Down-regulation of interferon regulatory factor 4 gene expression in leukemic cells. Although the bcr-abl translocation has been shown to be the causative genetic aberration in chronic myeloid leukemia (CML), there is mounting evidence that the deregulation of other genes, such as the transcription factor interferon regulatory factor 4 (IRF-4), is also implicated in the pathogenesis of CML. Promoter methylation of CpG target sites or direct deletions/insertions of genes are mechanisms of a reversible or permanent silencing of gene expression, respectively.