

# Why smoking and obesity make you grow older, faster

By Mark Henderson  
Science Correspondent

SMOKERS and obese people are biologically "older" than their contemporaries, British scientists have discovered.

Research at St Thomas' Hospital, Central London, has revealed that both smoking and obesity can accelerate a form of genetic decline associated with ageing that is thought to contribute to conditions such as heart disease and cancer. The study shows that women who smoke and those who are obese have shorter than normal telomeres — genetic structures that protect DNA from age-related damage.

The effect is so marked that obese women appear to be up to 8.8 years older in biological terms than women of a healthy weight, while heavy smokers appear up to 7.4 years older than those who have never smoked. While the researchers have yet to look at men's telomeres, they expect to see similar damage.

The findings, published today in *The Lancet*, suggest a new mechanism by which both factors play a part in causing age-related disorders such as heart disease and cancer.

Telomeres are stretches of DNA that rest on the end of each chromosome, the structures that hold the genes that are found in the nucleus of each cell. Telomeres are responsible for keeping each chromosome structurally intact when a cell divides.

Telomeres are sometimes likened to the bindings at the end of shoelaces that prevent them from unravelling, another analogy being the margin left around a document to be photo-

copied. Such a margin makes one more confident that no important text will be missed off when the document is reproduced. In similar fashion, the telomeres protect critical genetic information against loss during the copying process — but like the document margins, they become smaller and smaller with each reproduction.

As a result, telomeres get shorter as an organism grows older, and this is widely believed to underlie some ill-

**'Telomere length gives a snapshot of what life has been like up to that point for that patient'**

nesses that strike as the body ages.

In the St Thomas' study, a team led by Tim Spector measured telomere length among 1,122 healthy white women aged between 18 and 72 and examined the resulting data for trends associated with smoking or obesity. The women involved are on a database of twins who take part primarily in studies of heredity. Their status as twins, however, was not relevant to this research.

Professor Spector found that under normal circumstances, each telomere shortens by an average of 27 base pairs of DNA per year, though there are wide variations. Smoking and obesity were both associated with much more rapid shortening of the telomeres. Smokers had an

average telomere length that would normally be seen in people 4.6 years older. The effect was even stronger, at 7.4 years, for women who had smoked a packet a day for 40 years.

There was no correlation between body mass index, the standard measure of obesity, and telomere length, but there was a link between levels of the hormone leptin, a clinical marker of obesity, and telomere length. The average difference in terms of age was 8.8 years.

The results could be explained by the way smoking and obesity subject cells to greater oxidative stress, a form of tissue damage caused by oxidation that is known adversely to affect DNA.

Professor Spector said: "An interpretation of this is that obesity and cigarettes cause oxidative stress to increase. Their effects over time cause the loss of telomeres, which we believe is a marker of oxidative ageing.

"Telomere length is a great test as it is a constant thing in DNA. It gives a snapshot of what life has been like up to that point for that patient. Our results emphasise the potential wideranging effects of the two most important preventable exposures in developed countries — cigarettes and obesity."

While the scientists have yet to analyse whether the effects are cumulative, they think it highly likely that they will be. This would make heavy smokers who are also obese biologically older than normal by a decade or more. "If you're an obese smoker you will be at least ten years older, biologically," Professor Spector said.

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Three ages of a woman: top, as she is now; middle, as she will be if she ages naturally; bottom, as she will be on a pack a day

Please pass the trifle — I'll spark up another fag

By Ross Anderson

HERE we go again. When you eat, drink and smoke to excess, as I have taken vast pleasure in doing for more years than my increasingly erratic memory permits me to recall, you greet studies such as this with a resigned sigh. Then you have a large cod and chips, light a fag and head for the pub.

I have no idea how much this research cost but they needn't have bothered. All they had to do was ask my mother. "That's another ten minutes off your life," she used to say every time I ignited the end of an Old Holborn roll-up.

Once you strip away the DNA, the telomeres and the rest of the scientific gobbledegook, this study is just another case of "Let's get a grant and put the boot into the smokers again". They never compare a control group with, say, depressed people with no education, on low incomes, with broods of children eating rubbish, and living on crime-blighted estates. That's where to find women of 25 who look 50.

After a lifetime, albeit curtailed, of contributing iniquitous sums to the Exchequer in tobacco tax — and seething as wads of it are squandered on research into the bleeding obvious — I shall save the NHS even more money by departing with relative haste.

I hope to go with a smile on my face and a song in my heart; much in the manner of Marie Ellis, from Kent, who puffed her way through half a million cigarettes from the age of 15 and was cremated clutching a packet of Benson & Hedges. When Marie died last year she was 105. Or, if this survey is correct, nearer 120. Attagirl. Ross Anderson is a smoker and bon viveur. He writes occasionally about food in *T2*



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