بسم الله الرحمن الرحيم

**Sudan University Of Science And Technology**
**College Of Engineering**
**Biomedical Engineering Department**

# DNA Sequence Analysis

## A Project Submitted In Partial Fulfillment Of The Requirement For The B.sc (Honors) Degree In Biomedical Engineering

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# Abstract:-

The goal of this research is to analyze the components of the DNA which adenine and thymine and guanine and cytosine to see cancer before a tumor, and the analysis is by knowing association with each other, and also to be the expense of the dimers, which link each two components of the DNA and so is not the expense of the codons which link all three component has been observed change in density and analyze the DNA helps early diagnosis and treatment.

# CHAPTER1المستخلص:-

الهدف من هذا البحث هو تحليل مكونات الحمض النووي منقوص الاوكسجين وهي الثايمين والثايتوسين والجيانين والادينين,وذلك لاكتشاف السرطان قبل حدوث ورم,ويتم هذا عن طريق تحليل مكونات الحمض النووي ويتم حساب القواعد الاساسية والكودونات وملاحظة التغير في اشكال الكثافة,ويسهل تحليل الحمض النووي اكتشاف السرطان مبكرا وكذلك سهولة علاجه باقل التكاليف.

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# CHAPTER 5

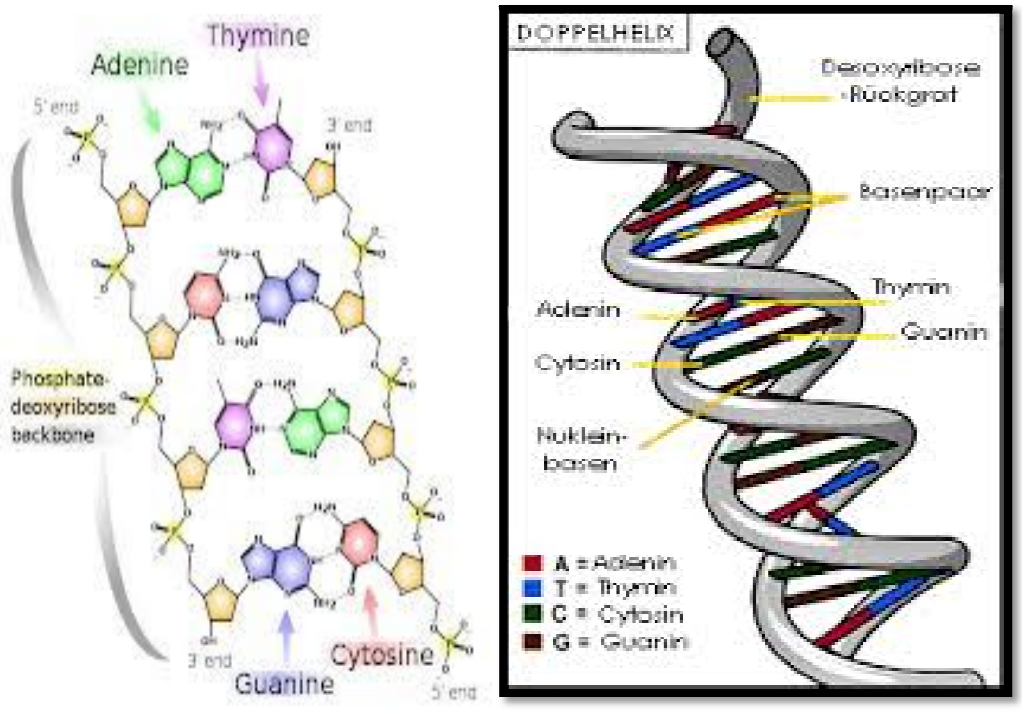
# Chapter One

# CHAPTER 6Introduction

## 6.1 1.1 General view:-

### 6.1.1 1.1.1 DNA:

DNA is able to act as a store of biological information because of its polymeric structure and because there are four different nucleotides. The order of nucleotides in a DNA molecule—the DNA sequence—is, in essence, a language made up of the four letters A, C, G, and T. The biological information contained in genes is written in this language, which we call the genetic code. The language is read through the process called gene expression. There are no chemical restrictions on the order in which the nucleotides can join together in a DNA molecule. At any point the nucleotide could be A, C, G, or T.




(Figure 1.1: shows DNA structures)

### 6.1.2 1.1.2 Cancer:

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. There are more than 100 different types of cancer. Cancer is a disease caused by genetic changes that develop over time. Although cancer can develop in virtually any of the body's tissues and each type of cancer has its unique features, the basic processes that produce cancer are quite similar in all forms of the disease.

## 6.2 1.2 Problem statement:-

We can detect the cancer by many methods of medical imaging, such like MRI, PET, X-RAY and CT Which the MRI and PET are used to show the physiological changes in the organs, When the X-RAY and CT are used to show the anatomical changes in the organs. And those methods detect the cancer in a late stage of the cancer.

## 6.3 1.3 Objectives:-

The general objective of this project was to detect the cancer at an early stage before the physiological change occurs which is occurs before the anatomical change happens and before the caner be very difficult to treatment, by DNA SEQUANCE ANALYSIS.

## 6.4 1.4 Thesis Layout:-

We have six chapters in this project. Each chapter speaks about different subjects. Chapter one: speaks about the introduction of the project which includes; general view, problem statement, objectives, methods and thesis layout. Chapter two: speaks about the theoretical background which include; introduction to bioinformatics, genomes, DNA and cancer. Chapter three: speaks about the literature review which include; old papers about the project. Chapter four: speaks about the methodology which include; explanation of the flow chart and description of the data we collect. Chapter five: speaks

about results and discussions. Chapter six: speaks about conclusion and recommendations. And then we have the REFRENCES.