OUTLINE 3

III. Control of Gene Expression in Prokaryotes

   A. Regulatory proteins

   B. The operon model

   C. Examples

       1. the lac operon (substrate induction)
       2. the tryp operon (end product repression)
       3. the lac operon (positive control)
Fig. 18.21

Negative regulation: Substrate induction

(a) Lactose absent, repressor active, operon off

(b) Lactose present, repressor inactive, operon on
Negative regulation: end-product repression

(a) Tryptophan absent, repressor inactive, operon on

(b) Tryptophan present, repressor active, operon off
Positive regulation of the lac operon

(b) Lactose present, glucose present (cAMP level low): little lac mRNA synthesized
Fig. 18.22b

Positive regulation of the lac operon

(a) Lactose present, glucose scarce (cAMP level high): abundant lac mRNA synthesized