

MAXIMISE YOUR GENETIC POTENTIAL

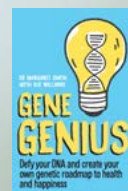
In this health advice taken from her new book, *Gene Genius*, molecular geneticist **Margaret Smith** provides health tips proven to maximise your sporting potential by turning up your good genes and dialing down the wayward ones.



Many of us determine what we're good at – or, at least, less bad at – through trial and error. While it's obviously not necessary to excel at a sport to enjoy it, generally the better we are at an activity, the more pleasure we'll get from it, and the more likely we are to stick at it and work out regularly as a result.

Knowing more about our genes can prove an extremely valuable training advantage. Genetics can now provide information about our individual endurance, power, strength, muscle fibre type and size, response to training, flexibility, ability to recover, injury risk, coordination and temperament.

It's not an absolute science since those genes account for only 66 percent of athletic ability (we now know that around 66 percent of athletic ability can be explained purely by gene SNPs or specific combinations of gene SNPs). But they still explain two-thirds of our sporting prowess – and that could well be the difference between not only winning and losing, but also between starting, and making it to the finishing line at all.



MARGARET SMITH
Dr. Margaret Smith is head of molecular genetics at Royal Melbourne Hospital, a contributor to the Human Variome Project and the developer of a widely used breast cancer screening

test. Recently, Margaret became the co-founder of a nutritional genomics company called SmartDNA. *Gene Genius* (by Dr Margaret Smith with Sue Williams) is published by Harlequin. \$19.99.

Coaching Genes to Reach Your Goals

Sports performance is complex since it involves more than 200 genes, and we still have so much left to learn about them all. That's never to say, though, that we individually don't have any input into whether or not we'll be good or bad at certain sports. With our lifestyle choices, we can boost the genes that help us do well in, say, running, and try to weaken the genes that may hinder us in, for example, jumping. Our genes might tell us we'll never be a world champion high jumper but, with the right diet, exercise, practice and training, we can still do better than just accepting the genetic hand we have been dealt.

Knowing about our genes could help not only with our performance, but also our recovery. We could learn that maybe we should try some sports we'd never before considered, and think about different positions on the field that could well see us even more successful. For elite athletes, looking at how they can turn up the good genes and dial down the wayward ones is a great way of pushing their bodies harder and finding an edge over their competitors.

Nutrition and Exercise

When we play sport and exercise, our bodies burn more nutrients to keep going. So if we want to get the most out of our exercise regimens, then we need to make sure we eat well, with healthy serves particularly of a good lean protein, like fish or chicken, and the vitamins B and C.

Protein helps to build our muscles and to repair them after exercise, so it's important we consume enough of it. Many athletes now drink protein shakes for a quick boost after exercise to aid with their recovery. The B vitamins are also important as they help with fat burning. Good sources include whole cereal grains, seeds, nuts, dairy products and leafy greens. Vitamin C, meanwhile, has a role in removing the free radicals associated with oxidative stress in our bodies. Most fruits and vegetables can supply us with vitamin C, with a few of the star performers being broccoli, oranges and pineapple.

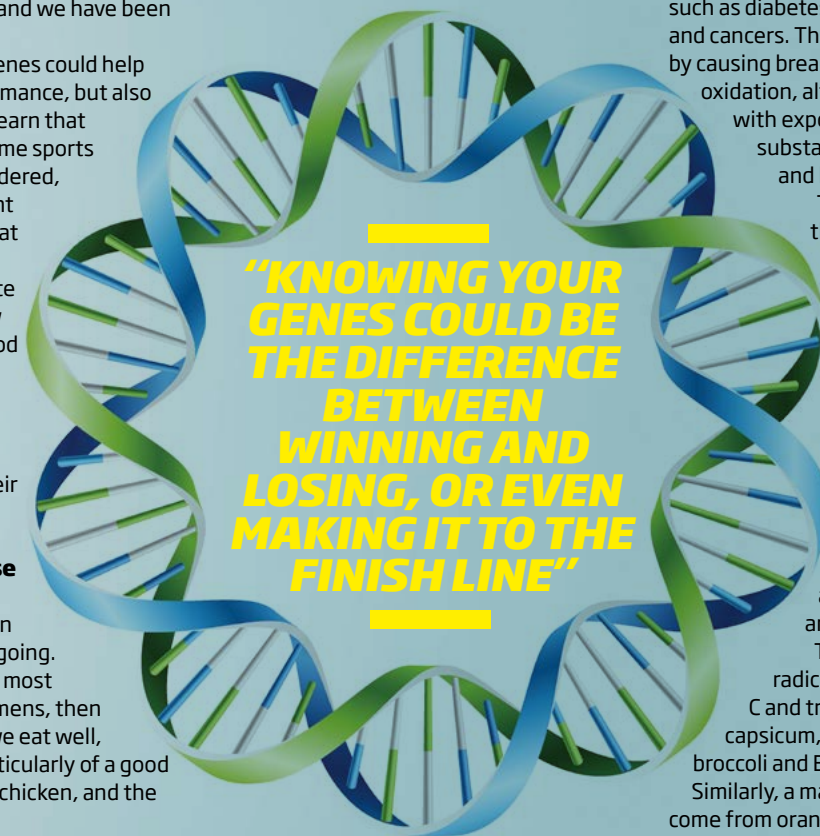
In addition, we need to drink plenty of water, and keep up our sodium or salt intake. They come from our body as sweat

and they must be replaced. Tea or coffee aren't acceptable substitutes as the caffeine they contain can have a diuretic effect, which causes the body to produce urine or a loss of water.

Inflammation

If you've inherited a genetic vulnerability to inflammation, where your tissues are reacting to harmful illnesses, infection or damaged cells, then it's important to follow a diet that will help fight the inflammation. If you exercise, that becomes even more vital.

It's known that low-grade chronic



"KNOWING YOUR GENES COULD BE THE DIFFERENCE BETWEEN WINNING AND LOSING, OR EVEN MAKING IT TO THE FINISH LINE"

Oxidative Stress

Our bodies constantly react with oxygen as we breathe and our cells produce energy. During exercise, we produce more energy and, as a result, generate cell-destroying free radicals. These, in turn, cause oxidative stress. When our protein-controlled oxidant response doesn't keep up with the stress, then oxidative damage can be caused.

There are also what we call "Rusty Genes", genes with SNPs that affect the enzymes' ability to fight oxidative stress, or "cellular rusting". They've been implicated in the cause of many diseases, such as diabetes, cardiovascular disease and cancers. They can damage DNA by causing breaks in the strands, base oxidation, alteration in combination with exposure to cancer-causing substances, like cigarette smoke, and binding to proteins.

The best way to reduce the damage that's threatened by free radicals and oxidative stress is by fighting them with antioxidants. So if we do exercise, we need to make sure we eat plenty of fruit and vegetables, since they're excellent sources of antioxidants, while the individuals with these SNPs might also need additional antioxidant support too.

The most potent free radical-busters are vitamin C and trace elements found in capsicum, strawberries, kiwi fruit, broccoli and Brussels sprouts.

Similarly, a major ally, carotenoids, come from orange and red vegetables. The back-up force, the health-giving polyphenols, are supplied by apples, berries, grapes, celery, onions, kale, nuts, tea, coffee and cocoa.

There are also several enzymes that fight to reduce oxidative stress too. Many of these enzymes are reliant on minerals in the diet, such as selenium, copper, manganese and zinc.

It's critical to understand that, if we're going to exercise – with all its benefits for our bodies – it's vital that we fuel ourselves properly. The antioxidant defense system relies on nutrients, trace minerals and efficient enzyme activity and, without those, we might effectively be exercising on empty... and damaging ourselves with oxidative stress. **F**