

Integrative Biology

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Cellular systems biology of chromosome dynamics

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The questions of how genes are regulated remains fundamental even after many decades of intense study. Rather than just studying the linear, one-dimensional sequence of DNA to inform us about regulatory mechanisms, we can now investigate the complex 3-dimensional organization of whole genomes. It has become clear that this organization is non-random and highly dynamic. To address new questions in genome architecture, we are taking a systems biology approach, combining the bioinformatic determination of chromatin states with quantitative experiments and dynamic, stochastic models of whole genome organization. Comparing these results with our experimental data has led us to understand how biophysical properties of the chromatin fibre lead to significant and biologically relevant self-organization of the genome.

Biography

Karen Lipkow was originally trained as a Molecular Biologist with undergraduate degree and research at the University of Konstanz, Germany and Rockefeller University, New York and has obtained his PhD degree from the University of Oxford, UK. For her Post doctorate at the University of Cambridge, she switched to computational biology. Since becoming a Group Leader in Cambridge, she is combining both computational and experimental approaches to study the mechanisms that shape cellular architecture. She is also an Editorial Board Member of the world's oldest scientific journal.

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