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Spatial and dynamic organization of molecular structures in the cell nucleus

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Statements

1. Telomeres have been found to be frequently associated with PML bodies and play an important role in the formation of these bodies (this thesis).
2. Unlike claimed by Ludérus (M.E. Ludérus et al., *J. Cell Biol.* 2006), telomeres are attached to a nuclear matrix structure containing lamin A, emerin and actin but not lamin B2 (this thesis).
3. Telomere dynamics are increased during the G1 phase of the cell cycle, due to rearrangements in the nucleus that occur after mitosis has taken place (this thesis).
4. Sumoylation of telomere binding proteins by the MMS21-containing SMC5/6 complex is necessary for PML body formation (this thesis).
5. The cell nucleus is an amazing structure that in spite of containing large quantities of macromolecules, still offers sufficient space for large structures to move at relatively high speed.
6. ALT-associated PML bodies facilitate telomere lengthening in telomerase negative cancer cells rather than functioning as rubbish-bins collecting disposed linear telomeric DNA (C.L. Fasching et al., *Cancer Res.* 2007).
7. Sliding-neighborhood image operations can be performed much more efficient using GPU (Graphics Processing Unit) instead of CPU (Central Processing Unit) hardware.
8. Although described in nearly all student text books about cell biology there is no consistent evidence for the folding of chromatin in regular 30-nm fibers in living cells. This concept should therefore be replaced by a dynamic irregular folding model compatible with fast transcriptional regulation (K. Maeshima et al., *Curr. Opin. Cell Biol.* 2010).
9. The adjuvants to boost the immune response used in medical vaccines that are suspected to be the cause of allergies developed in individuals at a later age, should no longer be used since milder adjuvants with less allergenic properties are available (R.K. Gupta, *Adv. Drug Delivery Rev.* 1998).
10. The reason why pain evolved during evolution is because animals were too stubborn to learn from milder stimuli.