NUCLEOSOME PACKING IS MEDIATED BY HISTONE H1

H1 BINDS TO SPECIFIC REGION OF NUCLEOSOME

11 nm
Figure 8-9

linker DNA

core histones of nucleosome

"beads-on-a-string" form of chromatin

NUCLEASE DIGESTS LINKER DNA

nucleosome includes 200 nucleotide pairs of DNA

released nucleosome core particle

11 nm

DISSOCIATION WITH A HIGH CONCENTRATION OF SALT

octameric histone core

146-nucleotide-pair DNA double helix

DISSOCIATION

H2A

H2B

H3

H4
<table>
<thead>
<tr>
<th>Histone Type</th>
<th>Approximate Molecular Weight</th>
<th>Number of Amino Acids</th>
<th>Approximate Content of Basic Amino Acids</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>17,000–20,000</td>
<td>200–265</td>
<td>27% lysine, 2% arginine</td>
</tr>
<tr>
<td>H2A</td>
<td>13,900</td>
<td>129–155</td>
<td>11% lysine, 9% arginine</td>
</tr>
<tr>
<td>H2B</td>
<td>13,800</td>
<td>121–148</td>
<td>16% lysine, 6% arginine</td>
</tr>
<tr>
<td>H3</td>
<td>15,300</td>
<td>135</td>
<td>10% lysine, 15% arginine</td>
</tr>
<tr>
<td>H4</td>
<td>11,300</td>
<td>102</td>
<td>11% lysine, 4% arginine</td>
</tr>
</tbody>
</table>

**Figure 13-9** Sequence and domain structure of the histones. Each of the histones is divided into extended, charged domains and a globular hydrophobic domain. The extended and globular domains correspond to regions that are variable (V) and conserved (C) in amino acid sequence between the histones of different species. Although the interactions of the charged and nonpolar segments are still largely unknown, it appears that both regions coordinate in binding histone molecules to each other and to DNA.
short region of DNA double helix

"beads-on-a-string" form of chromatin

30-nm chromatin fiber of packed nucleosomes

section of chromosome in an extended form

condensed section of chromosome

entire mitotic chromosome

NET RESULT: EACH DNA MOLECULE HAS BEEN PACKAGED INTO A MITOTIC CHROMOSOME THAT IS 50,000x SHORTER THAN ITS EXTENDED LENGTH

Figure 8-10
TELOMERASE BINDS

TELOMERASE EXTENDS 3' END
(RNA-templated DNA synthesis)

COMPLETION OF LAGGING STRAND
BY DNA POLYMERASE
(DNA-templated DNA synthesis)