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Living Well

New cells for old as we age



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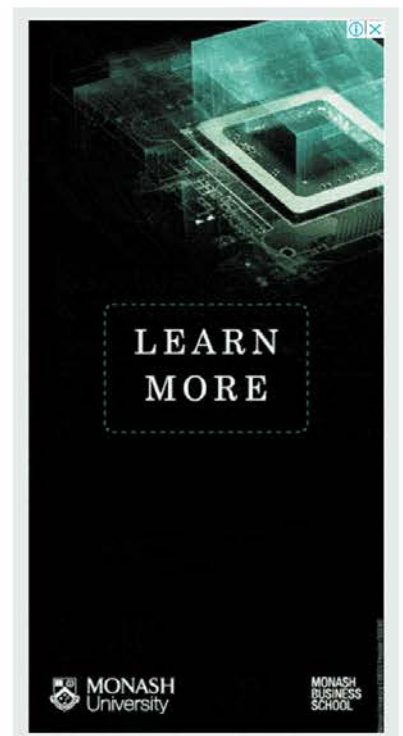


Nature provides the body with the ability to replace old cells with new ones and this renewal process continues throughout life

What are some of the obvious outward signs of ageing? Grey hair, facial wrinkles, crow's feet, turkey neck, sagging breasts and changing body shape.

These have become the cause of despair for some in middle and old age, but have provided a great business opportunity for many in the anti-ageing, beauty and cosmetics industries.

Wrinkles now outnumber pimples. Last year, the number of people in Singapore over the age of 65 became equal to the number of people under 15.



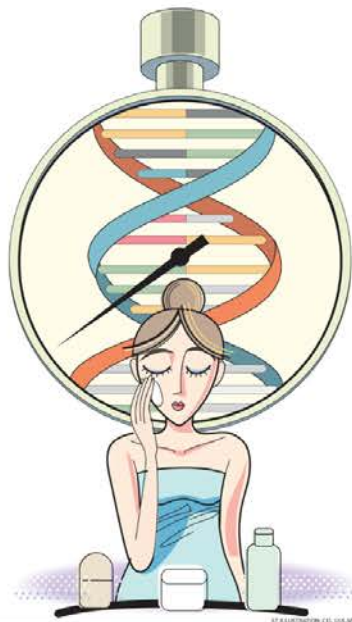
Therefore, understandably, skincare products for ageing skin have swamped the market.

As in other places, aesthetics surgeons have carved out a new speciality niche to remove fat, add fat, remove wrinkles, tighten skin and refashion the ageing face and body. Dermatologists have added their expertise to this venture. There is a frenzy to replace old with new.

But what is often overlooked is that nature has provided the body with the ability to replace old cells with young ones. This renewal process continues throughout life. Old cells are replaced with new ones at the rate of millions a second. By the time we finish reading this sentence, 50 million of our cells will have died and been replaced by new ones.



New cells for old seems to be the body's mantra.



ST ILLUSTRATION: CEL GULAPA

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internal organs.

Cells of the human body have differing lifespans based on their function and type. The surface layer of skin (epidermis) is recycled every two weeks or so. In order for this to happen, we shed 30,000 to 40,000 epidermal cells every hour. That is more than 3.6kg of skin cells exfoliated in a year.

There are many different types of cells in the body, but all have the same basic structure. Cells make up tissues which are layers of similar cells and perform a specific function.

Organs like our kidneys, heart, liver and brain are formed of different types of tissues.

The adult body is made up of approximately 100 trillion cells, 600 muscles, 206 bones and 22

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Whatever our age, our inner self is always younger than what we see on the surface. It is astonishing that even when we are middle-aged, most of our cells may be just 10 years old or less.

This surprising truth was verified in 2005 by a team of Swedish researchers from the Karolinska Institute in Stockholm, led by Professor Jonas Frisen.

His work showed that we generate new brain cells throughout our lives, especially in the hippocampal area, which is involved in learning and the formation of new memories. This is a positive finding for the process of ageing.

One question to ask then is why do we get wrinkled and why does our skin sag as we grow older if many of our cells are younger than our age? Part of the answer is that as we grow older, our skin loses collagen and elastin, which form the supportive connective tissue around the cells. It is the elasticity of elastin that makes our skin soft and youthful. With its loss, the skin begins to sag.

Also, the facial muscles weaken with age and with the constant pull of gravity, the sagging continues with the passage of time.

Another very important question to ask is that if the body remains so capable of renewing its cells, why does regeneration not continue forever? The answer is that the more times cells divide, the more errors creep into the process.

These errors or mutations tend to occur in the DNA (our unique genetic code) which gradually degrades its information. The slightly faulty instructions that are passed on now create new cells that are less healthy than their progenitors.

This process continues until the cells enter senescence.



> Senescence is the process by which cells irreversibly stop dividing and enter a state of permanent growth arrest without undergoing cell death. Eventually, the process culminates in cell death.

The irony about cellular senescence is that, on the one hand, it inherently tends to prevent cancer as it stops cell division, but, on the other hand, this lack of cell division prevents tissues from indefinitely renewing.

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> One type of cell that does not replace itself so well in old age is the stem cell.

Stem cells are mother cells that have the potential to become any type of cell in the body and this is why they are so special.

The number of stem cells in young people is very much higher than that in older people and this is the reason why there is a better and more efficient replacement mechanism in the young as compared to the old.

Also, the ageing process makes these stem cells less effective at repair over time.

The net result is that over the course of many decades, long-lived organs like our brain, heart and skeletal muscles begin to progressively lose cells and their functions become increasingly compromised.

However, not all is lost in older age. In the case of muscles, even though they weaken, they still respond to exercise.

Instead of recruiting new cells, the size of the existing exercised cells increases and this

contributes to some build-up in muscle tissue.

Thus, exercise in older age becomes so important to retain our muscle power. We can then continue with our activities of daily living and remain independent.

Also, as we learnt earlier, new brain cells are formed in the hippocampus throughout life. So we find out that old age adds even as it takes away.

An interesting fact about ageing is that it even affects the pace of our nail growth. The average normal growth rate for finger nails is about 3mm a month and 1mm a month for toe nails. That is why finger nails need to be trimmed more often than toe nails.

However, ageing slows the rate of nail growth by about half a per cent each year after the age of 25.

Nails also become thicker in the older person as compared to a younger person.

Thus, we can still nail a person's age even though he or she might have had loads of aesthetics surgery.

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