

Functional architecture and dynamics of the chromatin fiber: a systemic viewpoint

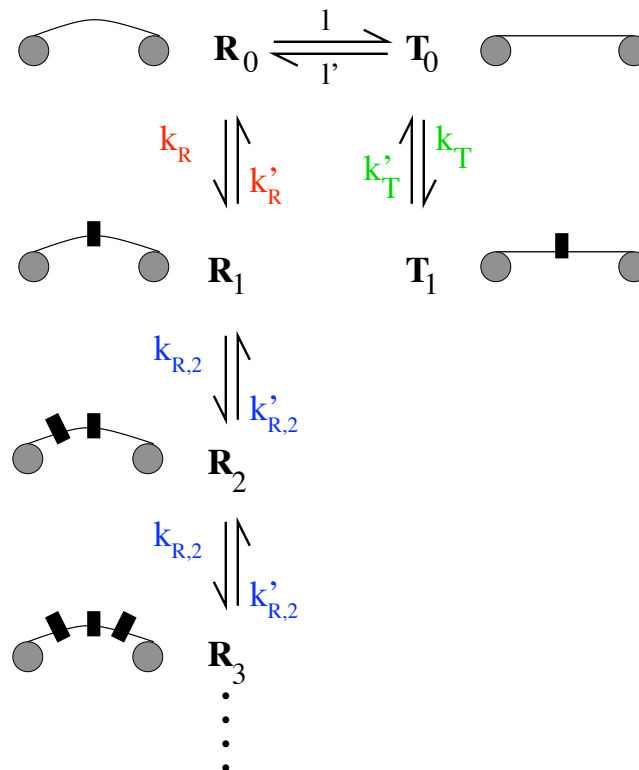
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A systemic approach is necessary to account for the feedback control exerted by the emergent properties of a living system onto its elements and their behavior. I will illustrate this point with the possible influences exerted at the DNA level by the chromatin superstructure. We claim that this control of local processes by the fiber structure and conformational dynamics can be understood as a generalized allosteric control, in which the allosteric entity is the DNA or the nucleosomes.

References

- A. Lesne, J.M. Victor. Chromatin fiber functional organization: some plausible models, Eur. Phys. J. E 19, 279–290 (2006).
- C. Beavin, M. Barbi, J.M. Victor, A. Lesne. Transcription within condensed chromatin: Steric hindrance facilitates elongation, Biophysical Journal 98, 824-833 (2010).



Allosteric control by histone tail acetylation of multiple intercalation within linkers (grey disks: nucleosomes, black rectangles: intercalating proteins). Note the parallel with the kinetic model of cooperative allostery proposed by Monod, Wyman and Changeux in 1965.