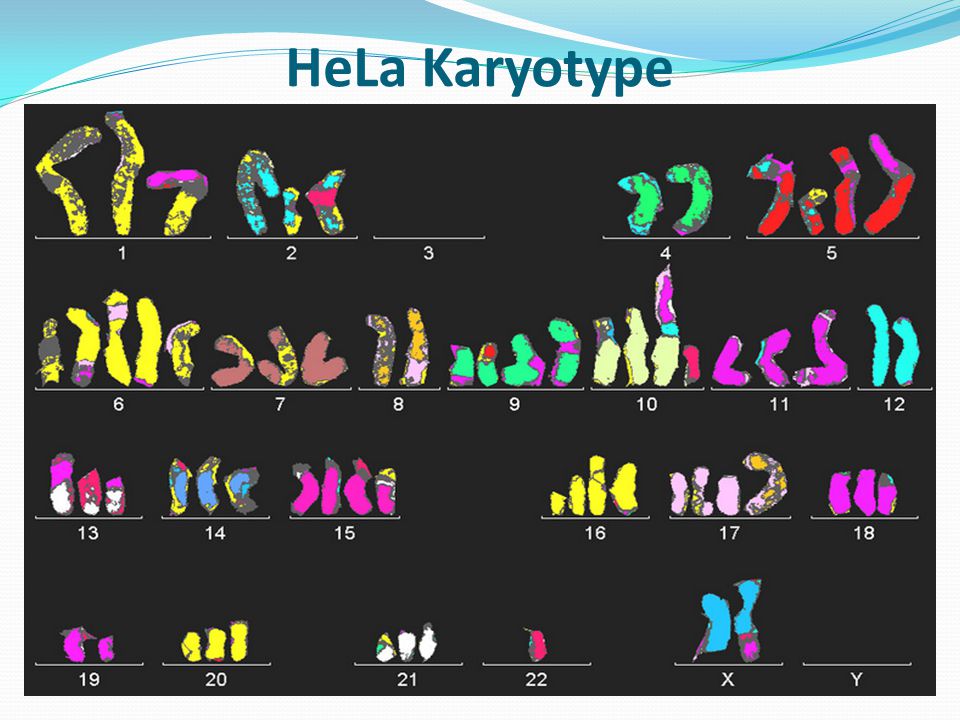
A normal human karyotype includes 46 chromosomes, but cancer can cause an altered Karyotype. Below is a karyotype of the HeLa cells using a chromosome paint procedure so that each chromosome has a characteristic color:



Write a report answering the following questions:

1. How are these cells different from a normal Male and female karyotype? Characterise the differences?
2. If you were to sequence chromosomes of the Hela karyotype and compare it to the normal chromosomes, what genetic changes do you expect to observe?
3. Why do karyotype differences occur in cancer and how does it specifically express itself in the Hela Cells?
4. Over the years, Hela cell lines have been known to contaminate other cancer cell lines grown in lab. Human Papilloma virus (HPV 18) is integerated into the Hela Genome. Why did this happen? Explain in detail how scientists can look for contamination in a genome with computational tools?