# Mitotic retention of gene expression patterns by the cell fate-determining transcription factor Runx2

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During cell division, cessation of transcription is coupled with mitotic chromosome condensation. A fundamental biological question is how gene expression patterns are retained during mitosis to ensure the phenotype of progeny cells. We suggest that cell fate-determining transcription factors provide an epigenetic mechanism for the retention of gene expression patterns during cell division. Runx proteins are lineage-specific transcription factors that are essential for hematopoietic, neuronal, gastrointestinal, and osteogenic cell fates. Here we show that Runx2 protein is stable during cell division and remains associated with chromosomes during mitosis through sequence-specific DNA binding. Using siRNA-mediated silencing, mitotic cell synchronization, and expression profiling, we identify Runx2-regulated genes that are modulated postmitotically. Novel target genes involved in cell growth and differentiation were validated by chromatin immunoprecipitation. Importantly, we find that dur