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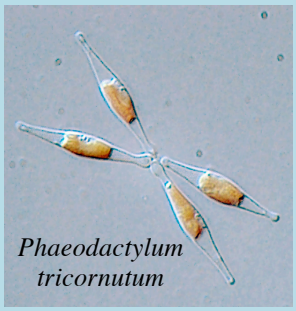
Epigenomics and its Connection to Evolution

To complement the previous multicellular organism epigenetic information → Model unicellular organisms → **Diatoms**

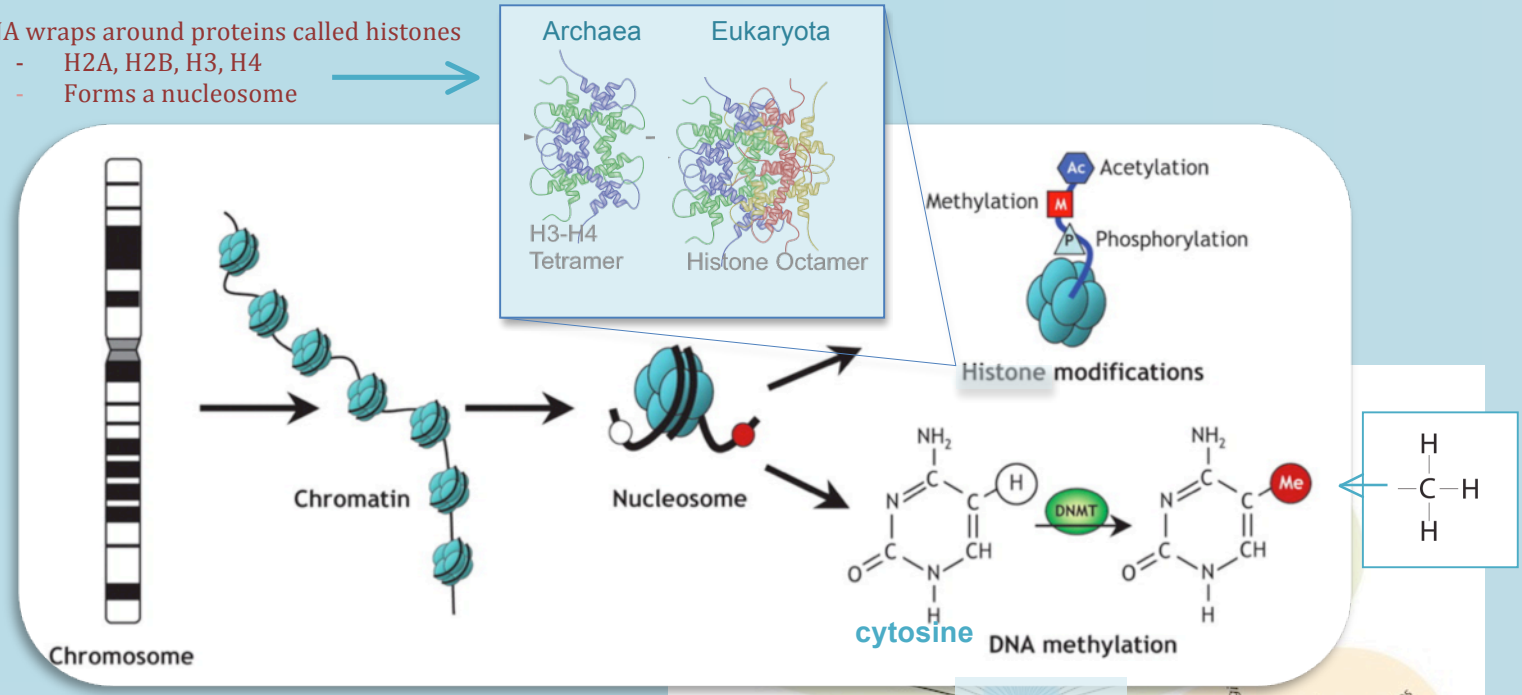


A diverse, widespread phytoplankton. → Unicellular eukaryotic plants (Primary producers)

They evolved about 150-200 million years ago from a eukaryotic cell that engulfed bacteria similar to algae.

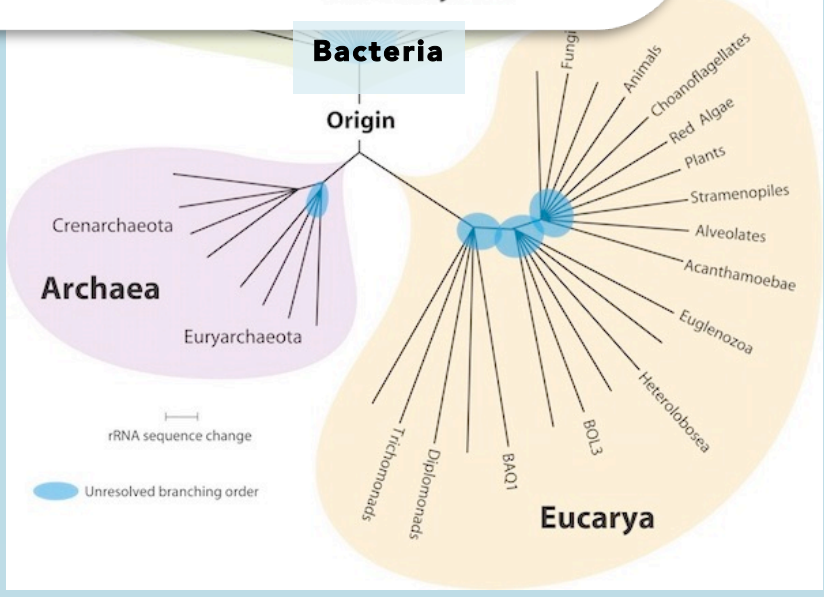
Epigenetic markers are **chemical modifications to DNA** that **do not** affect the sequence, but **do** affect the **expression** of genes.
They are generally **influenced by the environment** and are **inherited by offspring**.

DNA wraps around proteins called histones
- H2A, H2B, H3, H4
- Forms a nucleosome



Epigenomic modifications can change genomes throughout evolution because organisms are able to modify gene expression to **survive stressors** as well as **pass down enhanced fitness** onto descendants.

Comparing epigenetic markers can give Insight into the gene modifications that aided in **divergent evolutions and formation of new species.**



Rastogi, A., Lin, X., Lombard, B., Loew, D., & Tirichine, L. (2015) Probing the evolutionary history of epigenetic mechanisms: what can we learn from marine diatoms