

Microbyte:

OPERONS

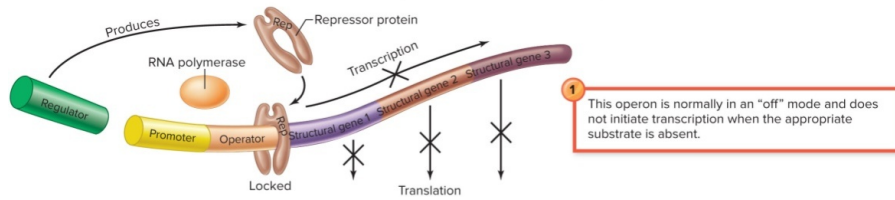


Genetic regulation of protein synthesis: **operons**

- An operon is a coordinated set of genes regulated as a single unit
- Found only in bacteria and archaea
- Operons can be *inducible* or *repressible*:
 - Substances in the environment surrounding a cell determine whether an operon is turned on or turned off
- **Inducible operons:** genes in inducible operons START getting transcribed when certain factors are present in the environment. (example: *lac operon*).
- **Repressible operons:** genes in repressible operons STOP getting transcribed when certain factors are in excess in the environment. (example: *arg operon*).

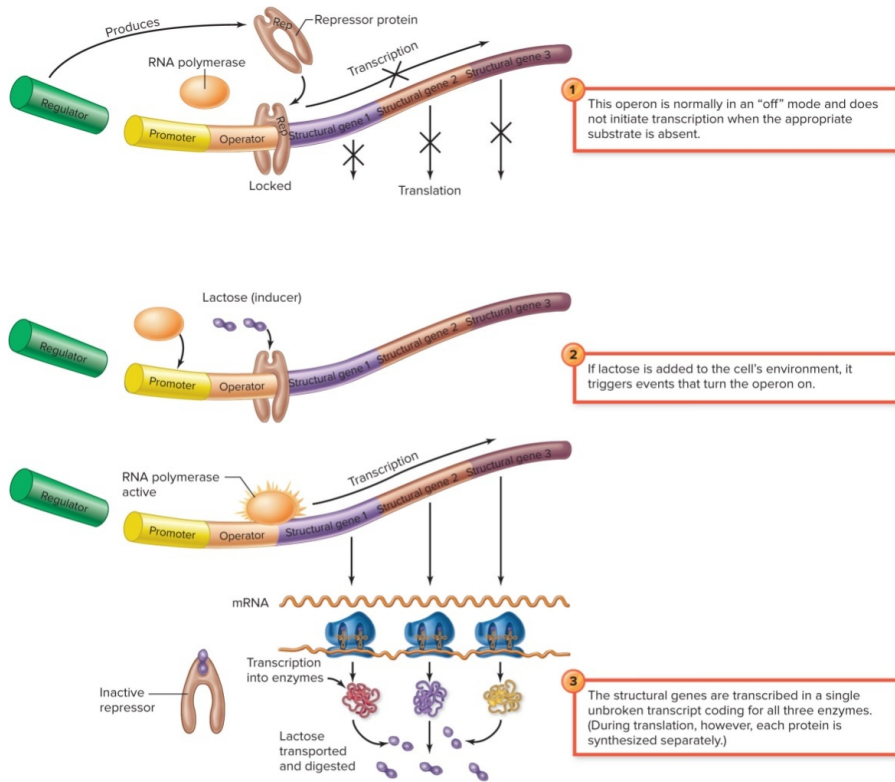
An inducible operon

The *lac* operon



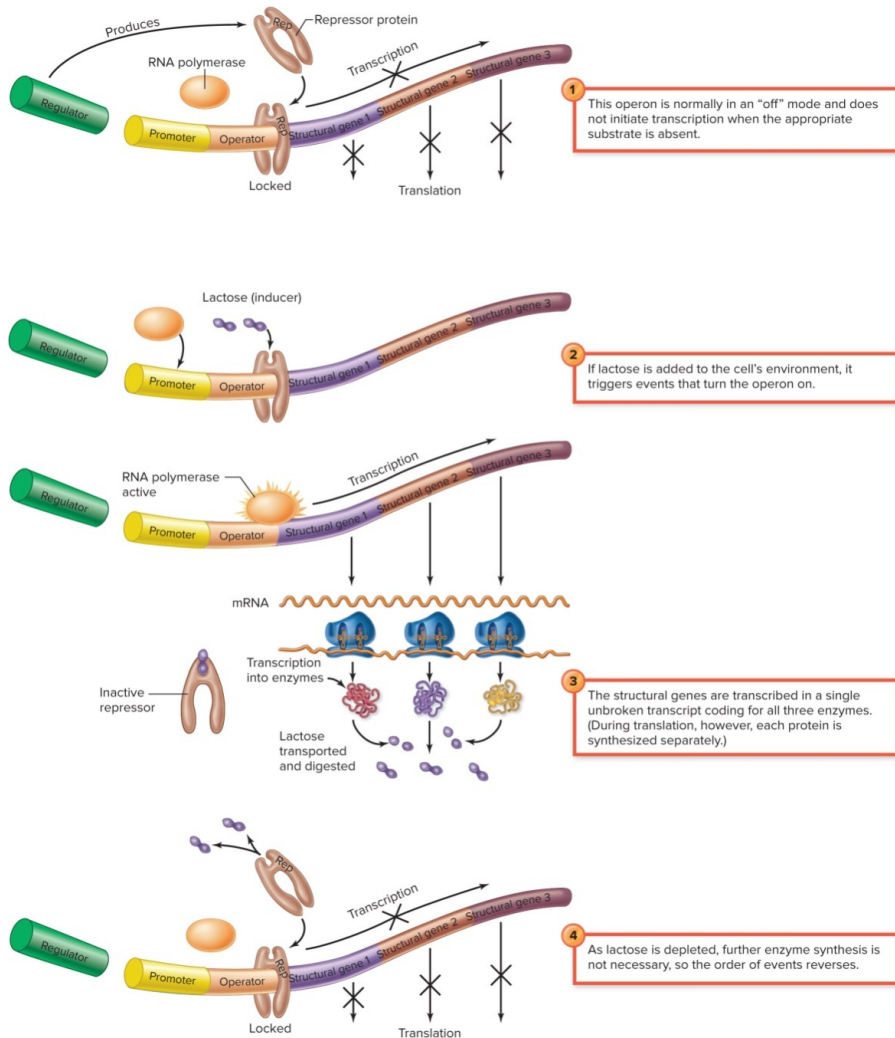
An inducible operon

The *lac* operon



An inducible operon

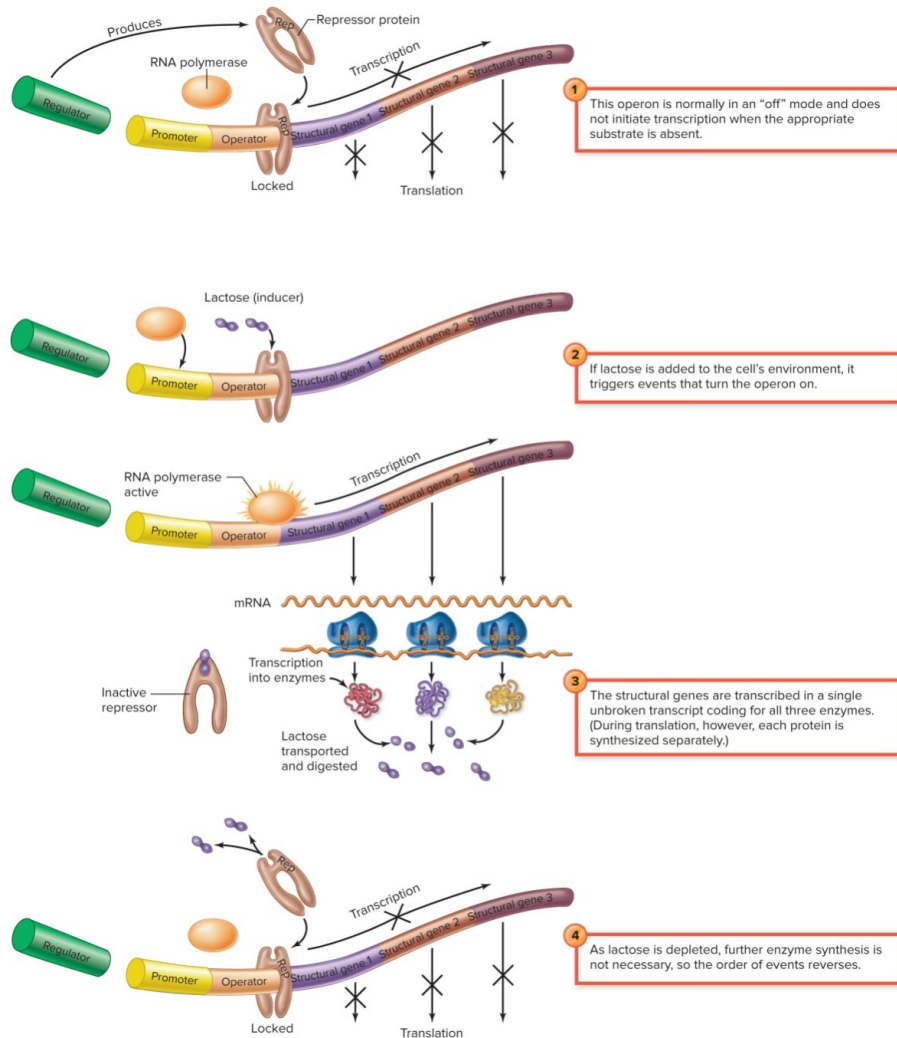
The *lac* operon



images from:
 Microbiology: A Systems Approach, Sixth Edition
 Marjorie Kelly Cowan and Heidi Smith

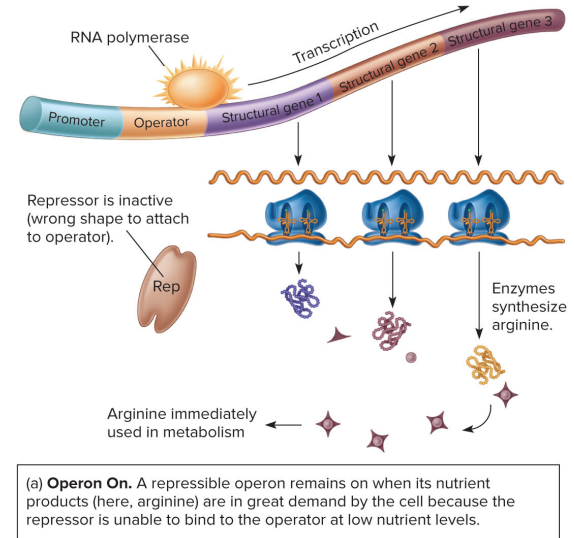
An inducible operon

The *lac* operon



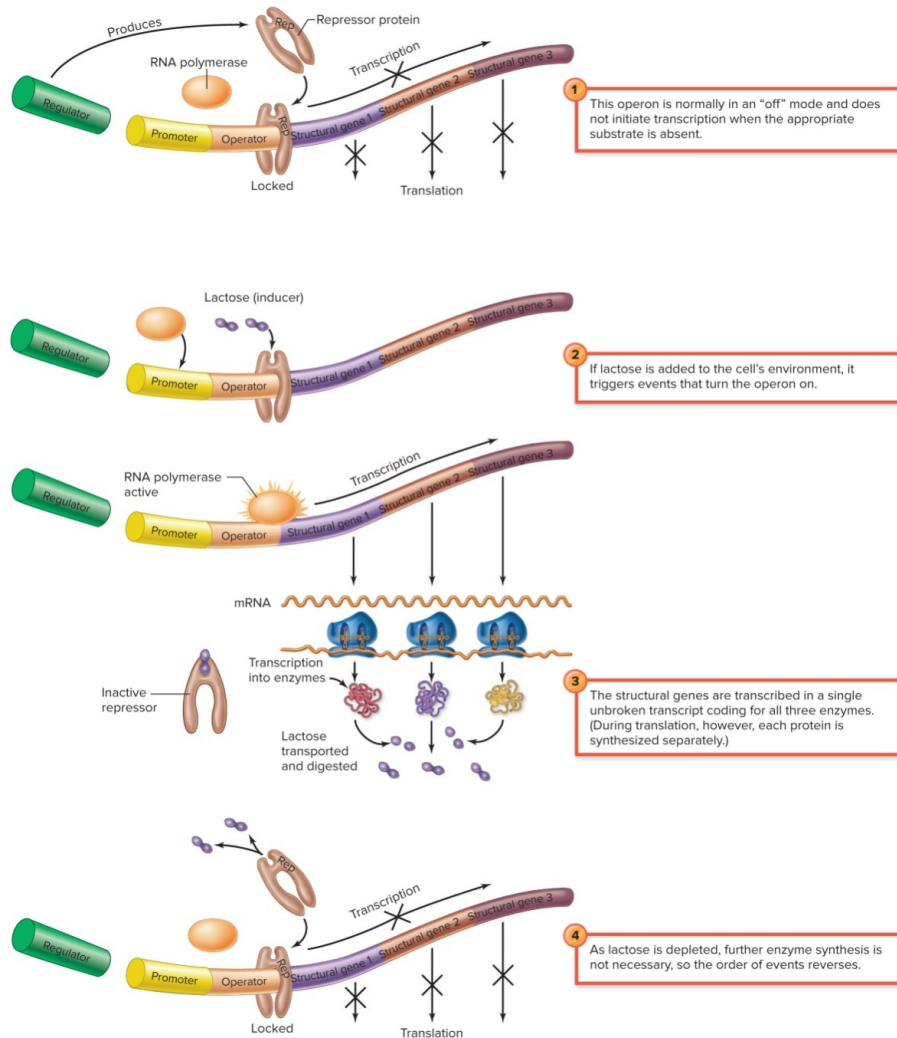
A repressible operon

The *arg* operon



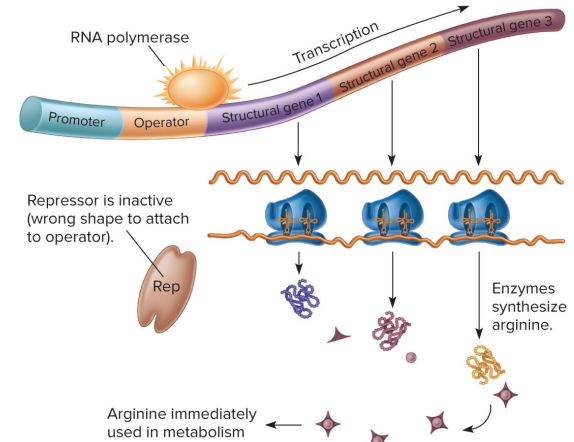
An inducible operon

The *lac* operon

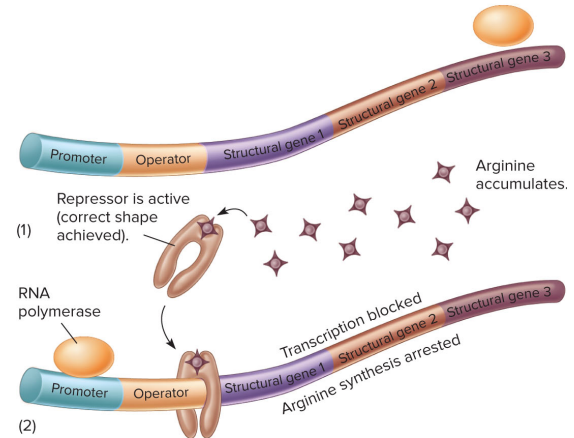


A repressible operon

The *arg* operon



(a) **Operon On.** A repressible operon remains on when its nutrient products (here, arginine) are in great demand by the cell because the repressor is unable to bind to the operator at low nutrient levels.



(b) **Operon Off.** The operon is repressed when (1) arginine builds up and, serving as a corepressor, activates the repressor. (2) The repressor complex affixes to the operator and blocks the RNA polymerase and further transcription of genes for arginine synthesis.

The *lac* operon (in a GIF)

To view the relevant gif:
[click here](#)

Micro is Magikal!

