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The environmentally-regulated interplay between local three-dimensional chromatin architecture and gene expression

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Propositions

Accompanying the thesis

The environmentally-regulated interplay between local three-dimensional chromatin architecture and gene expression

Fatema Zahra Rashid

1. The three-dimensional structure of the chromosome and the dynamics of the changes to its organisation in response to environmental stimuli are encoded in its sequence. (*Chapters 1 and 3 of this thesis*)
2. ‘Co-regulated’ genes of an operon show independent regulation. (*Chapter 3 of this thesis*)
3. Changes in local three-dimensional chromatin structure change the local gene expression profile. (*Chapter 3 of this thesis*)
4. Regulatory elements of an operon occur within other transcriptional units. (*Chapter 3 of this thesis*)
5. The deletion of *endA* improves the stability of chromatin extracted from fixed *E. coli* cells. This deletion will be important in developing gentler and more reproducible procedures for 3C and ChIP experiments. (*Chapter 3 of this thesis*)
6. In contrast to earlier assumptions, the deletion of *stpA* from *E. coli* that express H-NS comes at a physiological cost. (*Zhang, A., et al., 1996, EMBO J.; Chapter 3 of this thesis*)
7. HI-NESS will revolutionize chromosome labelling for microscopy-based studies of chromosome organisation and dynamics in eukaryotic cells in culture and in live animal models. (*Chapter 4 of this thesis*)
8. The evolution of transcriptional units encoding ABC transporters before the separation of archaea and bacteria makes ABC transporter operons and genes an

ideal system for studying the evolution of the interplay between chromosome structure and gene expression. (*Chapter 5 of this thesis*)

9. The best mornings begin with freshly-picked cherries from Betuwe in the heart of the Netherlands and french-press coffee brewed from a dark roasted melange of Ugandan robusta beans, and Arabica from Central America, South America, and Uganda.
10. The success of humanity derives from the same trait that holds it back: differences of opinion.
11. The skill of ice hockey players permits them to execute a flawless pirouette.
12. XLNC would be a remarkable successor to HI-NESS.