



K O N I N K L I J K E N E D E R L A N D S E
A K A D E M I E V A N W E T E N S C H A P P E N

The Dr H.P. Heineken Prize for Biochemistry and Biophysics awarded to Titia de Lange

Ladies and Gentlemen,

When Titia de Lange was a student, back in the 1970s, almost no one had ever heard of telomeres.

Biologists knew about DNA, about genes, about chromosomes. But what did these chromosomes look like at the outer ends? How could two twisted strings of DNA, just like threads at the end of a rope, not become unraveled? What protects those chromosome endings, those telomeres, from the chemistry of our own cells?

Back then, Titia de Lange decided to unravel the mystery. As she will tell you, it was love on first sight. In fact, she could not imagine studying anything else. How lucky she was, and how lucky we all are. Because of her life's work, we know a lot more about telomeres today than we did when she started.

For example, we know that telomeres are protected by six different proteins. The 'shelterin complex', Titia calls them when she talks to scientists. At the kitchen table, she will call them 'Charlie's Angels'.

Still, we also know that telomeres become shorter each time a cell divides. After ten or twenty cell divisions, the telomeres are gone, leaving their cells to die. Telomeres tell us a lot about our mortality: our cells have limited life spans, and therefore so have we.

Not *all* cells behave in this way. Stem cells, for one, just keep on dividing, because they have found a way to restore their telomeres. Regrettably, cancer cells can do the same. They, too, know how to rebuild telomeres, and that is one of the reasons why tumors keep on growing. That is why pharmaceutical companies today are also investigating telomeres. They could hold important keys to longer, healthier lives.

Titia de Lange's work has been central to what we now know about telomeres, because through the years, she remained faithful to her first love.

She never fails to mention the people who inspired her — great mentors such as Richard Flavell, Piet Borst and Harold Varmus. Today, however, we recognize that she has become a great inspiration in her own right.

Ladies and gentlemen, please join me in a round of applause for Titia de Lange, winner of the 2012 Heineken Prize for Biochemistry and Biophysics.