

Sumário

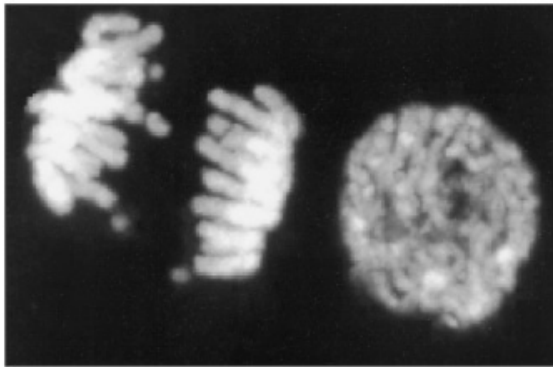
Replicação de DNA

- A Replicação é semi-conservativa.
- Replicação e ciclo celular.
- Origens de replicação. Reacção de síntese de DNA.
- As cadeias líder e atrasada. Fragmentos de Okazaki.
- O problema topológico.
- Actividades duma DNA polimerase.
- Replicação nos telómeros.

Bibliografia

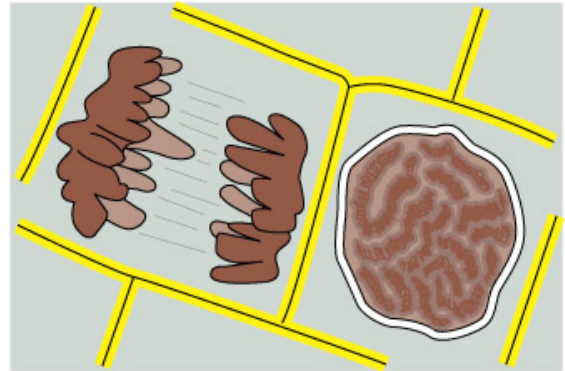
- Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2004) *Essential Cell Biology* 2ª ed. Garland Science Publishing. Cap.6.

Replicação e Ciclo Celular



dividing cell

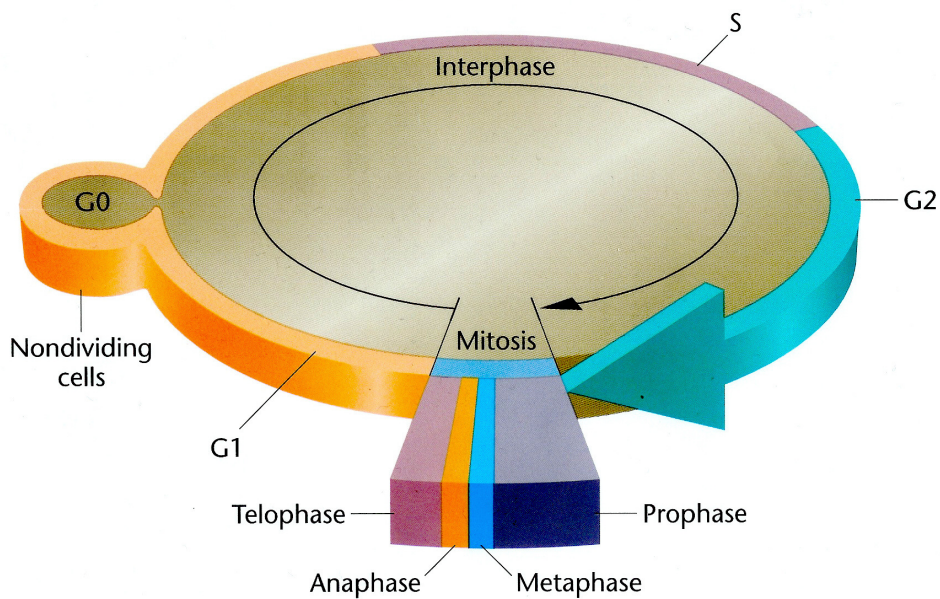
nondividing cell



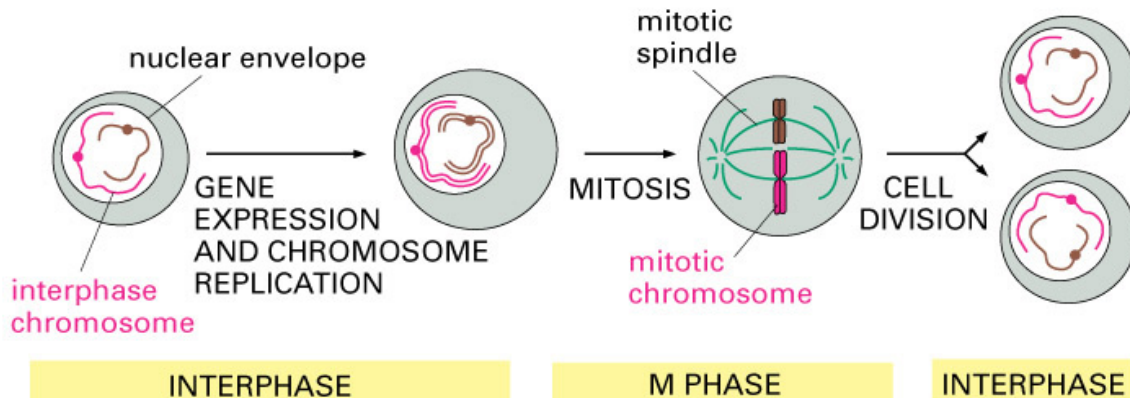
dividing cell

nondividing cell

Alberts et al (2004) *Ess Cell Biol* 2/e

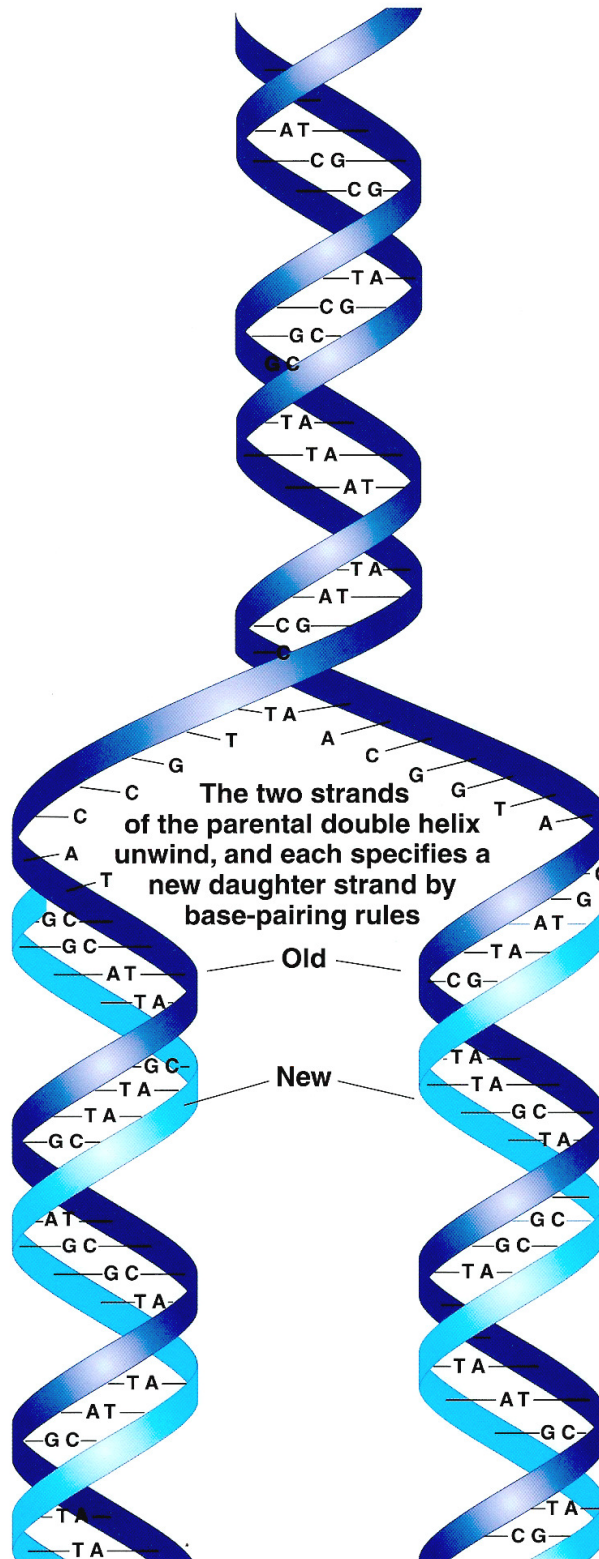


Klug/Cummings (1997) 5/e



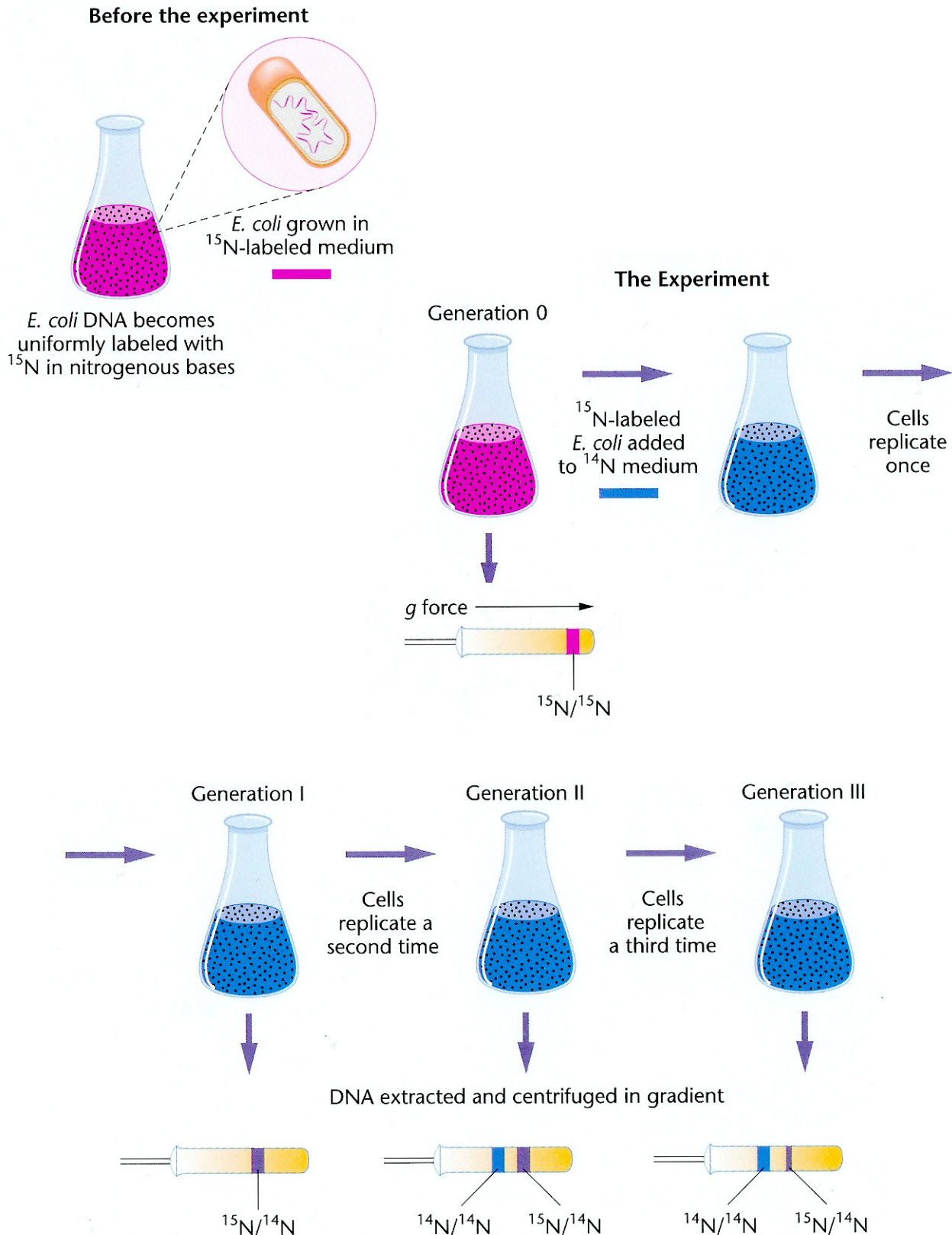
Alberts et al (2004) *Ess Cell Biol* 2/e

Replicação da Dupla Hélice

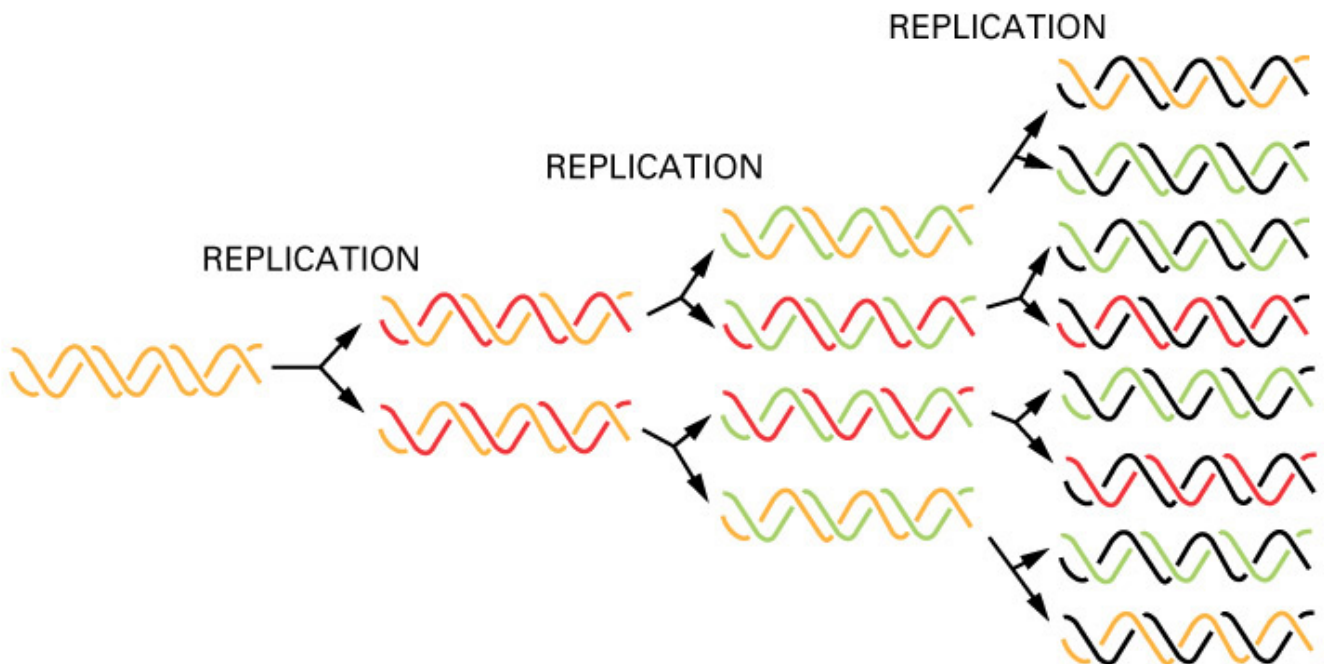
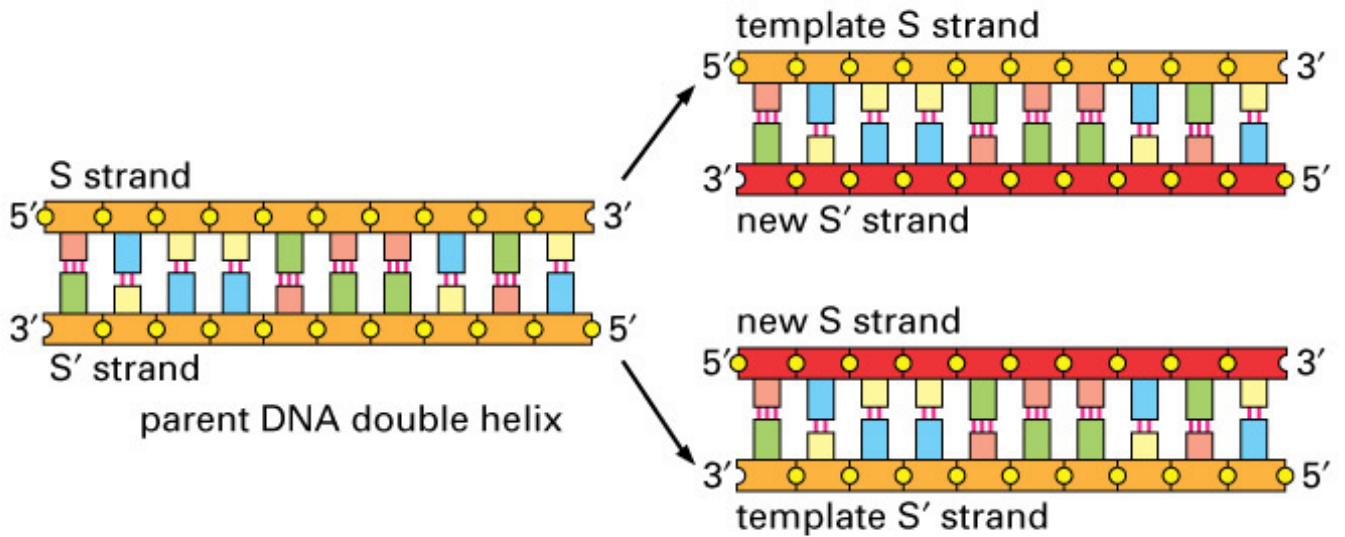


A Replicação do DNA é Semi-Conservativa

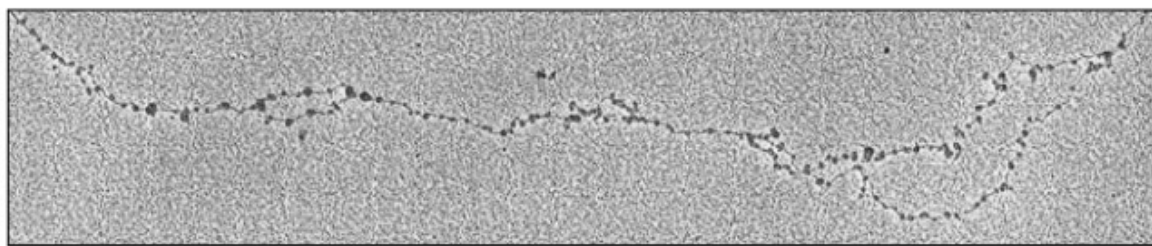
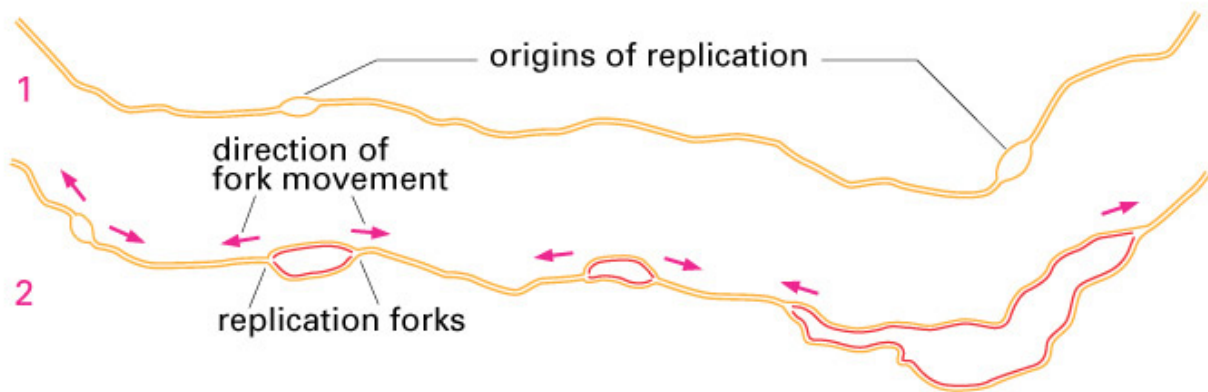
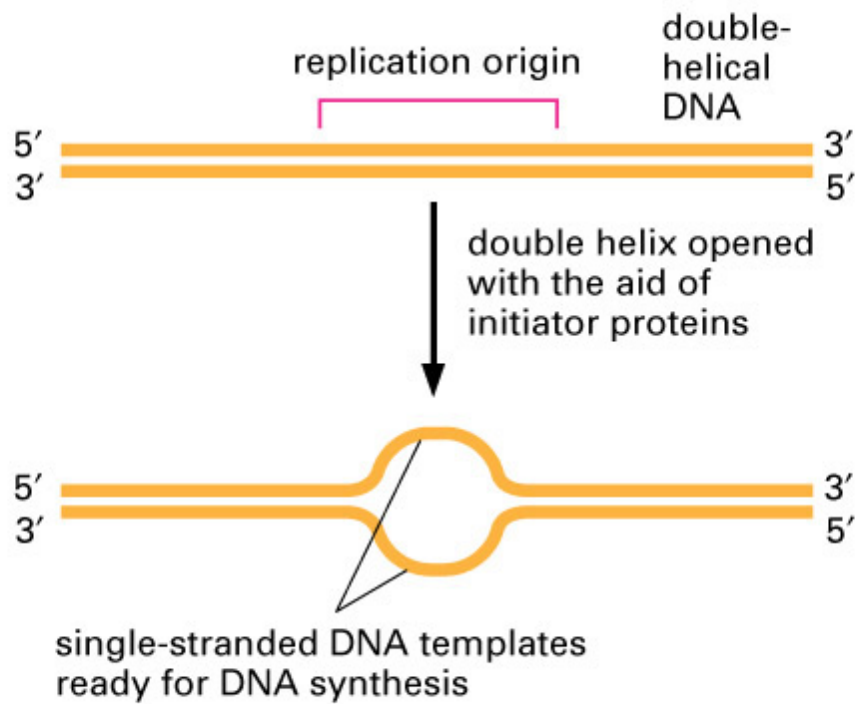
Experiência de Meselson-Stahl (1958)



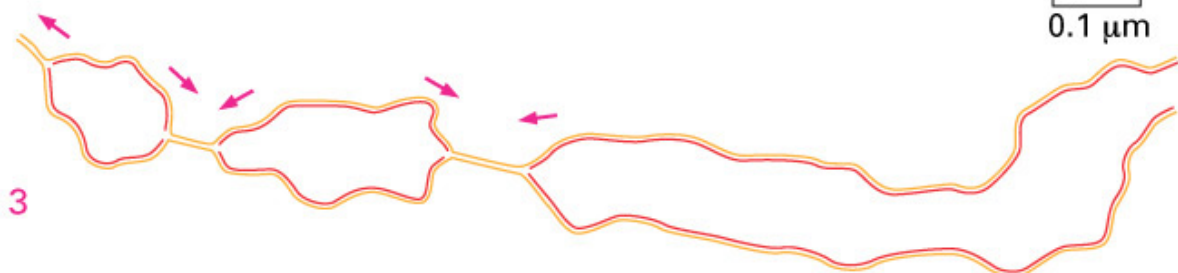
Replicação: Semi-Conservativa



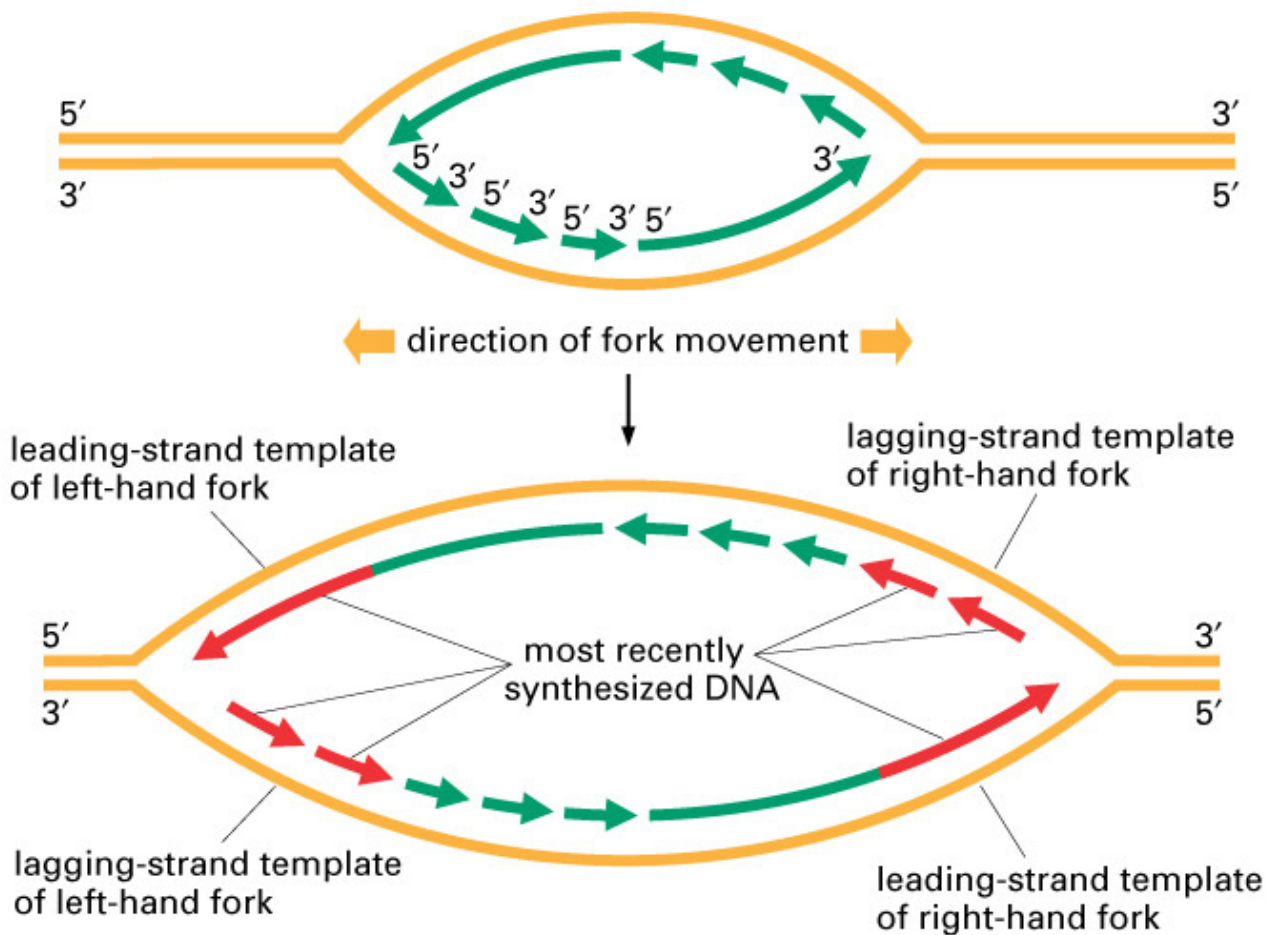
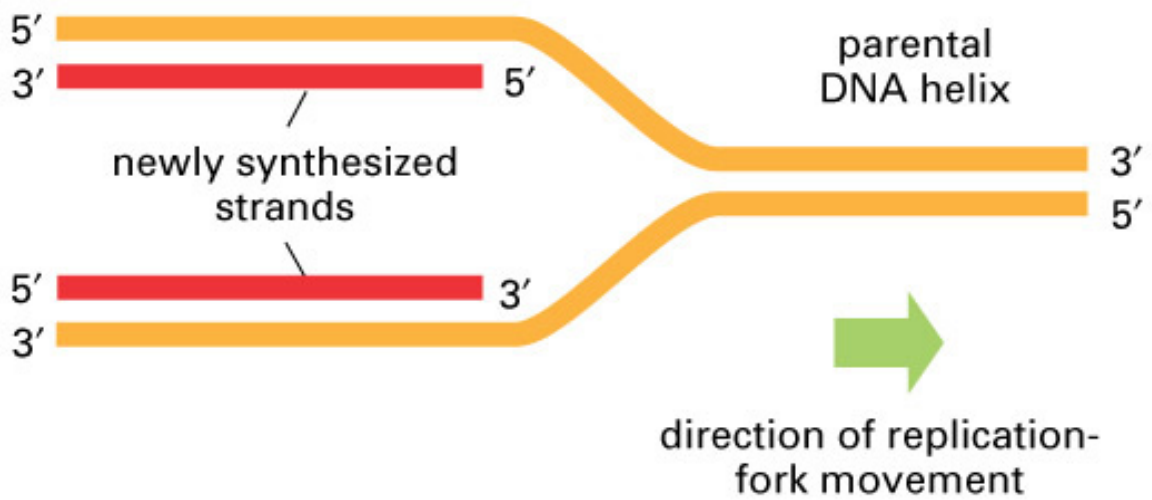
Origens de Replicação



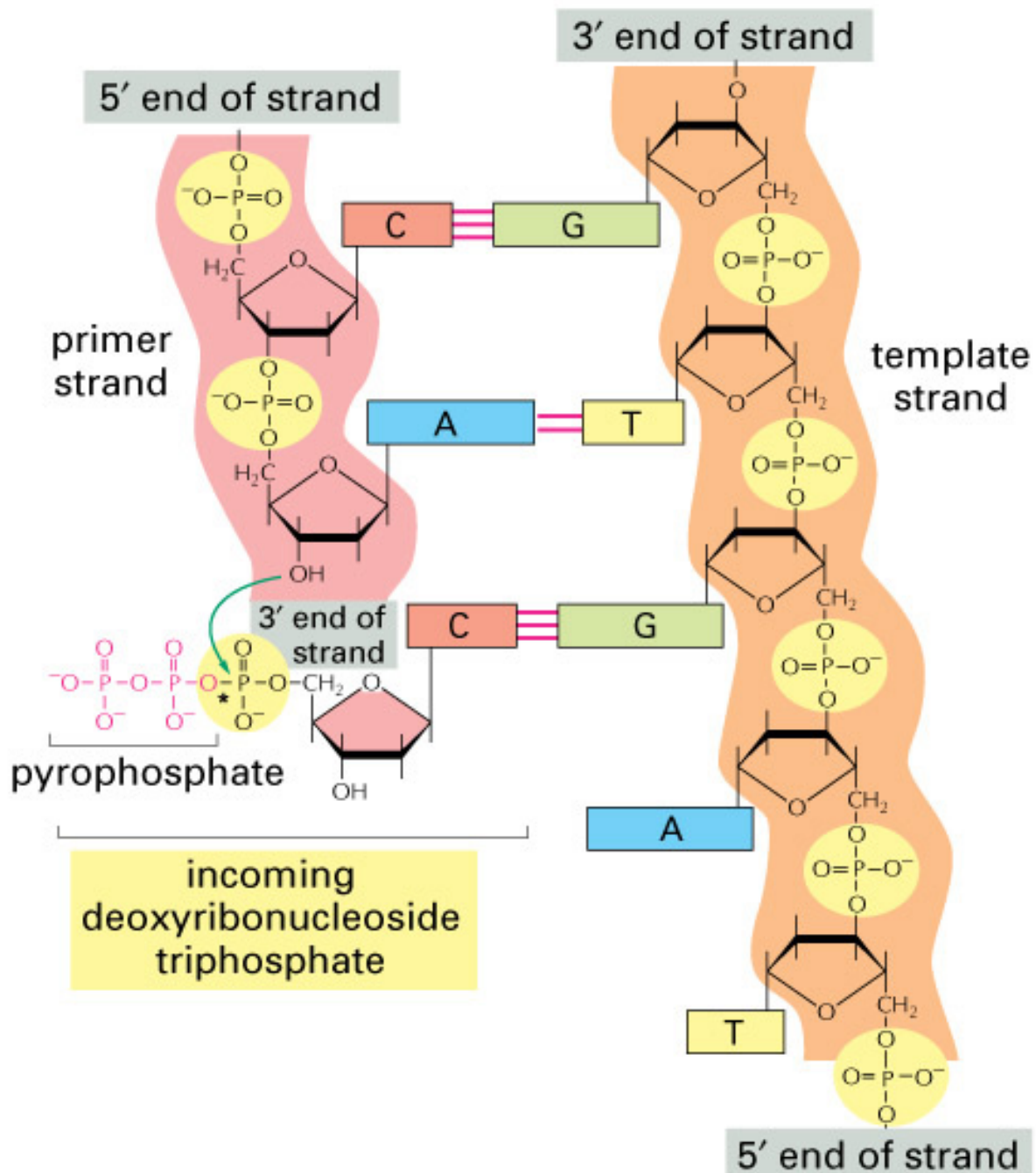
0.1 μm



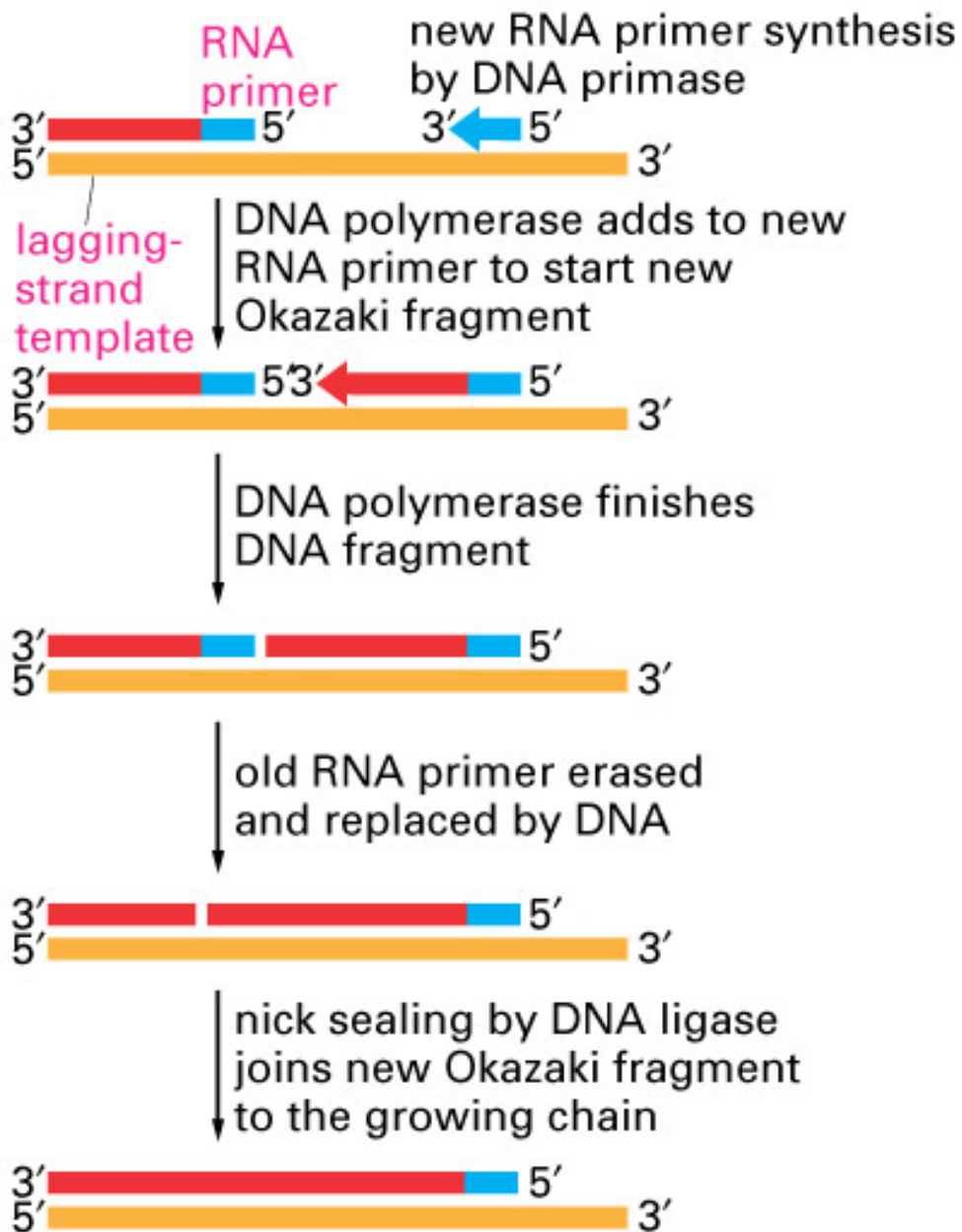
Direcção da Replicação



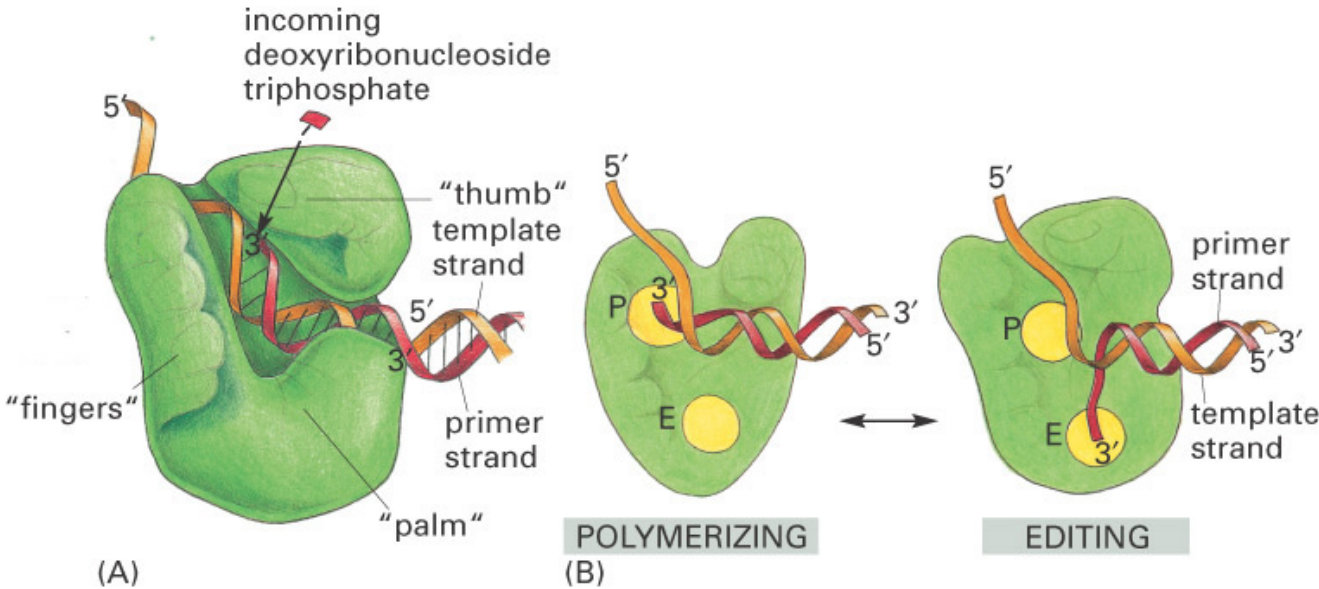
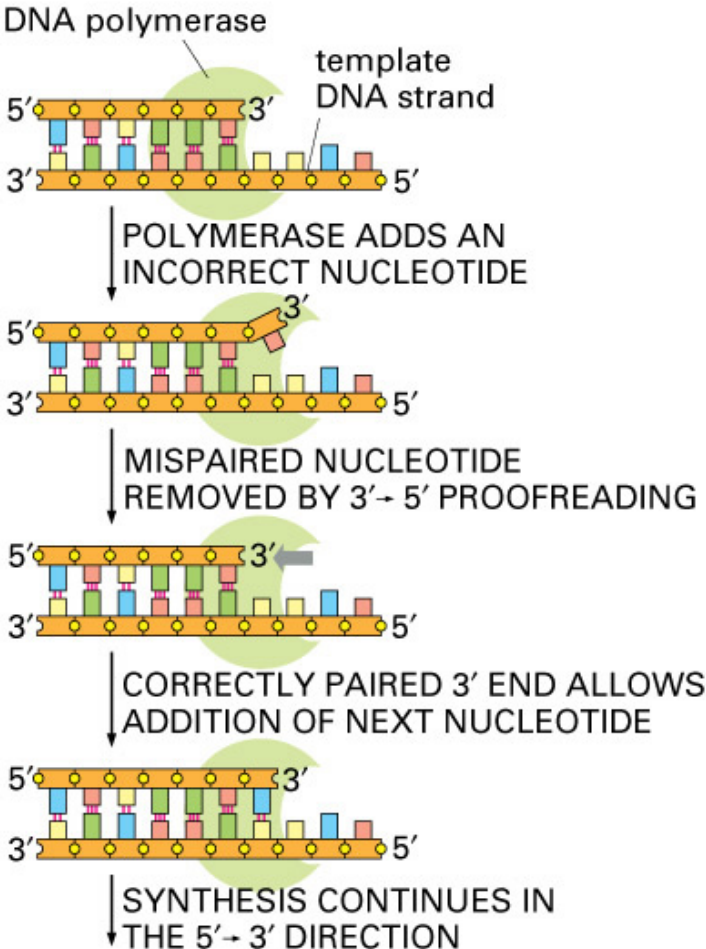
Reacção de Síntese de DNA



Cadeia 'Atrasada' e Fragmentos de Okazaki

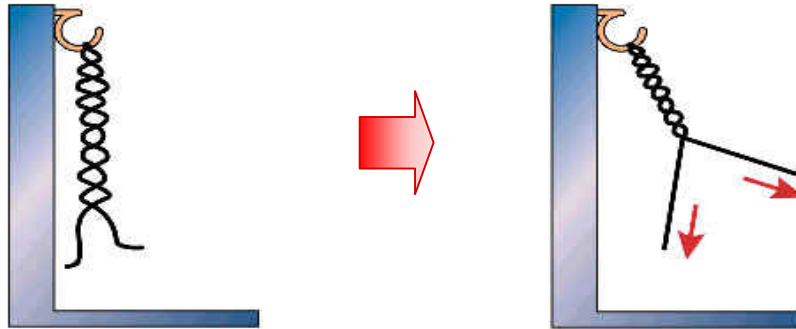


DNA Polymerases: Síntese e Reparação



O Problema Topológico

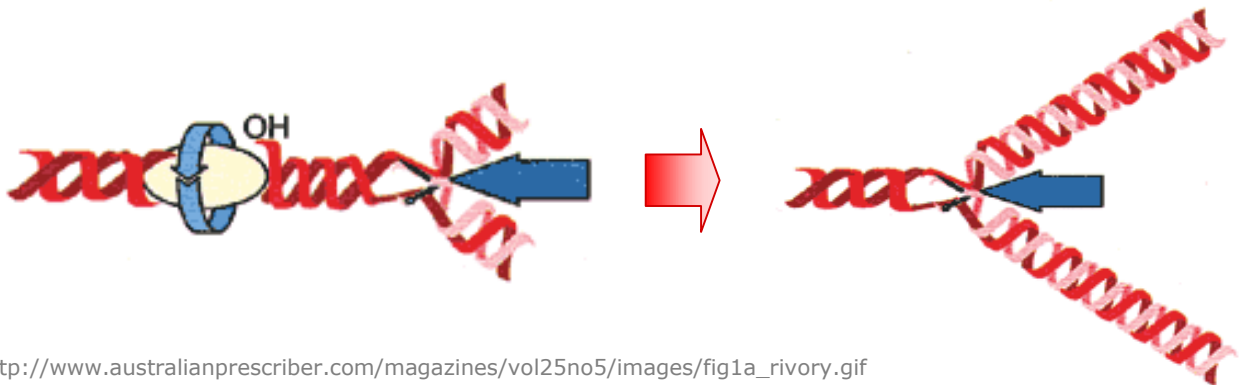
E.coli → 4 000 kb (400 000 voltas de hélice)
Replica-se em 20 min → rotação a 20 000 rpm!



<http://www.usd.edu/~jfallan/risticb413sp2001/lec6.h13.jpg>

A separação das duas cadeias na extremidade livre (*i.e.*, no garfo replicativo) **cria forças de torção crescentes** e faz com que o DNA ainda não separado fique mais fortemente enrolado.

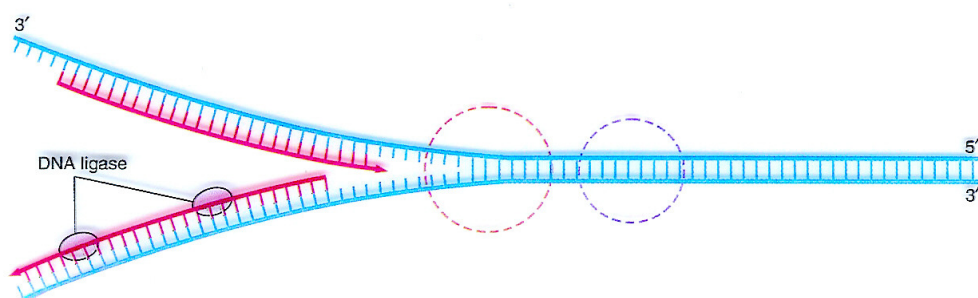
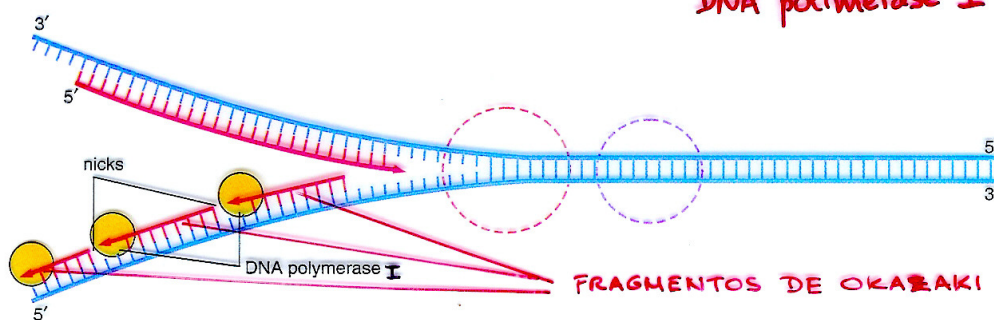
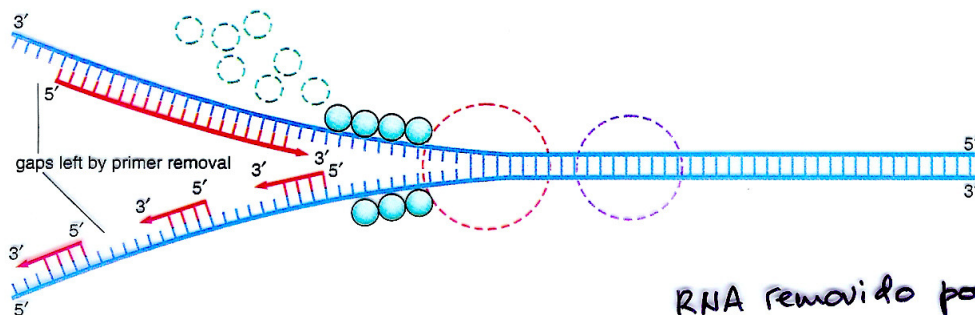
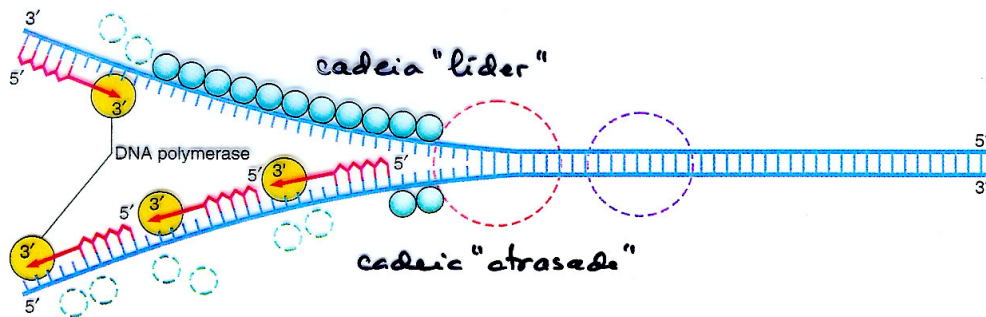
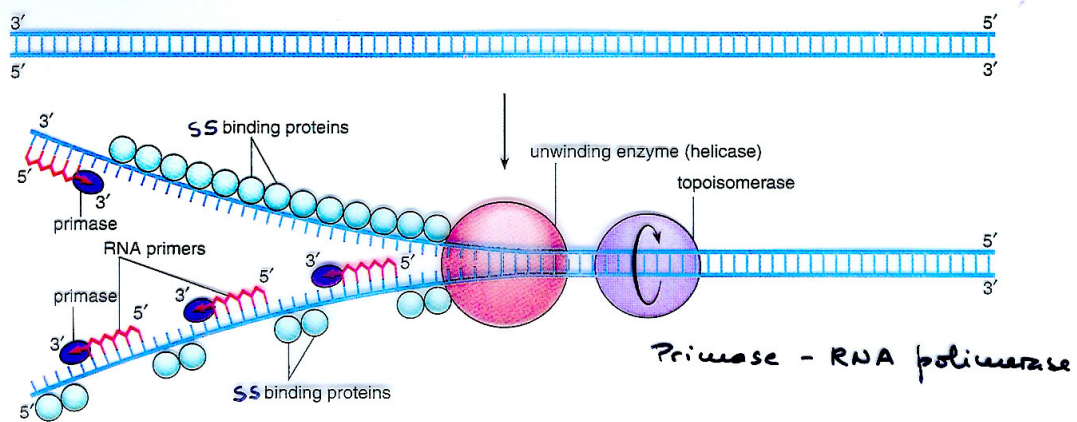
Mecanismo de acção das topoisomerases



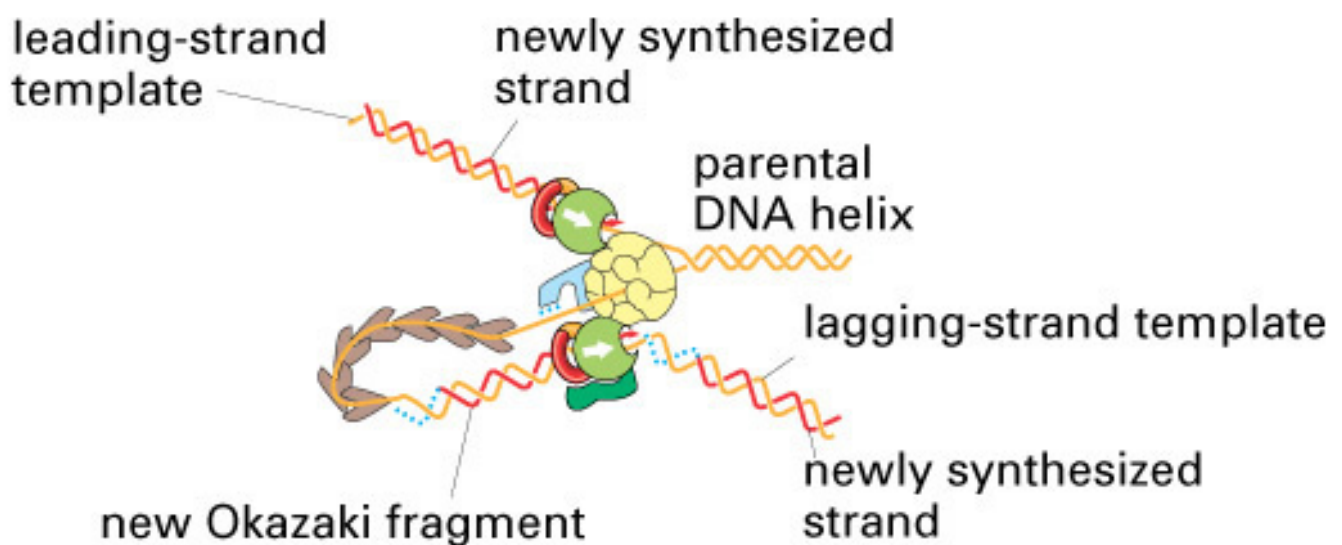
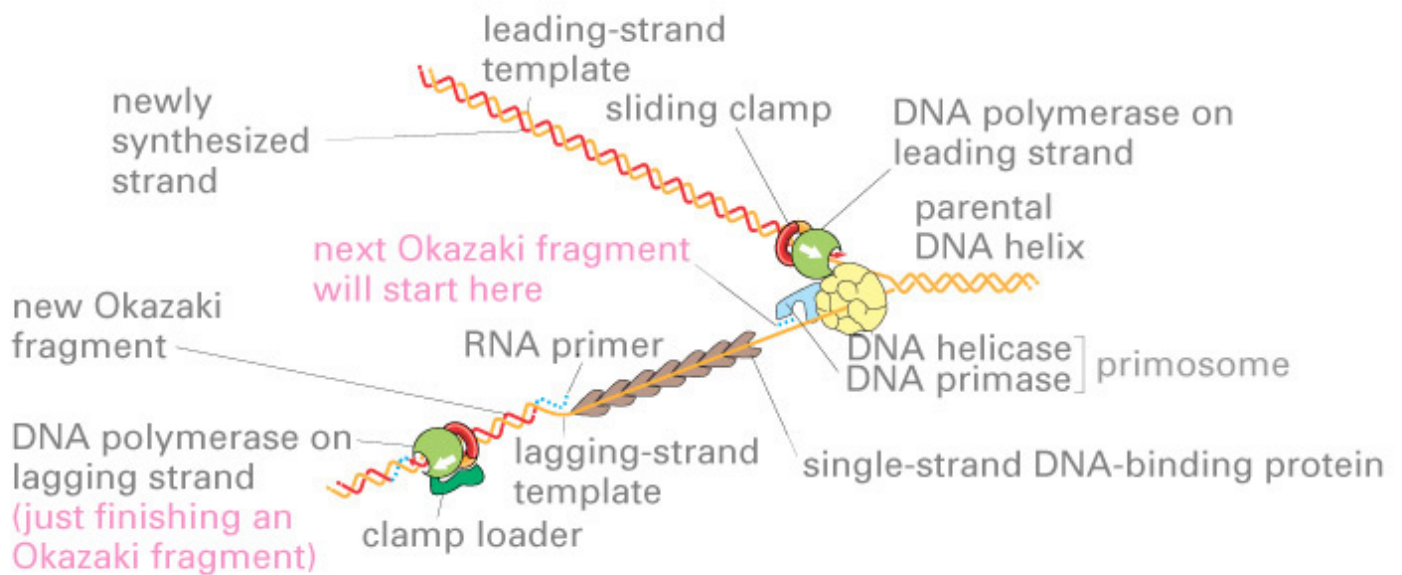
http://www.australianprescriber.com/magazines/vol25no5/images/fig1a_rivory.gif

As **topoisomerases** introduzem um *nick* no DNA, permitindo a **rotação** duma cadeia em torno da outra e **aliviando a força de torção** que se acumula à frente do garfo replicativo. O *nick* é **transitório**, sendo re-ligado imediatamente após a topoisomerase I ter libertado a outra cadeia.

Mecanismo de Síntese de DNA



Resumo dos Acontecimentos no Garfo Replicativo



Replicação nos Telômeros

