

# Cellular aging increases risk of heart attack and early death

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This is Clinical Professor of Genetic Epidemiology Borge Nordestgaard from the University of Copenhagen. Professor Nordestgaard is also a chief physician at Copenhagen University Hospital, where he and colleagues conduct large scale studies of groups of tens of thousands of Danes over several decades. Credit: University of Copenhagen

Every cell in the body has chromosomes with so-called telomeres, which are shortened over time and also through lifestyle choices such as smoking and obesity. Researchers have long speculated that the shortening of telomeres increases the risk of heart attack and early death. Now a large-scale population study in Denmark involving nearly 20,000 people shows that there is in fact a direct link, and has also given physicians a future way to test the actual cellular health of a person.

In an ongoing study of almost 20,000 Danes, a team of researchers from

the University of Copenhagen have isolated each individual's [DNA](#) to analyse their specific [telomere length](#) – a measurement of cellular aging.

"The [risk of heart attack](#) or early death is present whether your [telomeres](#) are shortened due to lifestyle or due to high age," says Clinical Professor of Genetic Epidemiology Borge Nordestgaard from the Faculty of Health and Medical Sciences at the University of Copenhagen. Professor Nordestgaard is also a chief physician at Copenhagen University Hospital, where he and colleagues conduct large scale studies of groups of tens of thousands of Danes over several decades.

### **Lifestyle can affect cellular aging**

The recent "Copenhagen General Population Study" involved almost 20,000 people, some of which were followed during almost 19 years, and the conclusion was clear: If the telomere length was short, the risk of [heart attack](#) and early death was increased by 50 and 25 per cent, respectively.

"That smoking and obesity increases the risk of heart disease has been known for a while. We have now shown, as has been speculated, that the increased risk is directly related to the shortening of the protective telomeres - so you can say that smoking and obesity ages the body on a cellular level, just as surely as the passing of time," says Borge Nordestgaard.

### **One in four Danes has short telomeres**

The study also revealed that one in four Danes has telomeres with such short length that not only will they statistically die before their time, but their risk of heart attack is also increased by almost 50 per cent.

"Future studies will have to reveal the actual molecular mechanism by

which the short telomere length causes heart attacks," says Borge Nordestgaard, and asks, "Does one cause the other or is the telomere length and the coronary event both indicative of a third - yet unknown - mechanism?"

Another possible prospect of the study is that general practitioners could conduct simple blood tests to reveal a person's telomere length and thereby the cellular wear and age.

**More information:** The study "Short Telomere Length, Myocardial Infarction, Ischemic Heart Disease, and Early Death" is scheduled for the March issue of the journal *Arteriosclerosis, Thrombosis and Vascular Biology* published by the American Heart Association.

Provided by University of Copenhagen

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