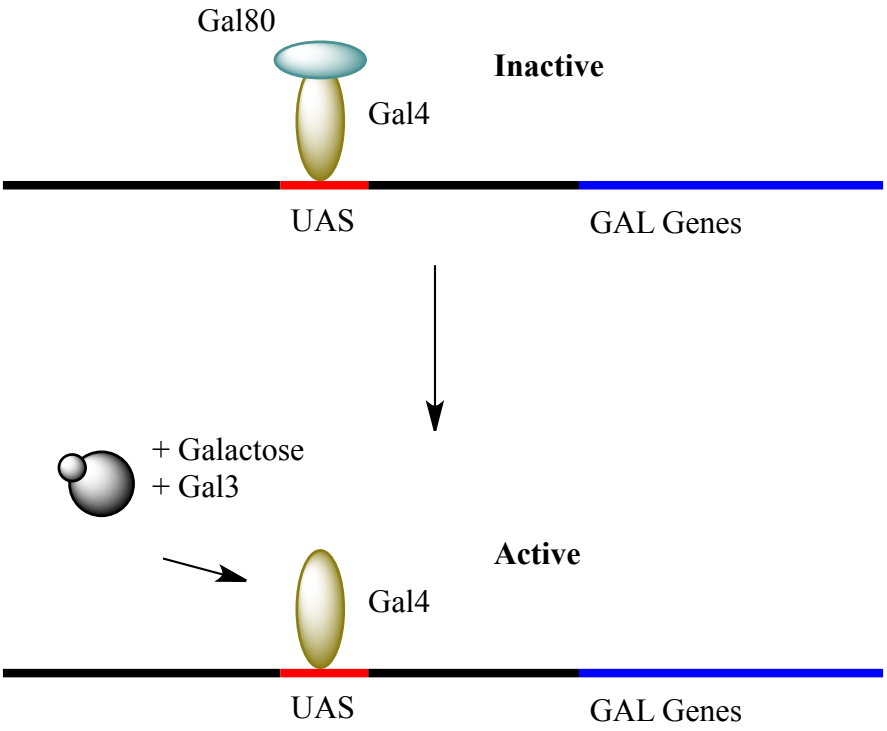
CONCEPT: GAL REGULATION

- The **GAL gene system** produces genes that transport and _____ galactose sugar in yeast cells
  - □ This system is **inducible** because it is regulated by the presence or absence of galactose
    - Absense of galactose = no transcription of GAL genes
    - Prescense of galactose = transcription of GAL genes (**positive control)**
  - □ Transcription of the GAL genes is controlled by the **UAS** region
    - The **Gal4** protein can bind to the UAS region at four sites
      - **Gal80p** negatively regulates GAL4 gene (makes Gal4 protein)
    - Absence of galactose: Gal80p binds to Gal4p and prevents transcription activation
    - Presence of galactose: galactose interacts with **Gal3p** which binds to UAS/Gal4p promoting transcription

EXAMPLE:



PRACTICE:

1. Which of the following is the purpose of the GAL gene system?
    a. To synthesize galactose
    b. To break down galactose
    c. To synthesize glucose
    d. To break down glucose

2. The GAL gene system is activated in which of the following conditions?
    a. Absence of galactose
    b. Presence of galactose
    c. Absence of glucose
    d. Presence of glucose

3. True or False: When the GAL gene system is activated, galactose binds to the UAS regulatory region.
    a. True
    b. False