Histone modifications

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Histones

Schematic representation shows the organization and packaging of genetic material. Nucleosomes are represented by DNA (grey) wrapped around eight histone proteins, H2A, H2B, H3, and H4 (colored circles). N-terminal histone tails (blue) are shown protruding from H3 and H4.

From: http://www.whatisepigenetics.com/histone-modifications/
Examples of the histone modifications for H3/H4

- Acetyl (lysine) (Ac)
- Methyl (lysine) (Me)
- Phosphoryl (Ser or Thr) (P)

Modification states:
- Unmodified
- Acetylated
- Methylated
- Phosphorylated
- Higher-order combinations

"Meaning":
- Gene silencing?
- Gene expression
- Histone deposition
- Mitosis/meiosis
- Gene expression
- ?
- Gene silencing?
- Histone deposition
- Gene expression

Ac - acetyl (lysine), Me - methyl (lysine), P - phosphoryl (Ser or Thr)

Slide from: mcb.berkeley.edu/courses/mcb110/ALBER/9.chromatin.ppt
ChIP-seq
Chromatin immunoprecipitation followed by sequencing

From: http://www.nature.com/nrg/journal/v10/n10/abs/nrg2641.html
Sources

• Cistrome – public data + analysis tools
• ENCODE – lots of public ChIP-seq data to be searched for

A FASTQ file containing a single sequence might look like this:

```
@SEQ_ID
GATTTGGGTTCAAAGCAGTATCGATCAAATAGTAATCCATTGGTTCAACTCACAGTTT
+
! ' * (((***+))%-%++)(%%.%1***+-+''))**55CF>>>>>>CCCCCCCC65
```

The character '!' represents the lowest quality while '~' is the highest. Here are the

From: https://en.wikipedia.org/wiki/FASTQ_format
Info extraction

From: http://www.activemotif.com/catalog/830/rna-free-transcription-profiling-services
Homework

Propose/find an idea how the relationship of histones and DNA could be or is used in everyday life. You should explain how your example is similar to histone-DNA relationship.

Answers to:

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