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► COVER: 'Spiralling events' by Patrick Morgan



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The explosion of interest in epigenetics over the past few years has had an impact on many branches of genetic and genomic research. One of the hottest topics in the field of gene regulation relates to the role of epigenetic modifications in dictating the expression output of the genome. In genomics, the advent of technologies for the large-scale profiling of these marks has made the characterization of epigenomes a coveted goal. And chromosome biologists are increasingly learning how epigenetic modifications contribute to the structural packaging of the genetic material at various levels.

This Focus issue of *Nature Reviews Genetics* reflects the broad impact of epigenetic research, from insights into basic mechanisms of gene regulation to potential biomedical applications. Keith Slotkin and Robert Martienssen (page 272) explore how the epigenetic control of transposable elements affects both gene regulation and chromosome biology, and Maria Blasco's Review (page 299) brings together evidence from recent studies that reveal a key role of histone modifications and DNA methylation in the regulation of mammalian telomeres. The contribution of recently developed epigenomic profiling technologies to our understanding of cancer biology is the theme of the Review by Manel Esteller (page 286), and the Review by Mikhail Spivakov and Amanda Fisher (page 263) discusses how the same techniques have led to a new understanding of the unique characteristics of stem cells. Finally, the ability of the environment to alter gene expression through its influence on epigenetic modifications is an emerging area of interest with important implications for understanding complex disease, as discussed by Randy Jirtle and Michael Skinner on page 253.

As usual, this Focus issue is accompanied by a Web Focus (<http://www.nature.com/nrg/focus/epigenetics>), an online collection of recent articles on epigenetics that have been published by Nature Publishing Group journals.

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