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Chemical synthesis of a recombinant human granulocyte colony stimulating factor (rhG-CSF) cDNA and its expression analysis

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Recently, granulocyte colony-stimulating factor (G-CSF) has been recognized as an important molecule for the treatment of a wide range of complex ailments such as cancer, AIDS, H1N1 influenza, cardiac and neurological diseases. Such a vast therapeutic potential of G-CSF has lured the scientists to utilize biotechnological approaches for the synthesis of this pharmacologically active agent. This study describes the use of a synthetic G-CSF cDNA molecule and its efficient utilization of producing the target protein by a simple cloning protocol. It was constructed the entire synthetic cDNA using a DNA synthesizer with the aim to increase its expression level by specific sequence modifications at the 5' end of the G-CSF coding region and decreasing the GC content without altering the predicted amino acids sequence. The identity of the resulting protein was confirmed by the highly specific enzyme-linked immunosorbent assay. In conclusion, a synthetic G-CSF cDNA in combination with the recombinant DNA protocol offers a rapid and reliable strategy for synthesizing the target protein. However, the commercial utilization of this methodology requires rigorous validation and quality control.

Biography

Salman A H Alrokayan has completed his PhD from Nottingham University, United Kingdom. He is the director of bionanotechnologyProgram, Visiting professor (Leeds University UK). He has 5 patents and published more than 50 papersin reputed journals and has been serving as an editorial board of "Journal of Biomaterials and Tissue engineering" as a Regional Editor " USA.

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