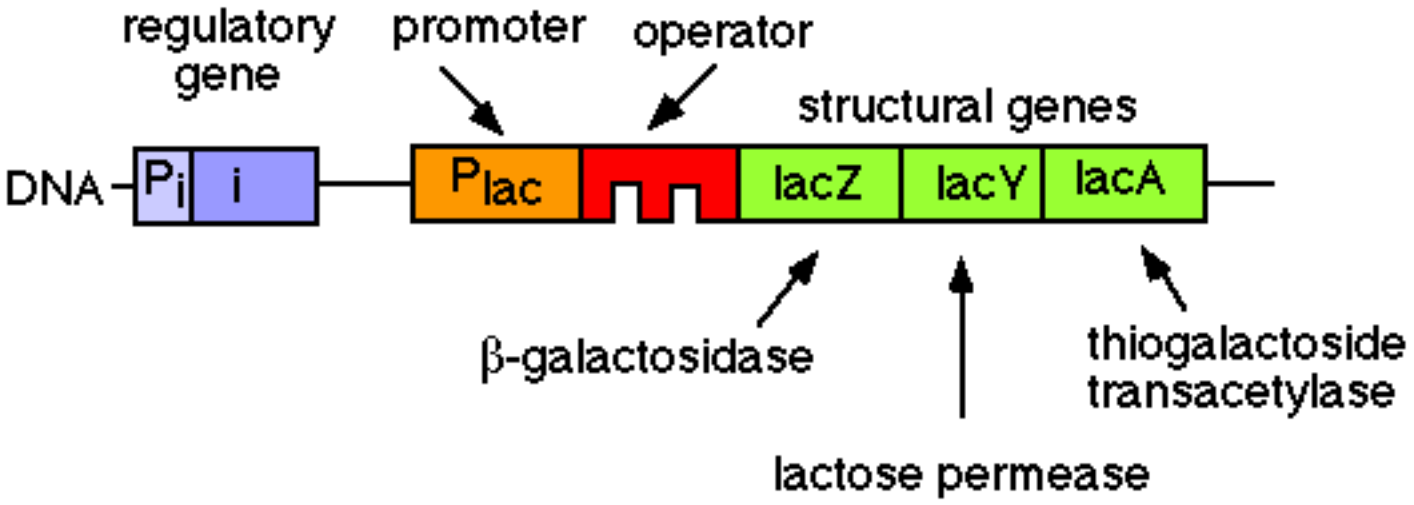
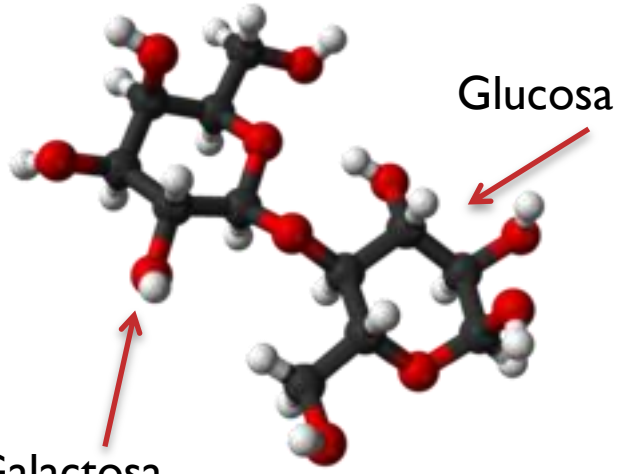
Circuitos biologicos:

El operon lac

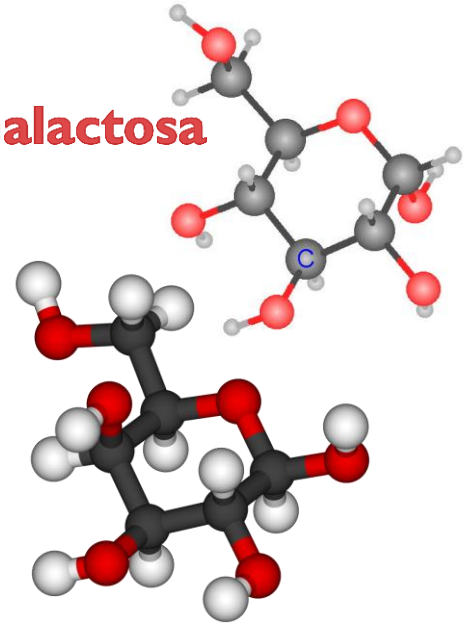


Cómo funciona?

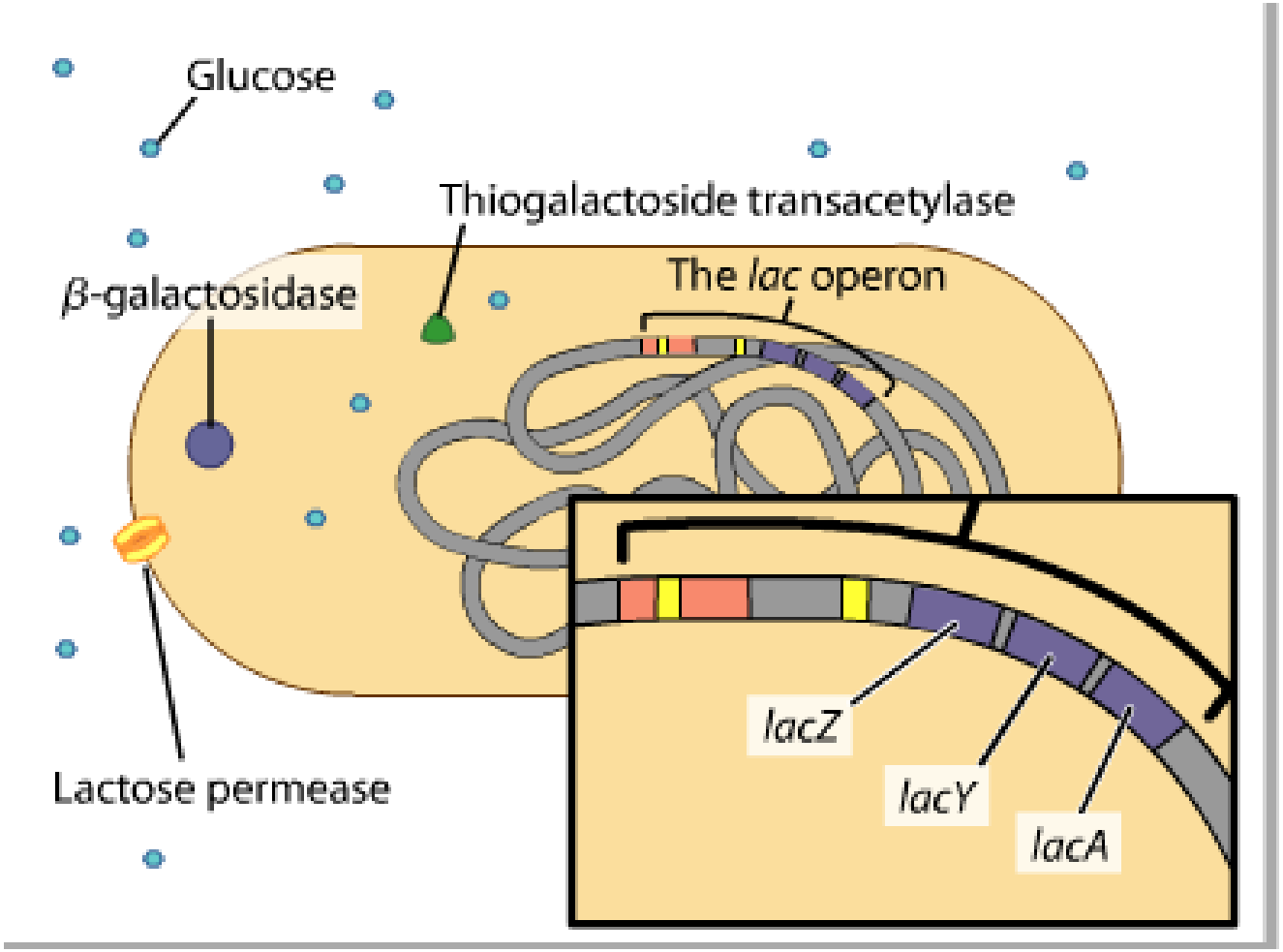
Lactosa



Glucosa + Galactosa



Operon Lac



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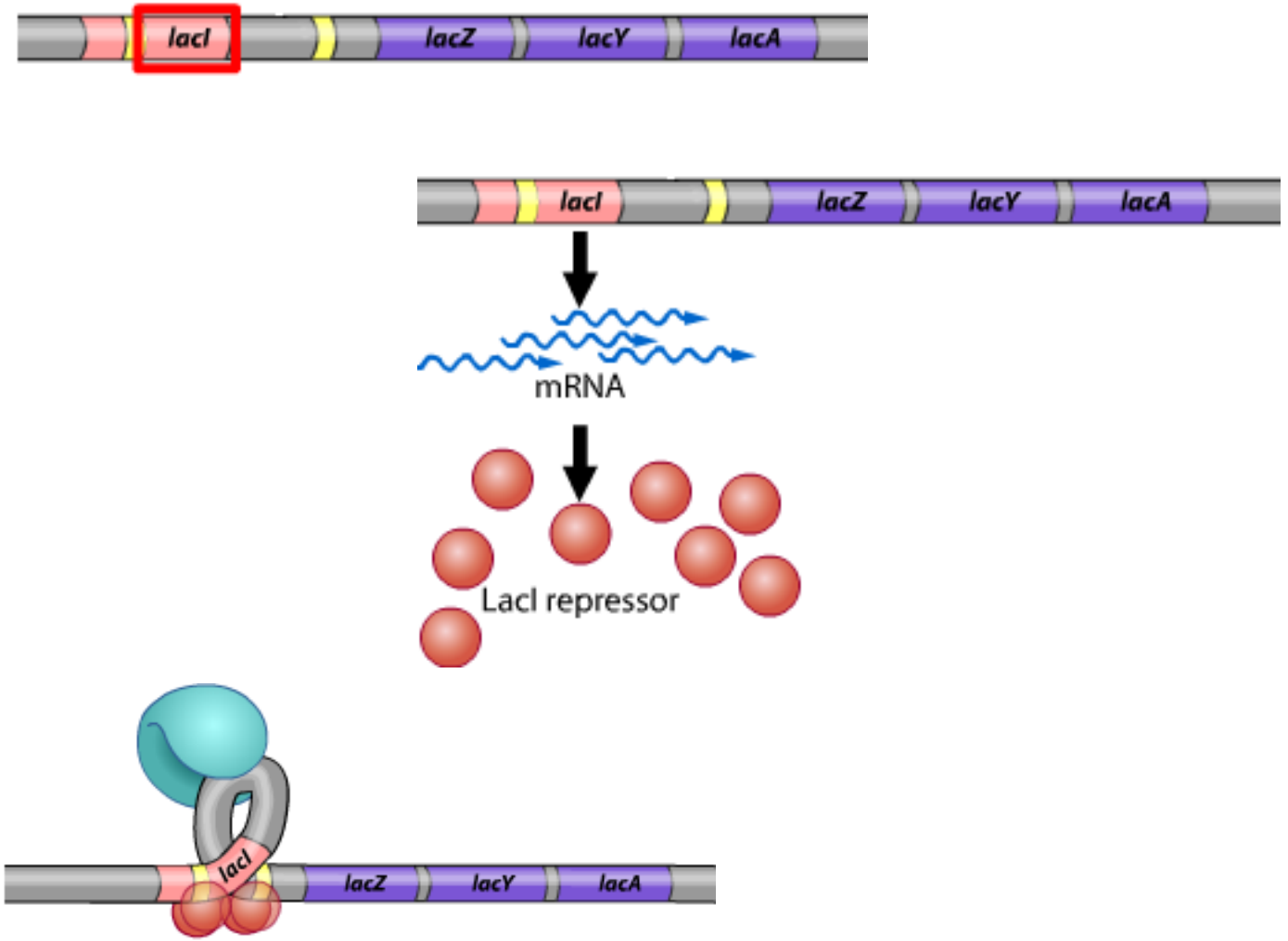
EL REPRESOR



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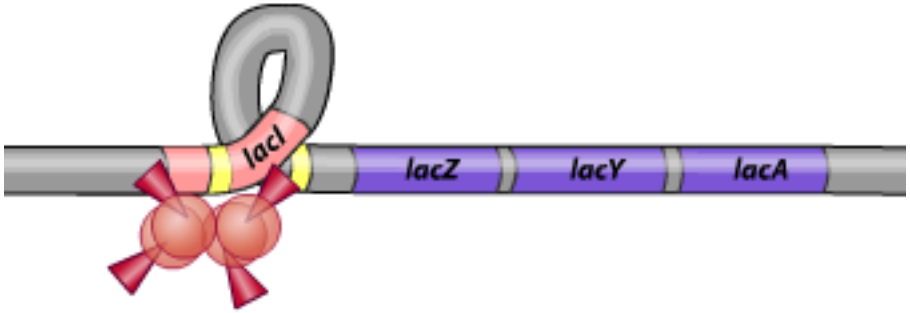
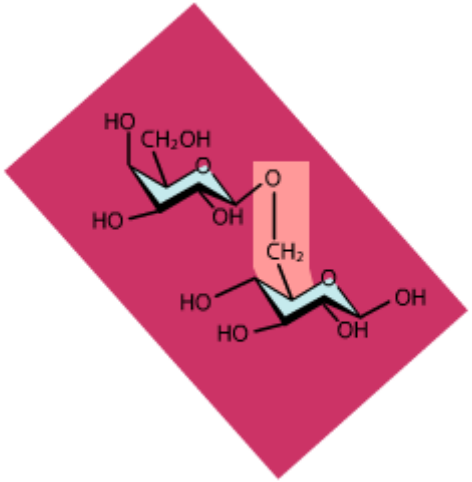
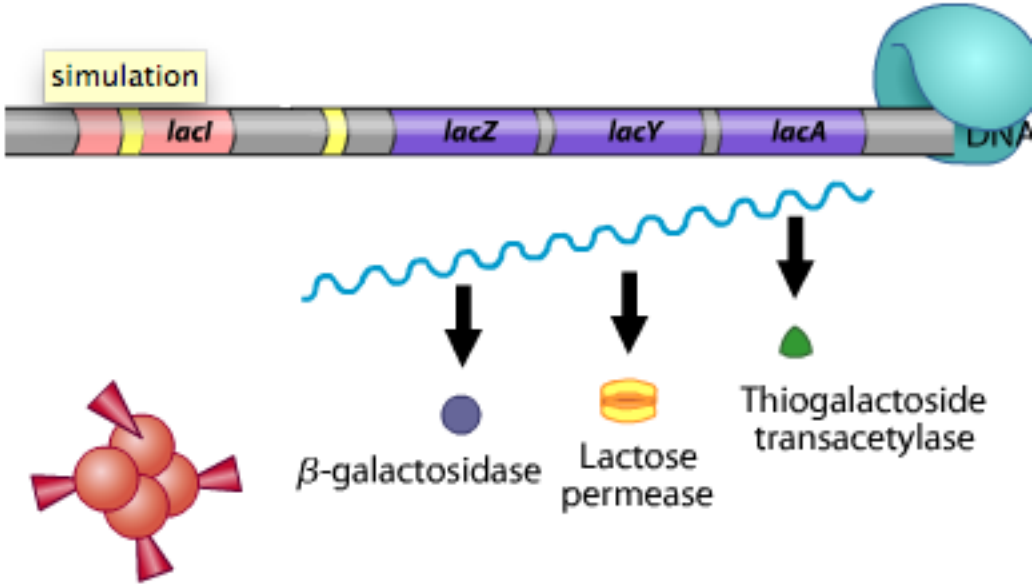
EL INDUCTOR







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OTRO INDUCTOR DE OTRA RUTA METABOLICA

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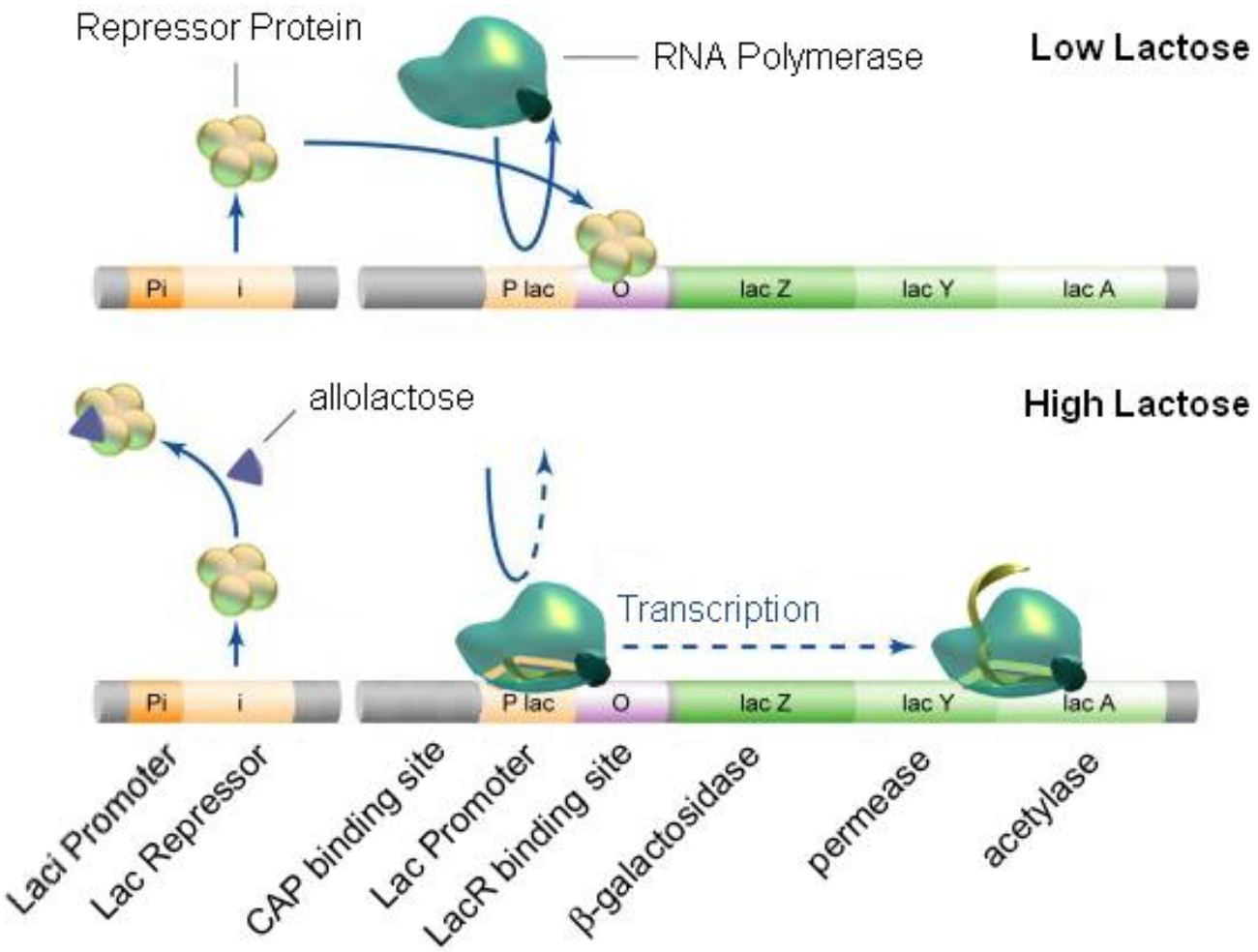
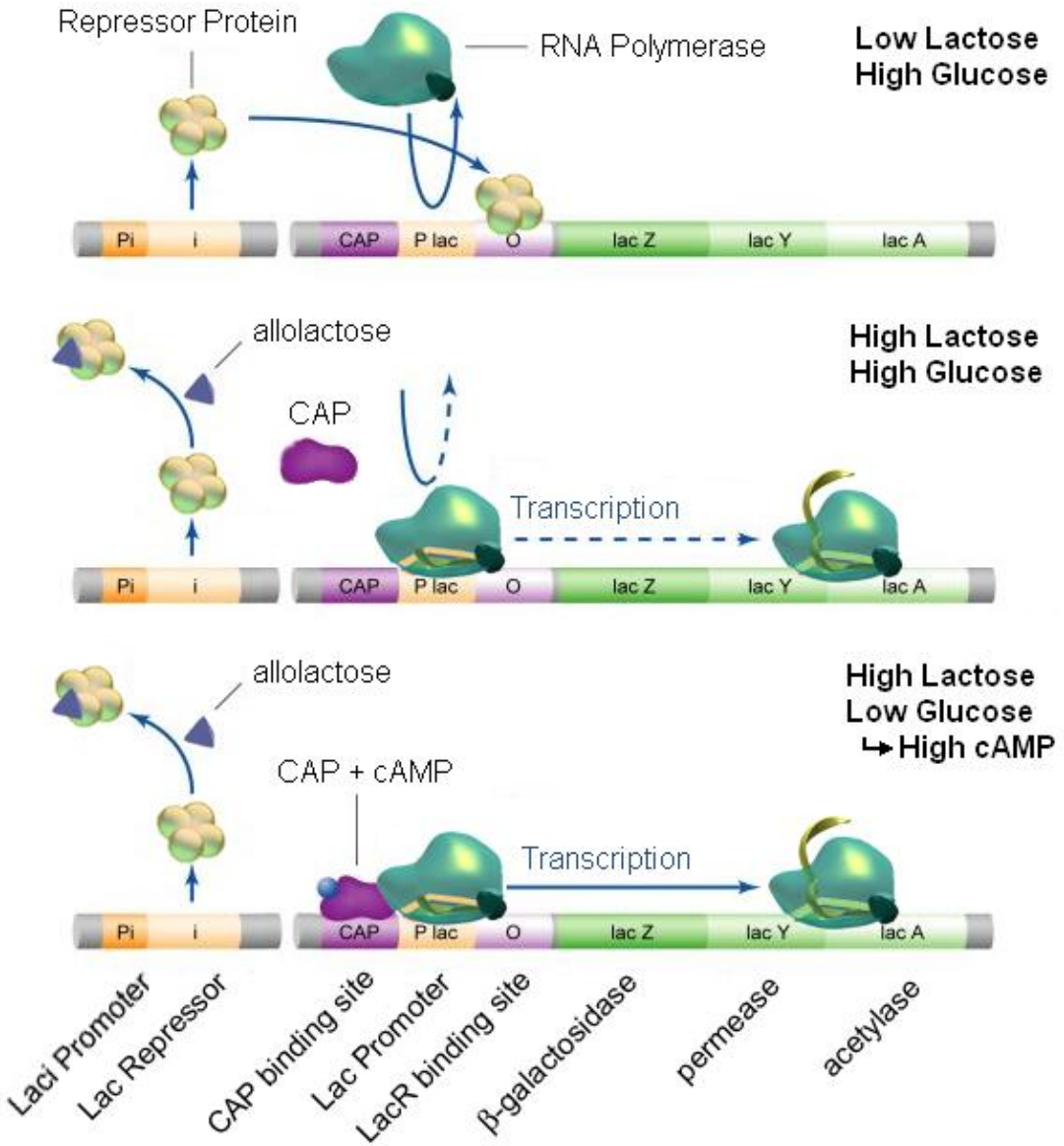
En ausencia de glucosa hay mucho cAMP lo cual también ayuda que la polimerasa se una al operón lac

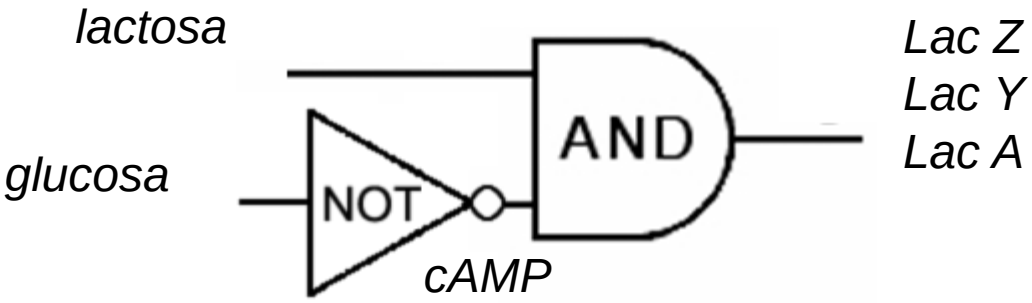


Alberts et al., Molecular Biology of the Cell

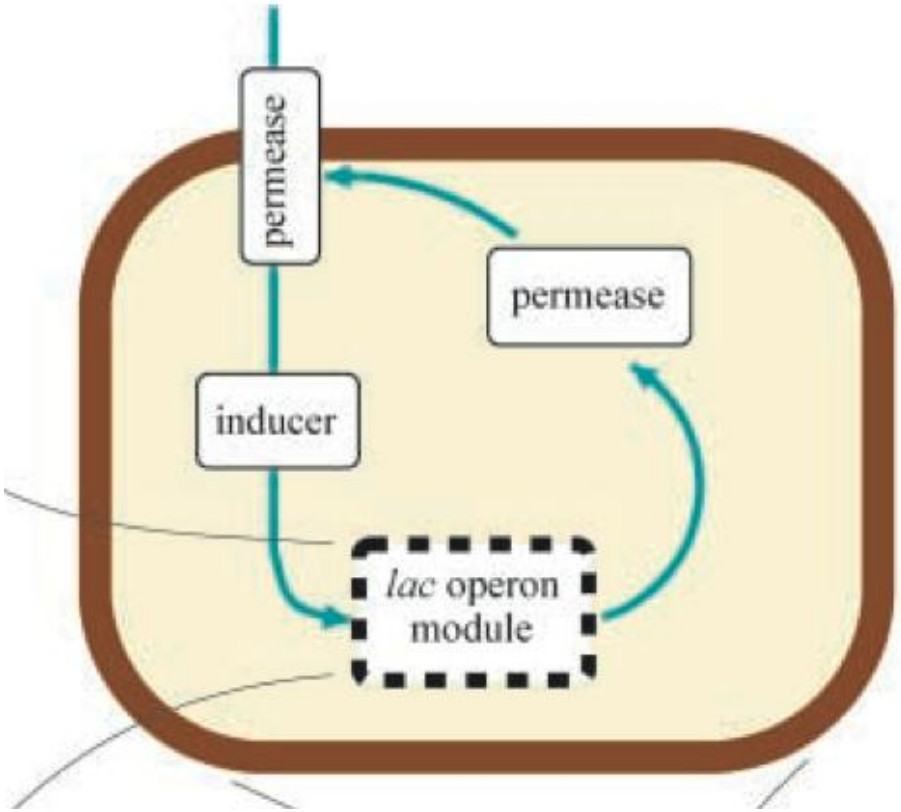


Alberts et al., Molecular Biology of the Cell

En resumen…..

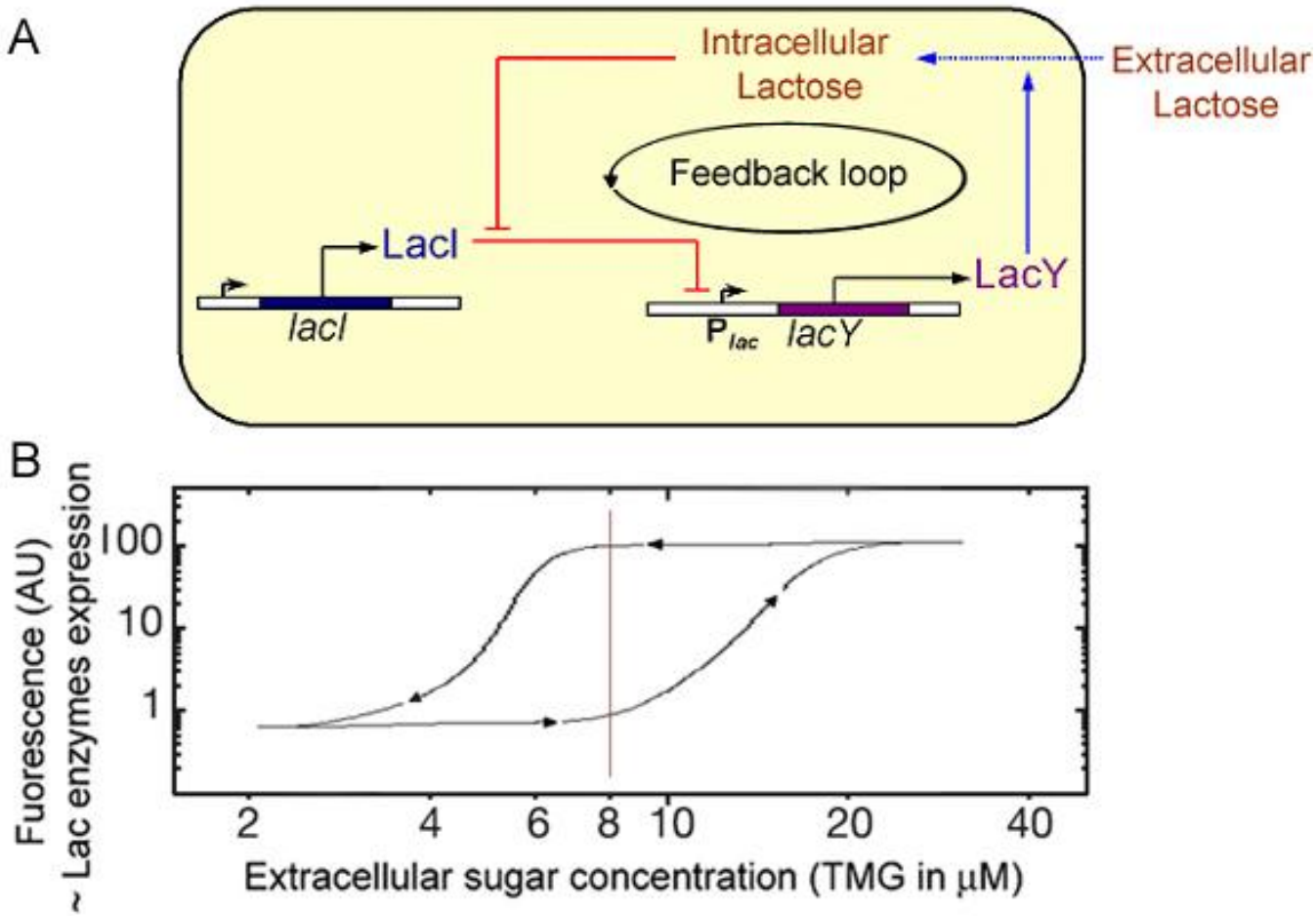


Feedback positivo

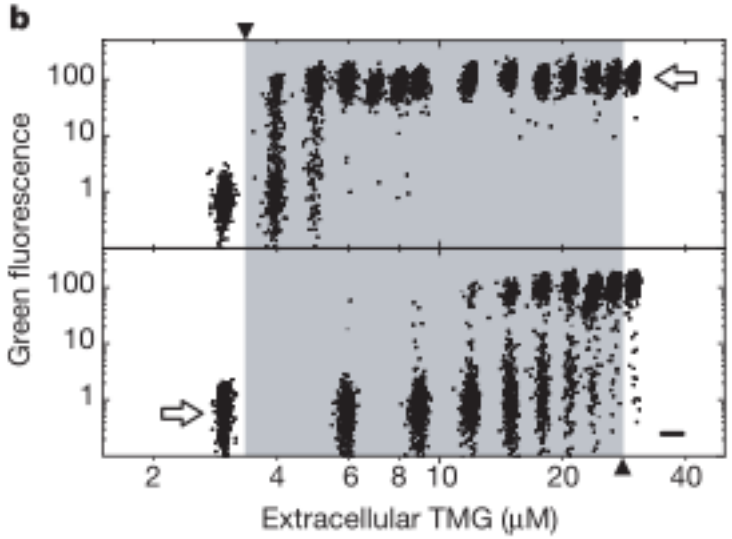


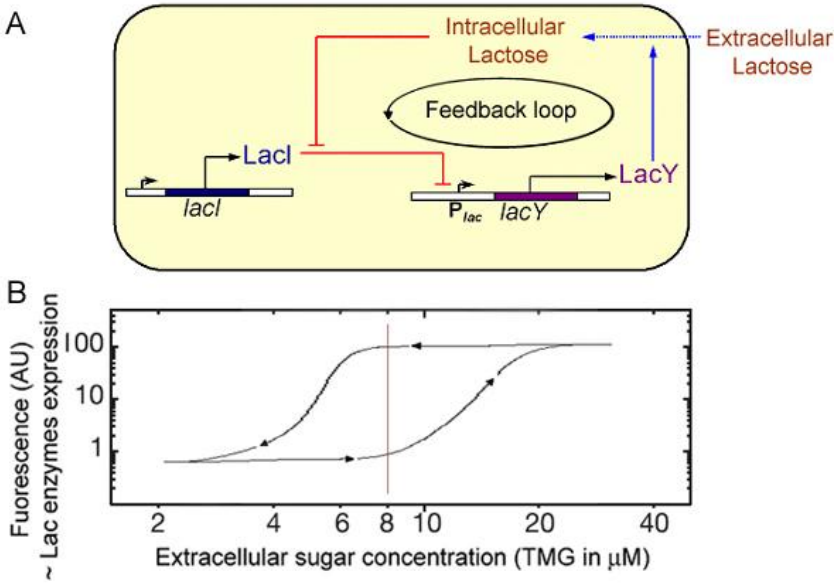
Vilar J. Guet C, Lieber S (2003)

Distintos niveles de detalle producen descripciones distintas, que pueden revelar principios generales.



La dinámica de las distribuciones es distinta a la del promedio:





E. M. Ozbudak et al. *Nature* **427**, 737 (2004)

Modelo matemático

Cambio a través del tiempo = Tasa Creación –Tasa Destrucción

$$\frac{dY}{dt} = f_1(I) - a_1 Y,$$

Modelo matemático

$$\frac{dR_{totales}}{dt} = k - \gamma R_{totales}$$

$$\frac{dR_l}{dt} = g(R_p, I) - \beta(R_l)$$

$$\frac{dR_p}{dt} = \beta(R_l) - g(R_p, I)$$

$$R_{totales} = R_p + R_l$$