Hello everyone I'm DoctorSunita Borkar from PESS,RSN College Farmagudi, Ponda. In this module we are going to talk about the production and fate of merozygote.
and abortive and complete transduction.

Bacteria have developed various mechanisms of gene transfer that

has led to genetic diversity and evolution. Horizontal gene

transfer is a common method of the gene transfer among

bacteria, with the transfer of genes occurs between cells of

the same generation. While in eukaryotic organisms, it is the

vertical gene transfer that is a transfer of genes from the

parent. to the offspring that is observed, Bacteria have three

different modes of transfer of their genetic material in the

horizontal gene transfer, that is by transformation

transduction and conjugation .Transformation is the uptake of

cell free or naked DNA, while transduction is the transfer of

the genetic material from the donor to the recipient mediated

by a bacteriophage. During Conjugation, the two organisms.

come in physical contact with one another and there is the

transfer of the genes from the donor to the recipient where the

conjugative plasmid called as F Plasmid is responsible for the

formation of the sex pilus or conjugation tube. The fragment

of the DNA that is transferred from the donor cell to the

recipient cell during this gene transfer mechanisms is called as

the exogenote.

while the recipient bacterial cell's own genetic material into

which the donor DNA can integrate is called as the endogenote.
. The presence of the exogenote in the recipient

cell results in the formation of a bacterial cell that is called

as a merozygote, which is initially diploid for a part of

its genome. During all the three gene transfer mechanisms.

In the horizontal gene transfer,it's only a portion of the DNA

that is transferred from the donor to. the recipient may be

as one to two to very few genes.This illustration explains about

the production and the fate of the merozygote, the exogenote

this is a piece of the DNA that has come from a donor cell

and entered into a recipient

Cell by three different mechanisms that is conjugation,

transformation, or transduction. The chromosome of the bacterium

which is acting as a recipient is called as the endogenote,

the exogenote has four

different fates in the

Recipient cell. In the first

the exogenote can

integrate with the endogenote to form a recombinant bacterium.

The second fate of the exogenote is that when it has its

own origin of replication, that it can replicate and

a copy of it is carried to all the cells. when this recipient cell multiplies by

binary fission, all the cells in the clone therefore would have

the exogenote. The third fate of.

the exogenote is that it does not replicate as it does not

have its origin of replication,but it remains in only one cell

as a result of which one cell at every generation would be a

partial diploid cell. The 4th fate of the exogenote is that

the host that is a recipient cells exonucleases and

endonucleases recognize it as foreign DNA and bring about the

degradation of this exogenote . This is termed as host

restriction. As we're studying about the different transduction

types, the transduction which isa method of gene transfer

mediated by a bacteriophage can be generalized or specialized. In

generalized transduction random Fragments of DNA are transferred

from the donor to the recipient,whereas in specialized

Transduction It is specific genes, that is restricted genes

which are transferred from the donor to the recipient.

Generalized transduction can be divided into two types that is

abortive and complete. Abortive Transduction is a type of

generalized transduction where the DNA remains free in the

cytoplasm and cannot undergo replication. This is as what we have discussed in the third fate of the exogenote.

In other words, what it means is that the DNA taken from the donor cell and introduced into a recipient cell having its own endogenote, this piece of the DNA from the donor cell will not integrate with the endogenote to form a recombinant, but would remain free in the cytoplasm, and it cannot also undergo replication because it does not have its own origin of replication. Therefore, in abortive transduction what happens is only one daughter cell in each generation contains the exogenote which is transmitted uni linearly. The Product of this gene say for example in the form of enzymes or some protein will be produced only by few cells, one cell at each progenythat is produced during the generation.This results in the formation of very slow growing colonies which are called as microcolonies. Abortive, transductants are bacteria that contain this not integrated transduced DNA and are partial diploids. As we have seen that in abortive transduction the exogenote is never integrated into the bacterial chromosome,but it remains free in the cytoplasm and is transferred only to a single cell during

each binary fission division of the organism.Complete transduction, on the other hand, is a type of generalized transduction where the DNA strands get integrated into the endogenote after pairing and crossover.This results in the production of a clone of cells as partial diploid and the bacterial progeny that is formed has the prophage. The presence of the prophage will result in change in the Genotype of the Organism that further changes the phenotypic characters of the Organism. The complete transduction is also called as a successful transduction or stable transduction. Whereas abortive transduction is called unsuccessful transduction. In this illustration we have a bacterial cell that has been infected by the phage. The phage has carried its. either own DNA or picked up a bacterial DNA and has introduced into this recipient cell. ThisDNA is called as the exogenote, whereas the bacterial DNA it's called as the endogenote When this cell divides by binary fission, that it results in the production of two cells. Now in this case, during the abortive transduction, the viral DNA or the bacterial DNA brought from another donor cell into a recipient cell is transferred only in a single cell that is,at each generation it would just

be 1 cell that would acquire this bacterial DNA, that is the exogenote. It has not got integrated, whereas the other cells would not be having this genome, so this transduction is called as abortive transduction. In complete transduction the exergenote gets integrated into the bacterial DNA and on replication the binary fission division this exogenote would replicate with the endogenote and a copy of this exogenote would be transferred to all the cells.as in the progeny.

So this transduction is called as complete transduction, successful transduction, or stable transduction. To Summarize, generalized transduction can be divided into two types that is abortive and complete. During abortive transduction, the DNA is not integrated in the endogenote,but remains free in the cytoplasm and because this DNA is transferred only to a single cell that the product of this gene will be synthesized by very few cells that will result in the formation of microcolonies.

Where as in complete transduction the DNA that is the exogenote gets integrated into the endogenote and a copy of it is transferred to all the cells in the progeny.

Thank you.