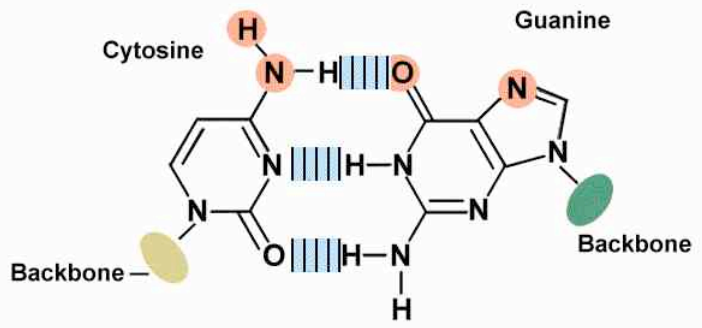
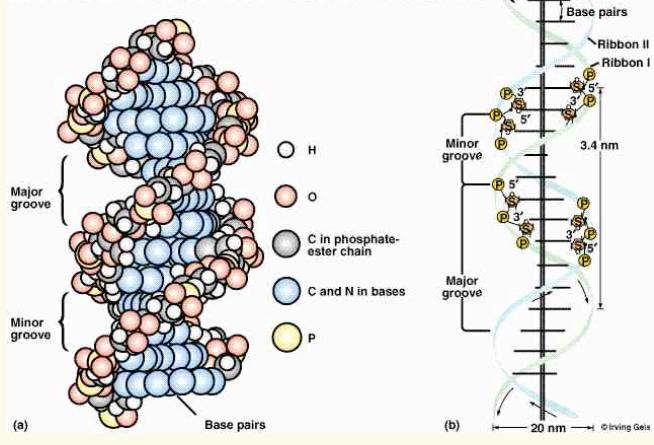
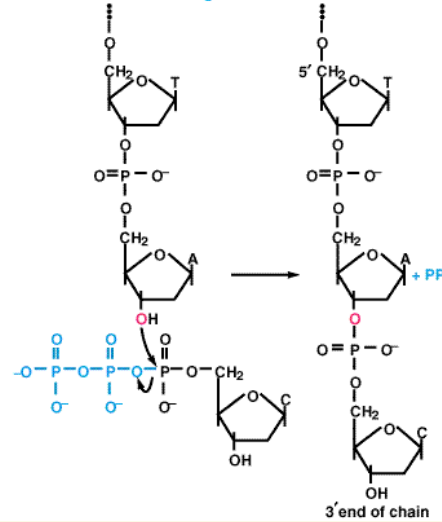
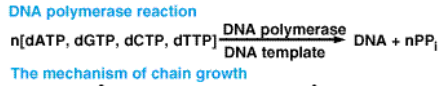


Genética microbiana

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DNA Double Helix Structure

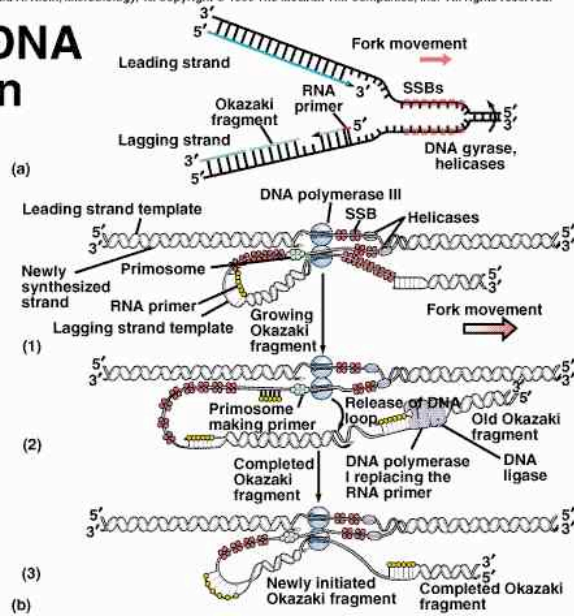


DNA polymerase Mechanism



Courtesy Dr. Timothy J. Richmond

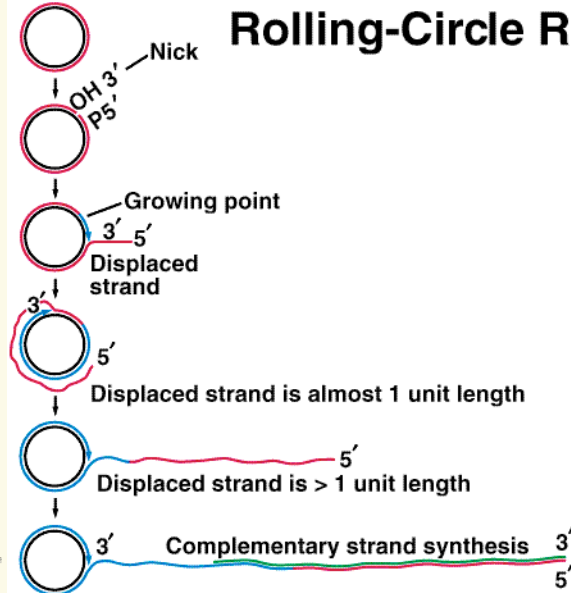
Bacterial DNA Replication



Courtesy Dr. Timothy J. Richmond

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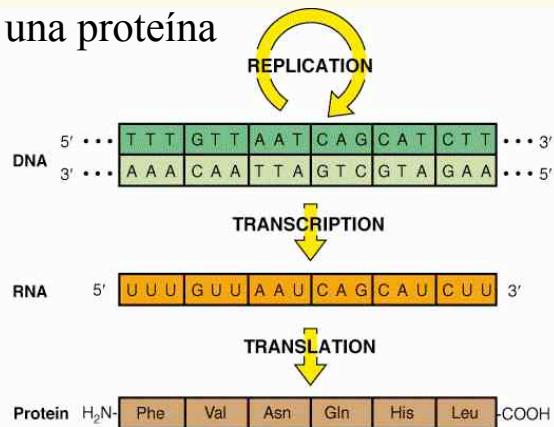
Rolling-Circle Replication



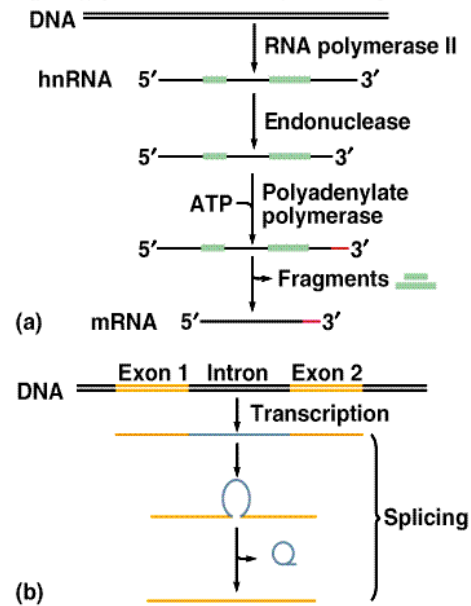
Courtesy Dr. Timothy J. Richmond

Genotipo vs. fenotipo

✓ Un gen una proteína



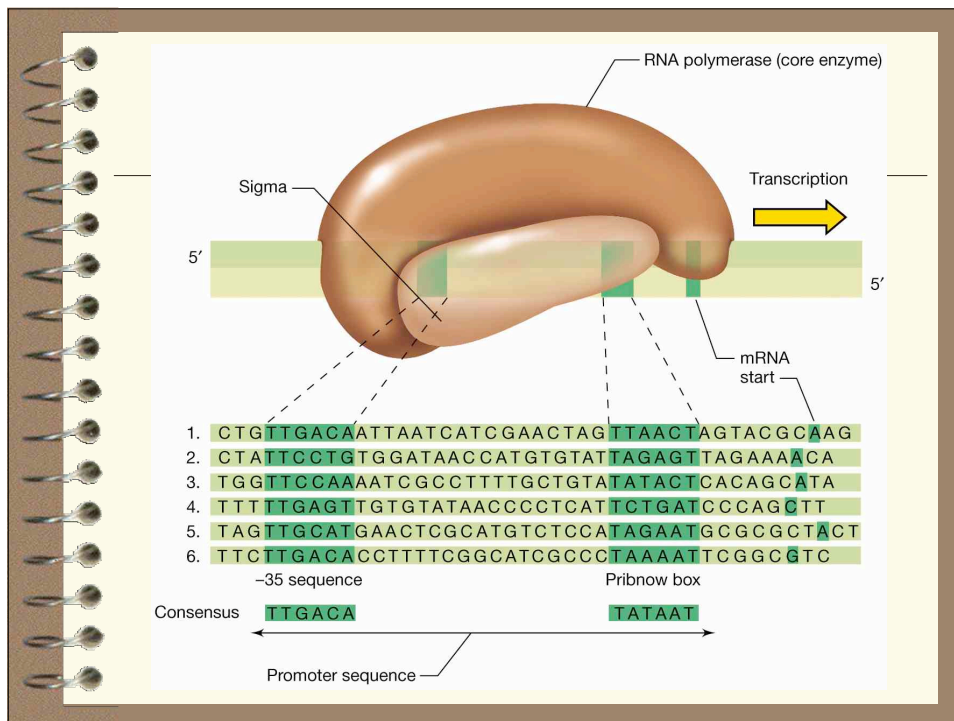
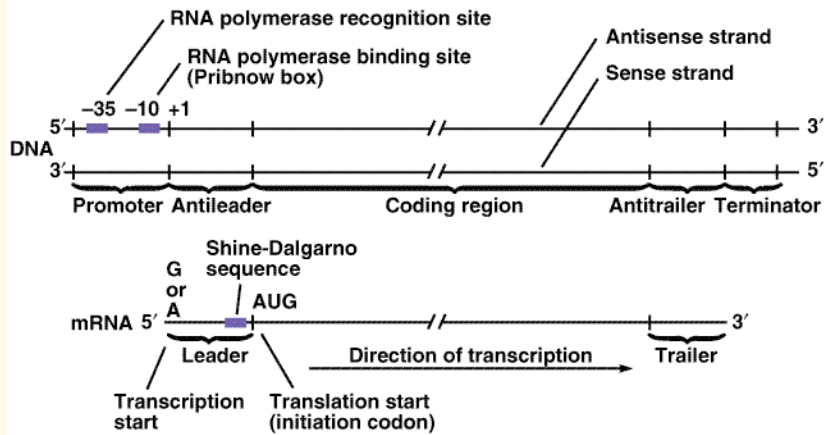
Eucaryotic mRNA Synthesis



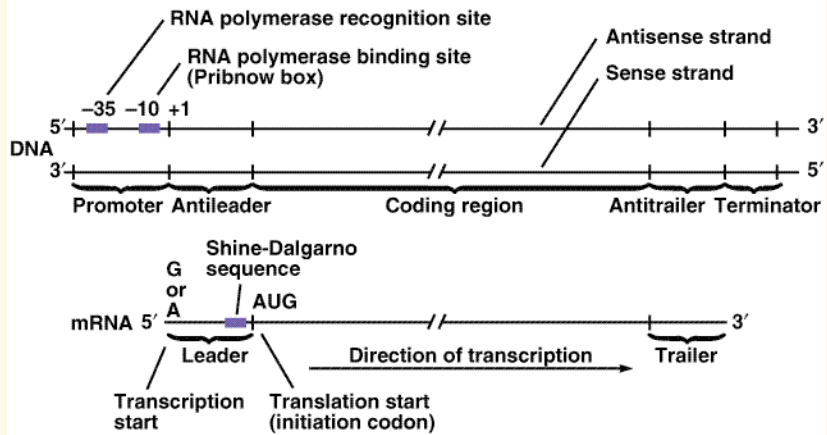
Metabolismo: Regulación de Síntesis y Actividad Enzimática

- ✓ Coordinación y regulación de metabolismo
- ✓ Estrategias generales:
 - Localización de metabolitos y enzimas en diferentes partes de la célula (canalización metabólica)
 - Estimulación o inhibición directa de enzimas críticas (regulación alostérica, modificaciones enzimáticas, “feedback inhibition”)
 - Control de número de enzimas (regulación de transcripción)

A Bacterial Structural Gene



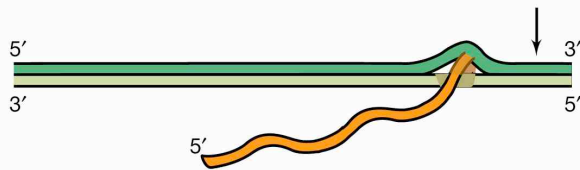
A Bacterial Structural Gene



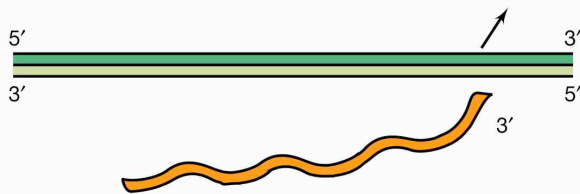
RNA chain growth



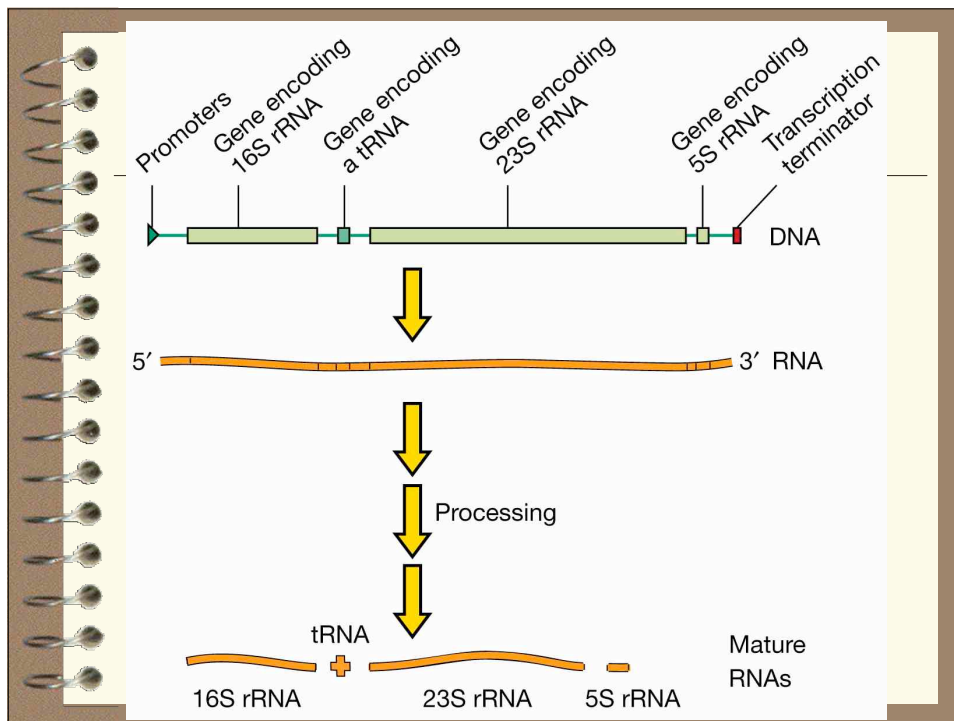
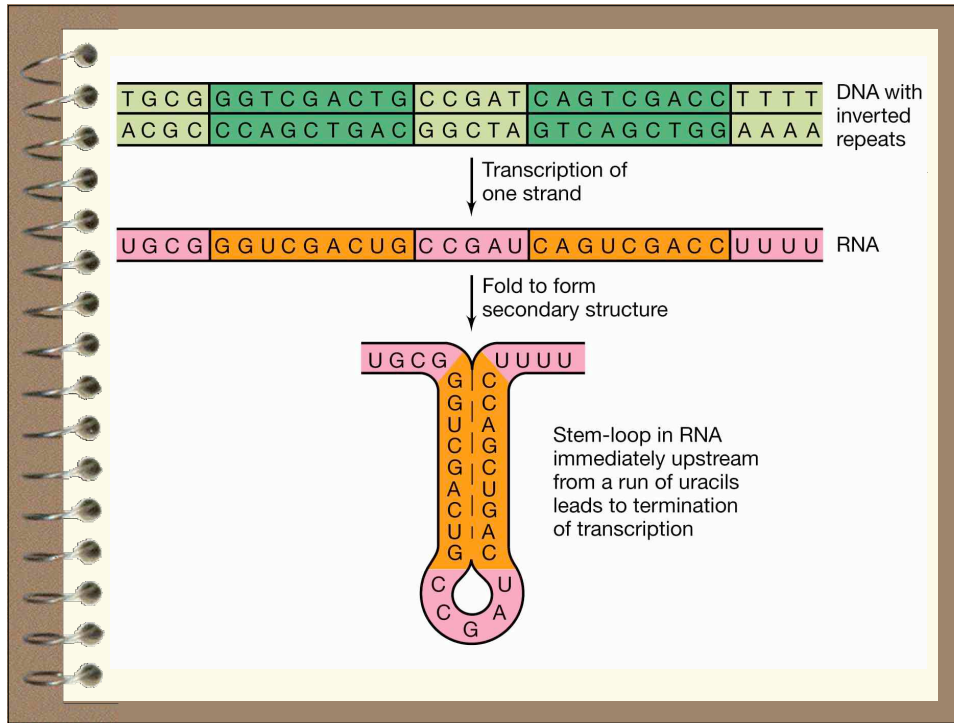
Termination site reached; chain growth stops



Release of polymerase and RNA

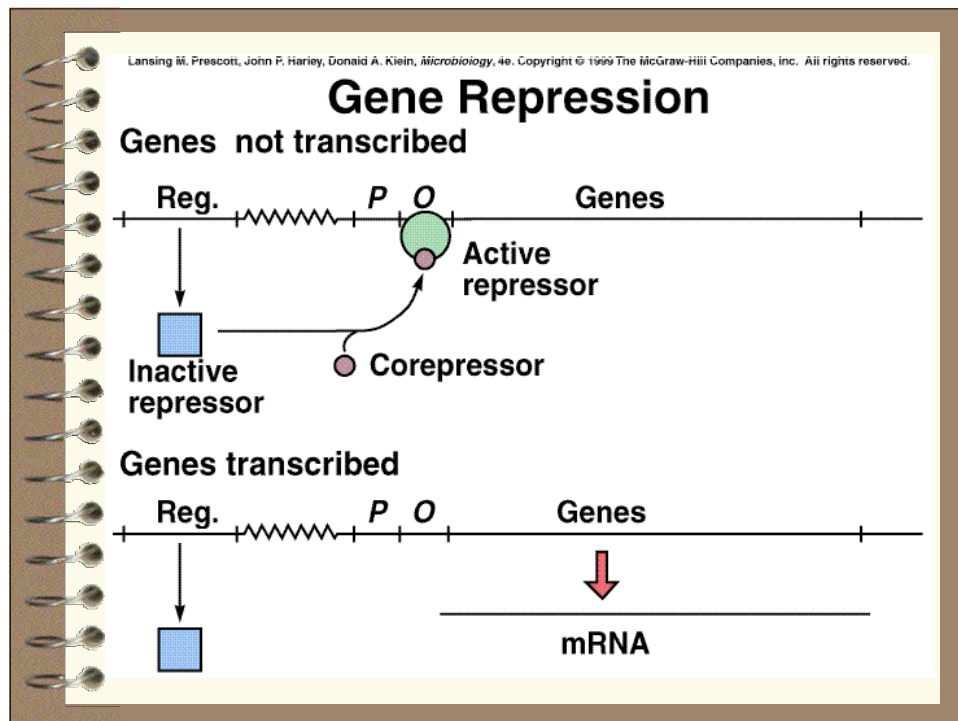


(a)



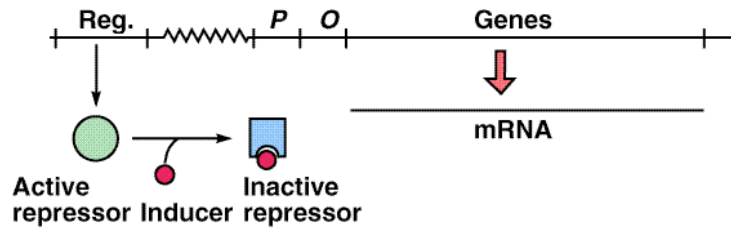
Transcripción genética

- ✓ Expresión constitutiva
- ✓ Expresión regulada
 - Inducción
 - Represión

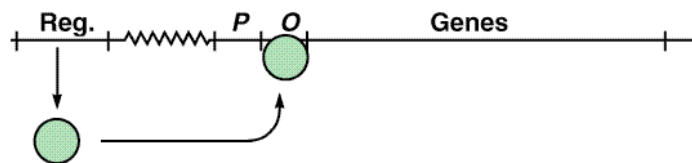


Gene Induction

Genes transcribed



Genes not transcribed

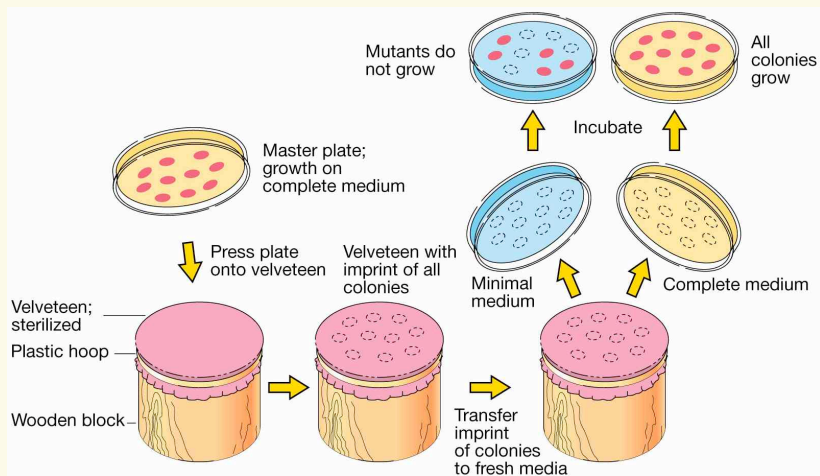


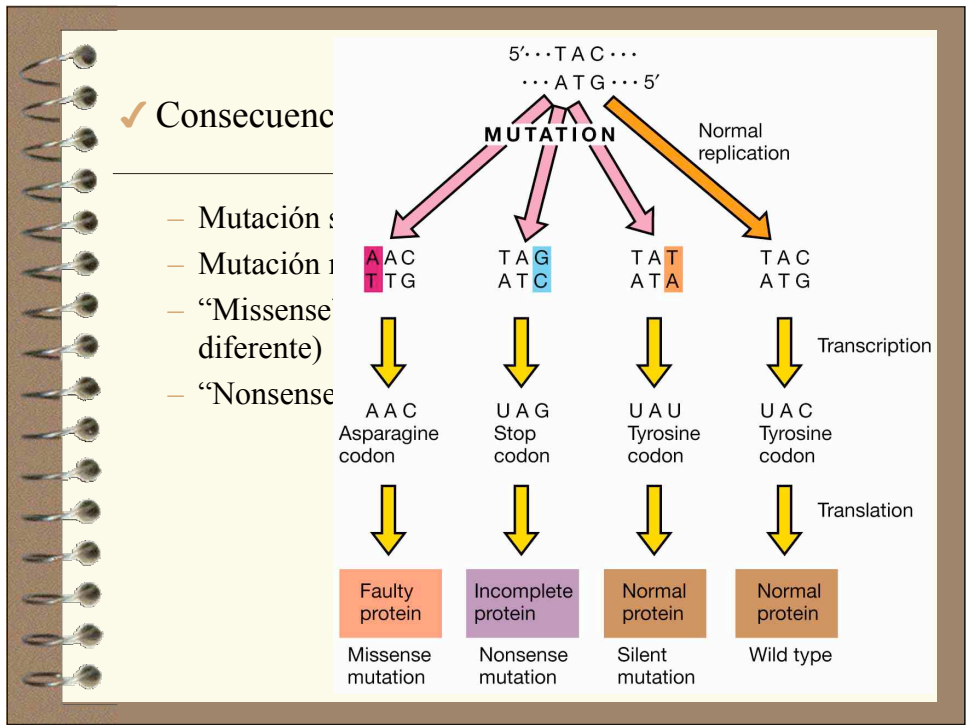
Mecanismos que introducen variabilidad genética

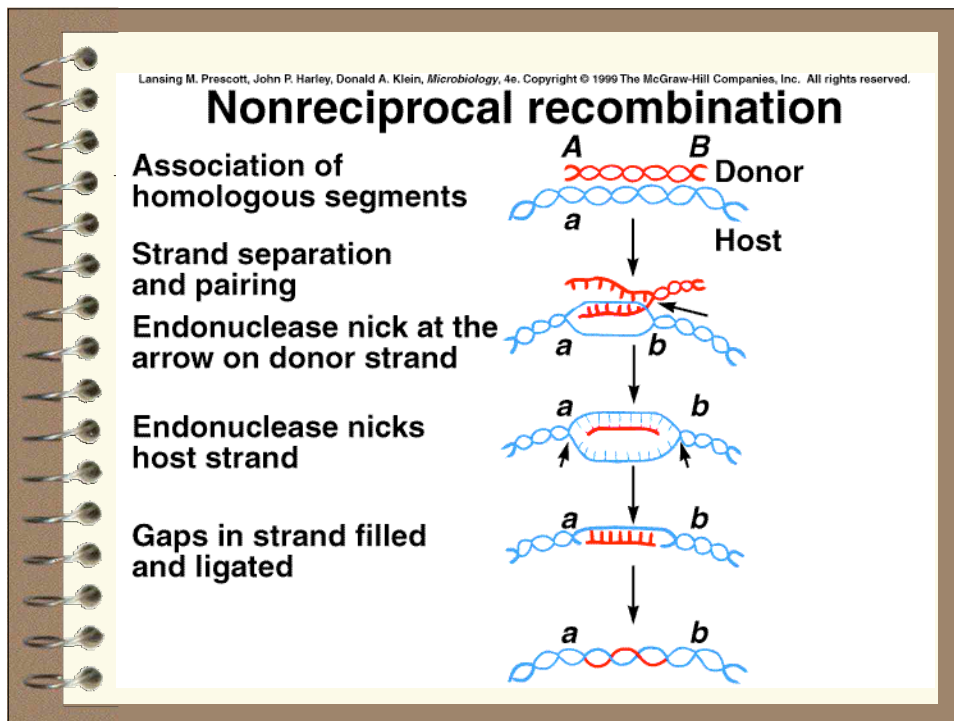
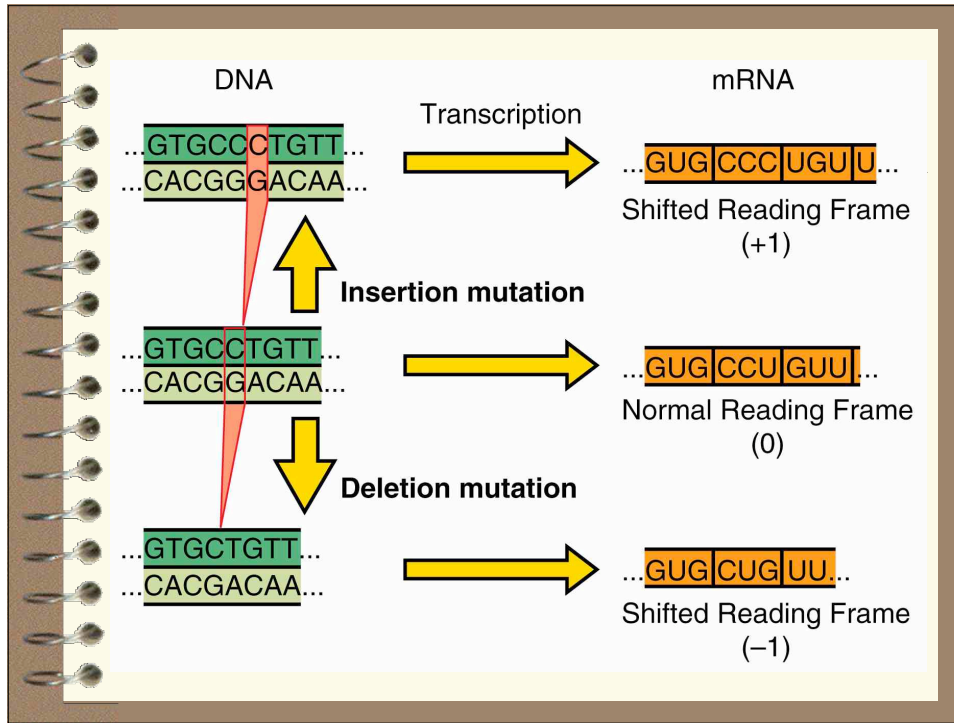
- ✓ Mutaciones
- ✓ Recombinación
- ✓ Transformación
- ✓ Conjugación
- ✓ Transducción
- ✓ Ingeniería genética

Mutaciones

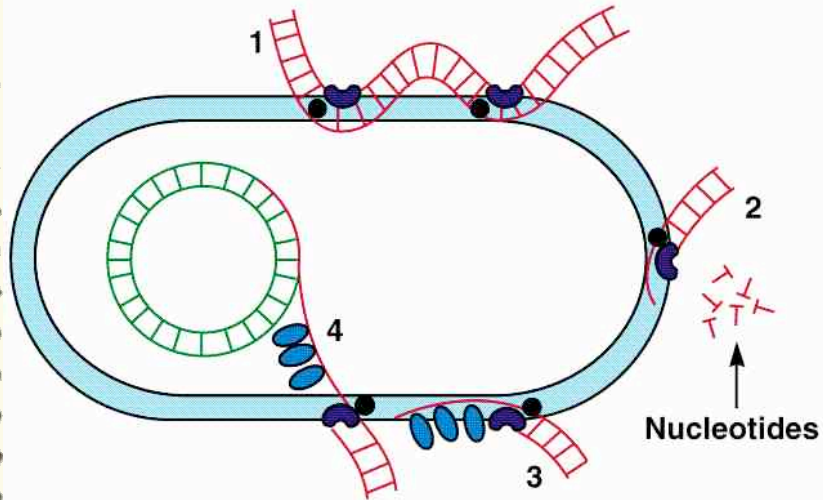
- ✓ Agentes mutagénicos (químicos, radiación, entre otros).
- ✓ Mutaciones condicionales (ej. auxotrofos vs. prototrofos).
- ✓ Deleciones & inserciones
- ✓ Espontáneas
 - Sustituciones
 - frameshifts
- ✓ Inducidas
 - Análogos de bases
 - Pareos de bases erróneos





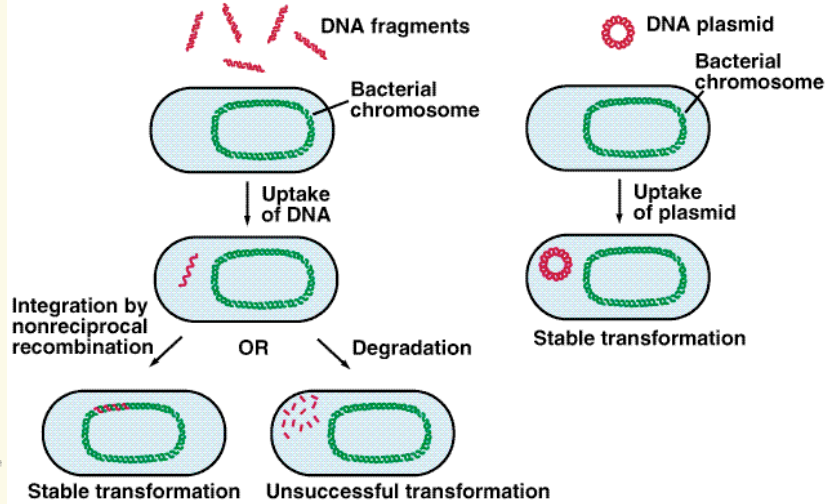


Mechanism of Transformation

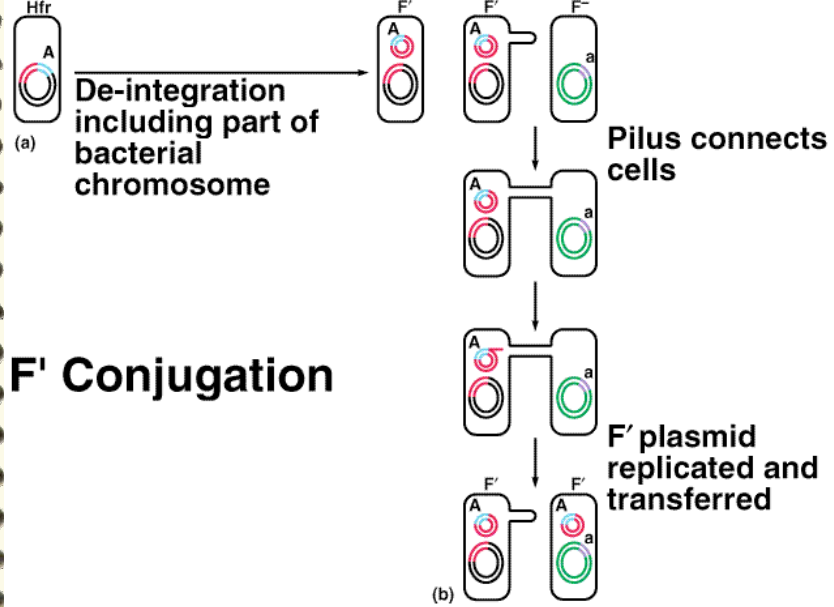
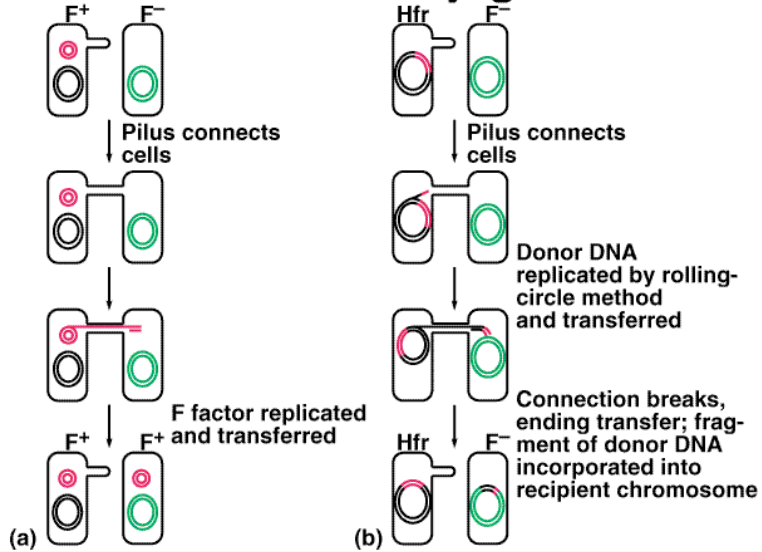


Bacterial Transformation

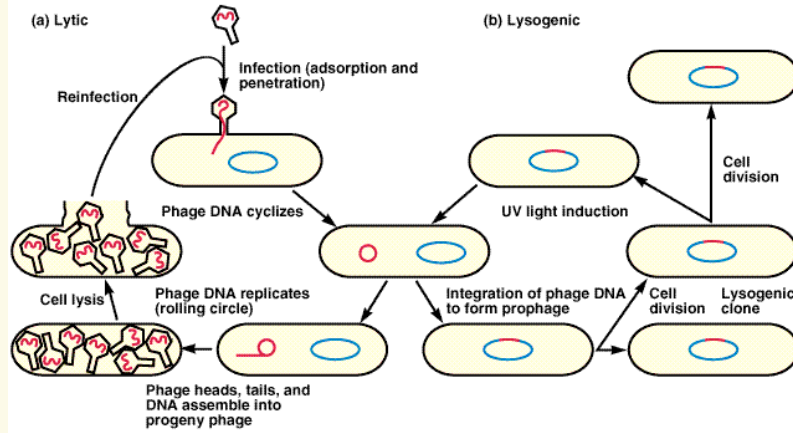
(a) Transformation with DNA fragments (b) Transformation with a plasmid



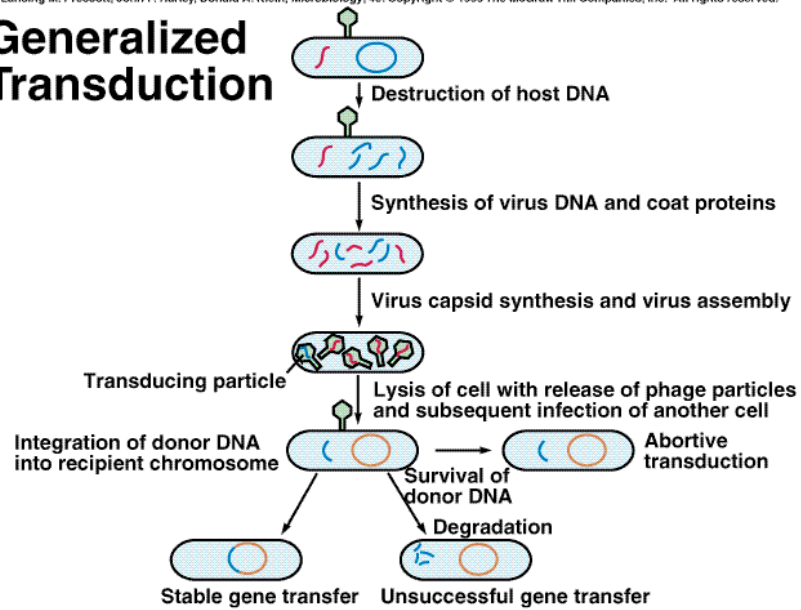
Bacterial Conjugation



Lambda Phage Life Cycles



Generalized Transduction



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Specialized Transduction

