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Non specific transcription initiation by RNA polymerase III and its possible implication in innate immunity

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RNA polymerase III (Pol III) is a key player in innate immunity, as it serves as a sensor of viral and bacterial DNA of infected cells. This sensing asset is based on promoter independent recognition of foreign DNA templates in the cytoplasm and transcription via nonspecific initiation mechanism. The resulting 5'-triphosphate RNA transcripts activate the retinoic acid induced gene I (RIG-I), thus leading to induction of type-I interferon. We have previously shown that the human catalytic ribonucleoprotein RNase P is implicated in formation of proficient initiation complexes of nuclear Pol III on 5S rRNA and tRNA genes. However, it was unknown if this ribonucleoprotein is also implicated in nonspecific initiation of gene transcription by cytoplasmic Pol III. We will present preliminary results that show that the H1 RNA subunit of human RNase P is implicated in promoter independent initiation of transcription of synthetic circular DNA templates (COLIGOs) by cytoplasmic Pol III. The regulatory role of H1 RNA in this transcription system may explain the existence of RNase P like RNA genes in DNA viruses and the possible roles of their transcripts in evading antiviral innate immune responses.

Biography

Nayef Jarrous is currently working at "The Hebrew University of Jerusalem, Israel". His research interest is based on "Human nuclear RNase P ribonucleoprotein in tRNA processing". He has published many articles in reputed journals.

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