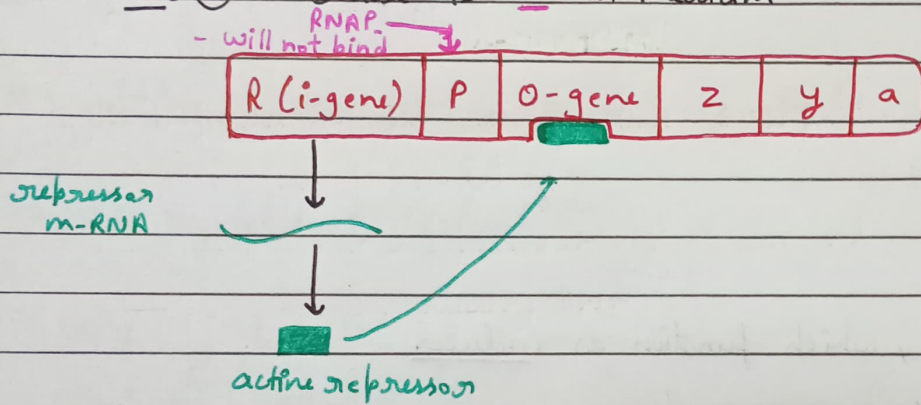


- (i) Lac-z :- It synthesizes enzyme  $\beta$ -galactosidase, which hydrolyses lactose ( $\beta$ -galactoside) into glucose & galactose.
- (ii) Lac-y :- It synthesizes permease which increases permeability of cell membrane for  $\beta$ -galactoside (lactose).
- (iii) Lac-a :- It synthesizes Transacetylase.

note:- There is common promoter & operator gene for structural gene

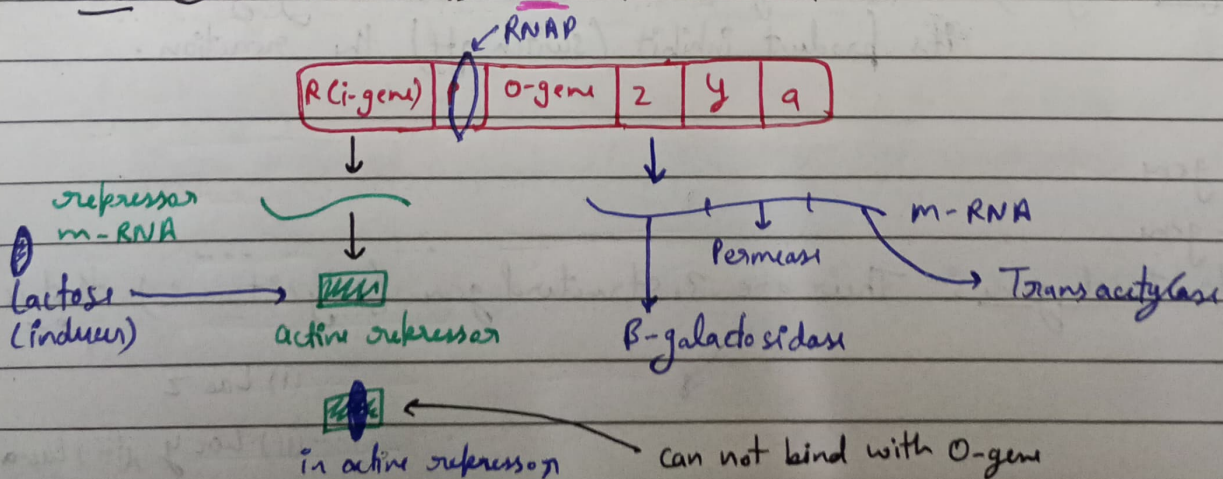
Case (A) :- Lactose is not in medium :-



Repressor +  $O$ -gene = Switch off

$\Rightarrow$  -ve regulation

Case (B) :- Lactose is present in medium :-



Lactose + repressor = Switch on  $\Rightarrow$  +ve regulation *Spiral*

Date .....

### Lac-operon

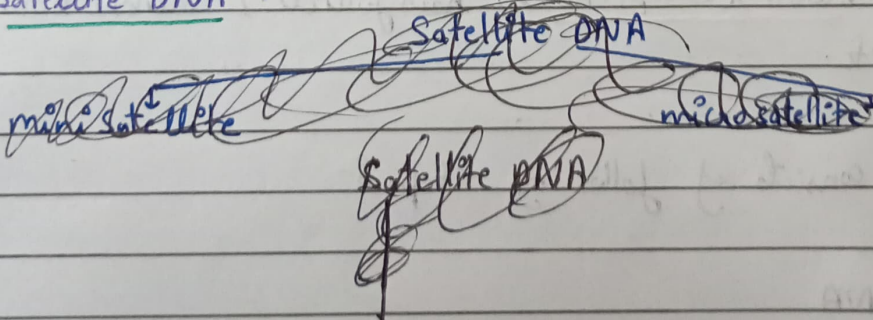
- Inducible operon
- for catabolism
- for carbohydrate metabolism
- have 3- structural gene
- does not show feedback inhibition

### Trypt-operon

- repressible operon
- for anabolism
- for essential amino acid
- 5- structural gene
- show feedback inhibition

## # DNA fingerprinting [DNA profiling] :-

- Allec Jeffrey & Prof. Lalji Singh ⇒ father of DNA fingerprinting
- DNA fingerprinting is based on identification of unique seq. which are differ in a population ~~the~~ except monozygotic twin.
- These unique seq. are k/a Repetitive DNA.
- repetitive DNA form minor peak during centrifugation and named as Satellite DNA.





## Satellite DNA

on the basis of :-

- ① No. of repeats (copy no.)
- ② Base composition (A:T rich) or (G:C rich)
- ③ length of segment

mini satellite



VNTR [1-20 kb]

microsatellite



STR [1-6 bp]

→ Variation Sequence of DNA or genetic variation in a population is k/a DNA polymorphism.

(mut)

→ DNA polymorphism for basis of DNA fingerprinting.

→ it is arise due to mutation.

→ it is transferred in a population if it does not affect reproductive ability of sexually reproducing animal.

→ The true DNA-Polymorphism is more than 0.01%

→ every tissue like Blood, (except: RBC), hair follicle, saliva, bone, skin, sperm, ovum etc.

→ DNA fingerprinting consists of following steps :-

- ① Isolation of DNA
- ② Digestion of DNA fragment with the help of restriction endonuclease
- ③ Separation of DNA ~~fragments~~ by segments by gel electrophoresis
- ④ transfer (blotting) of DNA fragment on synthetic membrane like nitro-cellulose or nylon.
- ⑤ Hybridization with radio ~~label~~ labelled VNTR (probe)

## ② Auto-radiography

Note :- Sensitivity of DNA ~~for~~ fingerprinting can be increased by PCR.

→ DNA polymorphism is also form bases of Human genome mapping.

### # Uses :-

- ① forensic science
- ② Paternity disputes
- ③ determining population and genetic diversities



Date .....

## Microbes in Human Welfare

imp:

# statin :- it is blood cholesterol lowering agent

→ it is competitive inhibitor

→ obtained from filamentous Yeast (Eukaryote) i.e. Moraxa purpurea

uv imp:-

# Cyclosporin-A :- it is Immune suppressive agent

→ obtained from Trichoderma Polysporum (imperfect fungi)

note:- Trichoderma is :-

① Free living fungi

② Present in root ecosystem

③ effective against several plant pathogen (broad spectrum pesticide)

(Biocontrol agent)

# Streptokinase :- it is blood clot buster.

→ obtained from Streptococcus bacteria

# Curd :-

→ it is partially degraded milk protein.

→ it is formed by LAB (group of microbes which convert milk into curd) which form acid, lactic acid.

→ curd is more nutritious than ~~with~~ milk due to the presence of Cyanocobalamin. (Vitamin B<sub>12</sub>)

→ it increases resistance against disease causing microbes in ~~our~~ our stomach



~~# Starch :-~~

### # Cheese :-

- it is partially degraded milk fat and protein
- the cheese is characterized by its :-

- ① flavour
- ② texture
- ③ taste

### # Types :-

- ① Swiss cheese :- The large hole in swiss cheese is due to CO<sub>2</sub>  
→ it is prepared with the help of bacterium propionibacterium shermanii
- ② Roquefort cheese :- prepared by penicillium roquefortii (ascomycotium fungus)

### # Toddy :- Traditional drink in south India

- it is prepared from fermented Sap of Palm, by the activity of Saccharomyces cerevisiae (yeast)

### # Beer and wine :- it is natural alcoholic beverage, formed by Saccharomyces cerevisiae

### # Antibiotic :-

- it is pro life for Human being and against life for disease causing microbes
- it is produced in fermenter

Date .....

- Antikinesis is example of ammensalism (0:-interaction)
- first antibiotic i.e. penicillin was discovered by Alexander Flemming by penicillium notatum during his experiment on ~~staphylo~~ bacteria staphylococcus.
- full potency to penicillin was provided by Florey and chain
- ~~1945~~ in 1945, fleming, Florey and chain got the noble prize of medicine.

#

Lipase →

Pectinase →

Citric acid →

Acetic acid →

Butyric acid →

# Sewage