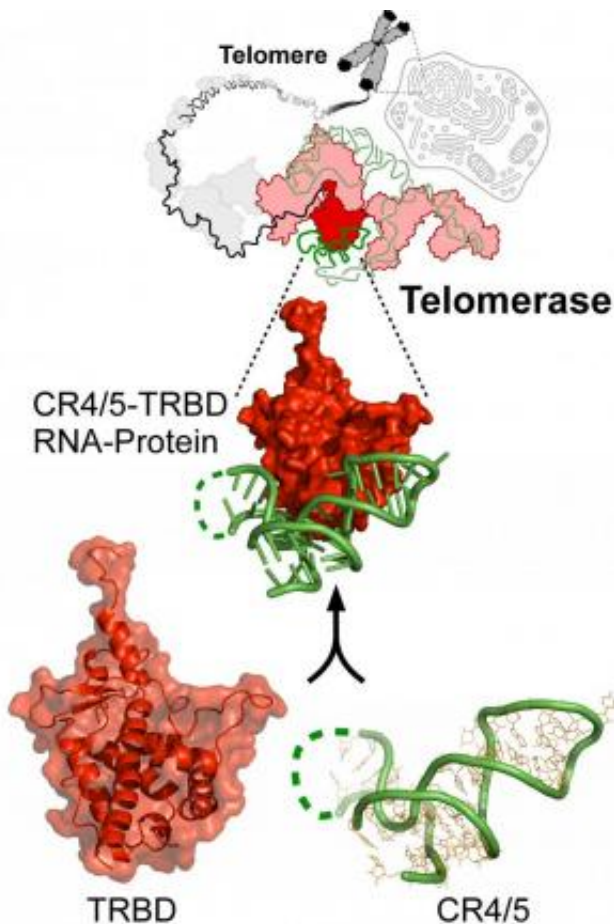


Scientists take steps to unlock the secrets to the fountain of youth

4 May 2014



This image depicts telomeres on a chromosome and shows the different components required for telomerase activity as researched by professor Julian Chen of Arizona State University and published on 05/04/14 in *Nature Structural and Molecular Biology*. Credit: Joshua Podlevsky

ASU scientists, together with collaborators from the Chinese Academy of Sciences in Shanghai, have published today, in *Nature Structural and Molecular Biology*, a first of its kind atomic level look at the enzyme telomerase that may unlock the secrets to the fountain of youth.

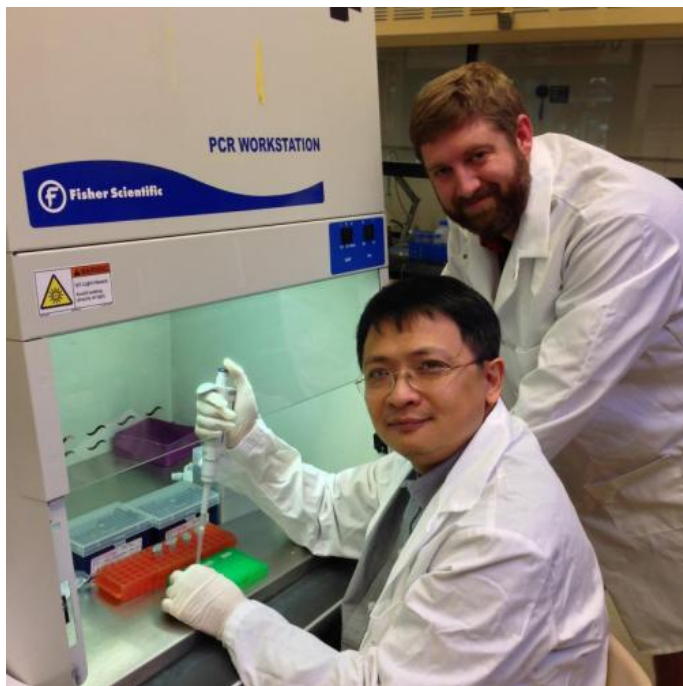
Telomeres and the [enzyme telomerase](#) have been

in the medical news a lot recently due to their connection with aging and cancer. Telomeres are found at the ends of our chromosomes and are stretches of DNA which protect our genetic data, make it possible for cells to divide, and hold some secrets as to how we age –and also how we get cancer.

An analogy can be drawn between telomeres at the end of chromosomes and the plastic tips on shoelaces: the telomeres keep chromosome ends from fraying and sticking to each other, which would destroy or scramble our genetic information.

Each time one of our cells divides its telomeres get shorter. When they get too short, the cell can no longer divide and it becomes inactive or dies. This shortening process is associated with aging, [cancer](#) and a higher risk of death. The initial [telomere](#) lengths may differ between individuals. Clearly, size matters!

"Telomerase is crucial for telomere maintenance and genome integrity," explains Julian Chen, professor of chemistry and biochemistry at ASU and one of the project's senior authors. "Mutations that disrupt telomerase function have been linked to numerous human diseases that arise from telomere shortening and genome instability."



Julian Chen and his graduate student Dustin Rand are shown in their Arizona State University lab continuing their research on the protein-RNA interaction in the vertebrate telomerase complex. Doctoral students Christopher Bley and Andrew Brown, also involved with the work, have graduated. Credit: Joshua Podlevsky

Chen continues that, "Despite the strong medical applications, the mechanism for telomerase holoenzyme (the most important unit of the telomerase complex) assembly remains poorly understood. We are particularly excited about this research because it provides, for the first time, an [atomic level](#) description of the protein-RNA interaction in the vertebrate telomerase complex."

More information: Structural basis for protein-RNA recognition in telomerase, [DOI: 10.1038/nsmb.2819](#)

Provided by Arizona State University

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