are brand new. It is vital to ensure sure the new cells are just as strong and as specialized as the previous cells they are replacing. For instance, collagen is the major structural protein and the foundation of all our soft-tissue (skin, hair, nails, joints, and organs). Certain variations in collagen genes might affect the structure and function of these areas. In bone and joint tissue, excessive breakdown of cells without a comparable formation of new cells will result in degeneration. Osteoarthritis on the surface of joints and osteoporosis in bones are common examples of such degenerative conditions that typically worsen with advancing age. Genes play a large part in the risk of developing these conditions, as does lifestyle factors such as diet.



BRAIN HEALTH | HIGH

The brain is the control centre of the body, and keeping it healthy is crucial for overall mental and physical health. The brain, much like any other major organ, needs a good consistent supply of nutrients, oxygen, rest, and replenishment. Processes such as detoxification, vascular health, glucose regulation, etc., all contribute to the health of the brain. Apart from regulating all our hormones and other biological processes, the brain is also responsible for cognitive function, including attention, focus, learning capacity, and memory. Brain health and function tend to decline with age but at a faster rate in individuals with unfavorable lifestyle behaviors (such as high-sugar processed diets or lack of regular exercise). Certain genetic variations may be another reason why our brain health and cognitive function might not be optimal.

THE GLOSSARY



GLUCOSE AND INSULIN | MEDIUM

Our cells run on glucose, a type of sugar obtained from the food we eat, such as carbohydrates which are the most concentrated source of glucose. Our body works hard to ensure that the amount of glucose in the blood is kept at just the right level - within a very narrow range - because too much can be toxic to our organs (and veins) and too little is insufficient to power important body processes. High blood glucose is often associated with weight issues and diabetes, but chronically elevated blood sugar also has other effects such as accelerated aging and chronic inflammation, which underlie every major chronic disease. How well insulin does its job is largely determined by certain genes as well as by our weight, diet, and lifestyle choices.



SEX HORMONE BALANCE | MEDIUM

Estrogen is a hormone most commonly known for being the major female sex hormone involved in reproduction, but it also circulates at lower levels in men, for whom it serves vital physiological roles. Estrogen-like molecules are also found externally in our immediate environment, in the foods we eat, and the packaging and products we are exposed to, as well as in artificial hormone medications such as the contraceptive pill and HRT. Cumulative lifetime exposure to estrogens can increase our cancer risk, so keeping a favorable estrogen metabolism and breaking down excess estrogens once they have served their biological purpose are very important. Estrogen is managed and broken-down in the liver and eliminated via the gut, so supporting liver and gut health is as essential for this process as is limiting exposure.



VASCULAR HEALTH | VERY HIGH

Our blood vessels are always working around the clock to transport goods (oxygen and nutrients) to all corners of the body, and in turn, to take waste away for 'disposal' or excretion. This is important for healthy blood pressure, appropriate clotting, clean arteries, and proper blood flow. The walls of our blood vessels endure a lot and need to be strong, healthy, and flexible to keep all our organs (including brain and heart) healthy. Blood pressure, much like blood glucose, is tightly regulated to stay in a narrow, safe range. If our arteries, veins, and capillaries are healthy and free of unwanted inflammation or oxidation, our whole system will function better. The integrity of our blood vessels is affected by certain genes that respond favorably to certain diet and lifestyle factors.



ADIPOGENESIS | LOW

The formation, storage, and release of fat cells are affected by variability in our genes. These gene variations may be partly responsible for why some people find it easy to gain or lose weight compared to others, even though their diet and lifestyles are similar. How our fat cells release energy is genetically determined by certain genes and their variations. Knowing how your fat cells are predisposed to store and release energy can empower you to make the right diet and lifestyle choices to suit your unique genotype.

THE GLOSSARY



APPETITE / SATIETY / INTAKE | MEDIUM

Some people are very sensitive to the sensation of satiety (fullness), while others often over-eat and take longer to register that they are full. We all experience hunger and fullness differently. While many people believe that serving sizes and other eating behaviors should be equal for all, variations in our genes determine our appetite level and satiety to some degree, and consequently, may affect our eating patterns (snacking, binge eating, servings, frequency of meals, etc.) in a very real, biological way.



ENERGY EXPENDITURE | MEDIUM

Energy expenditure is the amount of energy (kilojoules or calories) that is needed to carry out important functions such as breathing, digesting food, circulating blood, regulating temperature, and exercising. The more commonly used term when referring to how we burn calories is to say we have a 'fast or slow metabolism', although that is not entirely the correct biological term. The rate at which we use and manage calories for energy is largely determined by our genes, our activity, and what and how much we eat, resulting in significant inter-individual differences between how people burn up energy.



EXERCISE RESPONSE | MEDIUM

Research has confirmed that people's physiological responses to exercise vary considerably. Some people respond robustly and quickly to exercise (for example, they get fit fast and their body composition changes favorably), while others are less sensitive to exercise's effects. A significant contributor to these inter-individual differences in exercise response is genetics. An individual's physiological ability to mobilize stored weight (adipose tissue) and burn it for exercise fuel, is partly predisposed by certain genes. It is useful to understand the reasons why exercise might not be affecting or helping weight loss in the way you expect and what to do to balance things out.



PRO-INFLAMMATORY FAT | HIGH

Fat cells and fat tissue are not just inactive storage compartments for excess weight - they are metabolically active messengers (similar to hormones) that control our energy and glucose levels. Fat cells send important signals to the rest of the body and communicate with other organs, including the brain, liver, muscles, and immune system. These messenger molecules found in fat tissue are called adipokines. Adipose (fat) tissue secretes various pro- and anti-inflammatory adipokines to modulate inflammation and insulin resistance. If there is excess adipose tissue in the body, the inflammatory response can become disrupted, and these proinflammatory molecules increase. In obese humans, adipokines production is enhanced to induce insulin resistance and other complications like diabetes and heart disease. Obesity-induced inflammation can be managed by losing excess weight, which reduces adipokines.

THE GLOSSARY



WEIGHT GAIN AND WEIGHT LOSS RESISTANCE | LOW

There is considerable inter-individual variability in our physical ability to lose, gain, or maintain a healthy weight. Certain gene variations affect how we regulate energy and make us more genetically-prone to weight gain and slow weight loss. A one-size-fits-all model does not exist when it comes to how much or how frequently we should eat, or what type of exercise we should do and for how long. Genetic variations can explain, at least in part, how people respond to over-eating, exercise, and diet.



INJURY | VERY HIGH

Injuries are caused by many internal and external factors. A torn tissue or chronic overuse of the same muscles, tendons or ligaments do not affect everyone in the same way, or necessarily always result in injury. Your biology and genetics contribute to the development of injuries. Knowing your genetic-determined risk for injury can help to manage and mitigate the risks, and help you adjust exercise, lifestyle, diet, and recovery routines accordingly.



POWER | LOW

ENDURANCE | VERY HIGH

Whether you are a pro athlete or have difficulty motivating yourself to get out and exercise, knowing your 'exercise potential' can save you a lot of time and effort. Certain genetic variants determine your inherent sports and training performance potential. For example, the ACE gene is predictive of endurance and power-oriented performance, giving you clues as to what kind of workouts your energy would be best spent on.



RECOVERY | MEDIUM

Because exercise is a type of 'stress' on the body (albeit the good kind of stress), some level of wear and tear inevitably occurs in muscles and tissues during and directly after a workout. Given the right recovery resources and building blocks, the body quickly repairs and rebuilds muscles and tissues back to a healthy, normal state, ready for the next exertion. Without enough recovery time or resources, systemic inflammation and oxidative stress can arise in the body and the risk for tissue break-down, injury, and chronic pain increases.

THE GLOSSARY



CAFFEINE | HIGH

Caffeine is a central nervous system stimulant. In small amounts, caffeine's effects include mild euphoria, alertness, and enhanced cognitive performance; but in higher quantities, it can trigger anxiety, restlessness, irritability, nausea, and insomnia. The clearance of caffeine can vary to up to 40-fold between individuals, a genetically-determined ability. Certain gene variants confer a higher sensitivity to caffeine and are associated with slower metabolism of caffeine.



SALT | MEDIUM

Salt sensitivity is estimated to be present in 51% of individuals with high blood pressure and 26% of individuals with normal blood pressure. In individuals with salt sensitivity, blood pressure may increase when sodium (found in salt) is consumed. Although the mechanisms underlying salt sensitivity are complex, your genes can help determine and predict your response to salt.



VITAMIN D | LOW

Gene variations in your VDR gene suggest that your absorption, metabolism, and utilisation of Vitamin D may be compromised. We recommend that you have your Vitamin D levels checked and consult with a health care practitioner. Focus attention on Vitamin D, calcium, and Vitamin K2.

CLOSING

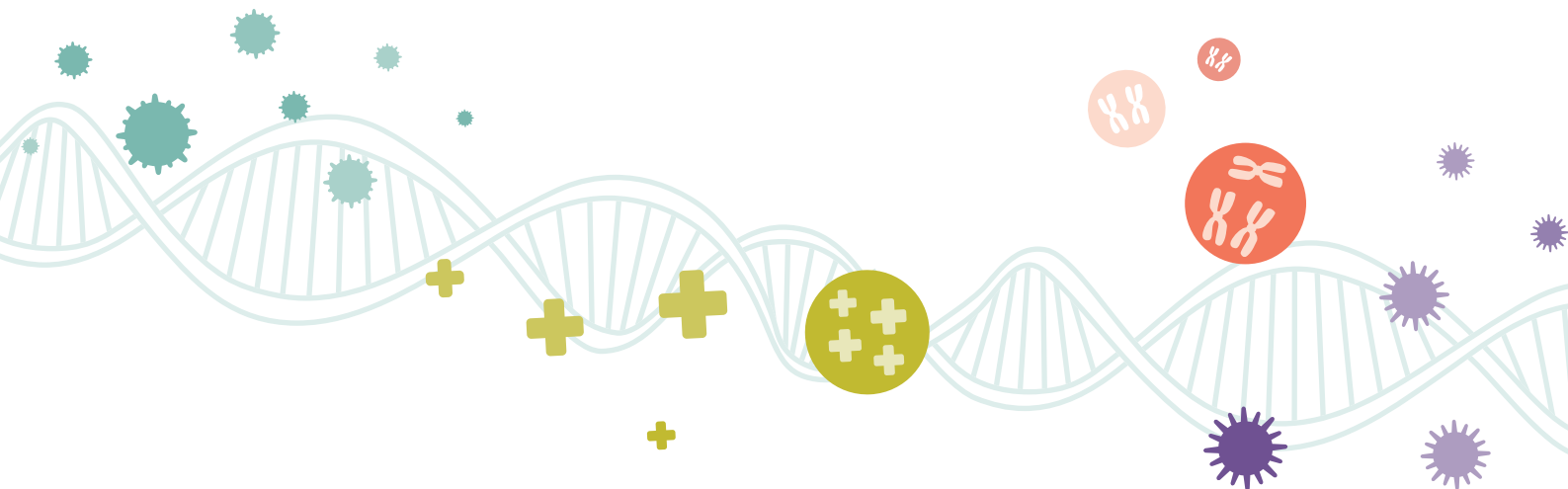
Practitioner-Driven Personalisation

Whether you want to optimise your well-being, prevent chronic illness, delay aging or up your game in sports, 3X4 Genetics provides the clues you've been missing and empowers you to take care of your health in a way that is personalised and precise.

Your genetic insights need to be put into context and investigated by a trained healthcare practitioner. We believe that recommendations on a report alone are not enough to bring about sustainable diet and lifestyle change. Your practitioner translates your genetic information and takes into consideration several other important factors - what you eat, how you think, how you deal with stress - and together you get the full picture of you.

The 3X4 Genetics Difference

- One test, many markers. No need to take several tests if one can give - you the answers.
- Better biological accuracy thanks to pathway-based analysis and recommendations which replaces the more outdated single gene variant based analysis of conventional genetic tests.
- Colour-coded impact scores makes it easy to understand your results and prioritise the most important key metabolic pathways.
- Built by a practitioner for practitioners, 3X4 puts genetics straight into practice, generating a practical, actionable plan of clear, summarised recommendations in every report.



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