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Mathematical model of biophysical mechanisms of telomere length maintenance in mitochondrial DNA of C. parapsilosis

The terminal structures of linear mitochondrial DNA (mitochondrial telomeres) in C. parapsilosis consist of repetitive long tandem units. Besides these linear telomeres other cyclic configurations as telomeric circles and telomeric loops were experimentally observed and are suspected to play an important role in telomere length maintenance. We construct a mathematical model that captures biophysical interactions of various telomeric structures on a short time scale and that is able to reproduce experimental measurements in C. parapsilosis. Moreover, the model opens up a couple of interesting open mathematical problems in quasi-steady state approximation and discrete coagulation-fragmentation dynamical systems. This is a joint work with . Tomáška, J. Nosek and K. Boová.