RAMA UNIVERSITY

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FACULTY OF ENGINEERING &TECHNOLOGY

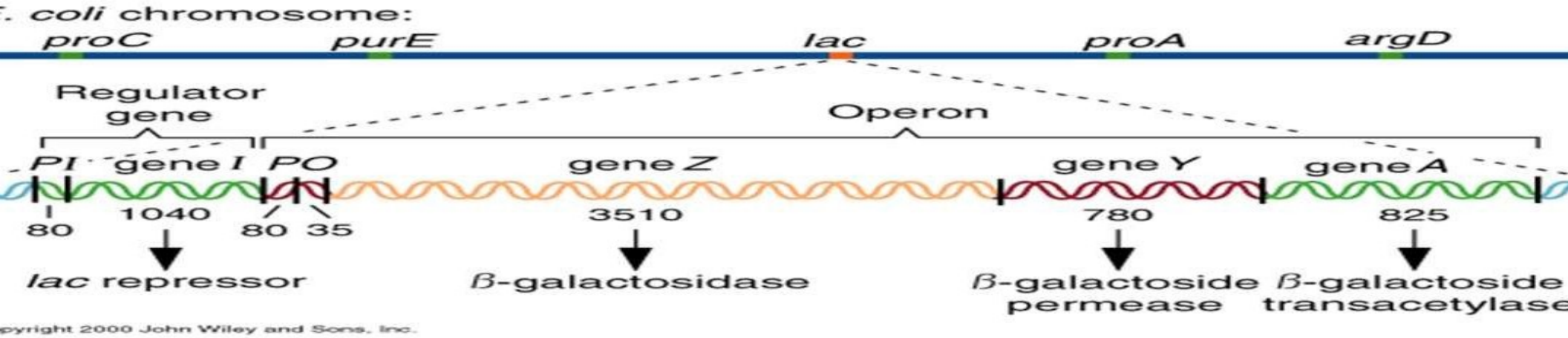
DEPARTMENT OF BIOTECHNOLOGY

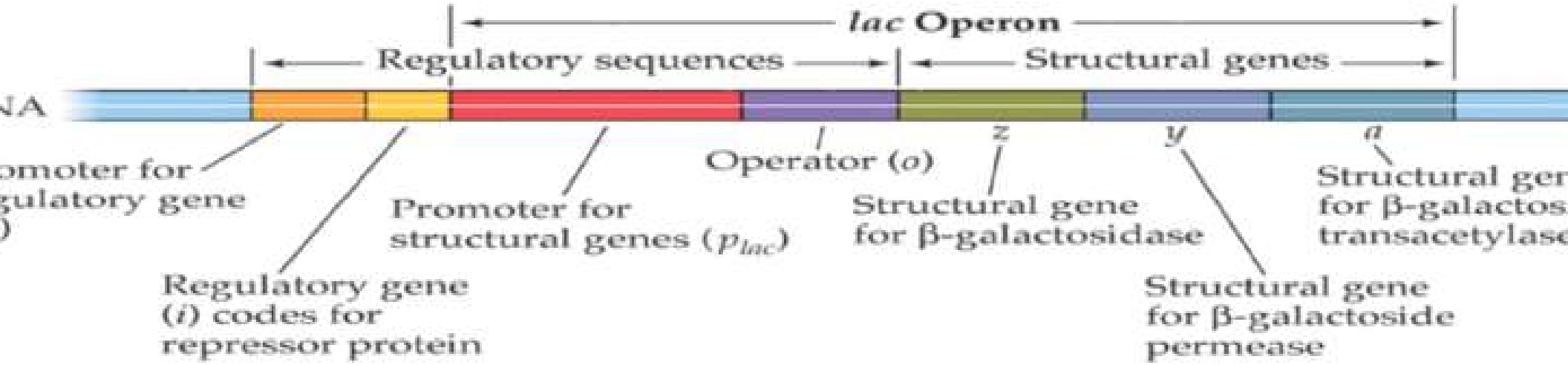
c Operon

The lac operon of the model bacterium Escherichia coli was the first operon to be discovered and provides a typical example of operon function.

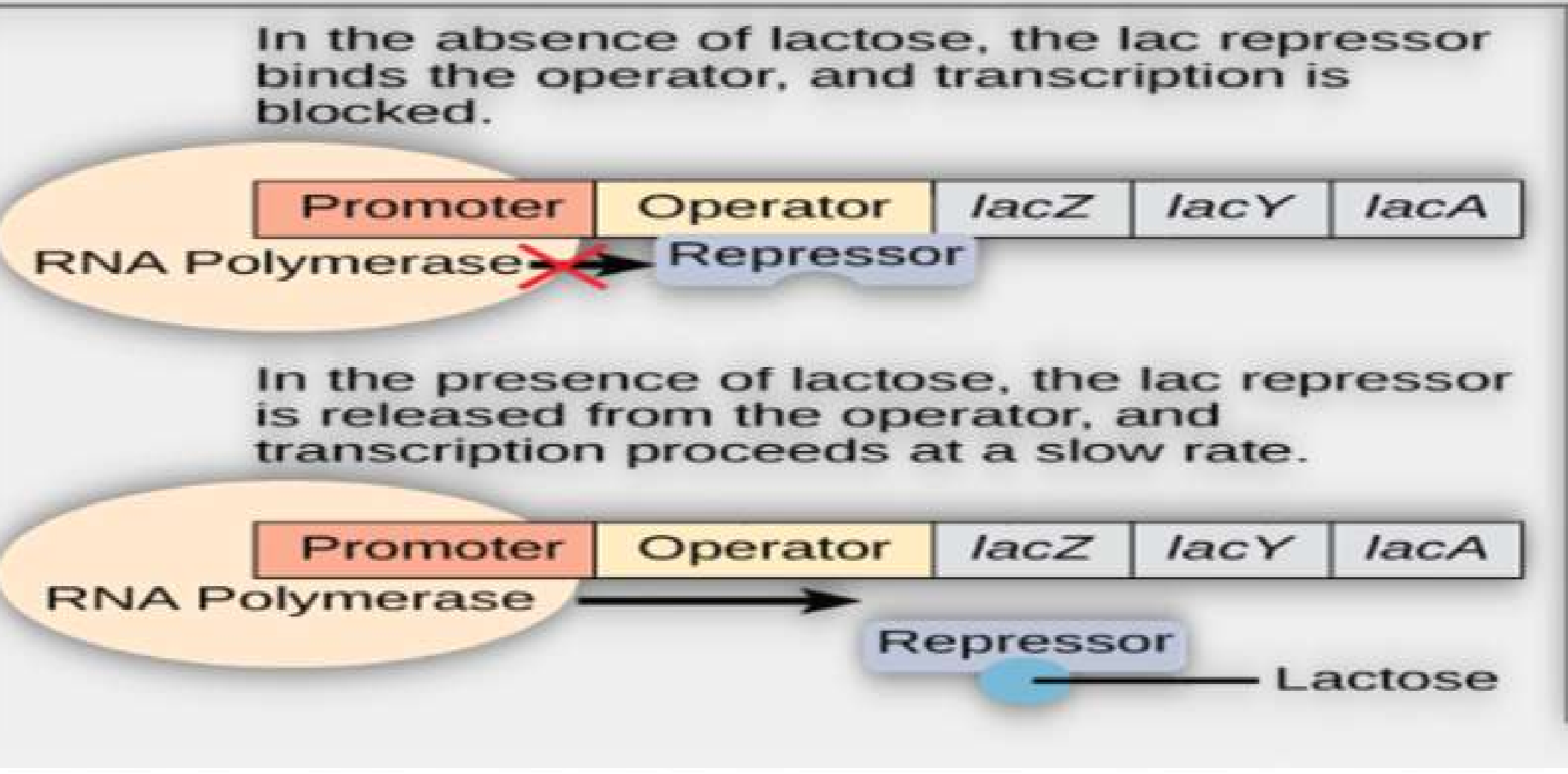
It consists of three adjacent structural genes, a promoter, a terminator, and an operator.

The lac operon is regulated by several factors including the availability of glucose and lactose.

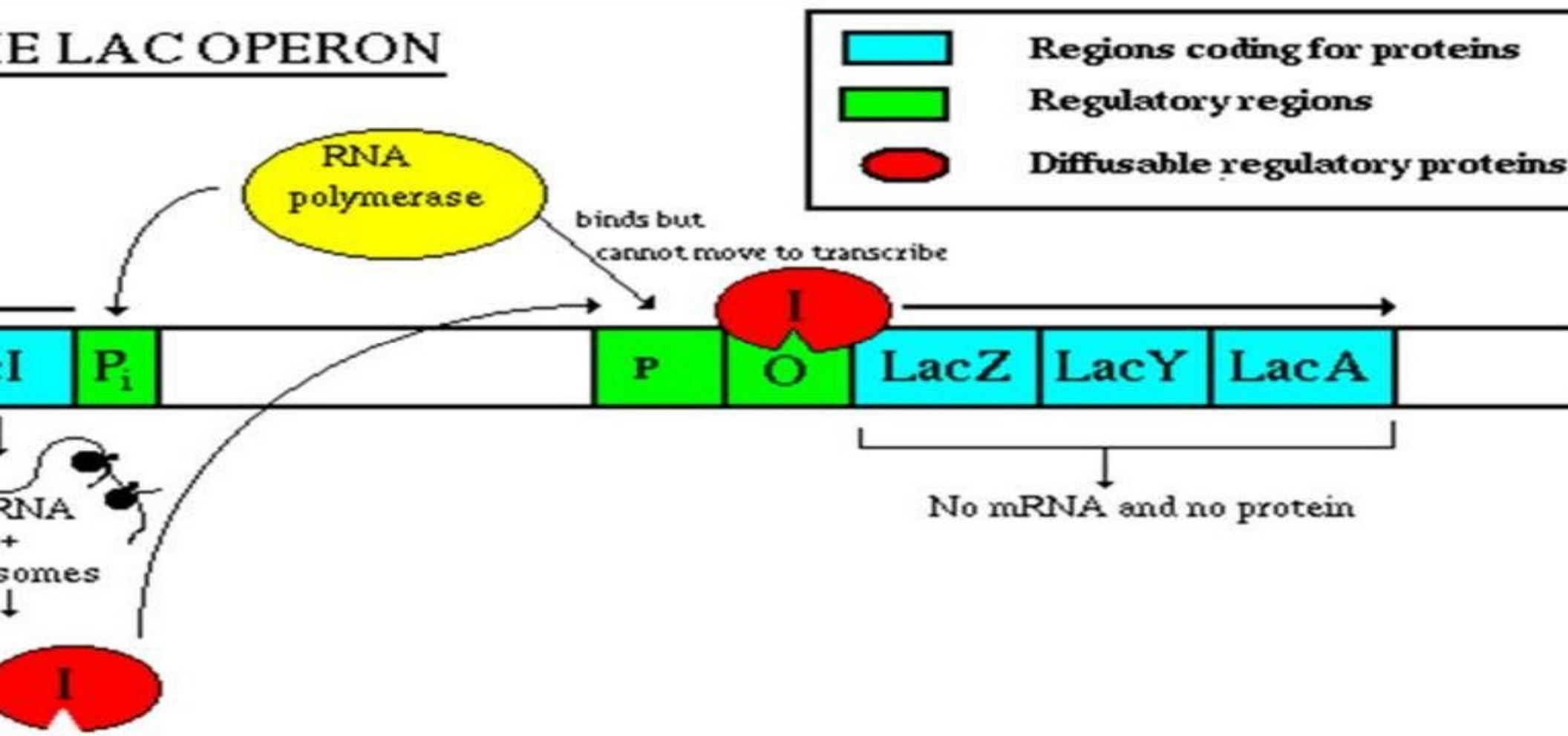




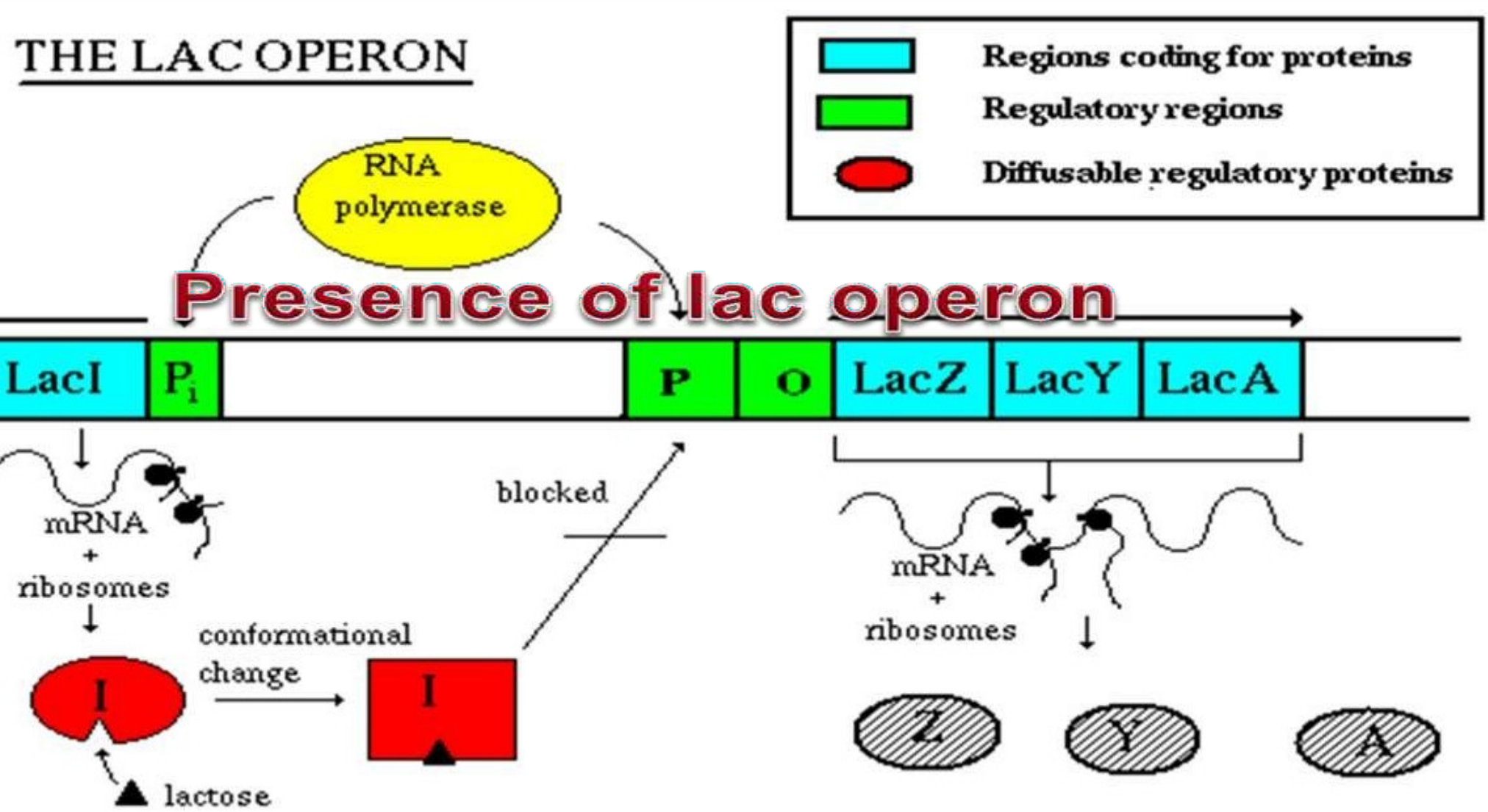
LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, Figure 13.16 The *lac* Operon of

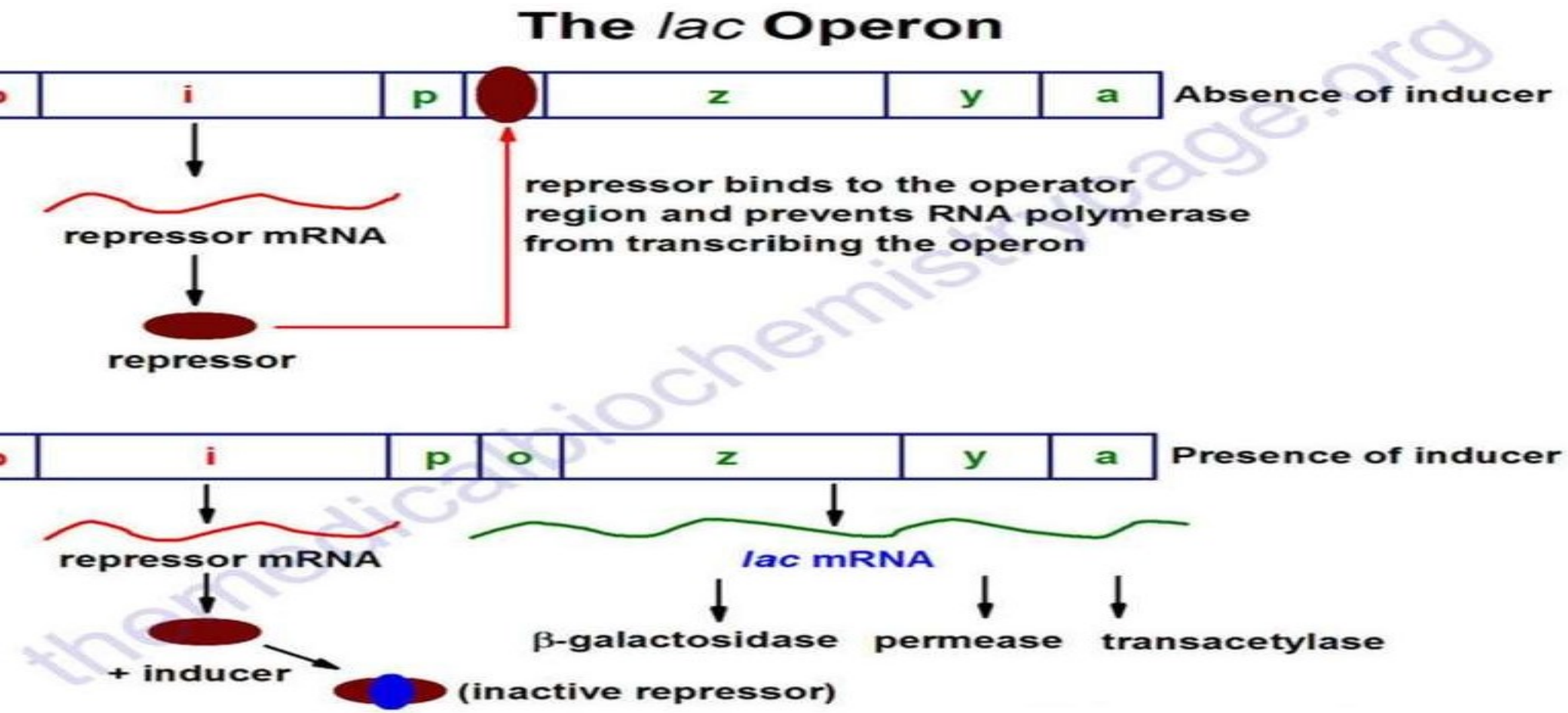

In the absence of lactose, the lac repressor binds the operator, and transcription is blocked.
Promoter
Operator
lacZ
lacY
lacA
RNA Polymerase
Repressor
In the presence of lactose, the lac repressor is released from the operator, and transcription proceeds at a slow rate.
Promoter
Operator
lacZ
lacY
lacA
RNA Polymerase
Repressor
Lactose

sence of Lac Operon



ence of Lac operon




The lac Operon
i
p
z
y
a
Absence of inducer
repressor mRNA
repressor binds to the operator region and prevents RNA polymerase from transcribing the operon
repressor
i
p
o
z
y
a
Presence of inducer
repressor mRNA
lac mRNA
β-galactosidase
permease
transacetylase
+ inducer
(inactive repressor)