

COVER STORY **Healthy Ageing**



Graceful & Healthy



Ageing

When we grow old, our body cells begin to fail. During the ageing process, damage accumulates itself in the body by external influences such as UV-radiation, which causes damage to DNA and proteins in our cells. But the harmful influences don't just occur on the outside. They cause damage during the metabolic process, converting substances into other substances. Therefore life itself creates damage thus we age, and eventually die.

Ageing is continuum of degenerating process after the peak at the age of 35 or so, and some people tend to have "biological ageing" faster than others. Several studies show how we can know the ageing process, such as artery ageing by means of carotid ultrasound and Ankle Brachial index, bone ageing by means of a bone scan and a screening form for cognitive function.

Ageing is characterised by changes in appearance, a lower metabolic rate, longer reaction time, decline in certain memory functions and decline in sexual activity. So, ageing is something that can be judged by appearance. Everyone recognises the signs: balding, grey hair and especially wrinkles. But, when does the ageing process actually begin? Here, *Future Medicine* makes an effort to know the mystery of ageing from experts like Dr Suresh Rattan, who heads the Laboratory of Cellular Ageing at the Department of Molecular Biology and Genetics, Aarhus University, Denmark. Excerpts from an interview

By Sumithra Sathyan

Ageing and anti-ageing

Can you tell us about your involvement in ageing research?

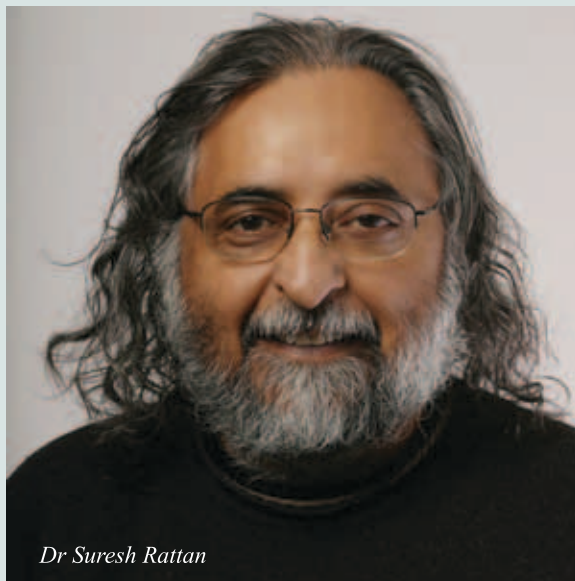
I have been involved in ageing research since my university days at Guru Nanak Dev University, Amritsar, where I did research projects on the ageing of insects for my BSc and MSc studies (until 1977); then I worked on the regeneration of Hydra at Jawaharlal Nehru University, New Delhi, for my MPhil research project (1979); then I studied ageing of human cells at the National Institute for Medical Research (NIMR), Mill Hill, London, for my PhD (1982); and finally I earned a post-PhD degree of DSc on the biology of ageing from Aarhus University, Denmark (1995). So, my whole academic career of more than 35 years has been around the question of biological basis of ageing.

My basic research on ageing also led to some new ideas and products on ageing modulation. For example, my discovery of kinetin and zeatin as ageing modulatory compounds are used in numerous skin care products worldwide. More recently, my ideas on mild stress-induced health beneficial effects, known as HORMESIS, are being developed into practical ageing modulatory methods called hormetins, including new skin care products, and general health promoting products at the nutritional and psychological levels.

So in your opinion, what is exactly ageing and anti-ageing?

Well, it is not my personal opinion, but a general scientific understanding emerging from more than 50 years of modern biological research on ageing, that ageing is the process and period beyond the age of about 45 years in which there is a progressive loss of our ability to maintain health, which leads to increased chances of occurrence of one or more age-related diseases and eventual death.

As regards anti-ageing, scientists avoid using this term because ageing is not a disease in itself (it happens to all if they live long enough; and something that happens to everyone is not a disease!!), and so cannot be treated or reversed. Ageing can be manipulated, and the rate of ageing can be slowed down to some extent, and health can be maintained. But ageing cannot be reverted; and anyone who claims



Dr Suresh Rattan



Scientific research has shown that there are no special genes which make us become old and die. Genes determine our ability to live and maintain health for about 40 years after which our cells and organs start becoming weaker and less functional. Several lifestyle factors, such as food, physical activity and psychosocial interactions affect ageing and lifespan





that he or she can reverse ageing or do a complete anti-ageing therapy, or achieve full rejuvenation is telling lies, and selling false promises.

If we have perfect genes and a perfect environment in which no damage occurs, is it possible to remain healthy, young and immortal?

What does “immortal” mean- infinity or a couple of hundred of years or what? If we have perfect genes and a perfect environment in which no damage occurs and nothing goes wrong in complex biological processes, then yes, we can remain healthy, young and immortal. But that is purely a wishful thinking. Evolution has not made us immortal, and laws of quantum physics do not allow anything to remain error-free all the time. Sooner or later all systems collapse. But there is no biological programme which makes us old or forces us to die. It is purely a chance event. And that is why we can

surely do a lot of things to maintain health and to extend health-span.

Suggestions for healthy living

Please share some important thoughts or notes which may make us live healthy.

Taking steps for a healthy life may point out as below. Some of these steps may look like common sense, but there is also a lot of science behind these steps now. Four main steps, in my view, are:

- **Understand the importance of proper food** in terms of proteins, carbohydrates, fats, minerals and other micronutrients. Our body needs every kind of food for proper physical and mental functioning. Even water can be a killer if over-used. Moderation, variety and pleasure are the secrets of a healthy nutritional lifestyle.
- **Recognise the importance**



One of the more damaging myths of ageing is that after a certain age, you just won't be able to try anything new or contribute anymore. The opposite is the truth. Middle aged and older adults are just as capable of learning new things and thriving in new environments as youngsters, plus they have the wisdom that comes with life experience. If you believe in and have confidence in yourself, you are setting up a positive environment for change, no matter what your age is



of physical and mental activity for a healthy life. Challenging yourself with physical and mental challenge-a kind of mild stress of choice, such as exercise- is the basis of hormesis, which gives numerous health benefits. Stress is bad only when it is not of your own choice. So choose your stress physical, mental, emotional face the challenge, and it will give you a sense of fulfillment, achievement, and better health.

- **Accept yourself** ; you cannot become young or healthy or whatever by denying your age or your other physical and mental conditions. Use medicine to regulate blood sugar levels, blood pressure etc to help you stay physically and mentally functional. Measure your health by your physical and mental independence, and not by the labels of diseases
- **Be responsible to yourself and your surroundings-** (plants, animals and atmosphere) . It is important for your health, survival and longevity that the health, survival and longevity of others are also maintained.

Current disease-perspective of health

Does the current disease-perspective of health need a change?

Disease-oriented approach to health is just like a religion's hell-oriented approach to ethics, that if you are not behaving good then you will burn forever in hell. It does not work. We need to make health as something attractive in itself, just as being ethical is important in itself, not because otherwise we will go to hell. But the main problem so far is we do not know what exactly health is- it can be highly variable and very personalised. We have to find our own limits of health, which make us physically and mentally independent in activities of daily living- this is how we define health. We need new methods and drugs For health, not AGAINST this disease or that fear or that hell ■