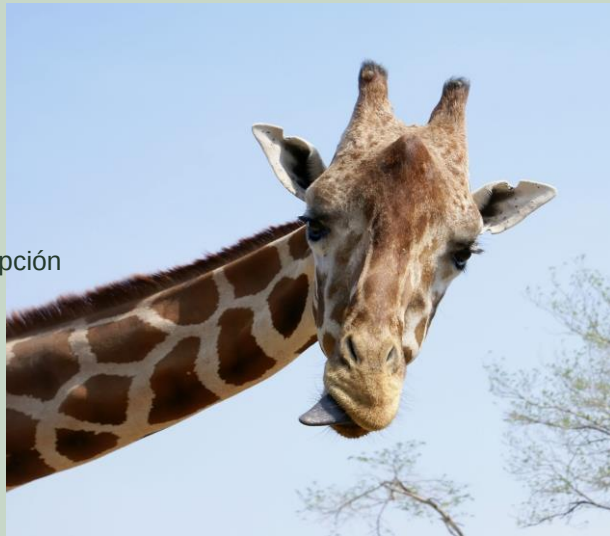
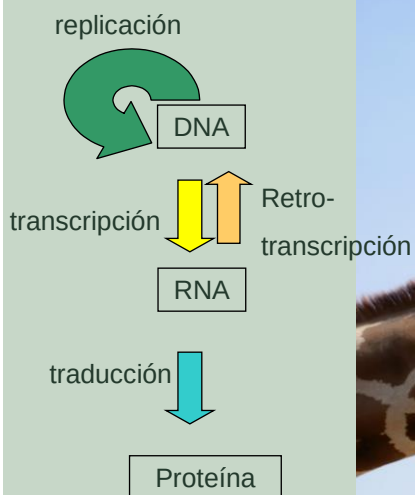
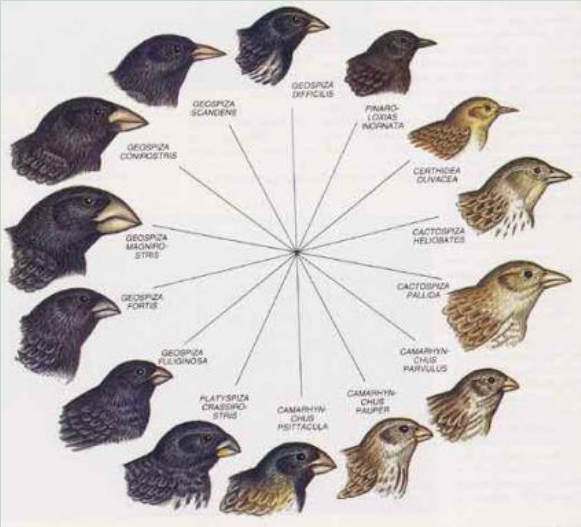
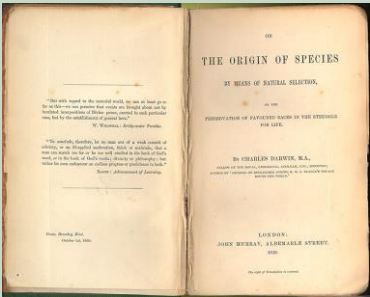


INTRODUCCION A LA BIOLOGIA CELULAR Y MOLECULAR

- Transcripción Genética -

El Dogma Central de la Biología Molecular

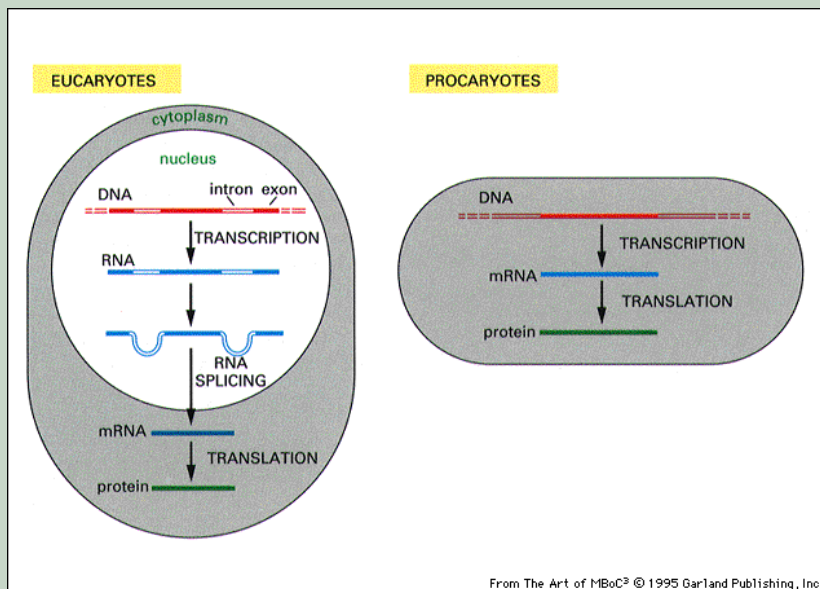




ARN

TYPE OF RNA	FUNCTION
mRNAs	messenger RNAs, code for proteins
rRNAs	ribosomal RNAs, form the basic structure of the ribosome and catalyze protein synthesis
tRNAs	transfer RNAs, central to protein synthesis as adaptors between mRNA and amino acids
snRNAs	small nuclear RNAs, function in a variety of nuclear processes, including the splicing of pre-mRNA
snoRNAs	small nucleolar RNAs, used to process and chemically modify rRNAs
Other noncoding RNAs	function in diverse cellular processes, including telomere synthesis, X-chromosome inactivation, and the transport of proteins into the ER

Eucariotas vs. Procariotas



Genes

“Secuencia completa de ADN que está involucrada en la formación de una cadena polipeptídica o de un RNA funcional”

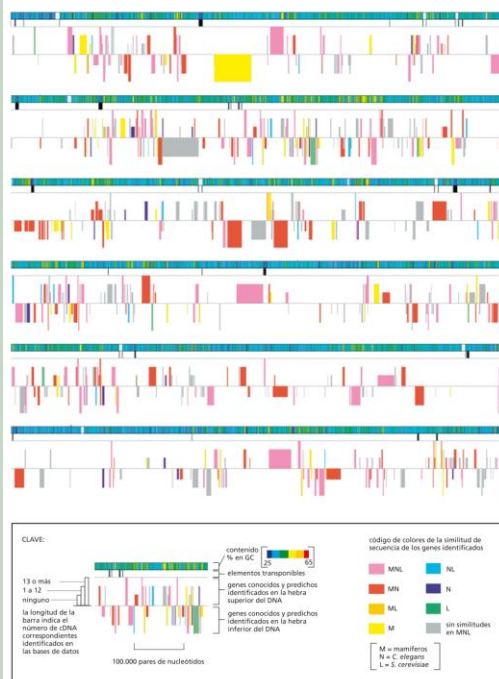
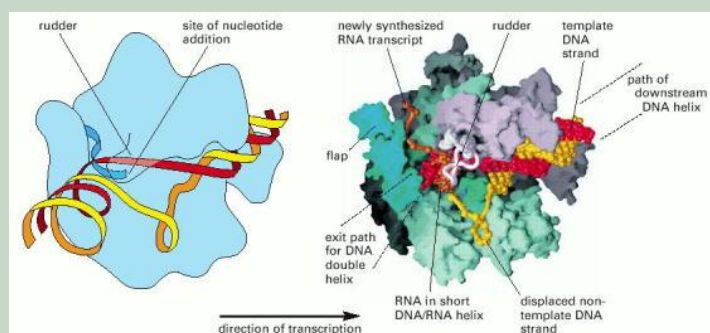
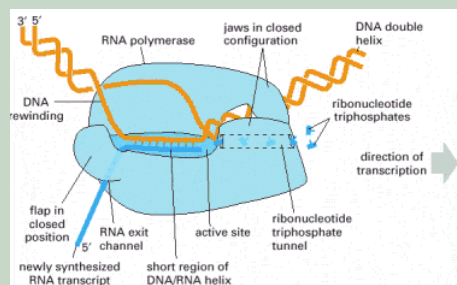
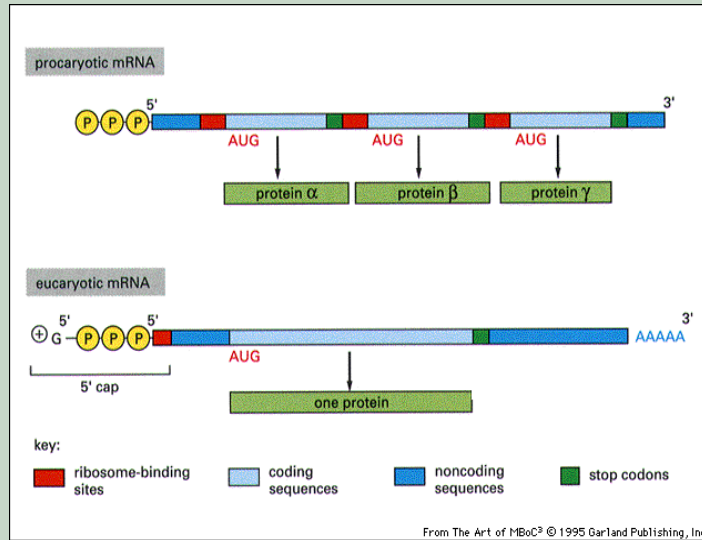


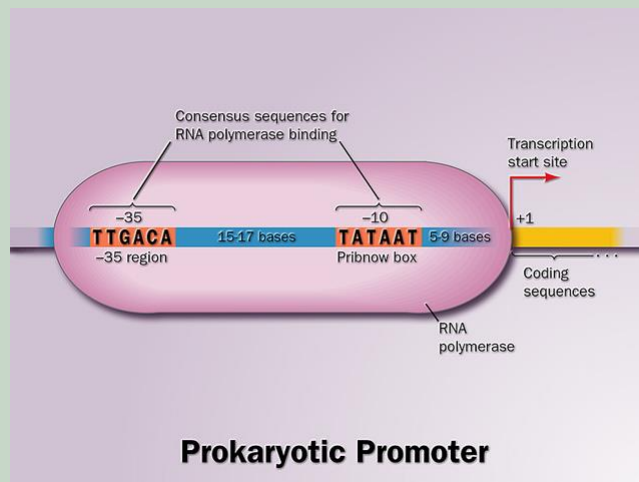
Figura 6-1 Biología molecular de la célula, quinta edición (© Garland Science 2008 y Ediciones Omega 2010)



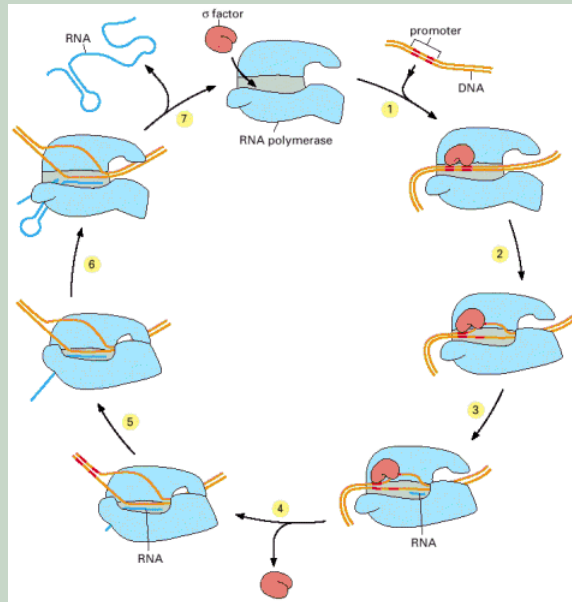
Genes



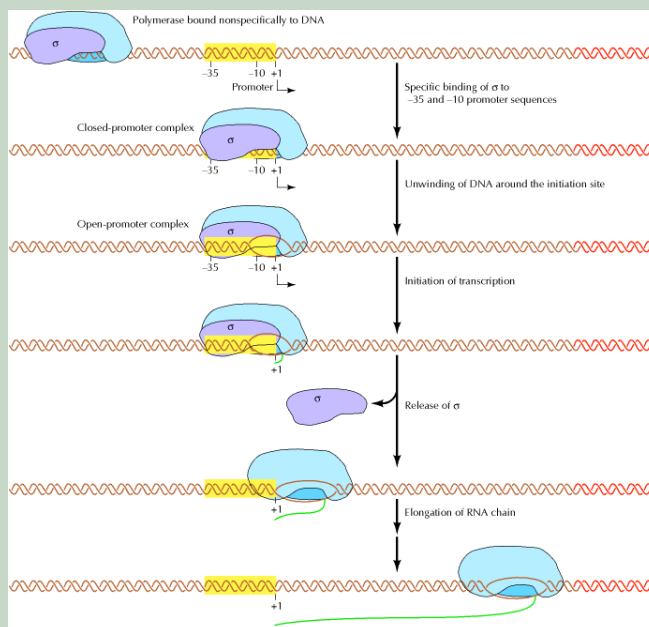
Promotor - PROCARIOTAS



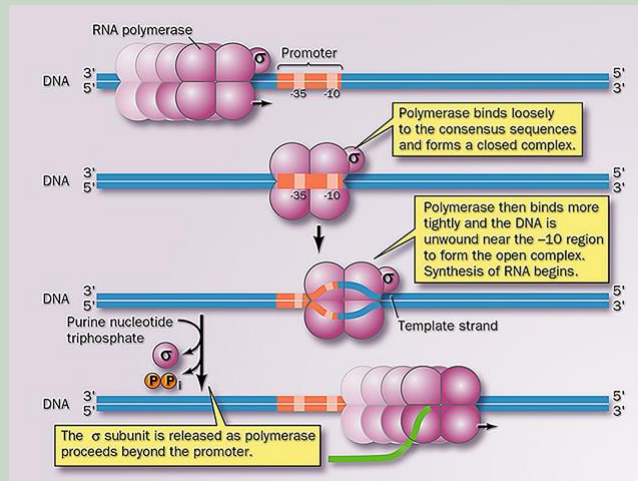
Ciclo de transcripción - PROCARIOTAS



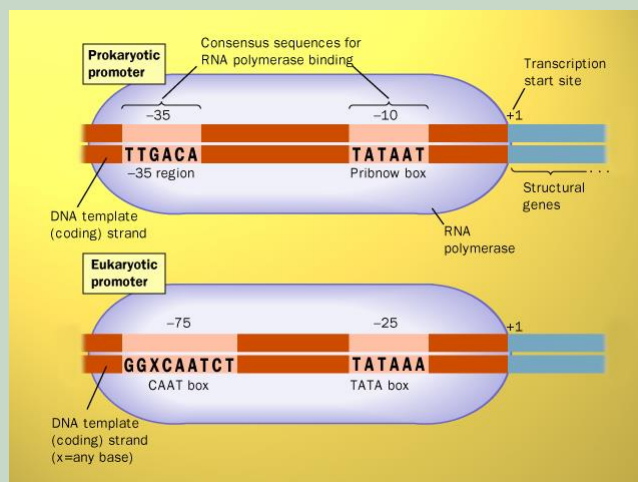
Comienzo de la transcripción- PROCARIOTAS

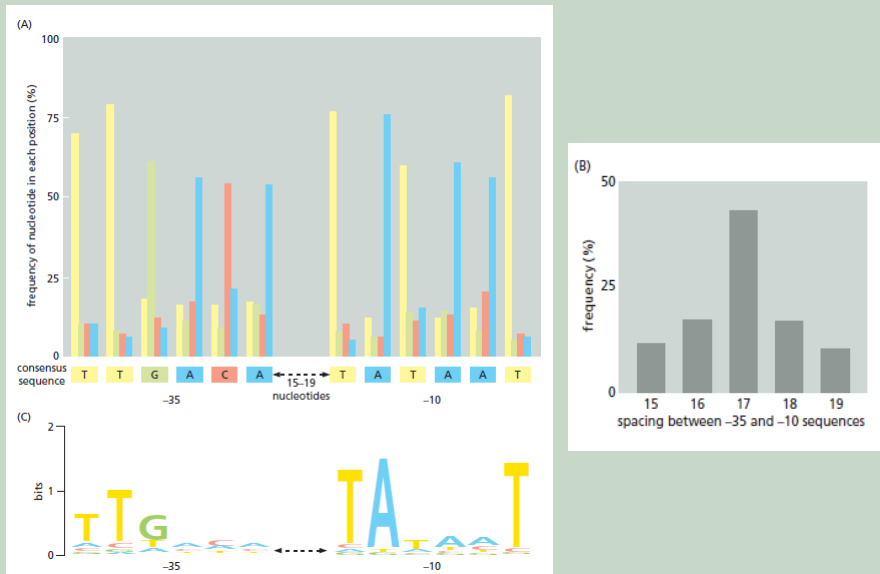


Inicio de la transcripción - Procariotas



Promotores – Procariotas vs Eucariotas



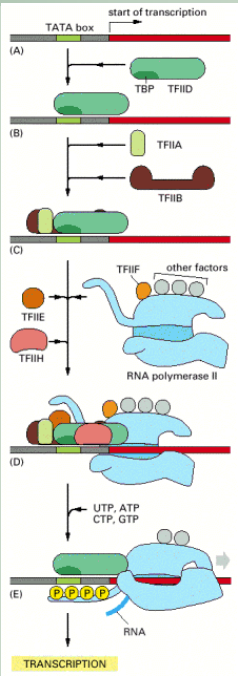


Polimerasas eucariotas

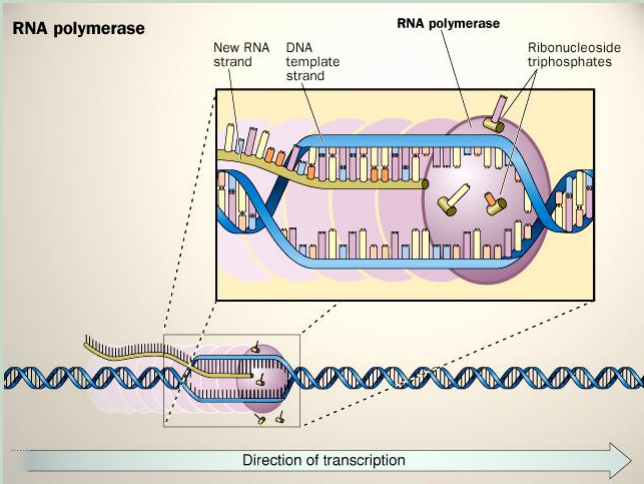
Eukaryotic RNA Polymerases		
Type	Localization	Cellular transcripts
I	Nucleolus	18S, 5.8S, and 28S ribosomal RNAs (rRNA)
II	Nucleoplasm	mRNA precursors and small nuclear RNAs (snRNA)
III	Nucleoplasm	tRNAs and 5S rRNAs

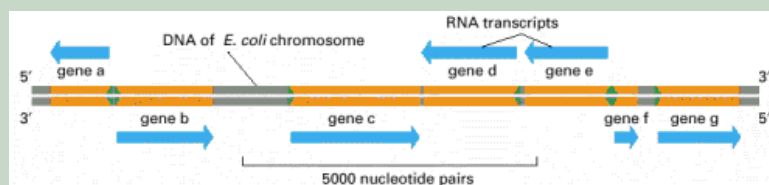
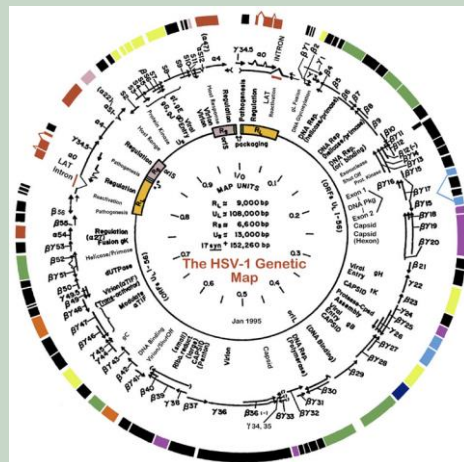
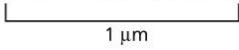
Inicio de la transcripción – ARNpol II (Eucariotas)

	-35	-30		transcription start point	+30
	BRE	TATA		INR	DPE
element	consensus sequence				general transcription factor
BRE	G/C G/C G/A C G C C				TFIIB
TATA	T A T A A/T A A/T				TBP
INR	C/T C/T A N T/A C/T C/T				TFIID
DPE	A/G G A/T C G T G				TFIID

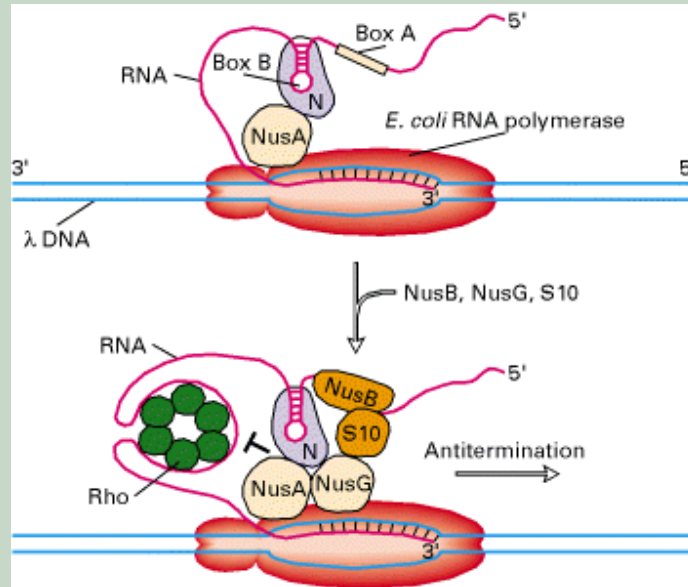


ARN Polimerasa





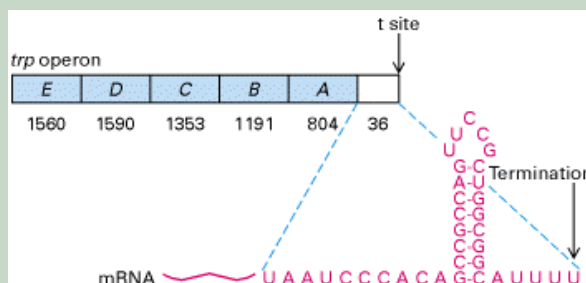
Fin de la transcripción RHO dependiente - PROCARIOTAS



Fin de la transcripción

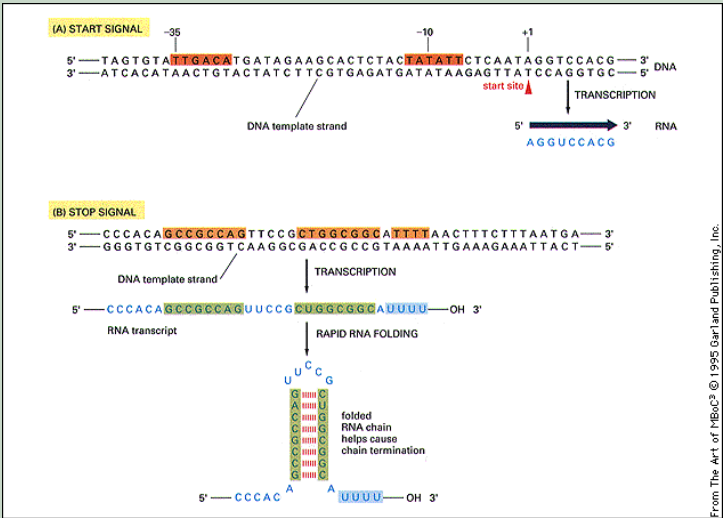
En procariontes se conocen dos sistemas de terminación de la transcripción que involucran a la misma RNA polimerasa, denominados: terminación Rho independiente (la mayoría de los operones) y terminación Rho dependiente

Terminación Rho-independiente: Estas secuencias de terminación poseen dos características típicas, una serie de residuos U en el RNA transcrito, y, antes de estos, una región autocomplementaria rica en GC.

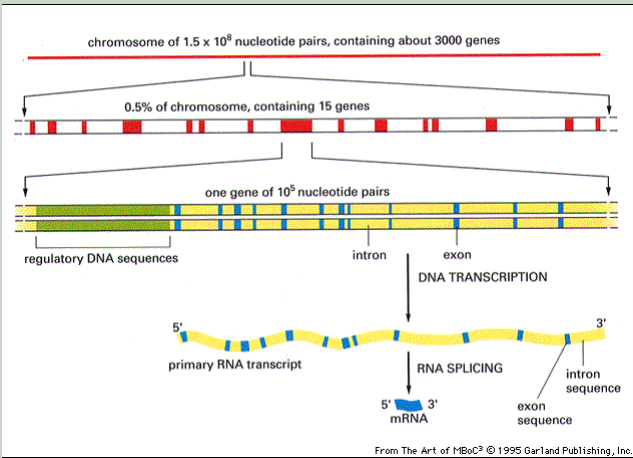


Esta estructura tallo-asa obliga a hacer una pausa a la RNA polimerasa. Además los pares de bases entre los residuos U en el extremo 3' de la hebra de RNA naciente y los residuos de A en la hebra de DNA plantilla son muy inestables en comparación con otros tipos de apareamientos de Watson-Crick

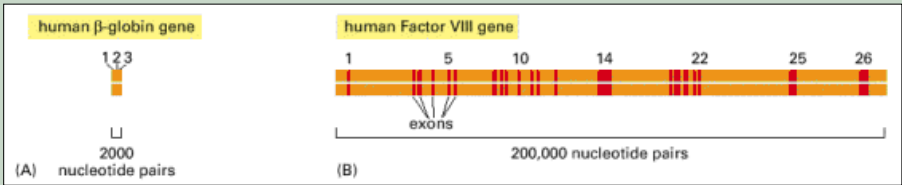
Fin de la transcripción



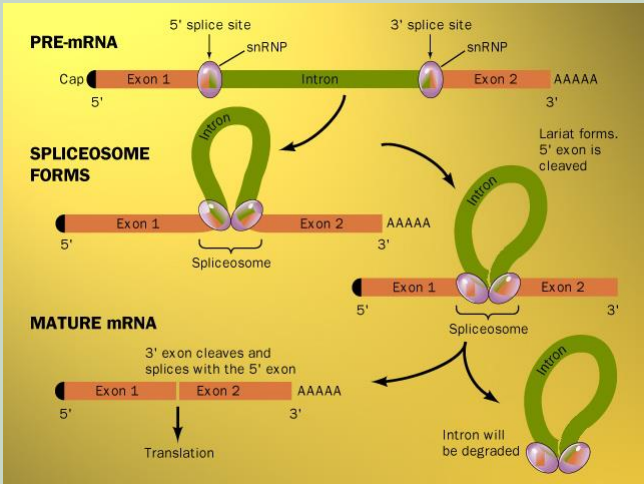
Intrones y exones



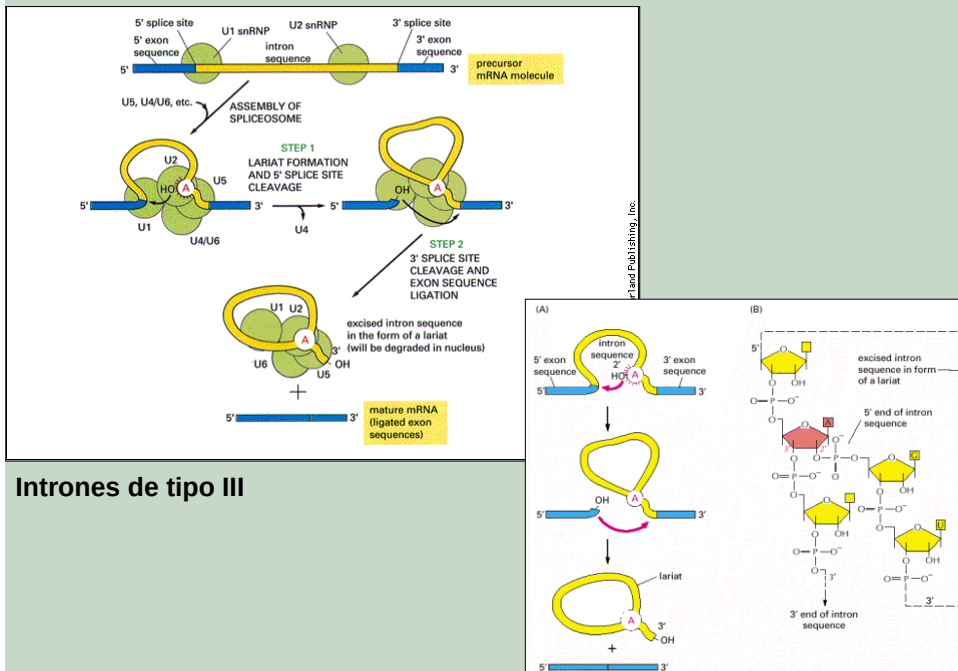
Intrones y exones



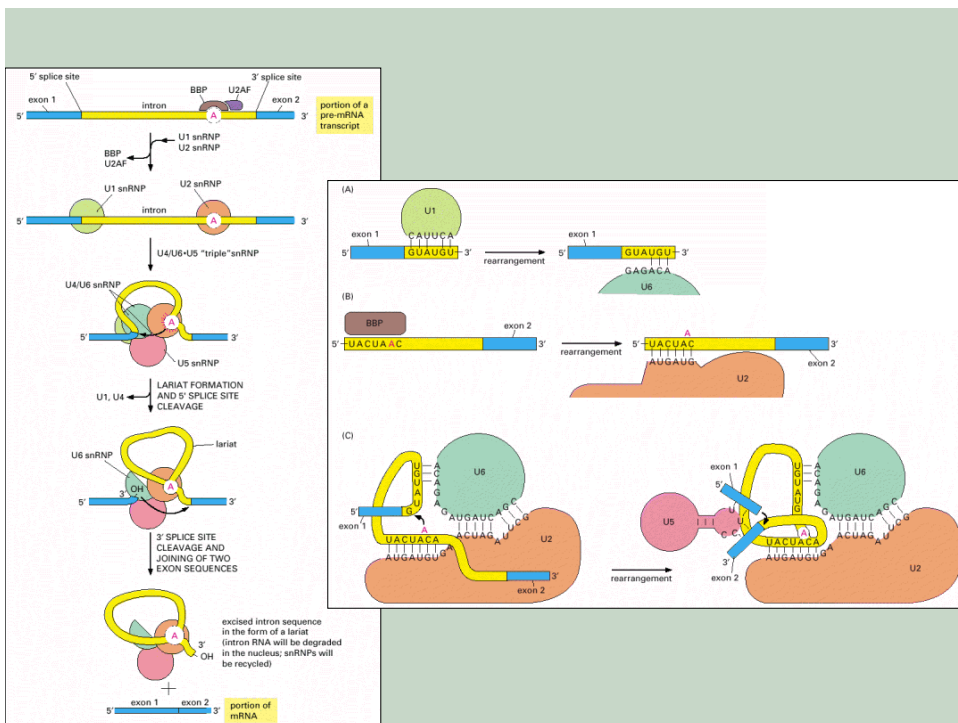
Splicing



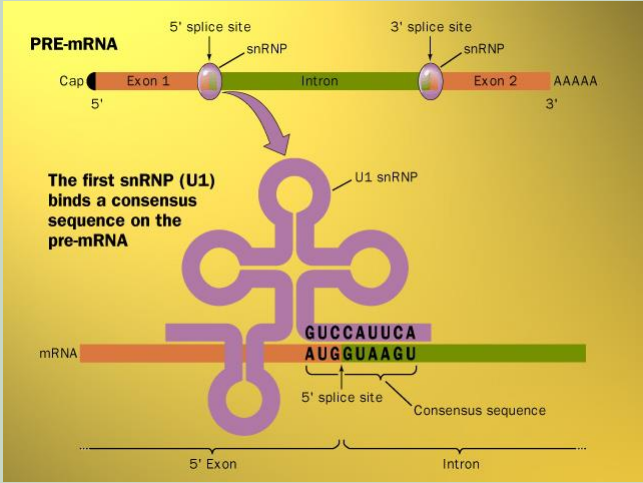
Splicing



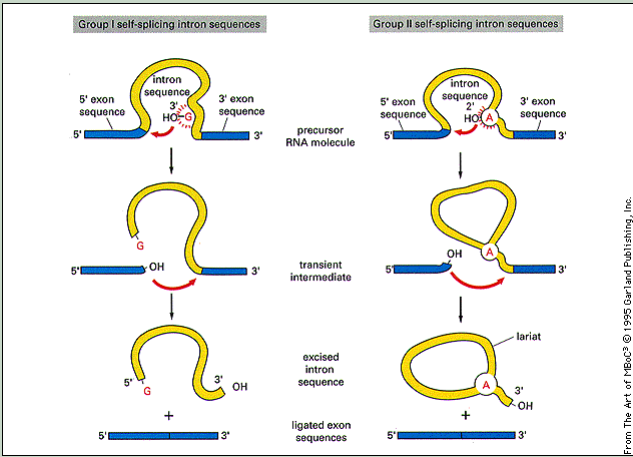
Intrones de tipo III



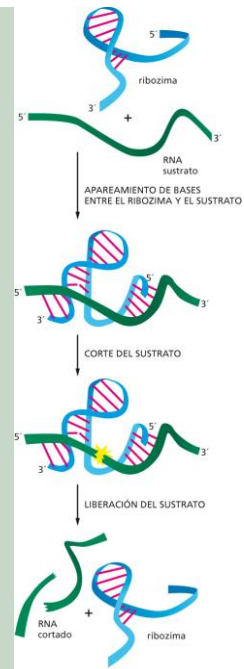
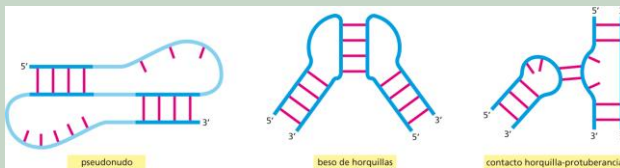
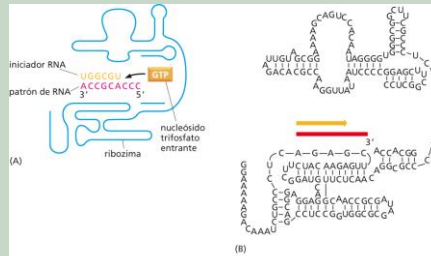
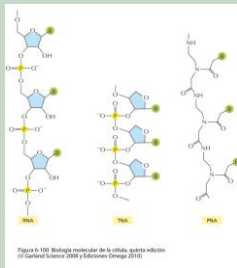
Splicing



Autosplicing – RNA catalitico



Intrones de tipo I y II



Splicing alternativo

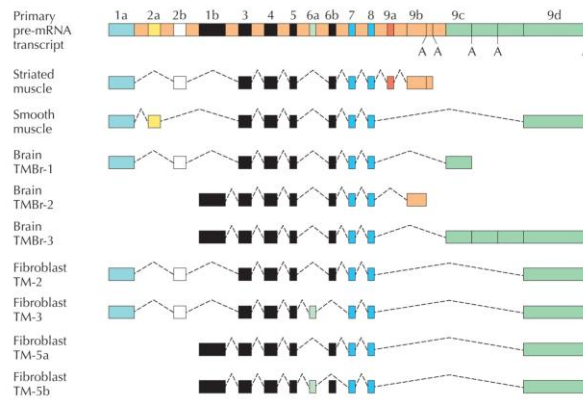
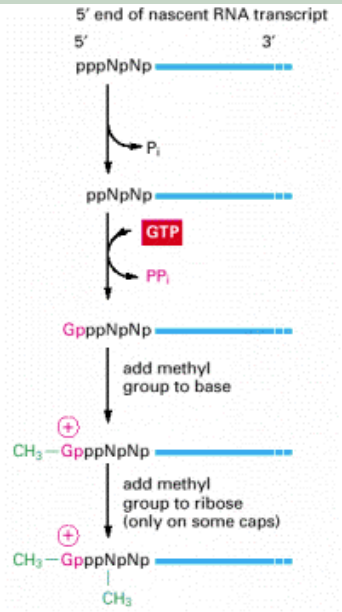
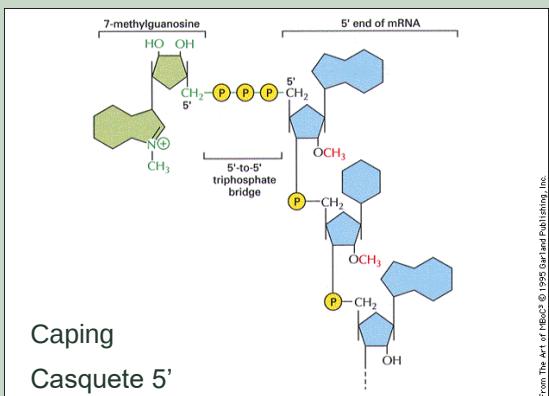


FIGURE 8.22. Alternative splicing. Multiple proteins are known to be made from the α -tropomyosin gene by alternatively splicing in different cell types. The orange boxes in the primary transcript represent introns; all other boxes are exons. For each tissue type the splicing form is shown by lines connecting the exons that are used.

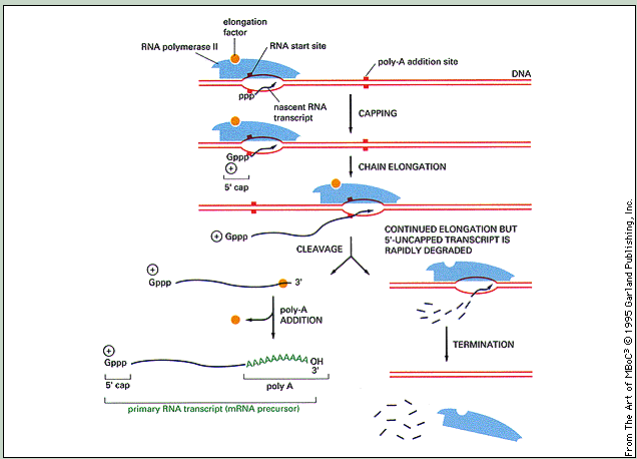
8.22, modified from Lees-Miller J.P. et al., *Mol. Cell. Biol.* 10: 1729–1742, © 1990 American Society for Microbiology

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Maduración del transcrito primario. CAP



ARNm



Poliadenilación

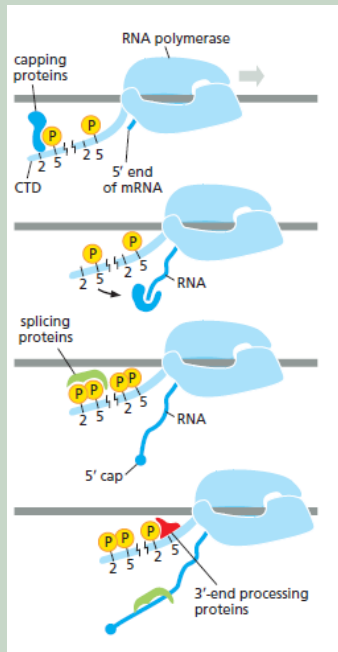
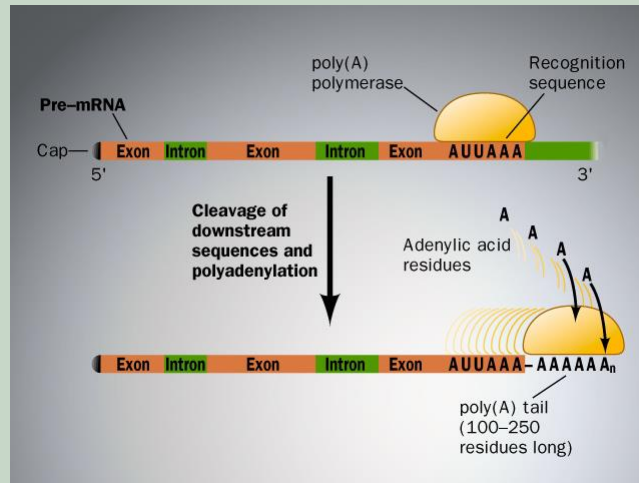
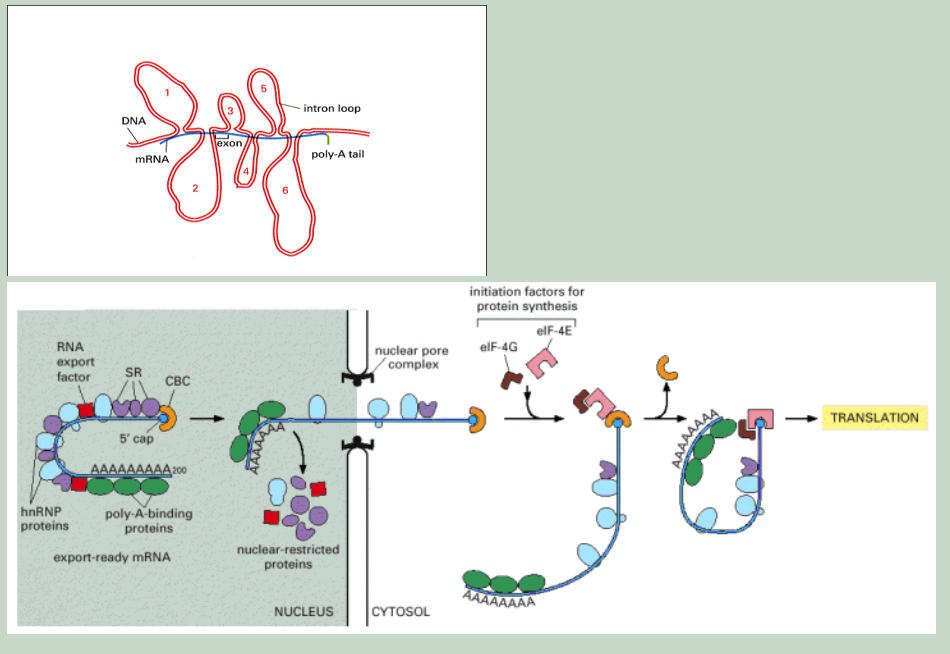
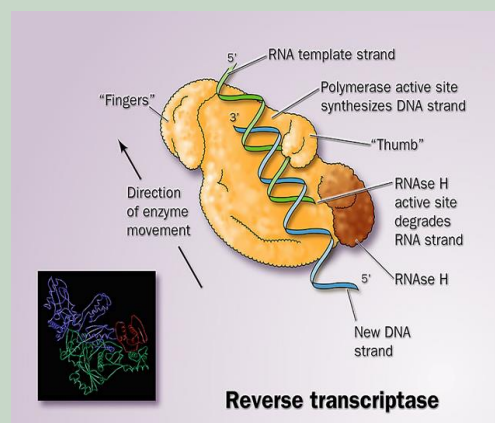
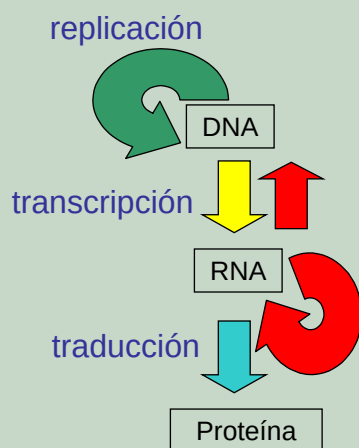


Figure 6-22 Eukaryotic RNA polymerase II as an "RNA factory." As the polymerase transcribes DNA into RNA, it carries RNA-processing proteins on its tail that are transferred to the nascent RNA at the appropriate time. The tail contains 52 tandem repeats of a seven-amino-acid sequence, and there are two serines in each repeat. The capping proteins first bind to the RNA polymerase tail when it is phosphorylated on Ser5 of the heptad repeat late in the process of transcription initiation (see Figure 6-15). This strategy ensures

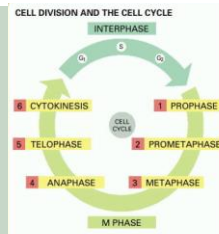
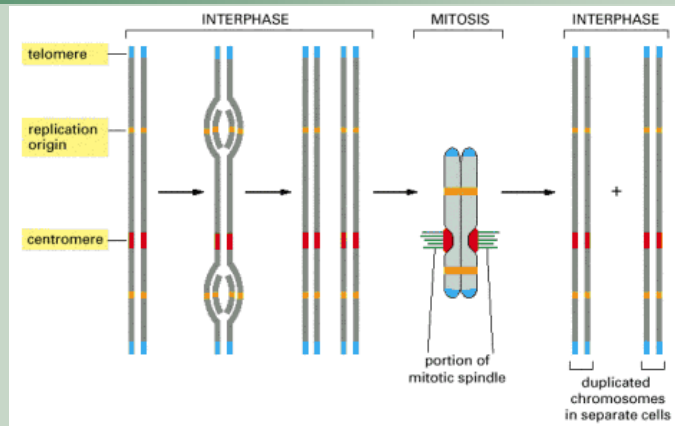
DNA vs. mRNA maduro



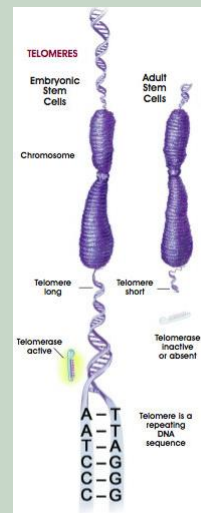
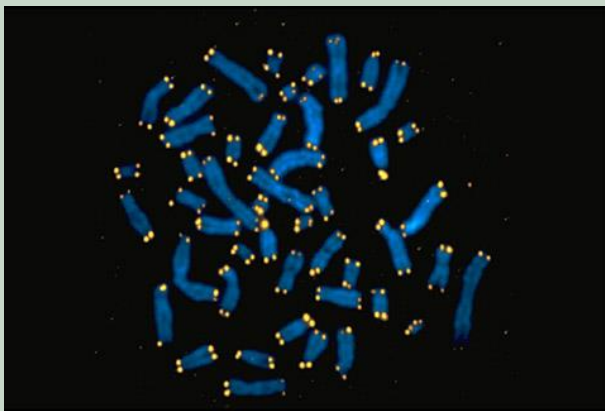
Retrotranscripción y replicación de RNA



ADN



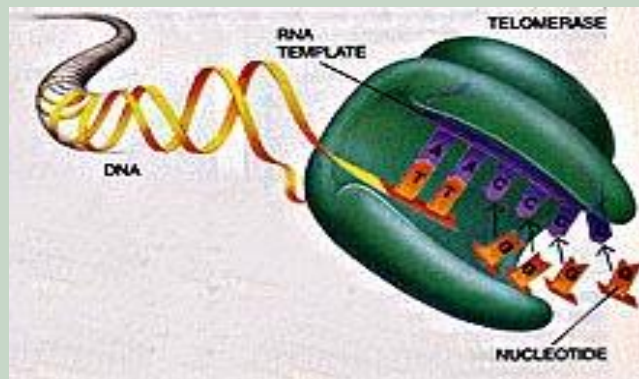
Cromosomas y Telómeros



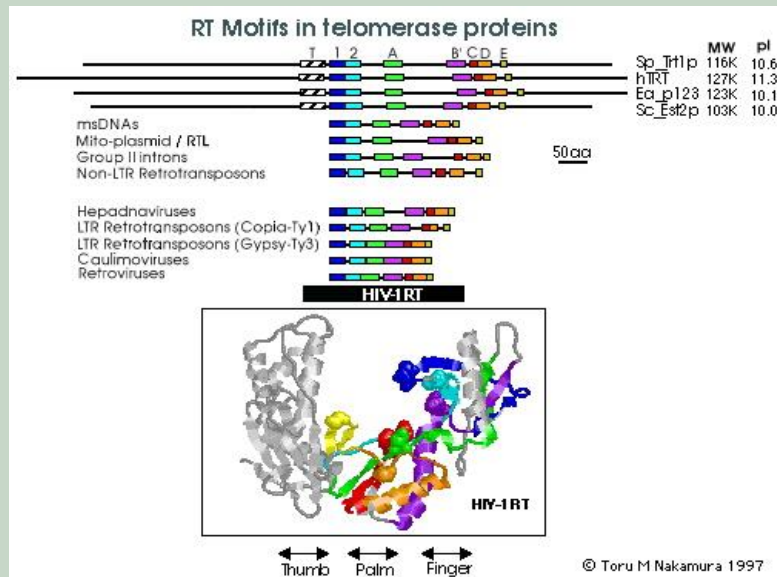
TELOMERASA

Es la enzima responsable de la replicación del ADN telomérico. Es una ribonucleoproteína, que contiene el templado de ARN con el que se impide la pérdida de secuencias que se produciría normalmente en cada división celular.

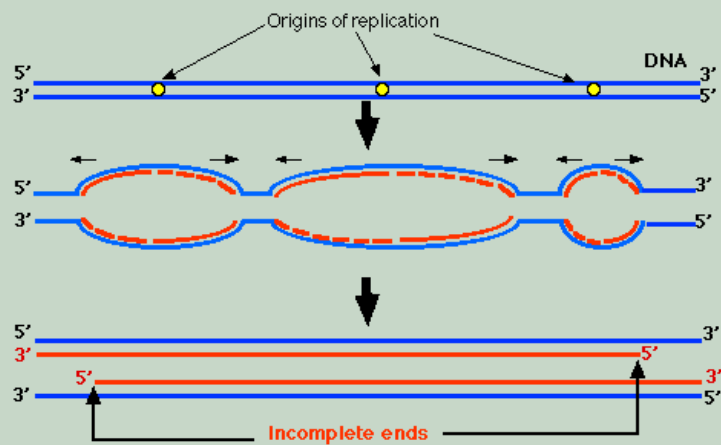
TELOMERASA

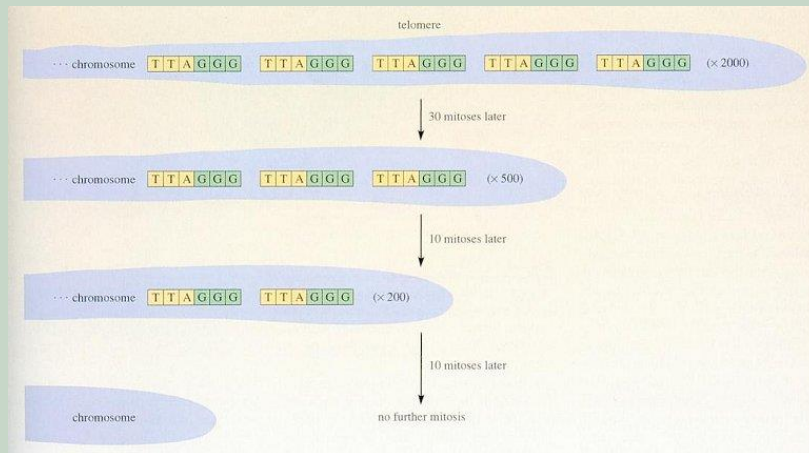


HOMOLOGIA DE LA TELOMERASA



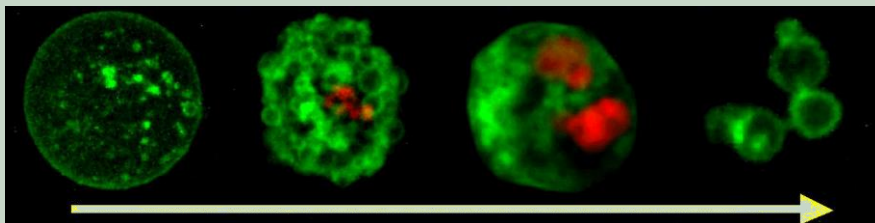
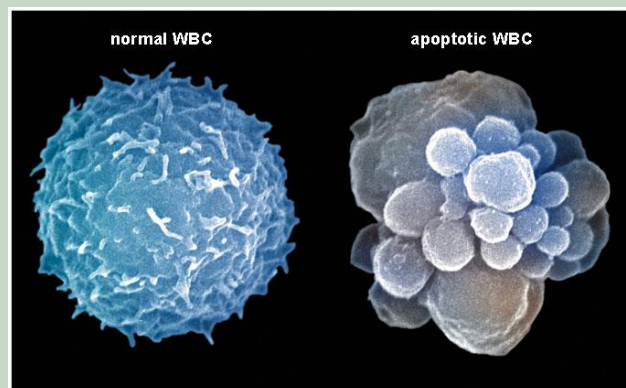
Acortamiento telomérico





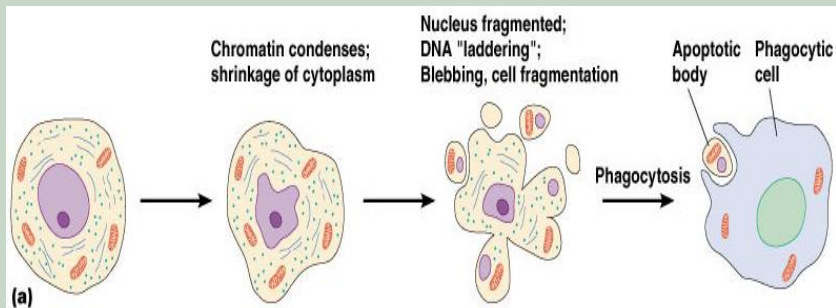
Senescencia Replicativa

Apoptosis



APOPTOSIS VS. NECROSIS

- ACHICAMIENTO CELULAR
- CONDENSACIÓN DE LA CROMATINA
- FRAGMENTACION DEL ADN
- VACUOLIZACION CITOPLASMÁTICA
- LISIS CELULAR



Research article

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Potential involvement of oxidative stress in cartilage senescence and development of osteoarthritis: oxidative stress induces chondrocyte telomere instability and downregulation of chondrocyte function

Kazuo Yudoh, Nguyen van Trieu, Hiroshi Nakamura, Kayo Hongo-Masuko, Tomohiro Kato and Kusuki Nishioka

Department of Bioregulation, Institute of Medical Science, St. Marianna University, Kawasaki City, Japan

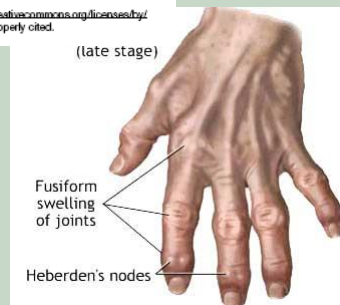
Corresponding author: Kazuo Yudoh, yudo@mariana-u.ac.jp

Received: 13 Nov 2003 Revisions requested: 4 Dec 2003 Revisions received: 25 Nov 2004 Accepted: 10 Dec 2004 Published: 26 Jan 2005

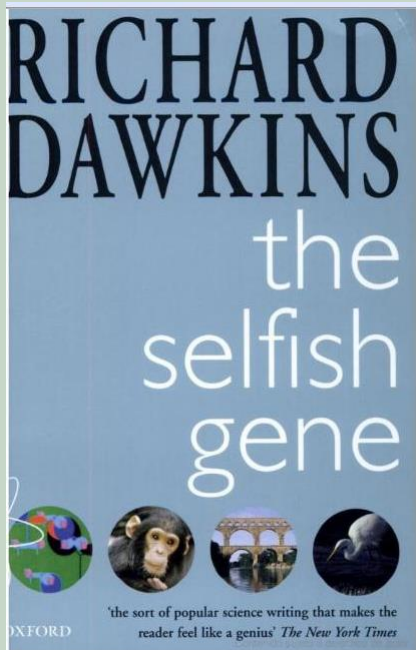
Arthritis Res Ther 2005, 7:R380-R391 (DOI 10.1186/ar1499)

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Progeria



El gen egoísta;
año de
publicación: 1976

