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Characterization of the Fab7 Boundary Element

[The aim of this project is to identify the DNA sequences and the proteins that are necessary for the complex temporal and spatial regulation of Abdominal-B, a gene that determines cellular identity during development.]

Because all cells within an organism contain the same genetic content, each particular cell must activate, or express, only a subset of genes, keeping the remaining genes inactive, or silent. It is this complex temporal and spatial regulation of gene expression that gives rise to the diverse cell types found within multicellular organisms. When genes are inappropriately activated or silenced, cells can become mis-specified. It is this misregulation of gene expression that gives rise to cancer.

My work focuses on identifying the DNA sequences and proteins that are required for the proper regulation of the *abdominal-B* (*Abd-B*) gene of the fruit fly. This gene is highly conserved between flies, mice and humans. Misexpression of a mouse homolog of the *Abd-B* gene causes cancer in mice. Many cancers in humans inappropriately express the human homolog of this gene. By understanding the factors that control the expression of the *Abd-B* gene, we may develop a better understanding of how cancers arise. Such knowledge will provide us with the information necessary to develop treatments and cures for cancer.