

Shared Learning Association of Chapel Hill Lindgren Lecture  
at The Church of Reconciliation; 110 N Elliott Rd; Chapel Hill NC 27514

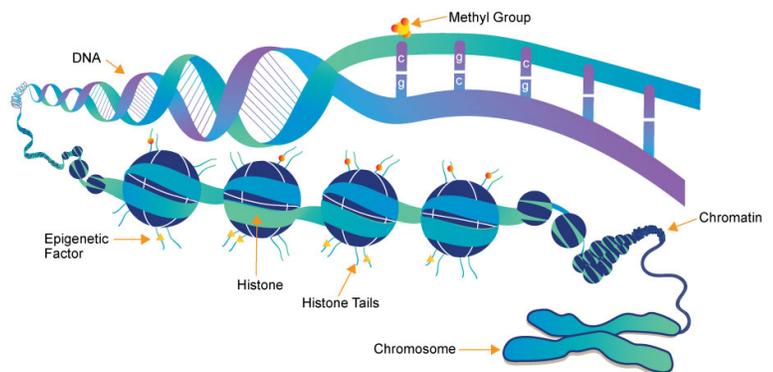
<https://sharedlearning.us/>

**Epigenetics and the Histone Code or “Things Mom Didn’t Have to Teach Me”**  
Friday October 22 at 11:15 am; by Zoom\* due to Covid.  
**LECTURER: Brian Strahl, Oliver Smithies Investigator**  
Full Professor and Interim Chair of Biochemistry & Biophysics  
University of North Carolina at Chapel Hill

Each cell in our body contains ~3.4 billion base pairs, which, if stretched out from end to end, would be 6 ft in length, but somehow fits into a cell nucleus only about 10  $\mu\text{m}$

(~0.00001 yards) in diameter. How our DNA is packaged into the nucleus and then unwound for gene expression and protein synthesis (both critical to cell identity and fetal development) is still poorly understood. Brian Strahl, co-Director of the UNC Program in Chromatin and Epigenetics, is at the forefront of deciphering how DNA is packaged and then unwound for expression. DNA packaging and unwinding is largely mediated by a class of proteins called **histones**. Brian’s lab has been studying these proteins and the small chemical additions that occur on them or they make to DNA (e.g., adding or deleting phosphate or methyl groups). These chemical changes act as molecular “road signs” that instruct the histones in particular cells on what they are supposed to do and when to do it. Thus, a section of DNA

that codes for expression of proteins needed to make an eye will remain wound up and unread in muscle cells. This regulation of gene expression without a change in the DNA sequence is termed **Epigenetics** and is one of the hottest topics in modern biology and medicine. Brian will cover the basics of how histones organize packaging of our DNA and then contribute to unwinding regions as they are needed in specific cells. He will also explore how histone modifications like methylation act to direct gene expression in ways that may transfer information between generations without changes in genes. Finally, he will highlight how a wide variety of human diseases result from modification of the machinery that alters or binds to histones.



\* Instructions for joining the Lecture will be on the Shared Learning website (<https://sharedlearning.us/>).