Lecture 19 – Chromosome structure 2

I. centromere
   A. Region of chromosome that associates with spindle fibers

   B. Terms
      1. kinetochore
      2. two types of centromeres:
         - holocentric
         - localized centromere

   C. chromosomes are characterized by centromere location

<table>
<thead>
<tr>
<th>name</th>
<th>centromere location</th>
<th>appearance in anaphase</th>
</tr>
</thead>
<tbody>
<tr>
<td>metacentric</td>
<td>middle</td>
<td>V</td>
</tr>
<tr>
<td>submetacentric</td>
<td>offcenter</td>
<td>J</td>
</tr>
<tr>
<td>acrocentric</td>
<td>near an end</td>
<td>&quot;hooked&quot; I</td>
</tr>
<tr>
<td>telocentric</td>
<td>at end</td>
<td>I</td>
</tr>
</tbody>
</table>

II. telomere –

   A. First, brief review of replication
B. What would happen during replication at ends of chromosomes?

C. How is the “end” problem dealt with?
   1. bacteria and some viruses:
   2. some linear viruses:
   3. eukaryotic chromosomes:

D. What’s a telomere?
   1. 
   2. 

E. how do telomeres solve the “end” problem?

F. Implications of telomeres on human health
   1. aging: telomeres not made in some cells
   2. cancer: some cancer cells reactivate telomerase expression