

Size Matters - When it Comes to DNA

June 9 2010

(PhysOrg.com) -- A new study at the University of Leicester is examining a sequence of DNA- known as telomeres - that varies in length between individual.

This follows evidence that these structures shrink in length over an individual's lifetime and that this may contribute to several diseases including those commonly associated with ageing and, perhaps most importantly, the development of cancer.

Now the study is trying to understand how this process is controlled.

Jonathan Williams, from the Department of Genetics, is conducting postgraduate research into this field. He said: "[DNA](#) in human cells is arranged into 46 linear structures known as [chromosomes](#). The ends of these [molecules](#) are particularly prone to damage from the environment inside the cell, and thus have special structures to protect them, termed [telomeres](#)."

"Telomeres consist of repeating pieces of DNA that vary in length between individuals. Important research over a number of years has shown that these structures shrink in length over an individual's lifetime and that this may contribute to several diseases.

Telomere shortening can be reversed in two specific ways:

- a protein termed telomerase can directly add new DNA to the end of telomeres.

- The second method is much less understood but most likely involves the copying of information from one telomere to another.

Said Mr Williams: “One of these methods must be activated during cancer development. The mechanisms controlling telomere length and the pathways reversing shortening largely remain a mystery.

“Now we are studying the ways in which changes to the chemical structure of DNA itself may control the lengthening of telomeres.

“Although these studies remain in their early stages it is hoped that the results may provide a better understanding of how the maintenance of telomeres is controlled, perhaps allowing for more targeted therapies for telomere associated disease in the future. “

Jonathan Williams will be presenting his research at the Festival of Postgraduate Research which is taking place on Thursday 24th June in the Belvoir Suite, Charles Wilson Building, University of Leicester (UK).

Provided by University of Leicester

Citation: Size Matters - When it Comes to DNA (2010, June 9) retrieved 25 April 2024 from <https://medicalxpress.com/news/2010-06-size-dna.html>

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