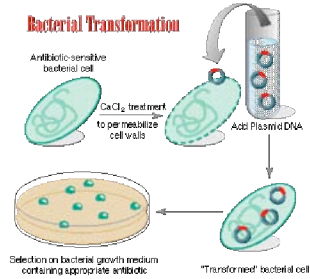## Transformation with pGLO Plasmid

HOW BACTERIA GAIN NEW GENETIC INFORMATION

- MUTATIONS
- RECOMBINATION
  - TRANSDUCTION
  - TRANSFORMATION
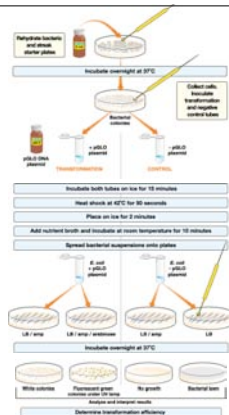 - CONJUGATION
- TRANSPOSITION

TRANSFORMATION

- Cells after death, release DNA
  - Naked DNA in solution
- Cells may take up DNA
  - Only in certain stage of cell cycle
    - Near completion of cell wall synthesis
- Competent cells-receptor sites on cell wall and plasma membrane
- Release competence factor that helps in uptake
  - Alters cell wall ⇒ Makes it more permeable to DNA
  - Not E. coli — needs to be treated to be competent
- Endonucleases cut linear DNA into small pieces
  - Recombination may occur between donor & recipient-complementary base pairing
  - Non-rcombined linear fragments are degraded
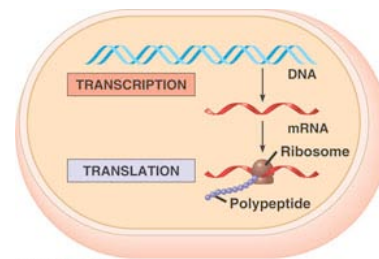 - Circular plasmid DNA protected from degradation

TRANSFORMATION

pGLO Transformation of *E. coli*

Gene Expression
Transcription & Translation

(a) Prokaryotic cell

Transcription starts at a promoter

Regulation of an Operon

The pGLO plasmid

The pGLO plasmid

The Arabinose Operon

• Negative or Positive gene regulation?
• Repressible or Inducible?

Expression of GFP

Without arabinose in media

With arabinose in media