**Clinical and Research Genomics Assignment #3**

**From Lecture\_07-09 (April 5th): Epigenomes, DNA Modifications, and Chromatin Dynamics**

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**Assignment: Analyze and contextualize data pertaining to chromatin dynamics and epigenetics.**

**Due Date: 10:00AM April 12th**

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**Epigenome and DNA Modifications**

Analyze and Contextualize DNA Methylation data from a RRBS experiment

If you do not already have it installed, install the free statistical program R on your computer:

<http://www.r-project.org/>

You can use the slides on this blog to understand the algorithms that we have discussed in class:

<http://zvfak.blogspot.com/2013/03/epiworkshop-2013-dna-methylation.html>

If you have trouble getting the package for R from the tutorial, you can download it here:

<http://code.google.com/p/methylkit/>

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Utilize the tutorial to familiarize yourself with R and the program.

Then, from the test dataset within the package, your assignment is to:

1. Check if there is an indication of PCR bias in the experiment.
2. Calculate # of differentially methylated cytosines (DMCs)
3. Annotate the DMCs with genes and discuss implications of that annotation.
4. Check correlation between samples.
5. Cluster samples to see if replicates cluster together

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**Please hand the assignment on the day of the lecture, or email if you cannot attend.**

**For any questions, please contact Alexa McIntyre (**[**abm237@cornell.edu**](mailto:abm237@cornell.edu)**), Ebrahim Afshinnekoo (**[**eba2001@med.cornell.edu)**](mailto:eba2001@med.cornell.edu))**, Priyanka Vijay (**[**prv2004@med.cornell.edu**](mailto:prv2004@med.cornell.edu)**), or Professors Mason (**[**chm2042@med.cornell.edu**](mailto:chm2042@med.cornell.edu)**), Elemento (**[**ole2001@med.cornell.edu)**](mailto:ole2001@med.cornell.edu))**, Leslie (**[**cleslie@cbio.mskcc.org**](mailto:cleslie@cbio.mskcc.org)**), and Li (**[**shl2018@med.cornell.edu**](mailto:shl2018@med.cornell.edu)**)**