

Medical biohacking to slow down the ageing process and fight disease

Our environment has evolved way faster than our genes can keep up with, but we need to protect our genes against this. Scientists are looking at our genes and how to stabilise the genome.



Source: ©supplied by agency. Dr Pheiffer giving her keynote talk at the SingularityU South Africa Summit Online 2021

For example, chronic stress, whether it is psychological, emotional, environmental, or physiological cellular stress, speeds up the amounts of microRNA* our bodies produce affecting the way we age and how long we live.

“However, it’s not the only factor that affect aging and living longer,” says Dr Tamara Pheiffer.

One of Africa’s thought leaders in medical biohacking, Pheiffer shared the latest insights about optimising human health, performance, quality of life as well as new technologies that are being researched to slow down the ageing process in a keynote talk at the SingularityU South Africa Summit Online 2021.

Biogerontology

“Biogerontology is the sub-field of gerontology concerned with the biological aging process, its evolutionary origins, and the potential means we have to intervene in the process.

“In this field of study, we look at several areas in the aging network and how we can clean up the accumulative damage in each region of the body, before it creates the aging process,” explains Pheiffer.

Telomeres

Telomeres are also examined. Telomeres are made of repetitive sequences of non-coding DNA that protect the chromosome from damage.

"They also play an important role in making sure our DNA gets copied properly when cells divide.

"Their job is to stop the ends of chromosomes from fraying or sticking to each other, much like the plastic tips on the ends of shoelaces," she explains.

What we are trying to do is to keep them long. Every time your cells become another cell, they stay as young as they were before," Pheiffer adds.

Powerhouses of the body

For the long-term, the other thing, looked at is mitochondria, the powerhouses in the human body.

"They create 97% of your energy and they take up about 40% of the volume of every single cell. The interesting thing is that mitochondria are bacteria. They're not part of our human genome," she explains.

Mitochondria are membrane-bound cell organelles that generate most of the chemical energy needed to power the cell's biochemical reactions. They have the own genes, but humans only get mitochondria from their mothers.

"From your mom's side, you can go back 10s of 1,000s of years to look at your ancestry more than from dad's side, she says.

However what is interesting thing, Pheiffer says is that we used to think that as they got sick and died off, we got sick and died off. "Now we've discovered ways to trick your body into making more.

New discoveries

The other area where new discoveries have been found is cells. When a cell dies, for instance, it doesn't get absorbed by the body.

"Think of a moody neighbour who is in a terrible mood. His mood doesn't only affect him. It affects his family and his neighbours. There's a ripple effect of everyone being in a bad mood.

"In the same way, sick cell spreads inflammation throughout the body. There are so many other topics like the way your cells speak to each other and the way we produce proteins," she says.

Environment

Another part of the research is into Epigenetics, the study of how your behaviours and environment can cause changes that affect the way your genes work.

"When we understand that genes plus environment equals phenotype, then external factors like smoking and stress and diet and lifestyle can all impact our health.

"You could have genes for diabetes, for instance but if you avoid excessive sugars, there's no reason you should get that.

"We've all seen photographs of identical twins where one went to prison and the other didn't or the one had an excessive lifestyle and how different their aging process is.

"These factors all affect the way we age, and how long we live," she says. .

"For now, we find the targets that those microRNA are speaking to, and we then create products, nutraceuticals, skincare, dots, and lifestyle changes that can really change the course of ageing," she adds.

* MicroRNAs (miRNAs) are a class of non-coding RNAs that play important roles in regulating gene expression.

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