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RNA polymerases in plasma cells trav-ELL 2 the beat of a different drum

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Abstract

There is a major transformation in gene expression between mature B cells (including follicular, marginal zone, and germinal center cells) and antibody secreting cells, i.e. ASCs, (including plasma blasts, splenic plasma cells, and long-lived bone marrow plasma cells). This significant change-over occurs to accommodate the massive amount of secretory-specific immunoglobulin (Ig) that ASCs make and the export processes itself. It is well known that there is an up-regulation of a small number of ASC-specific transcription factors Prdm1 (Blimp-1), Irf4, and Xbp1, and the reciprocal down-regulation of Pax5, Bcl6 and Bach2, which maintain the B cell program. Less well appreciated are the major alterations in transcription elongation and RNA processing occurring between B cells and ASCs. The three ELL family members ELL1, 2 and 3 have different protein sequences and potentially distinct cellular roles in transcription elongation. ELL1 is involved in DNA repair and small RNAs while ELL3 was previously described as either testis or stem-cell specific. After B cell stimulation to ASCs, ELL3 levels fall precipitously while ELL1 falls off slightly. ELL2 is induced at least 10-fold in ASCs relative to B cells. All of these changes cause the RNA Polymerase II in antibody secreting cells to acquire different properties, leading to differences in RNA processing and histone modifications

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