

Slide 3:

-Gene is the active part of the genetic material

*Polypeptides include:

-hormones -enzyme -proteins

In the transcription process the mRNA will have exons and introns and the introns will be removed and still at the nucleus and the exons will be re-joined together in different ways which lead to different sequences of amino acids so different polypeptides

Slide 4:

Models means different sources of cells

sources types of cells

Viruses: made up of two things:

protein envelope and genetic material (mostly DNA but some viruses RNA) they are very simple and sometimes we need to grow viruses to use it in different fields.

Bacteria: prokaryote (only)

very important because it is very easy to grow in the lab used to

-signed up the proper antibiotic that kills specific bacteria

-sometimes also to multiply some genes genetic engineering grow easily and rapidly

-Prototroph: bacteria grows on normal the nutrition doesn't need extra nutrition

-Auxotroph: needs an extra nutrition (vitamins , minerals , amino acids)

Yeast : they are the best choice to study eukaryotic cell and genetics in the lab as they can grow easily

Animal cells: they are not easy/hard to grow in the lab because their nutrition requirement is very high , but sometimes you need to grow animal cells for example you need to study cancer cells.

-Cell culture: cells that growing in the lab

-Can we grow an animal in the lab from a single cell? no

Plants cells: one of plant cell in the lab can grow too form a whole plant

Slide 5:

-Many diseases are caused by interaction between genetics and environment example high blood pressure / diabetes

* if someone have overweight and have some genetic defect will suffer from type 2 diabetes

but if he fit and have some gene defects he will not suffer from type 2 diabetes
it and if he were overweight and doesn't have some gene defect he will not have type two diabetes
-some disease are the purely genetics we call it genetic disease
-some diseases are environmental so we call it environmental disease

What is genetic counseling ?

Genetic counseling authorization disease are on raise nowadays if a boy wants to get married with a girl they should first go to genetic counselor , this genetic counselor marriage genes and study the genetic disease in the whole family and the genetic disease that happens in the girl family and make his processing
and then give the advice for the boy and the girl what type of genetic disease that their children may have and sometimes may advise not to get any children if there is a high percentage of getting some genetic disease

There is no cure for genetic disease

How to cure a genetic disease ?

Replacement the bad gene with a good gene (ex. diabetes)

Slide 6:

Genome is the whole /total genetic material in the cell which is normally where in the nucleus represented by chromosomes

humans genome means 46 chromosomes found in the nucleus

Are all the DNA active to form a polypeptide ?

no only 1% of the DNA while 99% non-coding (what is their function ? we don't know)

the function of DNA is form an mRNA (transcription) and then the mRNA form a polypeptide

Slide 8:

What is the distance between one and nucleotide and the next one? 0.34nm

-What is the distance needed to make a complete turn?

3.4 nm

-Any change of these natural in bases will cause a mutation

Slide 11:

-The nitrogen bases are found at the center of the DNA to be protected because they are the most important part

-Why the DNA makes a complete turn every 10 bases ?

Because each base pair is twisted about 36° to the next base pair after 10 bases 360° means one complete turn

-why the DNA is a spiral ? if the DNA remains straight the water will enter to the center of the DNA and cause broken of the DNA (nitrogen bases)

Slide 12:

RNA main function making a polypeptide

3 types:

tRNA = transfer , transporting amino acid during a translation

mRNA = copying one strand of the gene

rRNA = enter in the structure of the ribosomes

Slide 15:

Nucleotides are the building blocks of nucleic acids

amino acids are the building blocks of the protein

Slide 19:

Glucose = $C_6H_{12}O_6$ carbohydrates

Slide 21:

Purines is made of two fused rings

Pyrimidines made of single ring

Slide 24:

-Phosphate group has no contact with the nitrogen bases

-When forming the phosphodiester bond it loses two hydrogen and remain one OH and one O

-why we called DNA / RNA nucleic acids? because the release of the proton from the phosphate gives it a negative charge

What is a polypeptide bond ?

it is a covalent bond between two amino acid in the protein

what is the phosphodiester bond ?

it is the covalent bond between phosphate group and sugar

what is the glycosidic bond ?

it is a covalent bond between nitrogen bases and sugar