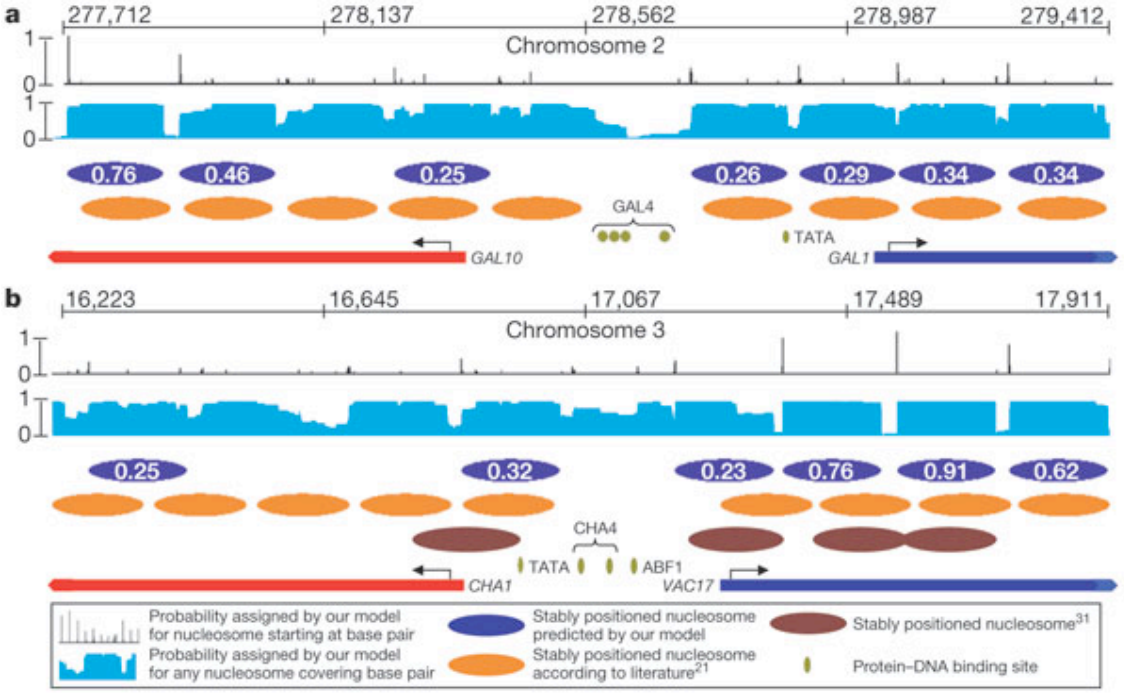
Genome Management and the Nucleosome

(Segal *et al.*)



DNA Packing in Viruses

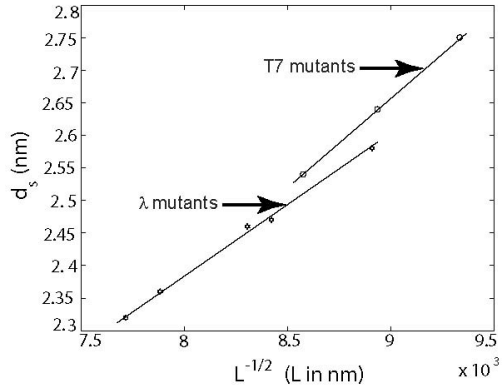
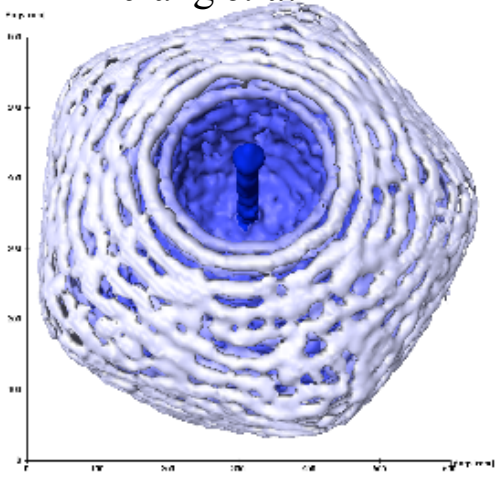


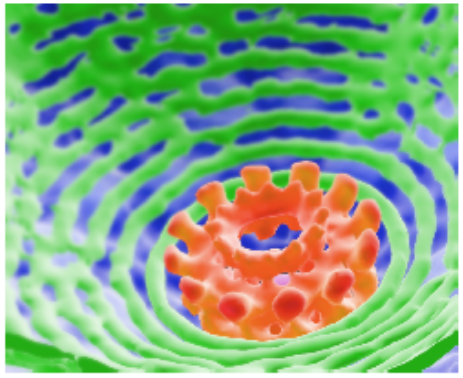
Fig.6

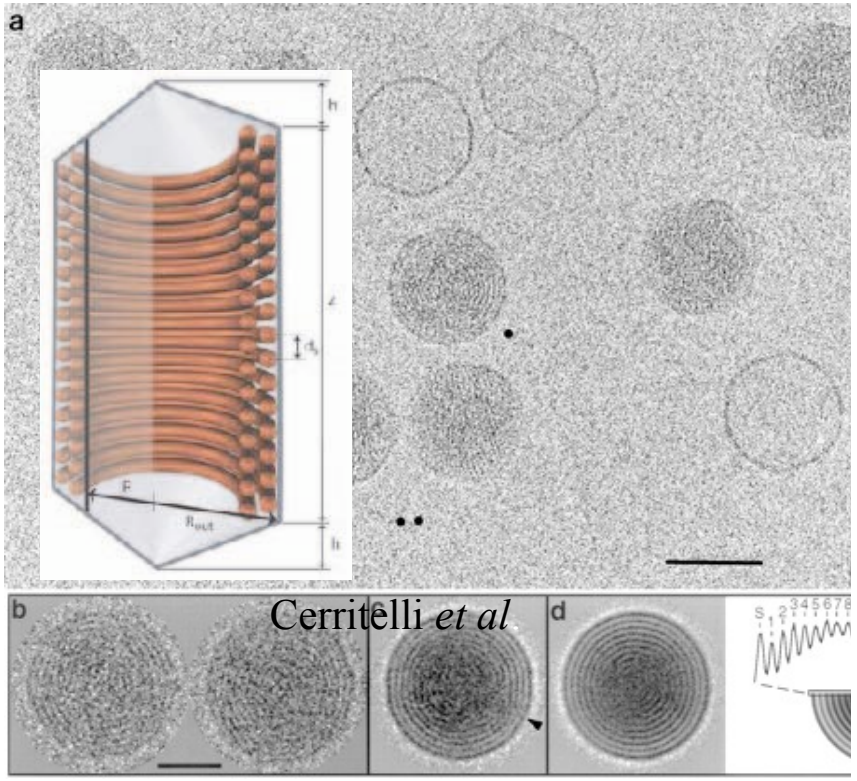
Structure of Packed DNA

Jiang *et al*



Lander *et al*

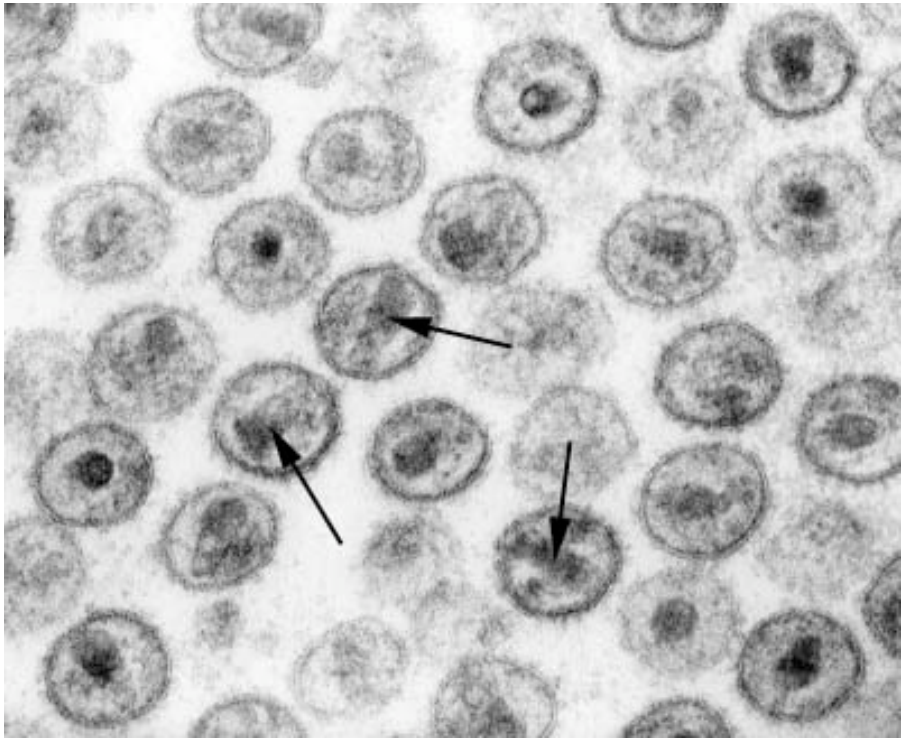


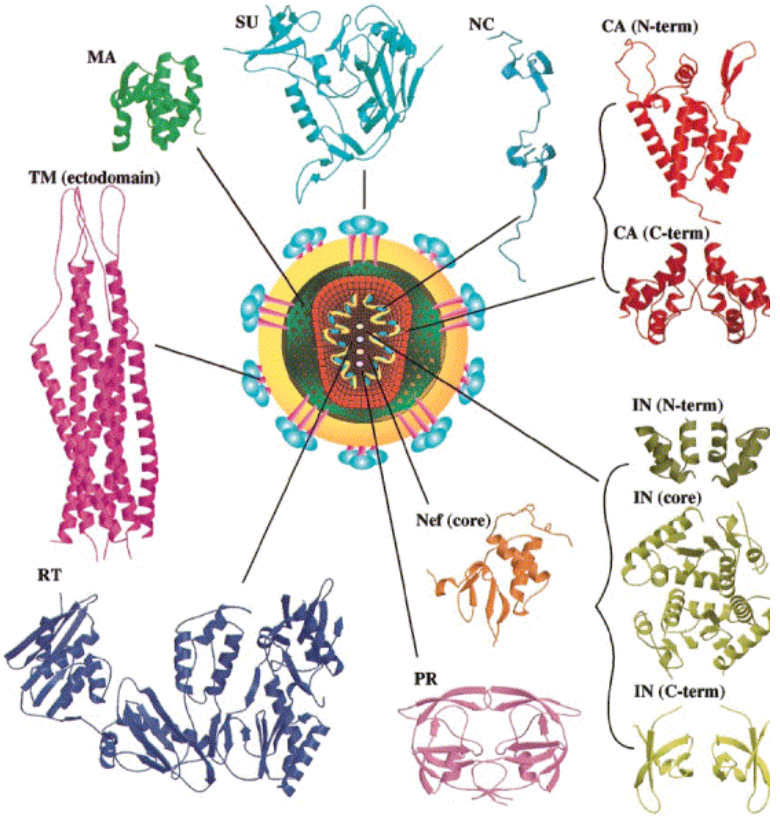


Cerritelli *et al*

- *Genomic material tightly packed in ordered arrangements.*
- *These pictures of packaged DNA are a jumping off point for our models of th confined DNA*

HIV RNA Packing???

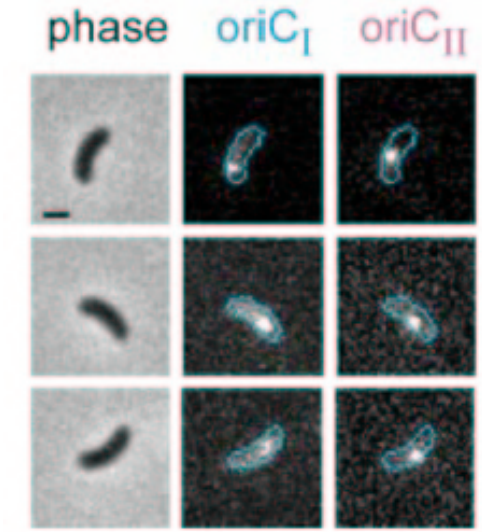


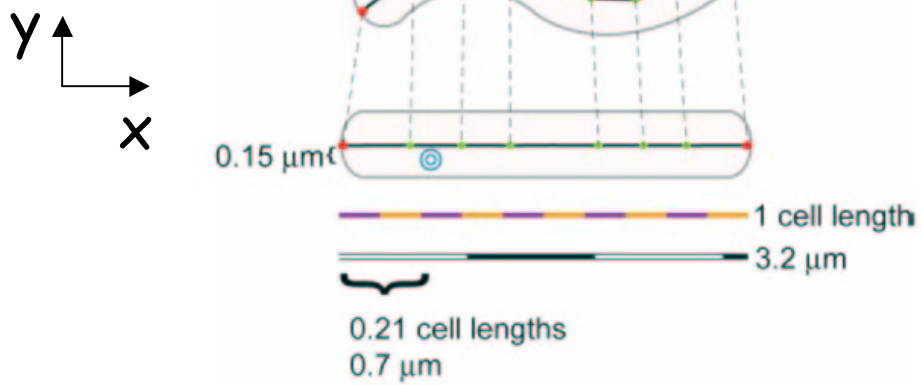


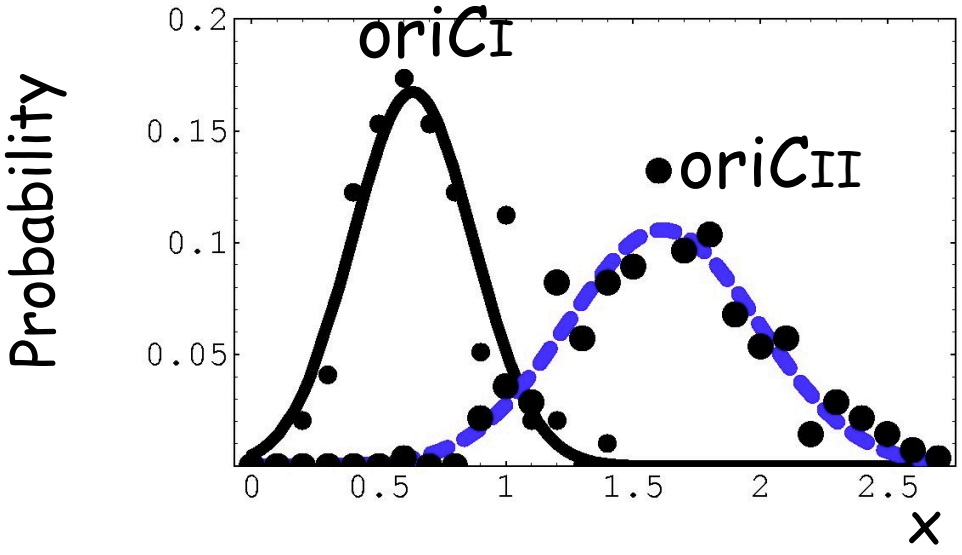
(Turner and Summers)

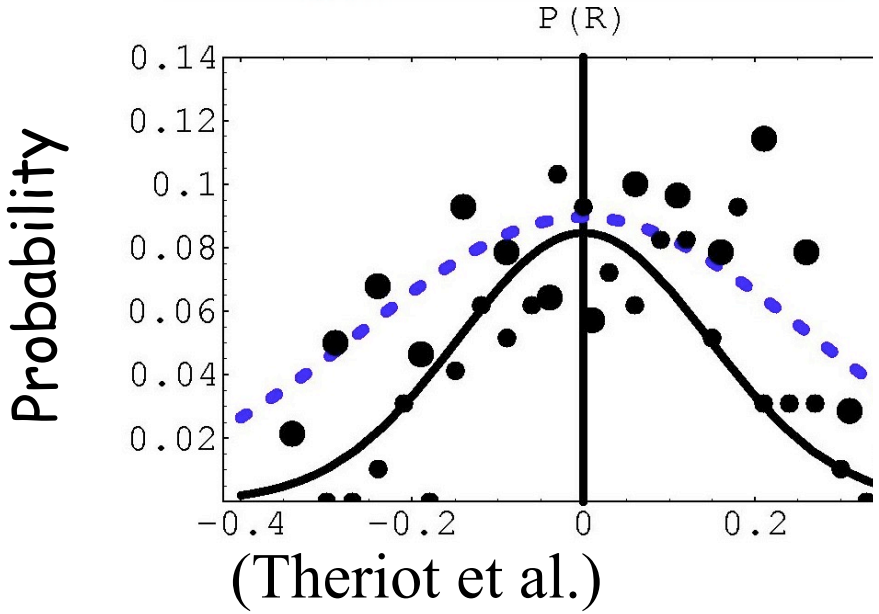
http://student.ccbcmd.edu/courses/bio141/lecguide/unit3/viruses/u2fig3a.html

Chromosome Geography in Vibrio



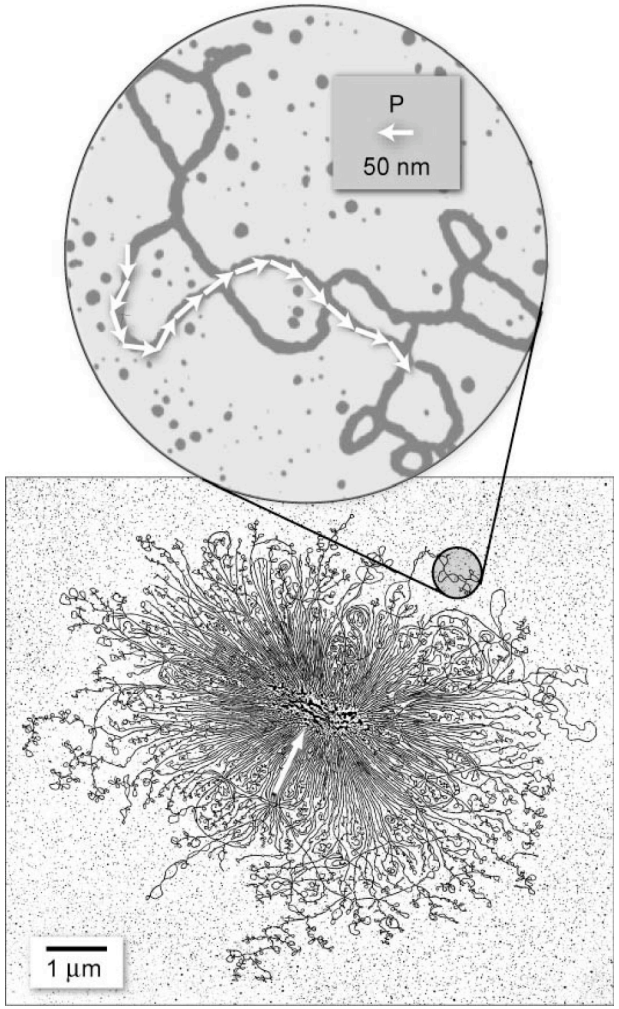


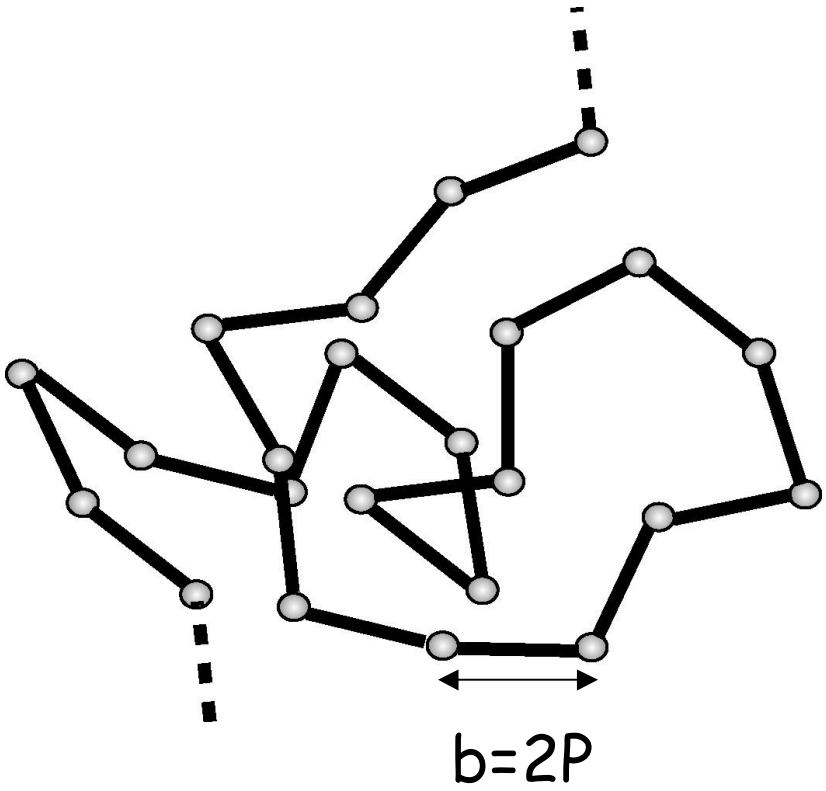




Replication origins are confined!

The Chromosome as a Polymer Blob





Electron Microscopy Images of the Nucleosome

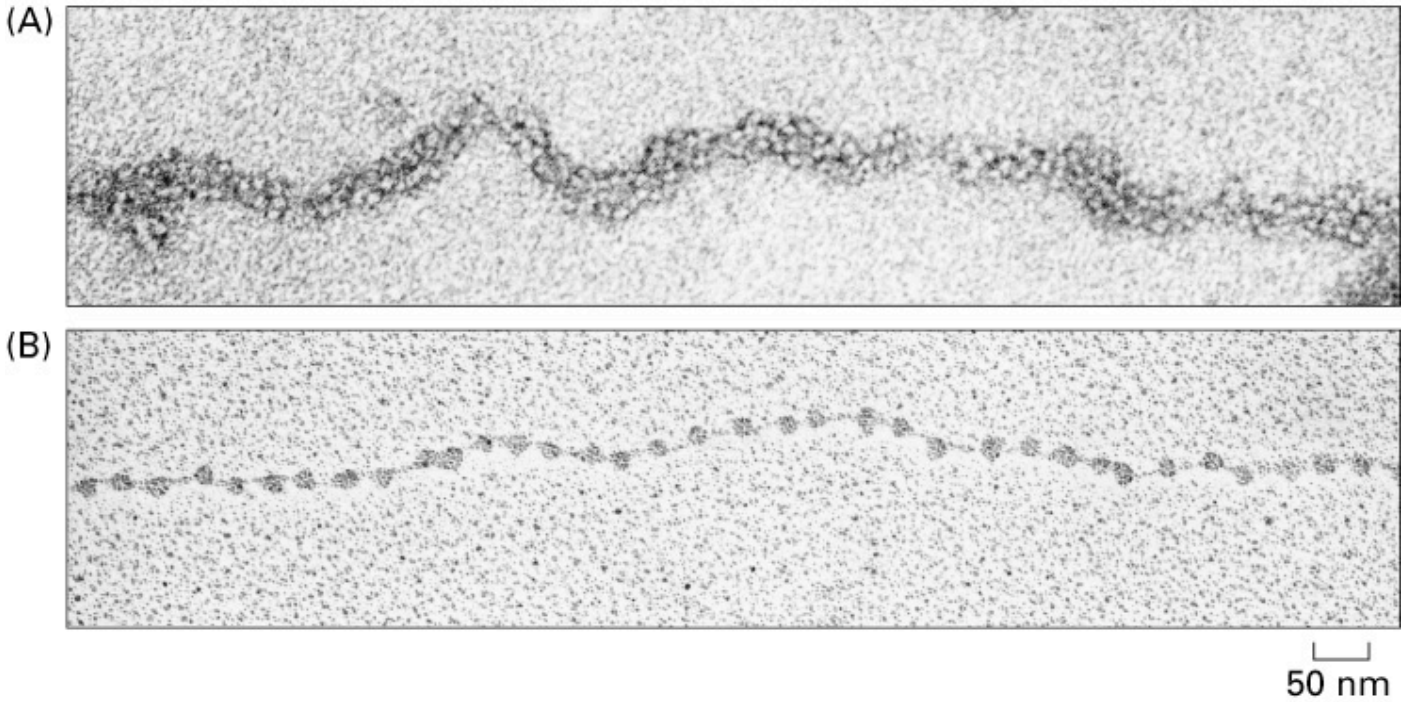


Figure 4–23. Molecular Biology of the Cell, 4th Edition.

Dissecting the Nucleosome

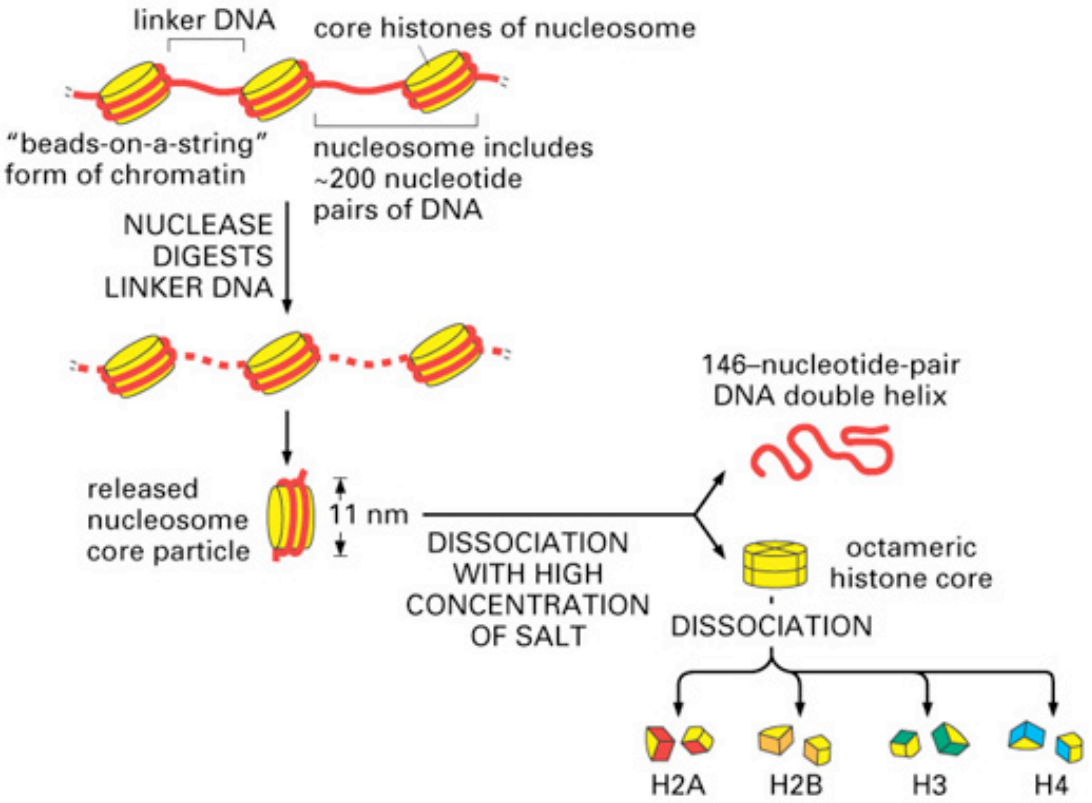
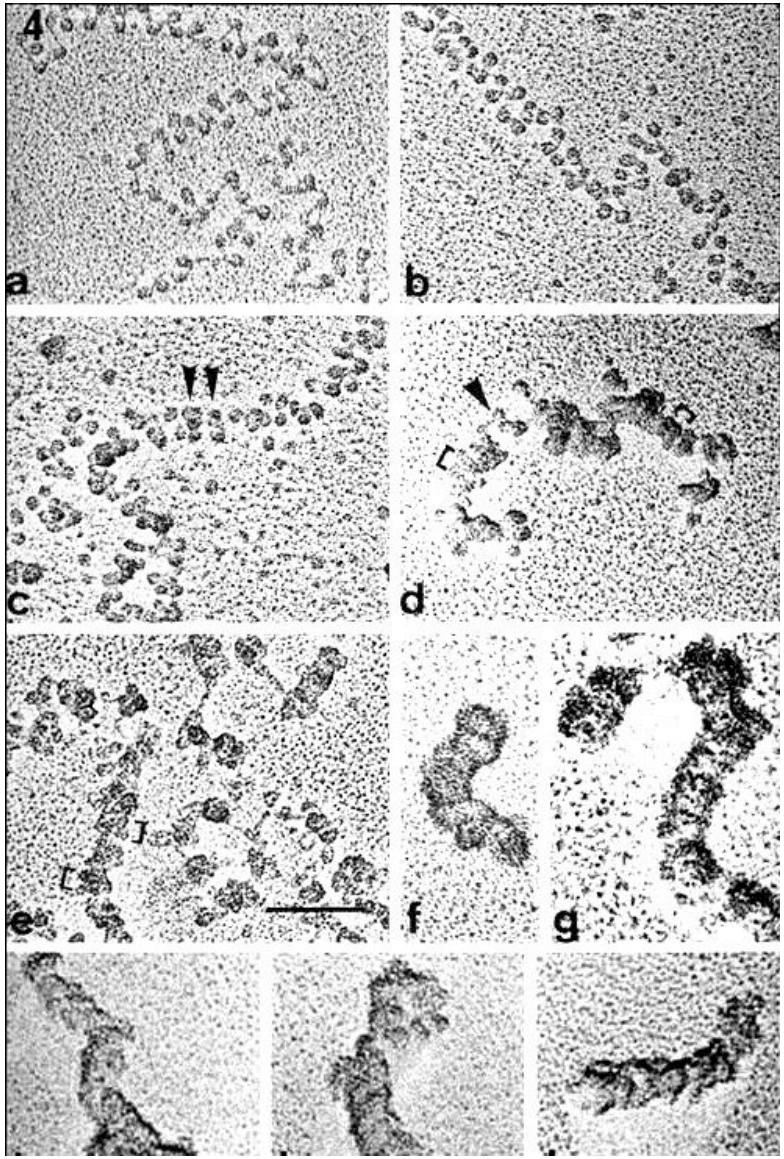
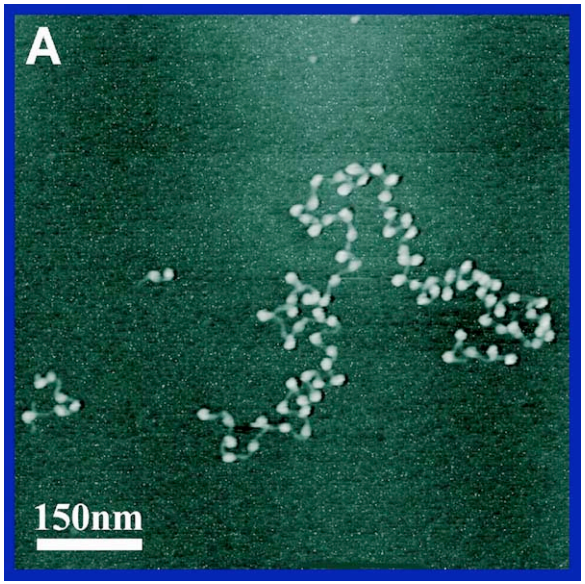


Figure 5-22 Essential Cell Biology, 2/e. (© 2004 Garland Science)

Electron Microscopy of Higher Order Structures



AFM Images of the Nucleosome



This image was obtained with purified chromatin fragments from chicken erythroid, using the cryo-AFM. It is seen that all the linker DNA is resolved directly, and the lateral dimensions of the nucleosome are similar to those determined by electron microscopy, and are only slightly greater than that from crystallography. The resolution her eis generally higher than that at room temperature. This was at low salt. The orientation of the nucleosomes appears to be random. With this purification (low salt), linker histones are supposed to be retained.

Atomic-Level Structure of the Nucleosome

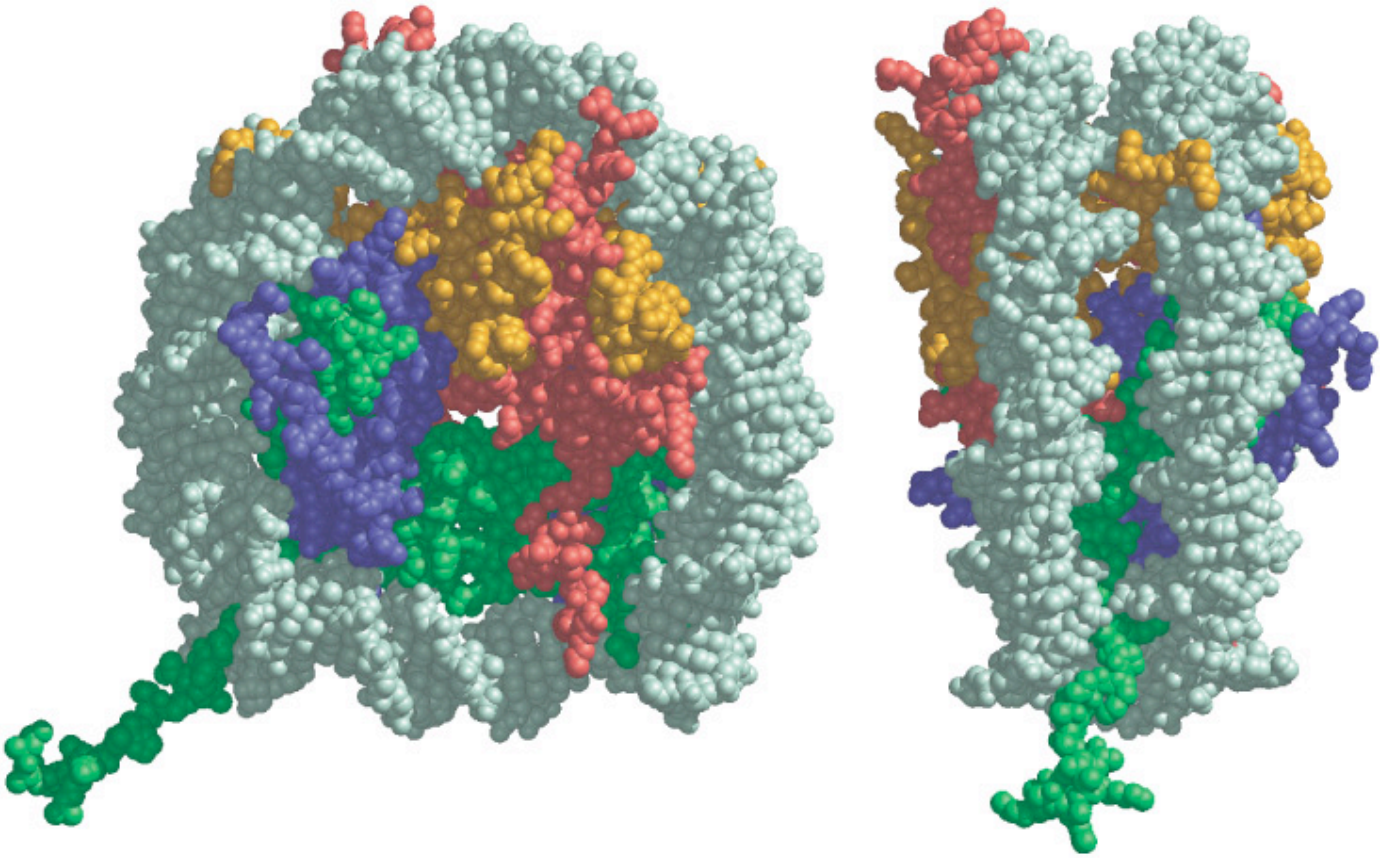
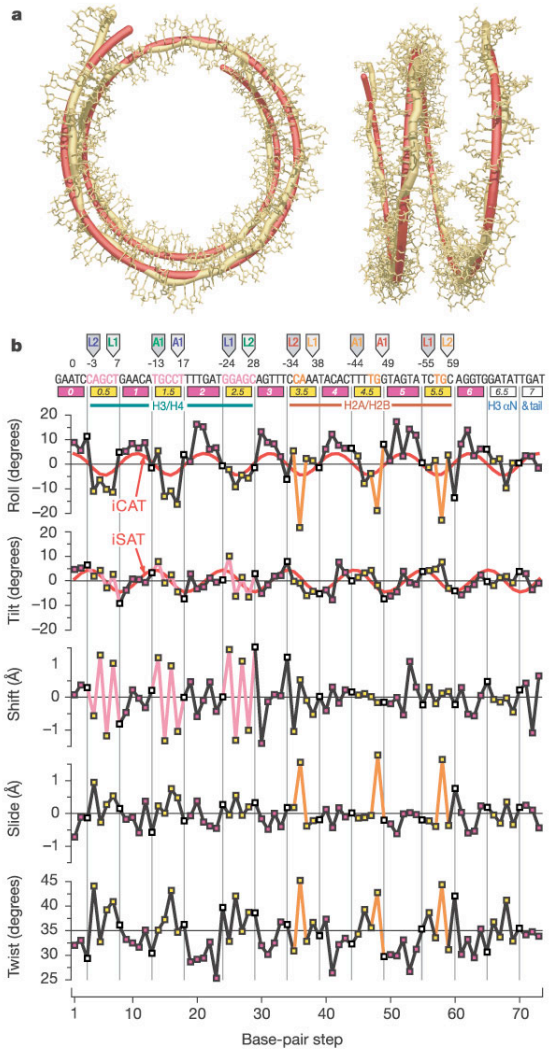


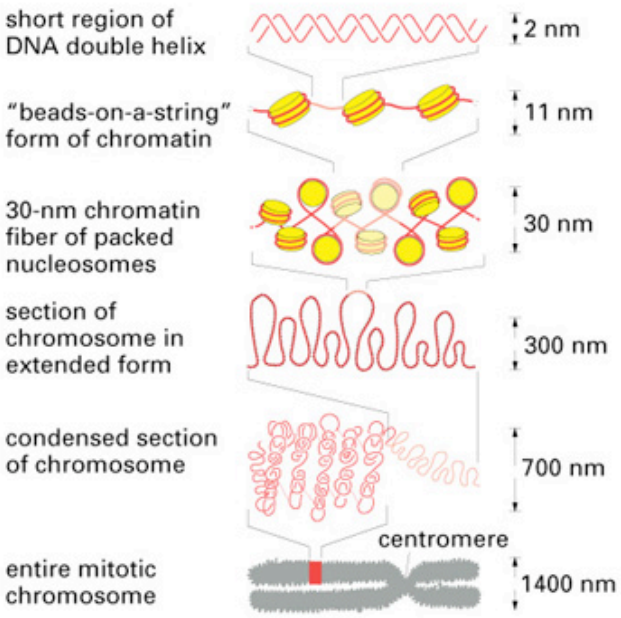
Figure 4–25. Molecular Biology of the Cell, 4th Edition.

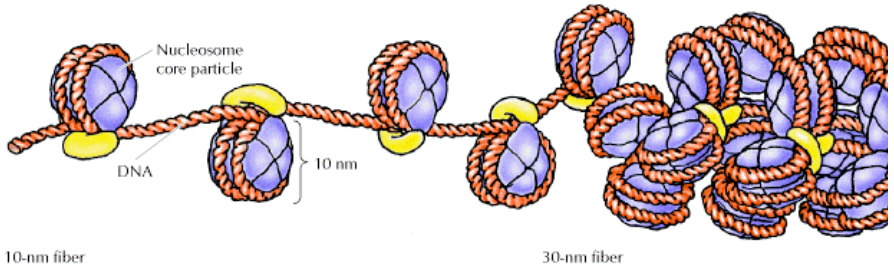
Atomic-Level Structure of the Nucleosome



(Richmond and Davey, 20

Higher Order Structure



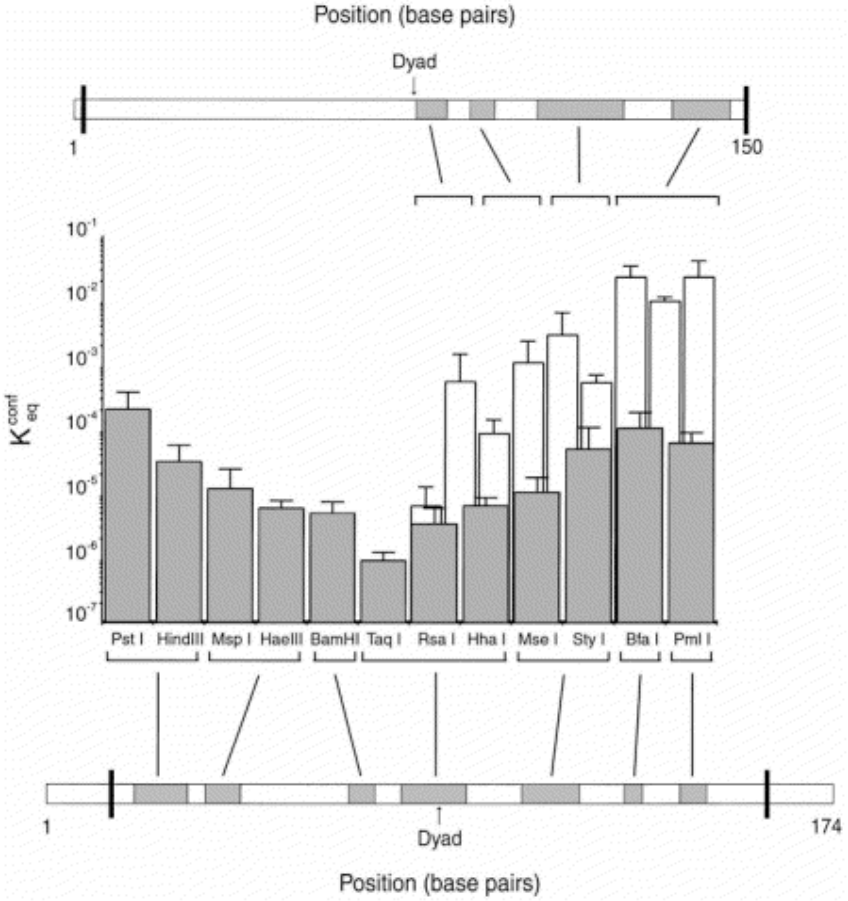


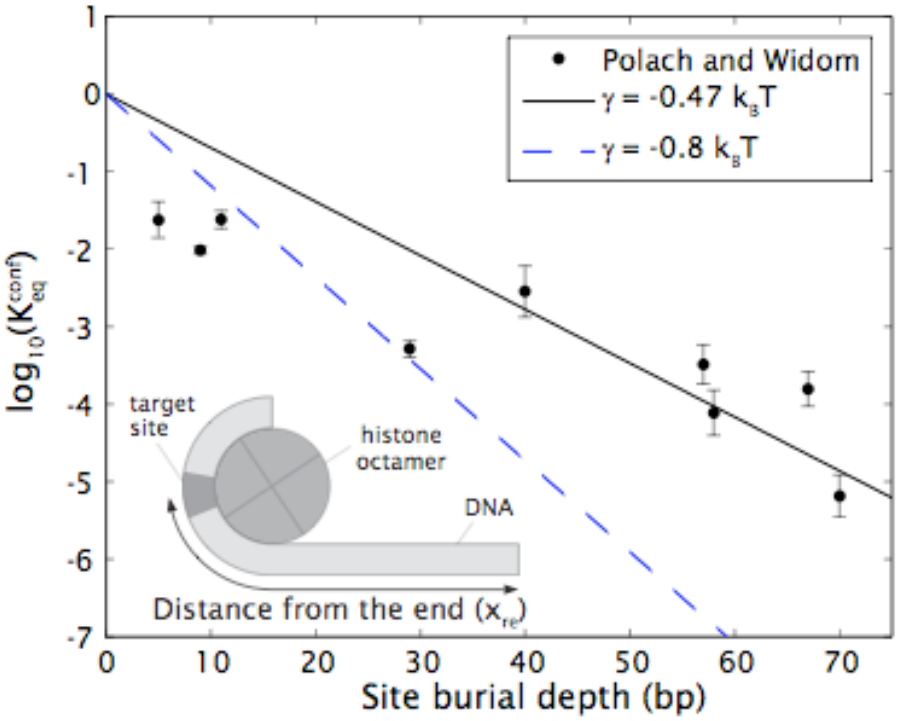
NET RESULT: EACH DNA MOLECULE HAS BEEN PACKAGED INTO A MITOTIC CHROMOSOME THAT IS 10,000-FOLD SHORTER THAN ITS EXTENDED LENGTH

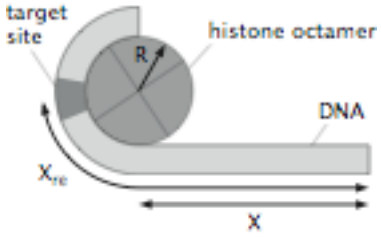
Figure 5-24 Essential Cell Biology, 2/e. (© 2004 Garland Science)

Measurements of Equilibrium Accessibility

(Anderson and Widom)

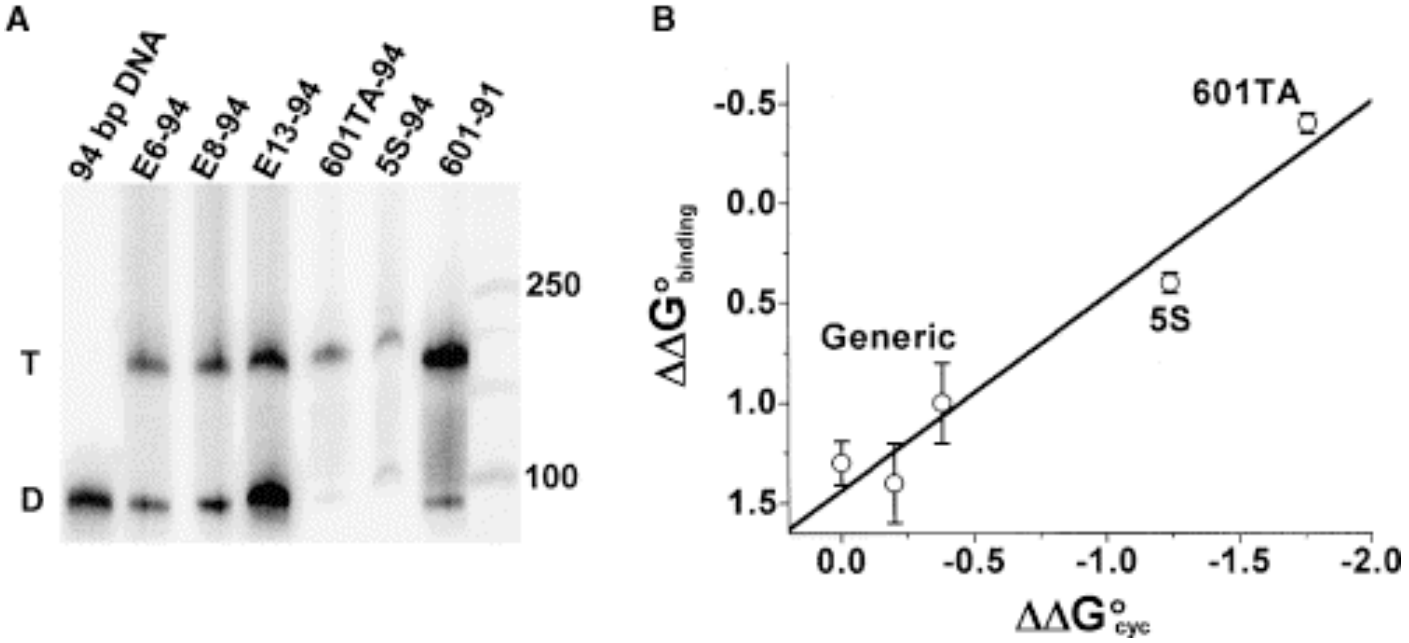






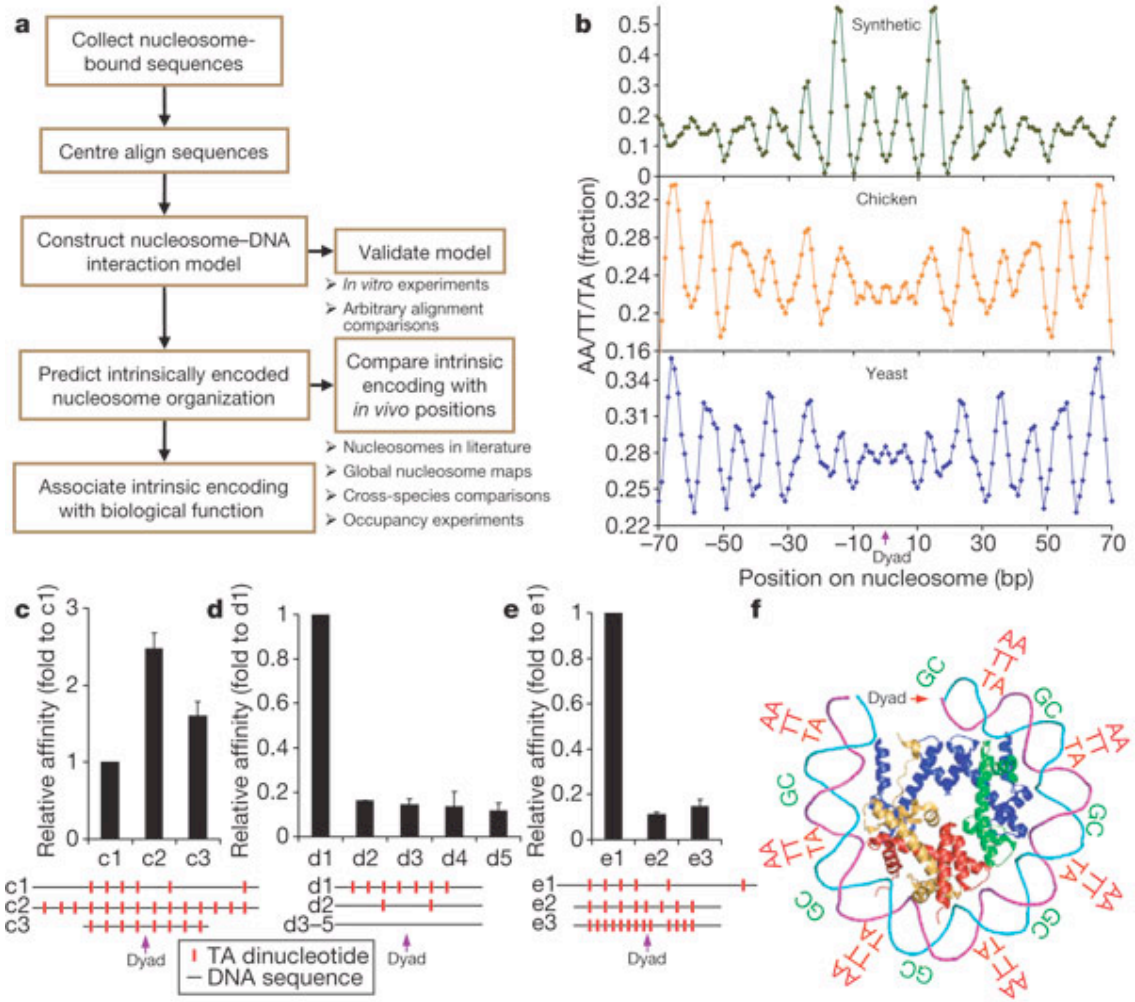
The Role of DNA Sequence

(Cloutier and Widom)



Nucleosomes Care About Positioning

(Segal *et al.*)



Consequences of Nucleosome Positioning

(Segal *et al.*)