

## Special Issue: Chromatin Biology and Epigenetics

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On the Cover: "An Epigenetic Map", commissioned by MCP, is a 20" x 20" oil painting by artist Julie Newdoll, 2015. This painting is part of a series in which the artist explores proteomics, and stems from a collaboration with MCP-editor-in-chief Al Burlingame and associate editor Ralph Bradshaw, with input from Benjamin A. Garcia, Ph.D., Presidential Associate Professor and Simone Sidoli, postdoctoral scholar of the University of Pennsylvania; and Michael Washburn, Director of Proteomics, of the Stowers Institute for Medical Research.

Description: In this Epigenetic Map, a phrase derived from CH Waddington's concept of the Epigenetic Landscape, a chromosome-shaped island in the center has both inaccessible mountainous terrain and flat open areas. Running over the landscape is a red ribbon of DNA, wrapped around clusters of grapes that represent histones incorporated into nucleosomes, and decorated with leaves of various colors representing epigenetic markers. Around the outside of the island, the accessible DNA of the flat, open area of the map has been magnified, so we can see epigenetic modifications to proteins and DNA being performed by mythological characters representing the enzymes that carry out this process. Starting in the lower left, the red DNA strand emerges from a tight clump of inaccessible chromatin, buried in red and orange leaves which represent repressive and transient histone markers. Hermes, the Greek winged messenger god, is decorating the histones with green, activating marker leaves. In his hand, he holds a message to activate MLL, an example gene product and epigenetic modifier. The shields represent proteins, and are labelled with the gene product they represent. You can see the Set/MLL label on the blue shield next to Hermes. Above him, a centaur is painting the grapes purple, indicating fully active histones. The centaur represents the unknown control mechanism of the epigenetic process. Across the top, two DNA modification enzymes are represented by the winged female figures above the unfurled and enlarged portion of the red DNA strand, where DNA bases A, G, T, and C can be read. The more sinister, bird-bodied figure on the left is oxidizing methyl groups, which modifies expression of the gene, while the more pleasant character on the right is adding methyl groups to the cytosines on the DNA. Continuing clockwise, Aglaia, goddess of beauty standing on the compass, applies enzyme modifications to the various protein shields in the form of brightly colored jewels. Below her, the satyr applies transient histone markers represented by orange leaves, while his female muse applies repressive histone markers in the form of red leaves. At the bottom right, the DNA again dives into a tight clump of red and orange leaves, where it is no longer accessible, like the DNA in the mountains on the chromosome island in the center. Julie Newdoll's fine art, journal covers, music and chemistry games can be found on [www.brushwithscience.com](http://www.brushwithscience.com)

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