IN BRIEF

TELOMERES

A human telomerase holoenzyme protein required for Cajal body localization and telomere synthesis

Venteicher, A. S. *et al. Science* **323**, 644–648 (2009)

The active telomerase comprises the telomerase RNA component (TERC), the catalytic telomerase reverse transcriptase and dyskerin. Telomerase Cajal body protein 1 (TCAB1) interacts with the active telomerase and is enriched in Cajal bodies — nuclear sites of ribonucleoprotein processing that function in the delivery of TERC to telomeres in S phase. Knockdown of TCAB1 prevents the localization of TERC to Cajal bodies, the association of the telomerase with telomeres and telomere synthesis. So, TCAB1 is a new telomerase component.

DNA-DAMAGE RESPONSE

Maintenance of the DNA-damage checkpoint requires DNA-damage-induced mediator protein oligomerization

Usui, T. *et al. Mol. Cell* **33**, 147–159 (2009)

Brca1 carboxy-terminal (BRCT) domain-containing mediator proteins form aggregates at sites of DNA damage and control the activity of checkpoint kinases. Upon DNA damage, Tel1 and Mec1 checkpoint kinases phosphorylate the SQ/TQ cluster domain (SCD) of the yeast Rad9 mediator. Phosphorylated SCD domains interact with BRCT domains in adjacent Rad9 molecules, thereby forming aggregates. Rad9 mutants that impair oligomerization activate the checkpoint kinase Rad53 but are unable to maintain checkpoint signalling. Once activated, Rad53 phosphorylates the BRCT domain of Rad9, which attenuates the SCD–BRCT interaction and inhibits Rad9 aggregation *in vivo*.

AGEING

Age-dependent deterioration of nuclear pore complexes causes a loss of nuclear integrity in postmitotic cells

D'Angelo, M. A. *et al. Cell* **136**, 284–295 (2009)

In dividing cells, nuclear pore complexes (NPCs) assemble into newly forming nuclei during mitosis. This process requires the expression of scaffold nucleoporins. By contrast, in non-dividing cells, the expression of scaffold nucleoporins is downregulated when cells exit the cell cycle. Once incorporated into the nuclear envelope, scaffold nucleoporins persist for the entire life span of a differentiated cell. The nuclei of old rat neurons show increased permeability. As age-dependent nuclear leakiness is accelerated by oxidative stress, the accumulation of oxidative protein damage at NPCs might be a crucial event during ageing.

MICRORNA

Biological basis for restriction of microRNA targets to the 3′ untranslated region in mammalian mRNAs

Gu, S. *et al. Nature Struct. Mol. Biol.* **16**, 144–150 (2009)

MicroRNAs (miRNAs) bind to the 3′ untranslated region (UTR) of target mRNAs to repress their translation and/or stability. However, the functional importance of target-site localization in the 3′ UTR is unclear. By modifying the stop codon of reporter genes to extend the coding region through the miRNA target sequences, Gu *et al.* found that miRNA-mediated inhibition of translation is impaired *in vivo* but is restored by slowing down translation. So, active translation interferes with the association of miRNAs with target mRNAs.