BHARATHIDASAN UNIVERSITY

Program: M.Sc., Biomedical Science

Course Code : 18BMS47C10

Course Title : Genetic Engineering

Vectors & promoters

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Vectors

- There are mainly two types:
  - Cloning vectors (plasmid)
  - Expression vectors (plasmid)

Cloning vectors

Cloning vectors have RNA poly binding site just upstream and downstream of PCS.

Ex. Topo vectors contains T7-RNA pol binding site just upstream of PCS

pGEM vectors contains T7 and Sp6 RNA-Pol binding sites (T7 is upstream and Sp6 downstream to PCS)

Use of this type of cloning vectors are one can clone any DNA fragment and can be transcribed using RNA polymerase.

Expression is very limited because the sequence around the DNA and its product does not contain collection of signals that are recognized by bacterium.

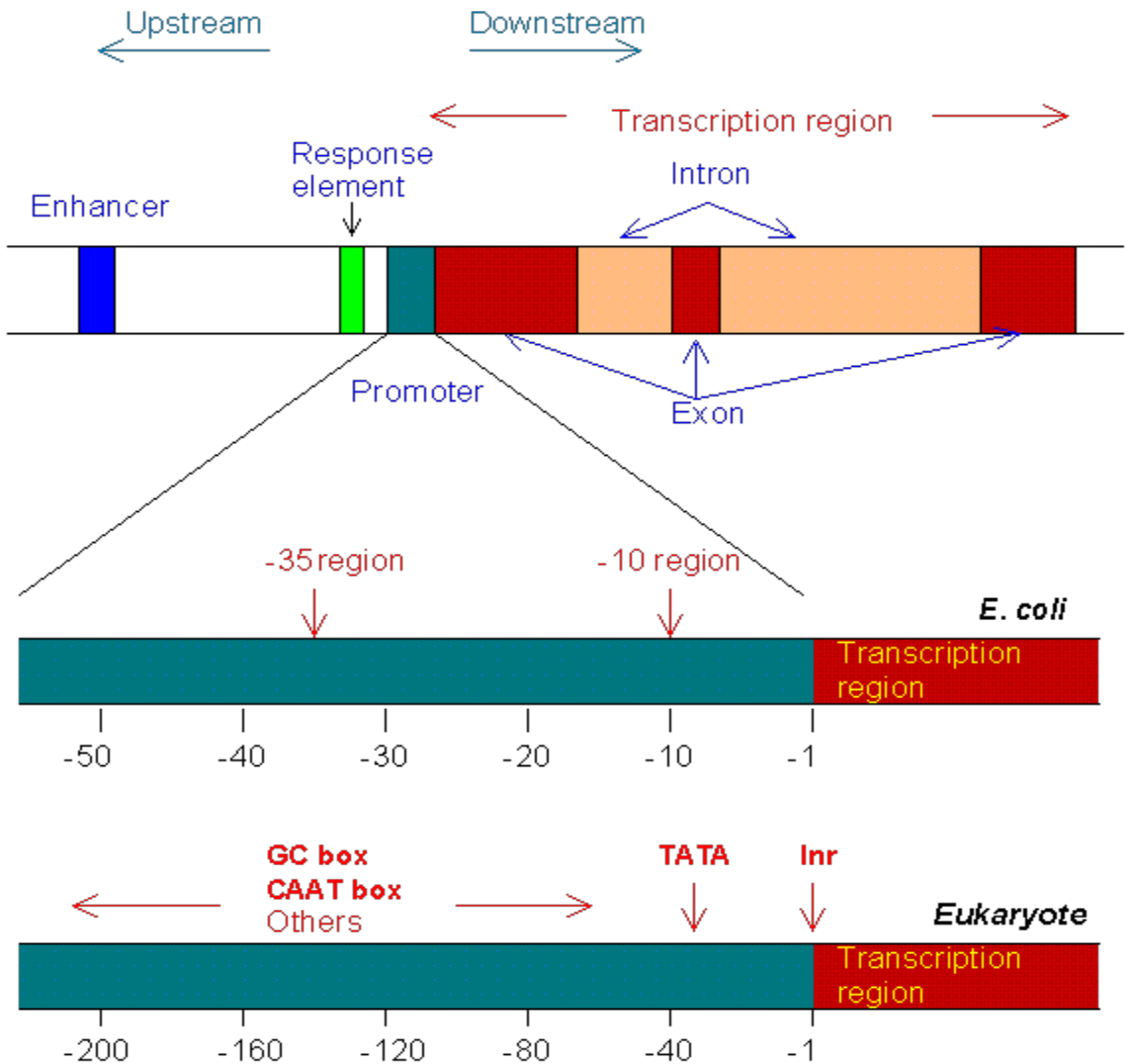
Expression vectors

Expression vectors are Cloning vectors that contain promoter, Ribosomal binding site, and a terminator signals on it.

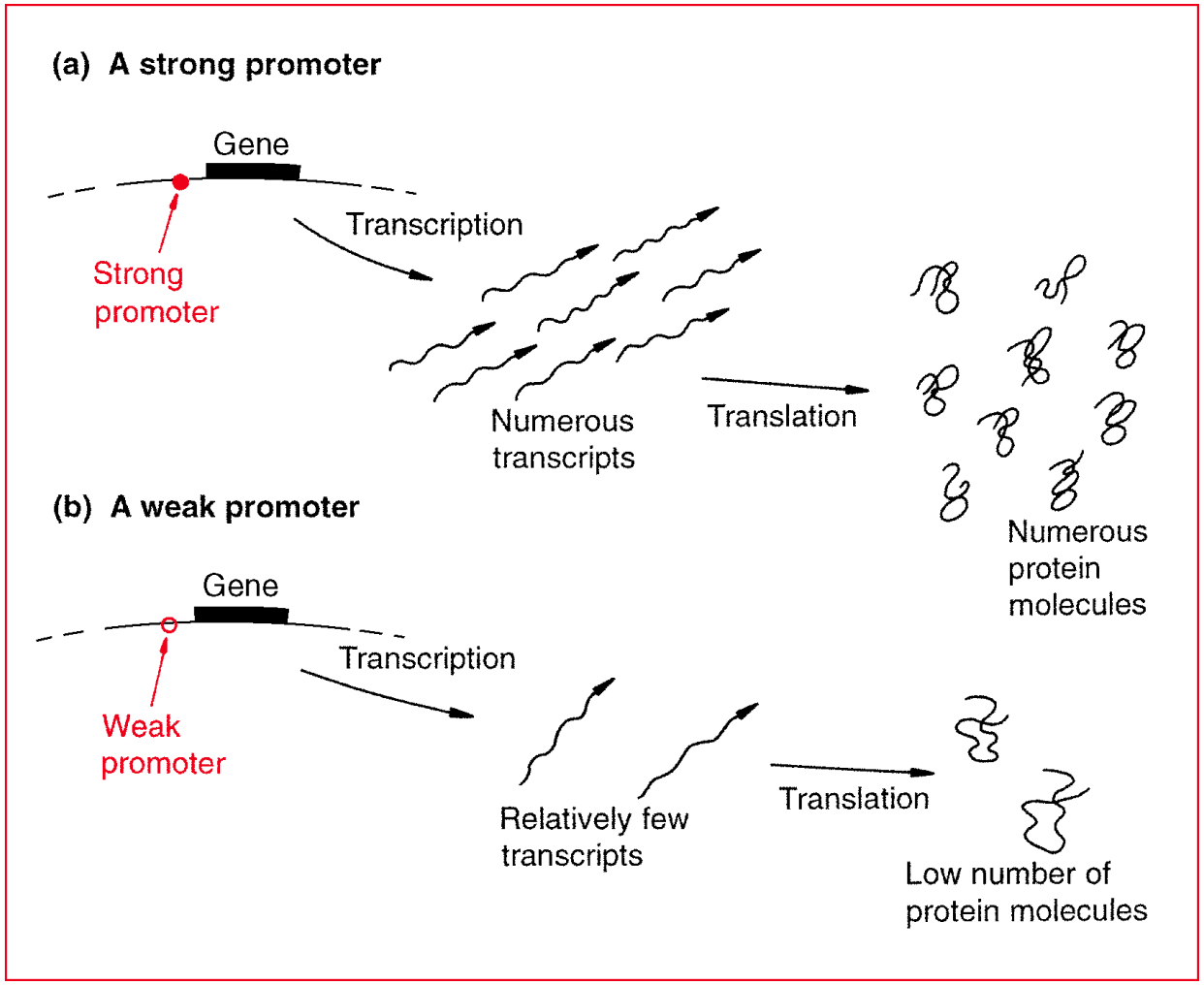
(1) promoter,
(2) Ribosome binding site, and
(3) terminator.

Ex. pcDNA for eukaryotes
pET for *E.coli*.

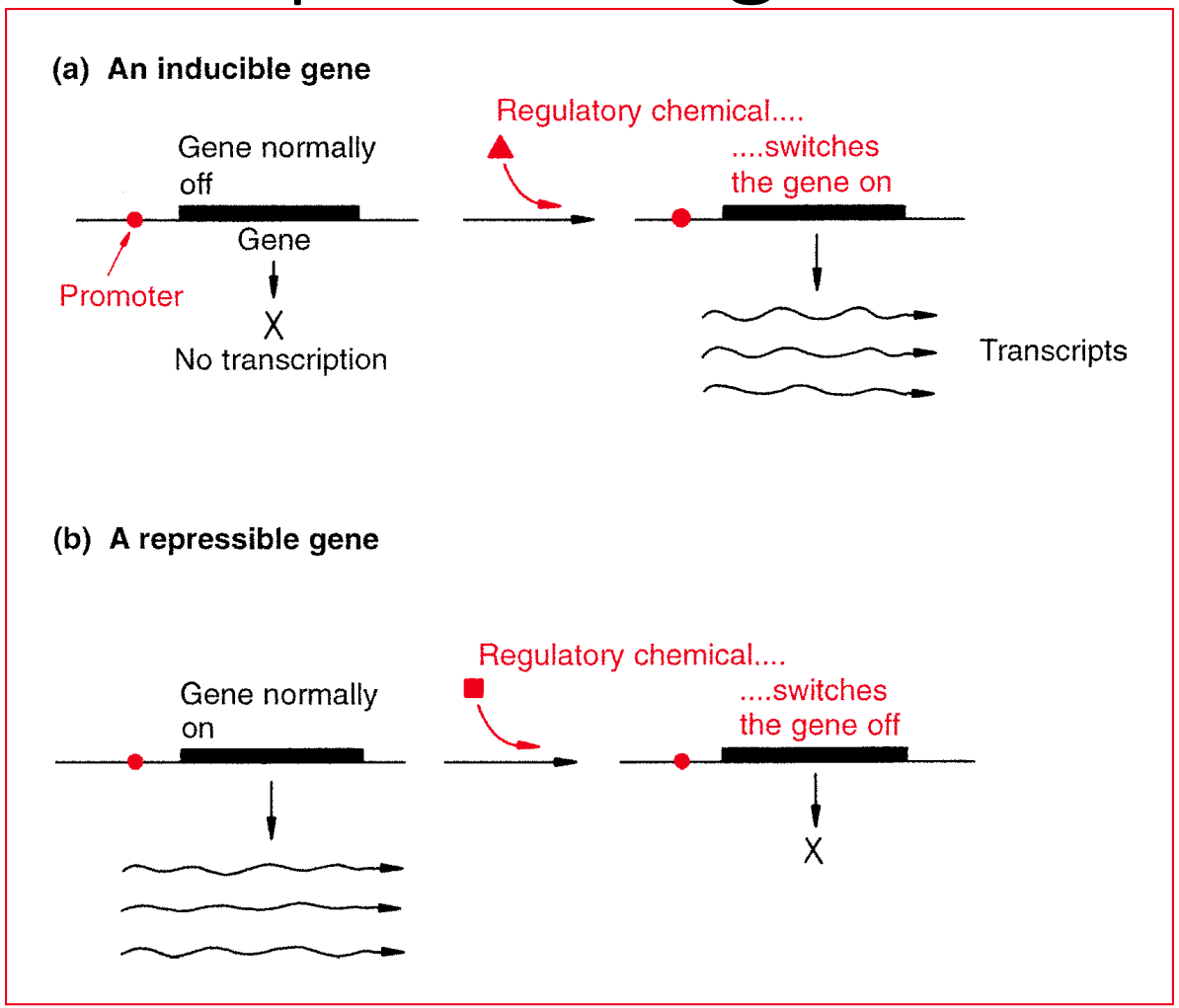
Typical promoter sequences for *E.coli* and animal.



Strong and Weak promoters

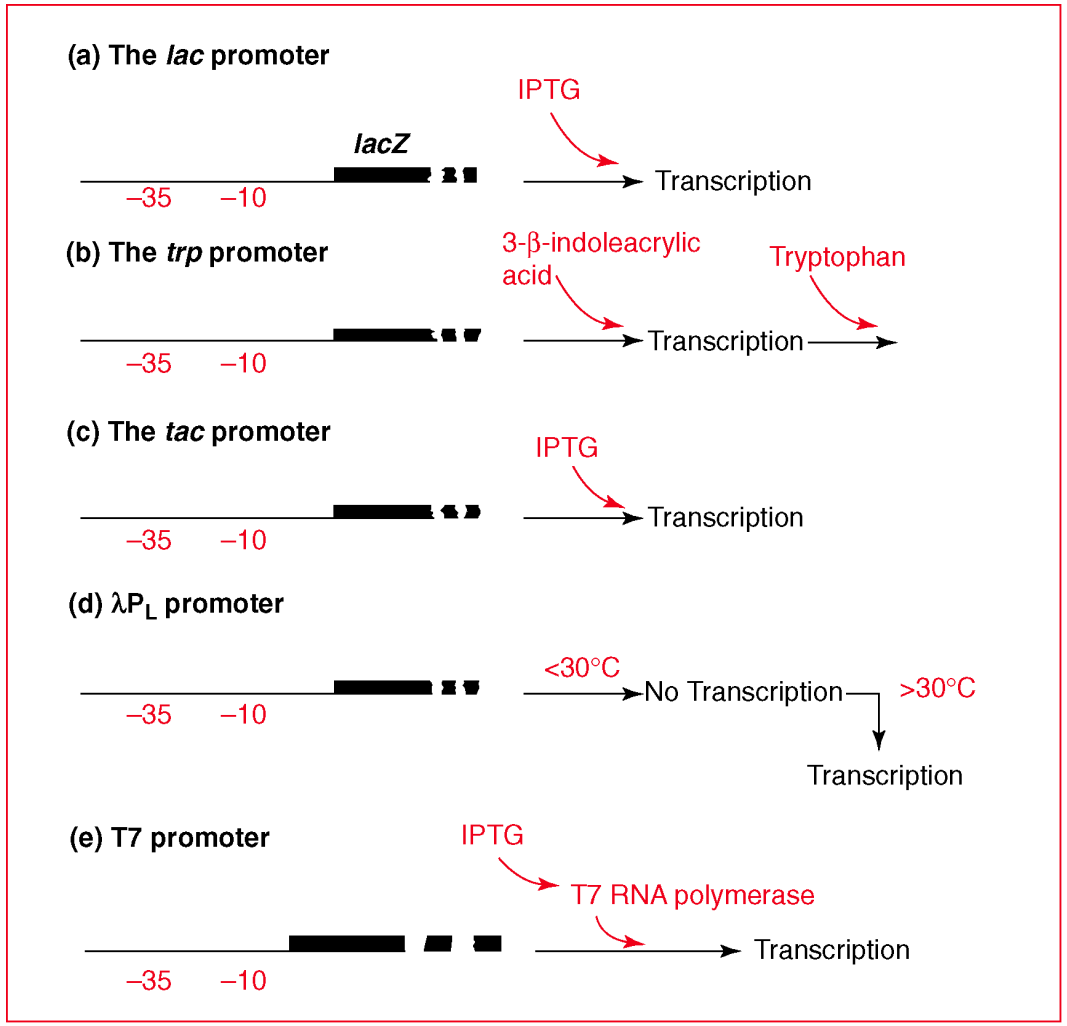


Inducible and repressible gene



Various promoters used in expression vectors

- *lac* promoter
- *trp* promoter
- *tac* promoter
- λP_L promoter
- T7 promoter



Four promoters frequently used in expression vectors for microbial eukaryotes.