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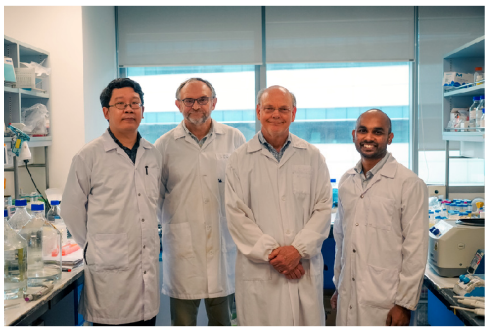
Discovering structure of key part of our chromosomes



Scientists from NTU Singapore have mapped out the molecular structure of a key part of our chromosomes called telomeres, which play a pivotal part in ageing and cancer.

The NTU team discovered that the building blocks of telomeres are stacked in columns like a spring. They also found that the shape of telomeres leaves a part of the DNA exposed and unprotected, leaving it more susceptible to damage than previously thought. The researchers said that their advance in genetic research would aid in explaining why humans age and develop cancer.

Telomeres are protective caps at the ends of the DNA molecules that make up our chromosomes. Like the plastic tips on the ends of shoelaces, the telomeres' function is to cap and protect the ends of the chromosome from damaging themselves by sticking to each other or fraying.

Previously, due to its chemical instability and complex repetitive nature, scientists have struggled to duplicate enough telomeric DNA in the laboratory to be able to use electron microscopes to observe how it is structured.

In their study published this month in the journal Nature, the researchers adapted existing processes to replicate DNA and saw that in telomeres, the nucleosomes, which contain tightly packed strands of DNA (deoxyribonucleic acid), are stacked in columns around chromosomal proteins called histones.

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