

## TECHNOLOGICAL INNOVATIONS OF ENCODE PROJECT AND FUTURE PERSPECTIVES

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**Background.** Encyclopedia of DNA Elements Project is a multinational project aimed at understanding the fundamental elements of the human genome. Various technologies have played a major role in the process leading to a promising future. **Objective of study.** The study aims to understand how technologies helped and will help in understanding the blueprint of human genome. **Material and methods.** The study is based on bibliographic sources that were analyzed using PubMed, Google Scholar, Science Direct, Nature Journals and other sources from web published within the period of 2014-2024. **Results.** Wide range of cutting-edge technologies including complex computational studies and powerful sequencing were used by encode scientists to reveal the unidentified realm of human DNA. Studies revealed how the interdisciplinary approach, with

the help of technologies paved the way to understand the fundamental elements of human DNA. CHIP-Seq, RNA-Seq, ATAC-seq and integrative computational analysis have been helpful in tracking down the chromatin dynamics making it accessible to the scientific field. Various functional elements were identified which led to revolutionary changes in research and therapeutical field. Cancer studies, genetic disorders and many other disorders were studied using the data received from the study. **Conclusion.** Understanding the functional elements of the human genome made it possible to find a solution for present day challenges in the field of medicine. With the help of technologies various data were retrieved with much more accuracy. ENCODE directed a promising future for solving many present-day challenges. **Keywords:** ENCODE, DNA, CHIP-seq, RNA-seq, ATAC-seq.

## DRUG INDUCED HEMOLYTIC ANEMIA

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**Background.** Drug-induced hemolytic anemia may occur in varies of time after administration of the drug, and often occurs in an acute and severe form. It is a disease caused by the breakdown of erythrocytes, resulting in an imbalance between the rate of synthesis and breakdown of erythrocytes. **Objective of the study.** Analyses of new results regarding the mechanisms behind drug induced hemolytic anemia and which drugs can produce this side effect. **Material and methods.** This article is based on data collected from several articles available on PubMed, PMC, Google Scholar, NCBI that have been published since 2018. **Results.** Drugs that cause hemolytic anemia include: cephalosporins, quinidine, ibuprofen, methyl dopa, levodopa etc. Cephalosporins were found to trigger hemolytic anemia due to an interaction between cefazolin coated erythrocytes with pre-existing anti-penicillin antibodies in a patient with allergy

to penicillin, it was majorly due to formation of an immune complex. Quinidine was found to cause hemolytic anemia by forming immune complexes which attached to erythrocytes and caused acute intravascular hemolysis. Ibuprofen were found to form immune complexes in the same way that methyl dopa an antihypertensive and levodopa, a dopamine agonist did, resulting in hemolytic anemia. Nitrofurantoin was used in a patient with quinolone-sensitivity, and it induced hemolytic anemia in patients with glucose-6-phosphate dehydrogenase deficiency. **Conclusion.** Hemolysis of erythrocytes is one of the main side effects caused by drugs. The administration of drugs must be individualized and based on their efficacy and harmlessness. Overall, we conclude that drugs can induce hemolytic anemia, and it must not be overlooked during treatment. **Keywords:** Hemolytic anemia, cephalosporins, erythrocytes.