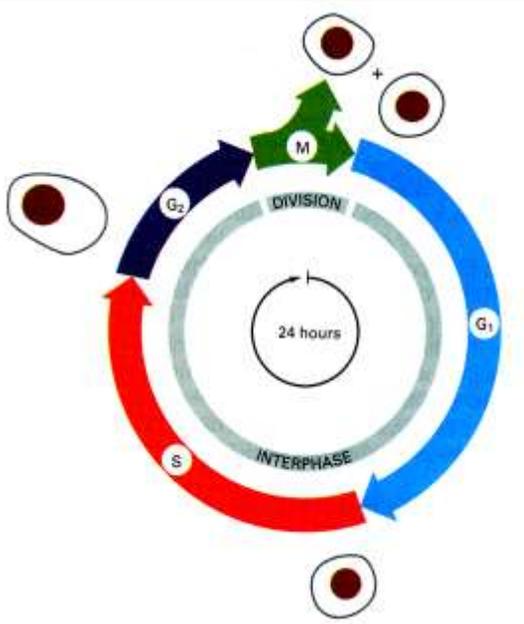


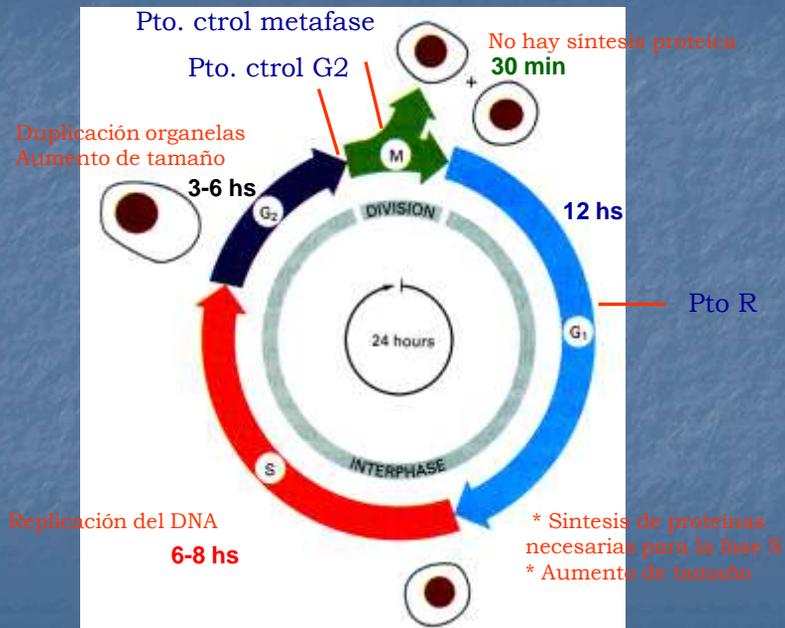
Ciclo celular



Interfase: G_1
S
 G_2

Estados: División
Quiescencia (G_0)

Ciclo celular



* **Proliferación** \longleftrightarrow **Quiescencia**

* **Duplicación del DNA + Crecimiento celular**

* **Desarrollo de puntos de control (*checkpoints*)**

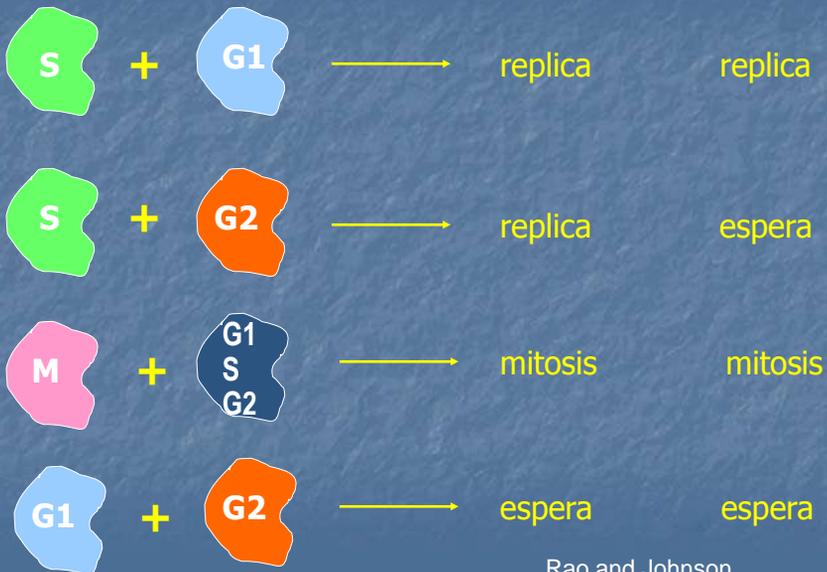
checkpoints rígidos

checkpoints lábiles

Incapacidad de proliferar

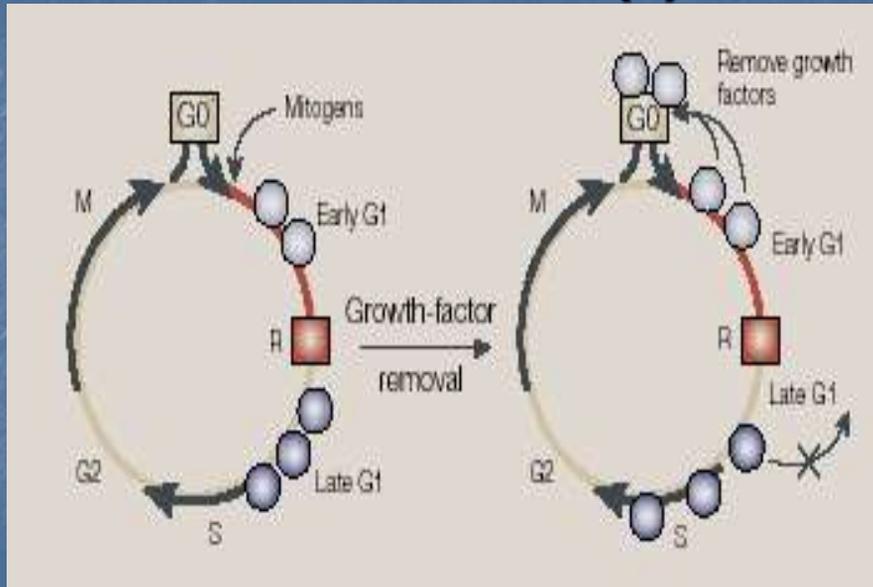
proliferación descontrolada

Experimentos de fusión celular



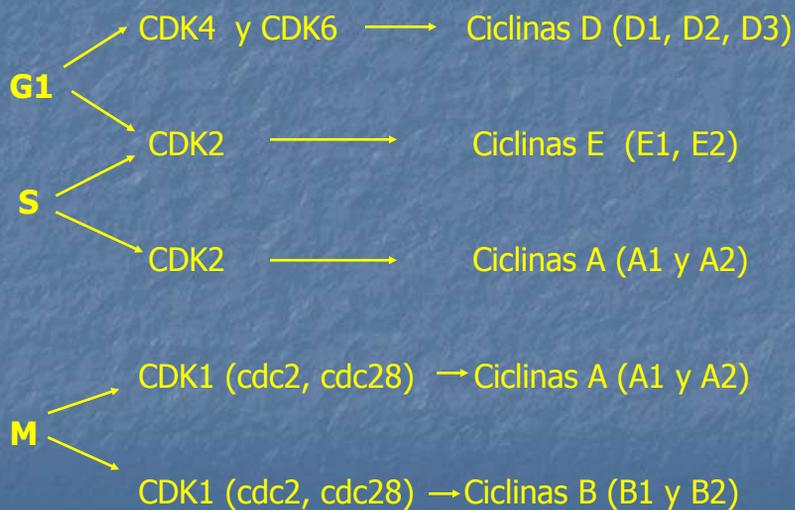
Rao and Johnson

Punto de restricción (R)

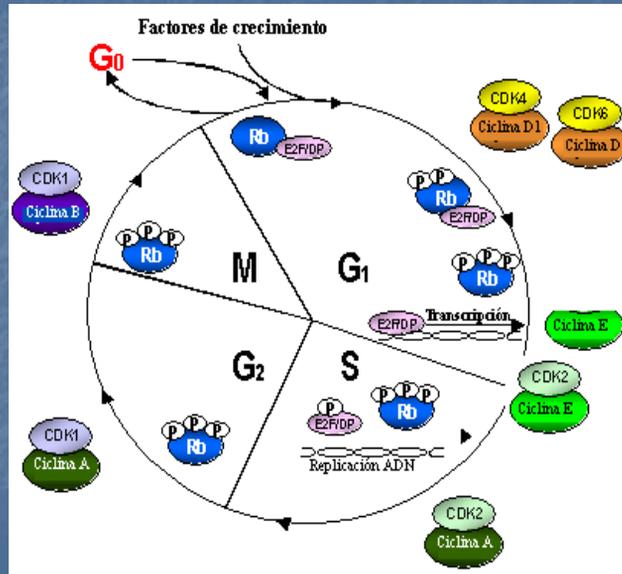


Nat. Rev. Cancer 1 (2001), 222

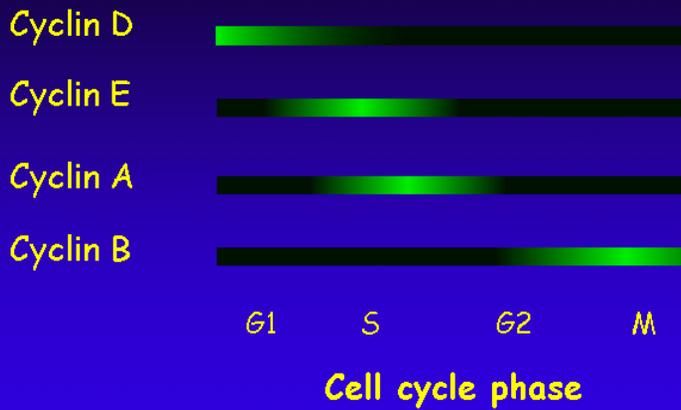
Ciclinas y CDKs



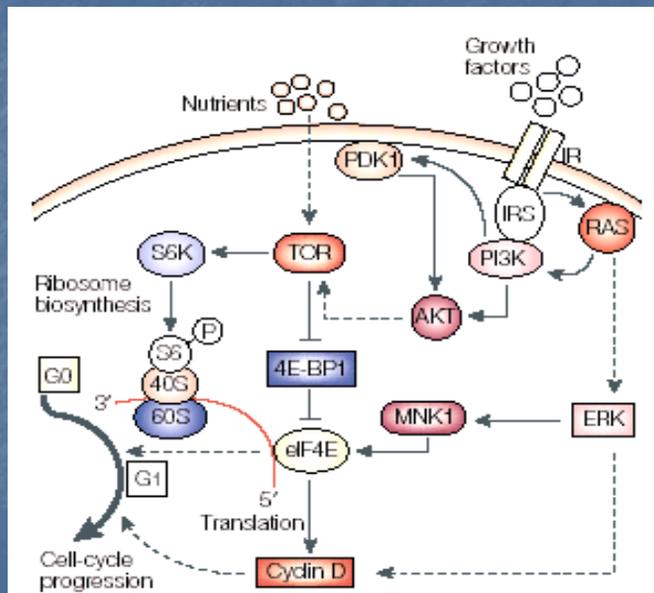
Ciclinas y CDKs



Expresión temporal de las ciclinas

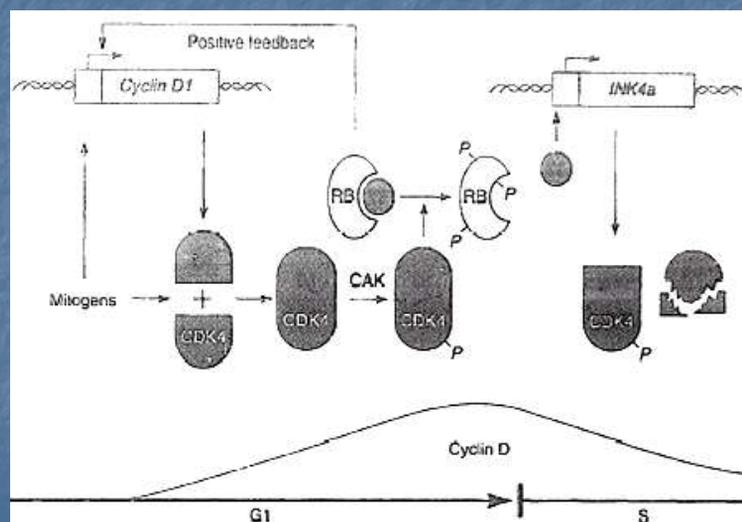


Crecimiento vs. división celular

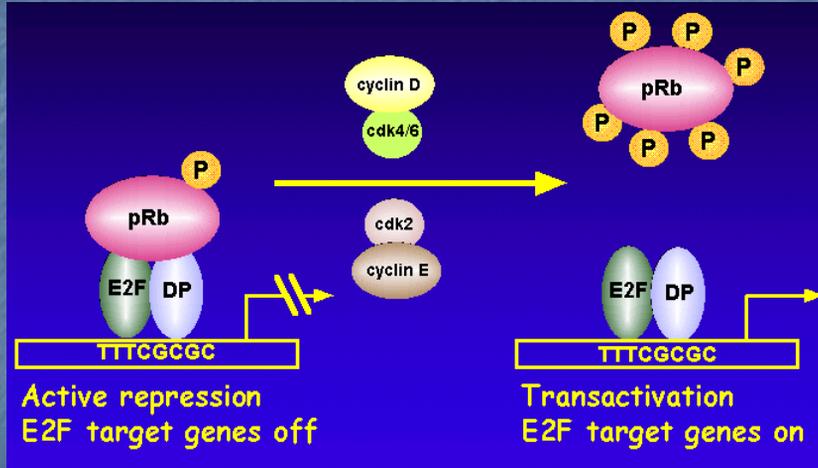


Nat. Rev. Cancer 1 (2001), 222

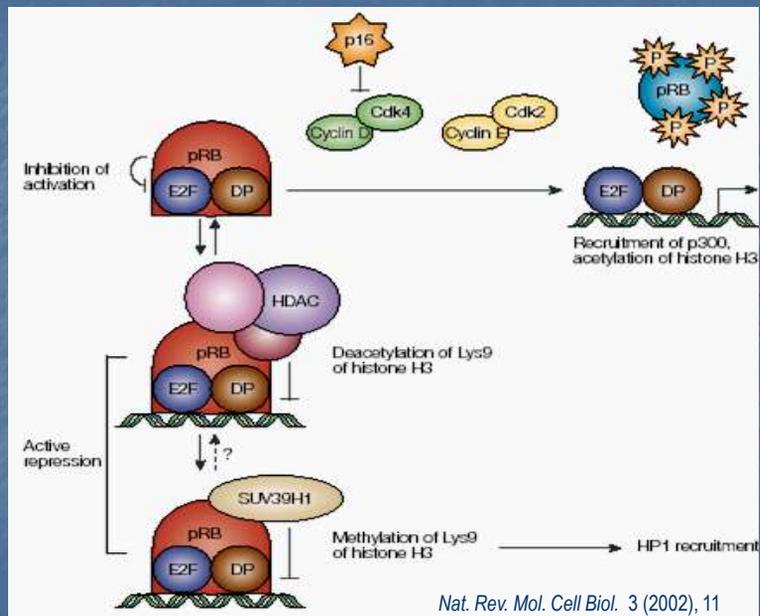
Ciclina D y fosforilación del Retinoblastoma



Activación del factor E2F



Mecanismos de represión de Rb sobre E2F



Inhibidores de CDKs (CKIs)

Familia Cip/Kip

p21 Cip1/Waf1 (CDKN1A)

p27 Kip1 (CDKN1B)

p57 Kip2 (CDKN1C)

Familia INK4

p16 INK4a (CDKN2A)

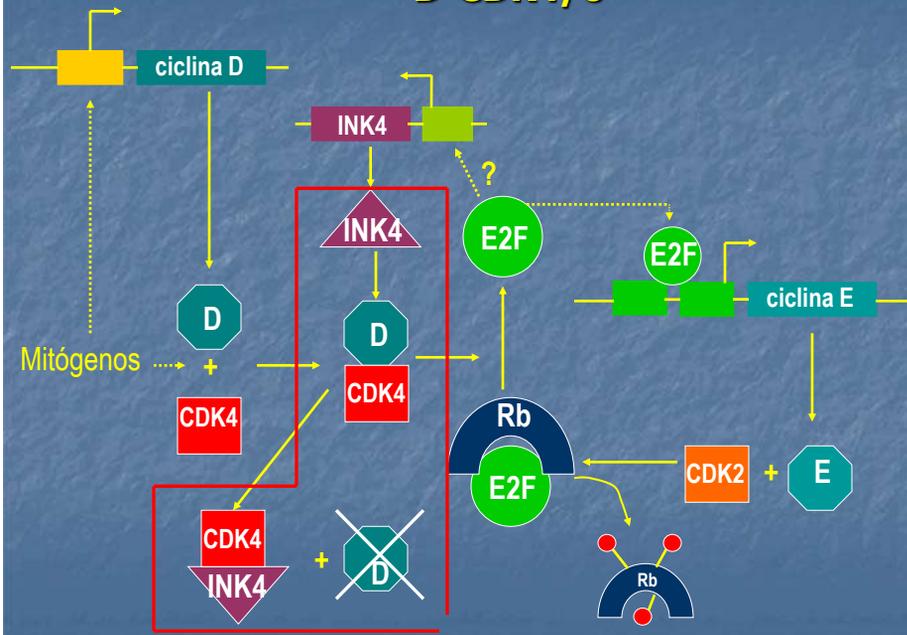
p15 INK4b (CDKN2B)

p18 INK4c (CDKN2C)

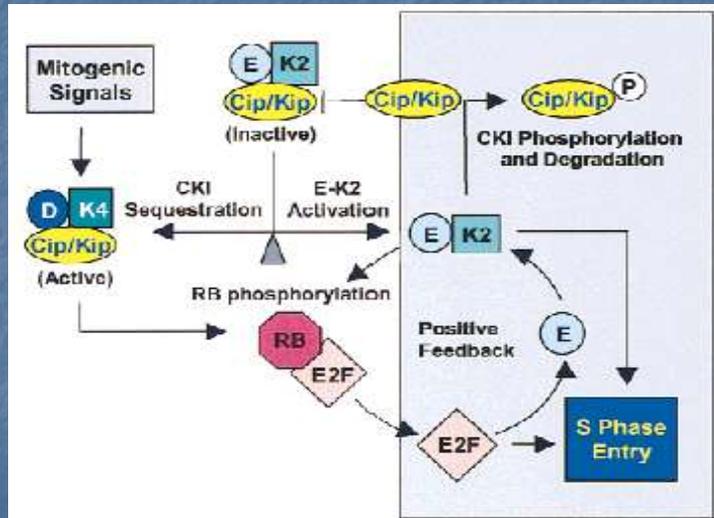
p19 INK4d (CDKN2D)



Proteínas INK4 inhiben el complejo ciclina D-CDK4/6

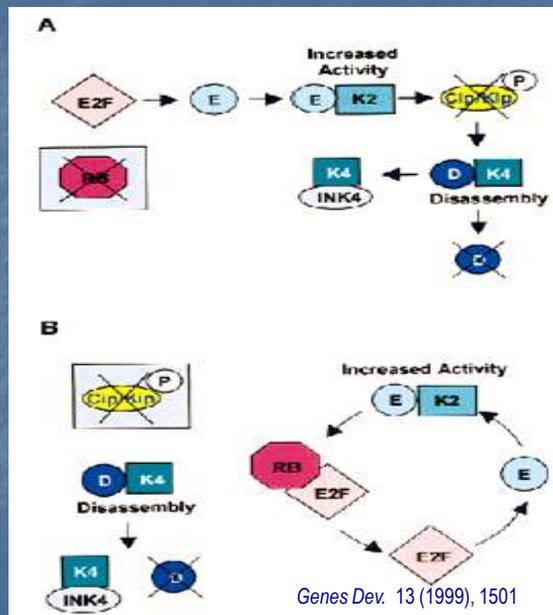


Transición G1/S



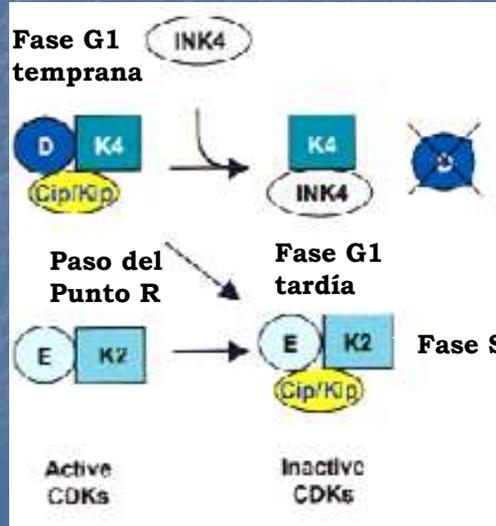
Genes Dev. 13 (1999), 1501

Pérdida de la función de Rb y Cip/Kip



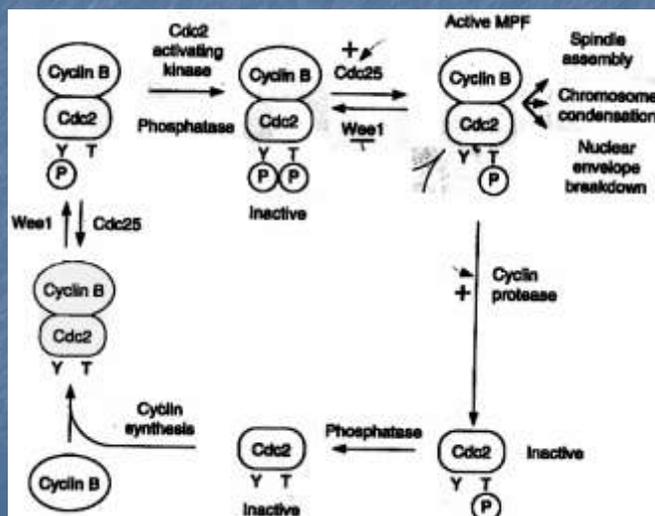
Genes Dev. 13 (1999), 1501

INK4 antagoniza la proliferación

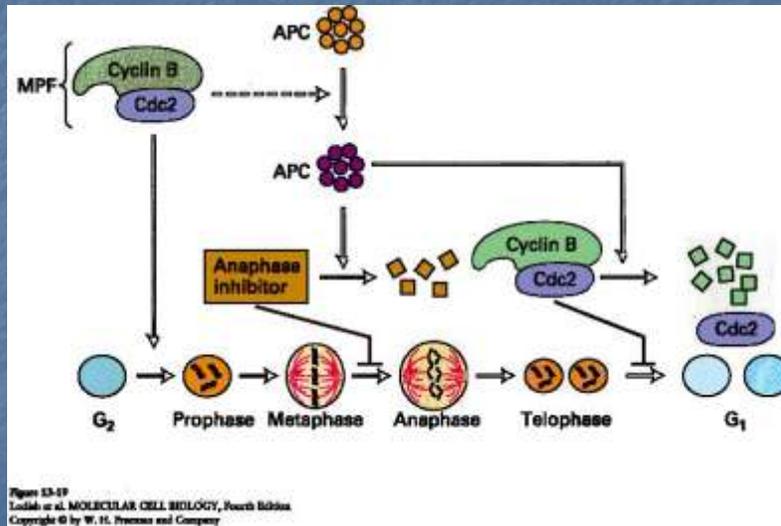


Genes Dev. 13 (1999), 1501

Activación de Famoso MPF (ciclina B/CDK1) Fase M



Mecanismo de acción de APC



Mecanismo de acción de APC

