



**Escuela de Verano 2006
Curso Células Cancerosas
Facultad de Medicina**

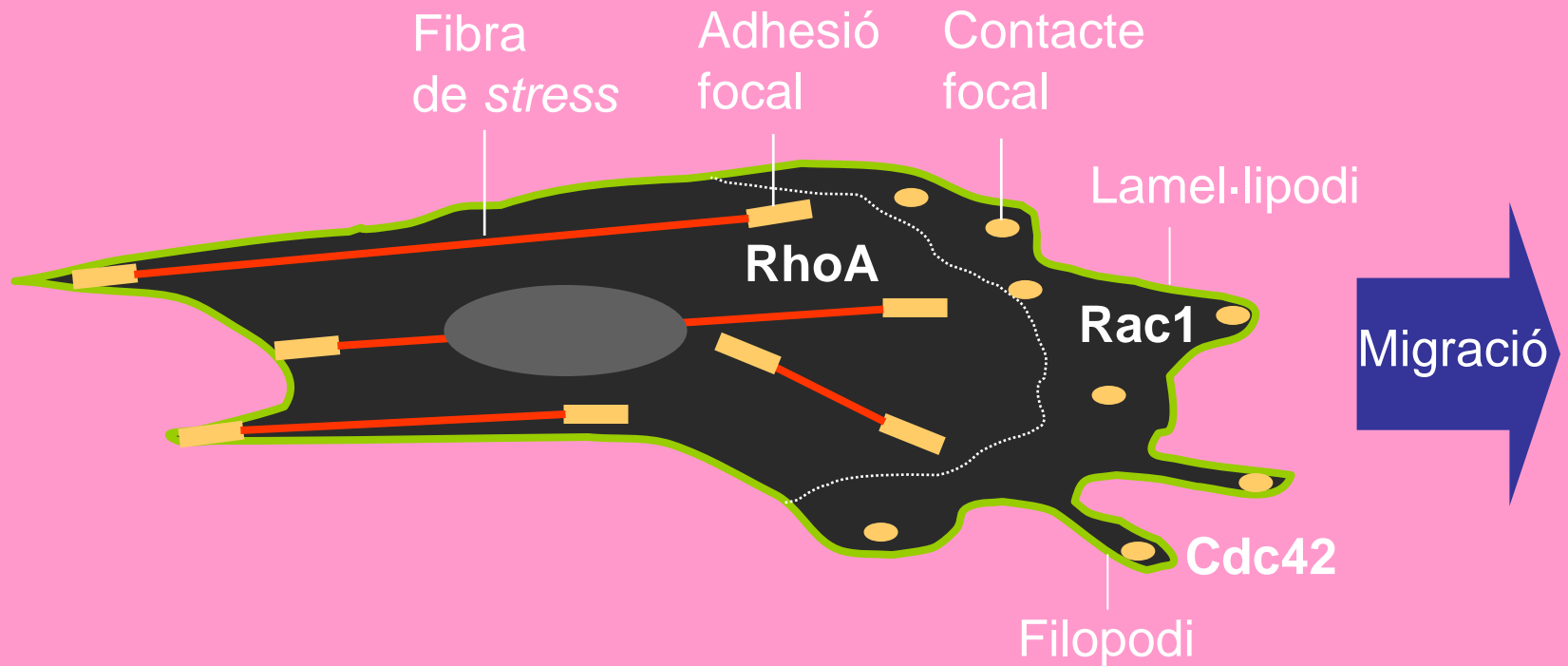


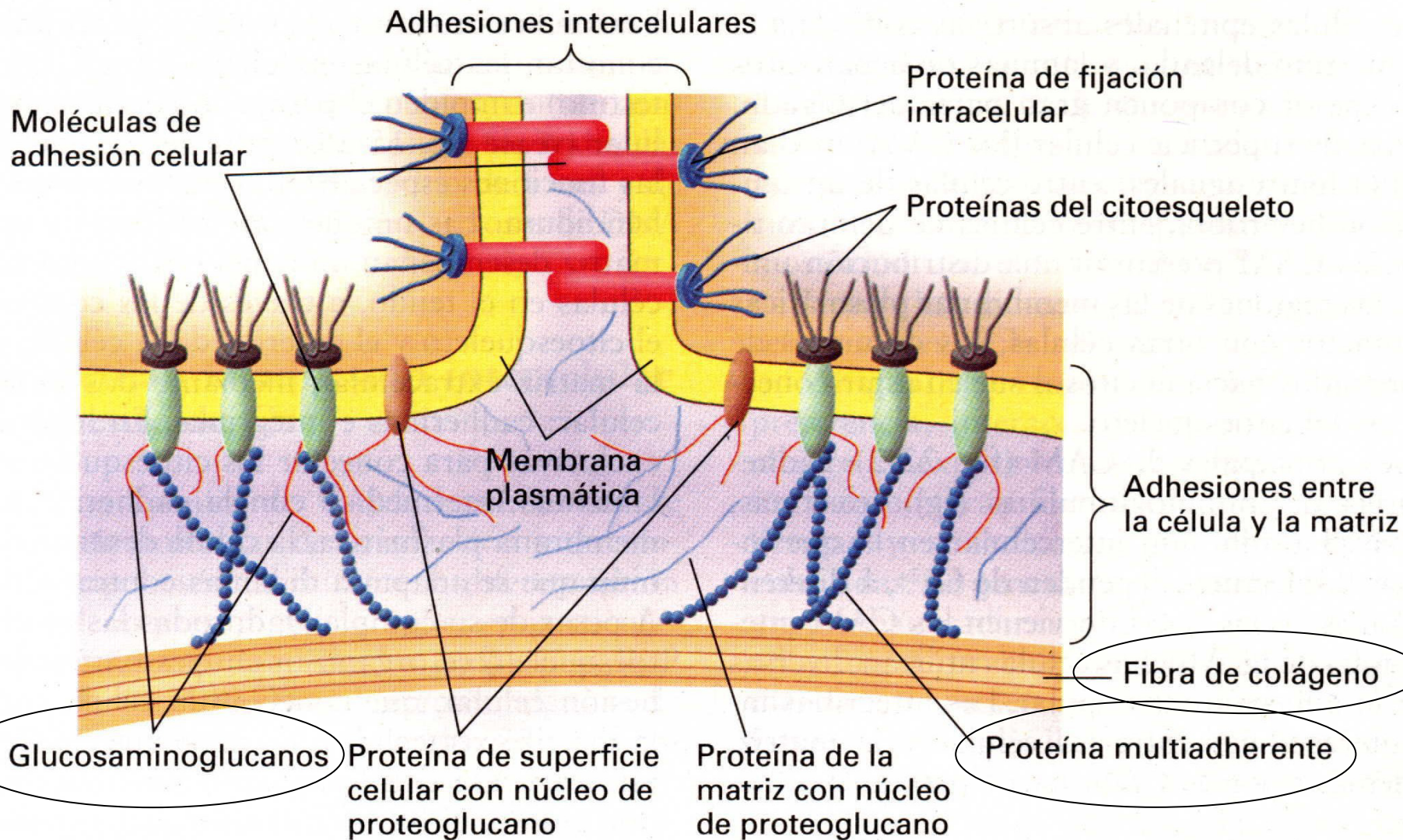
Componentes de matriz extracelular

Héctor R. Contreras M.

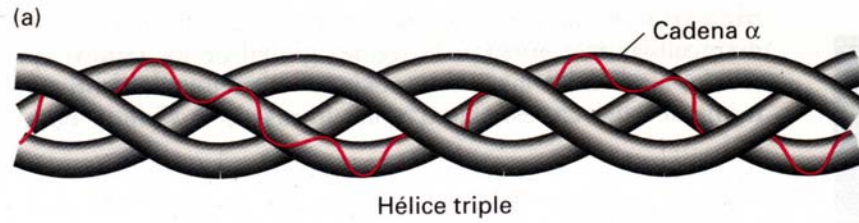
*Programa de Fisiología y Biofísica
Instituto de Ciencias Biomédicas
Facultad de Medicina. Universidad de Chile*

Fibroblast polaritzat en migració.

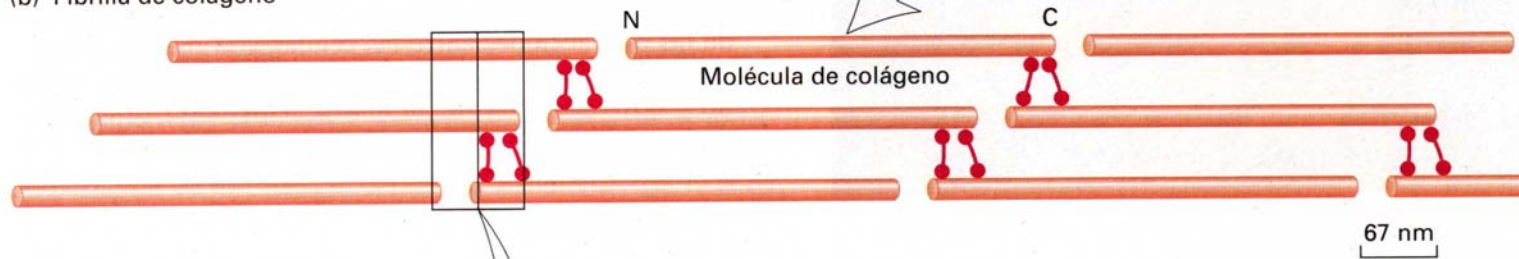




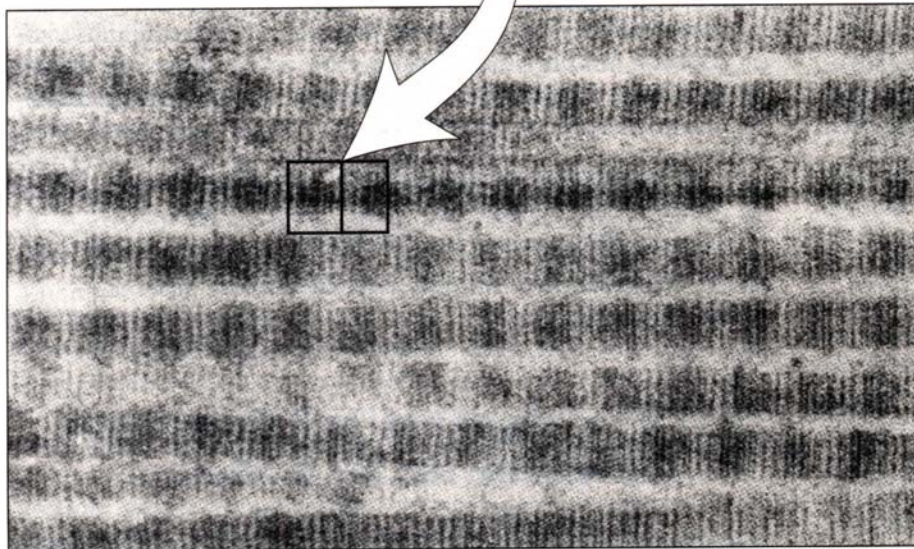
Colágeno

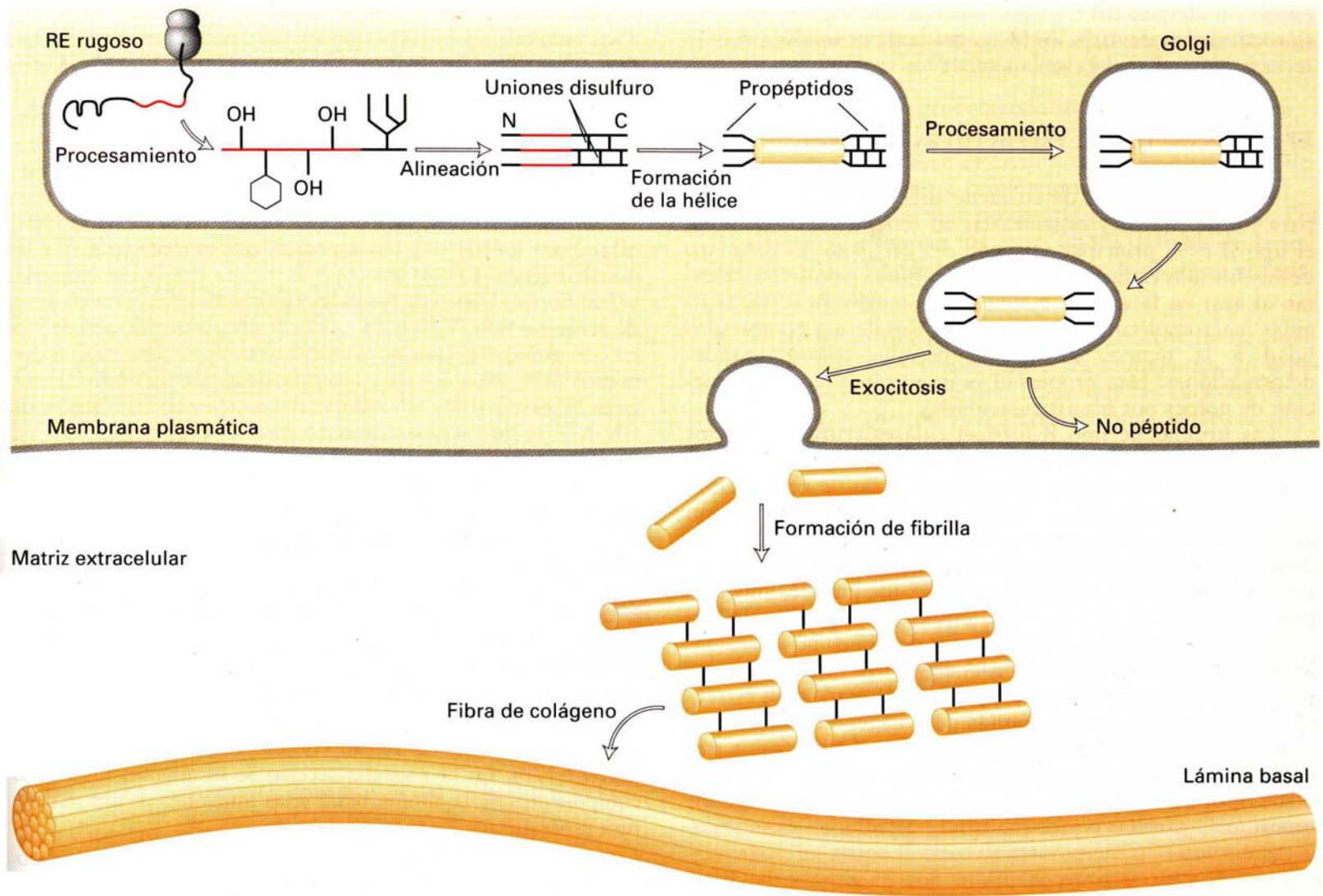


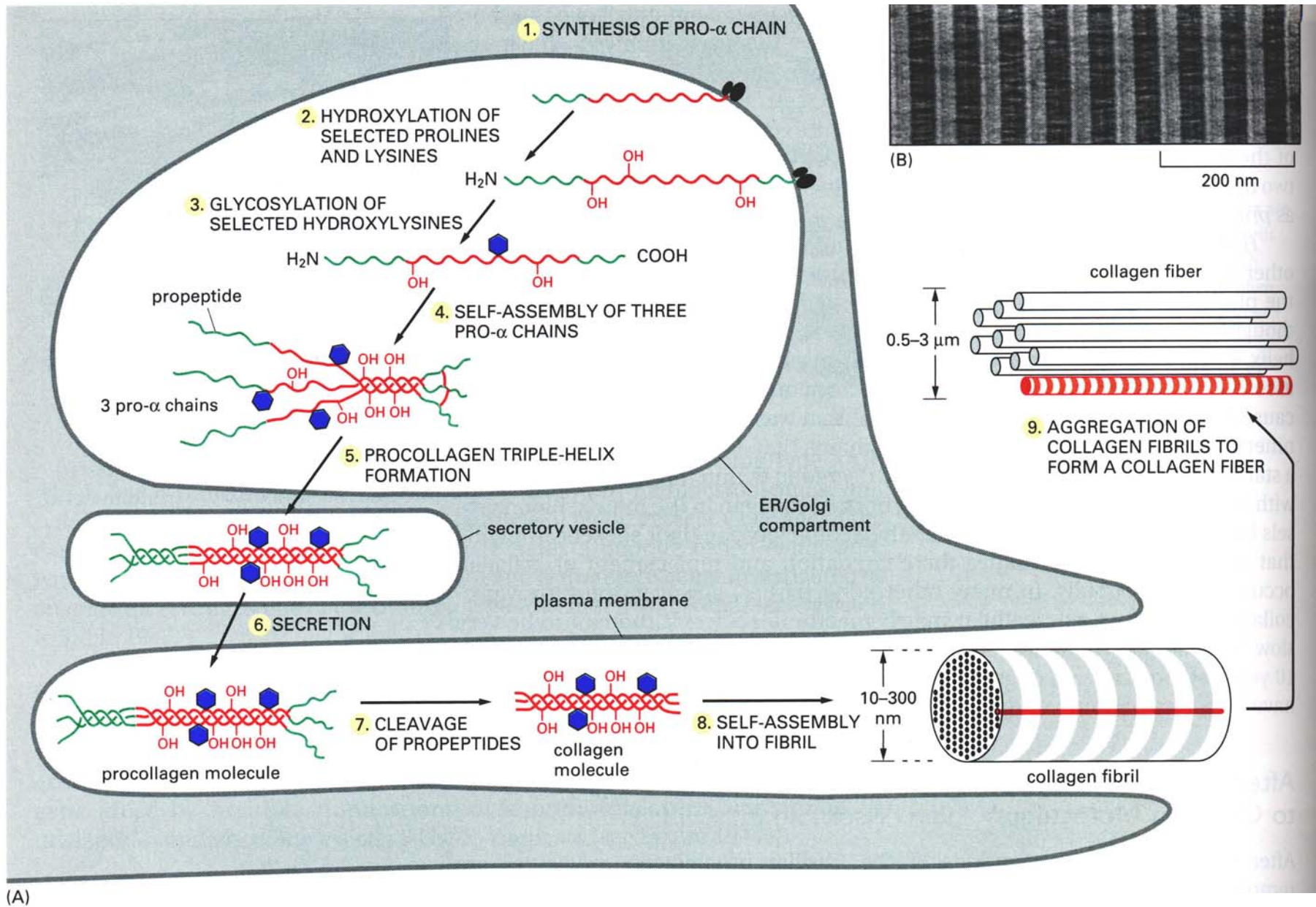
(b) Fibrilla de colágeno

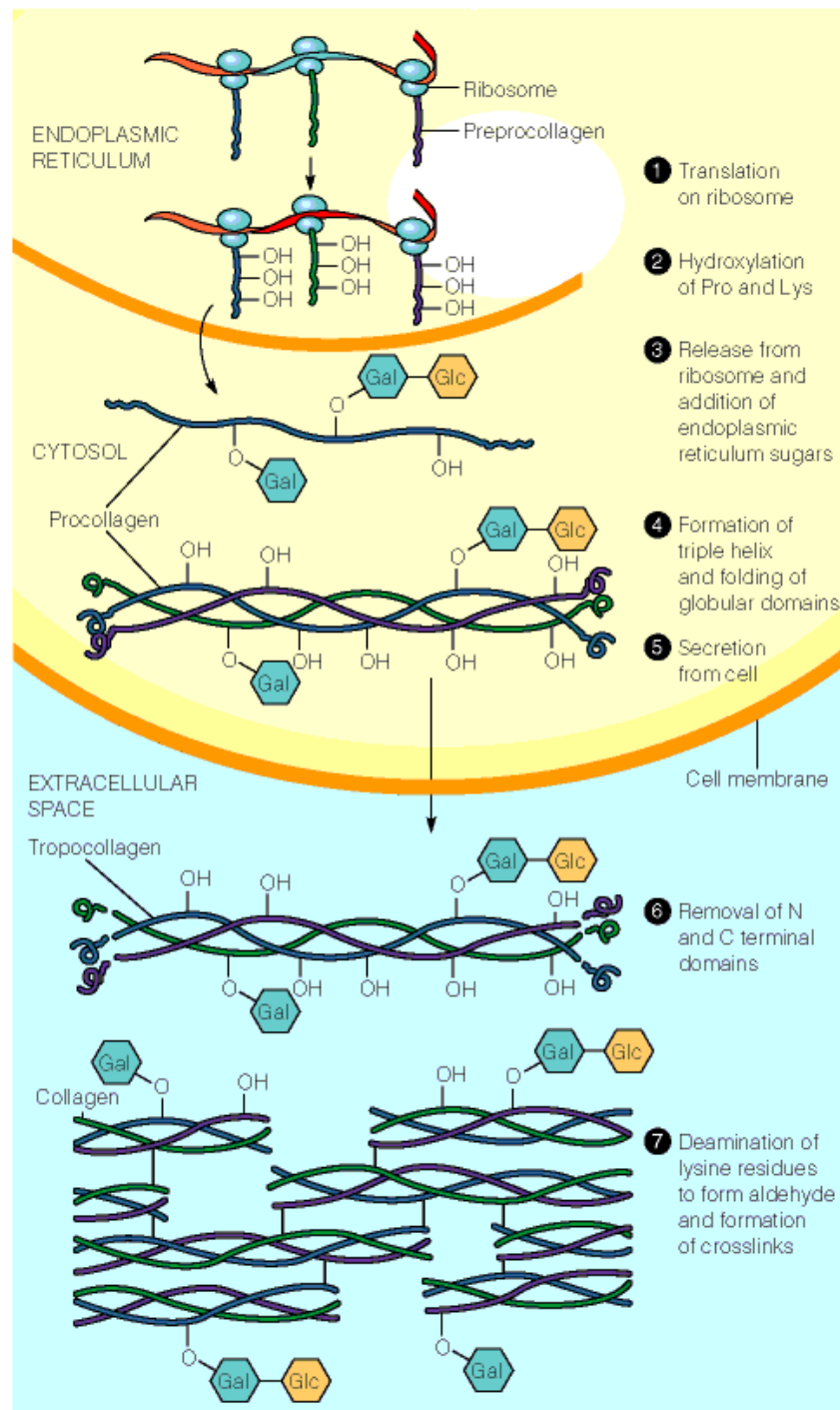


(c) Fibra de colágeno



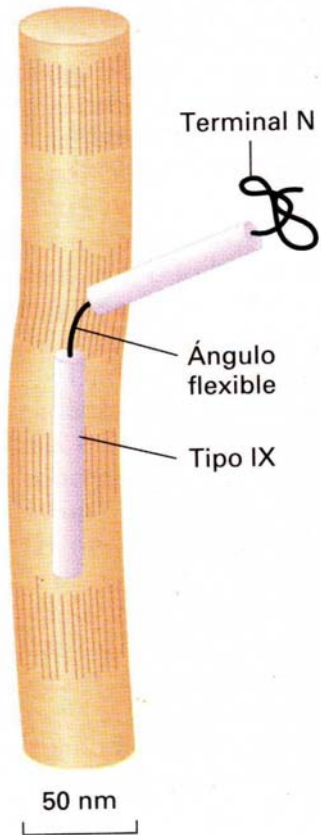






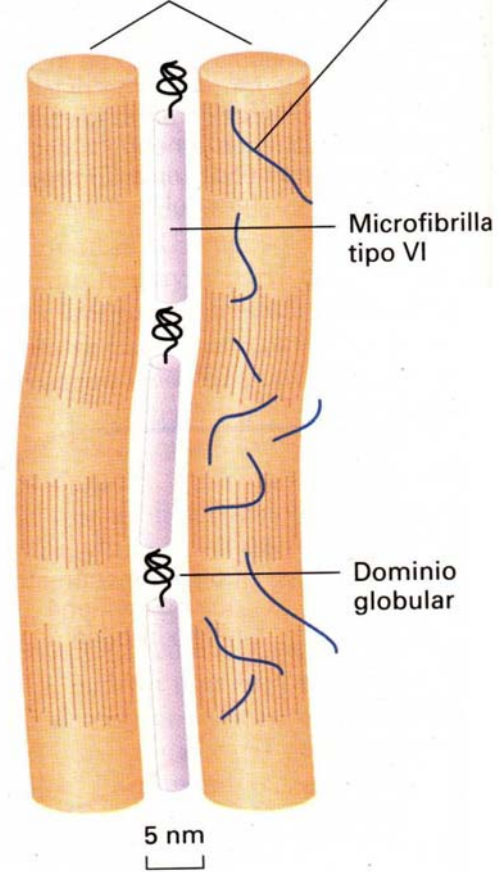
(a)

Fibrilla tipo II

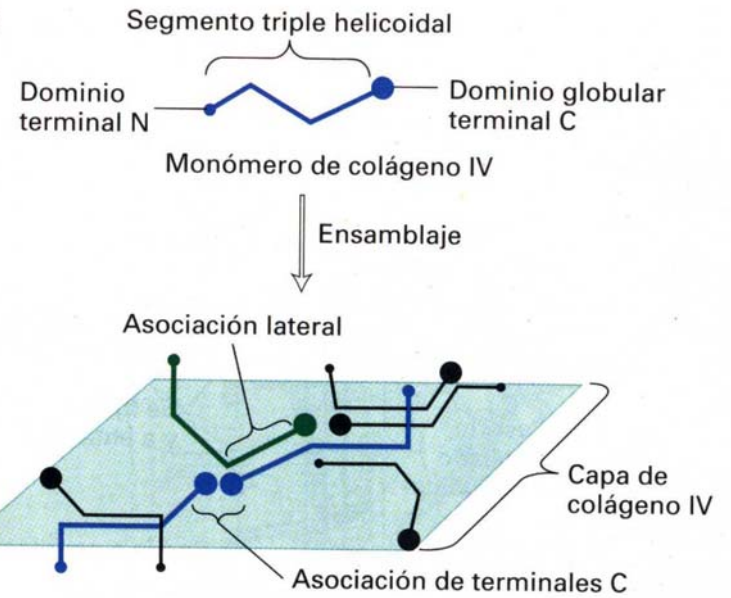


(b)

Fibrilla tipo I



(a)



(b) Retículo tipo IV

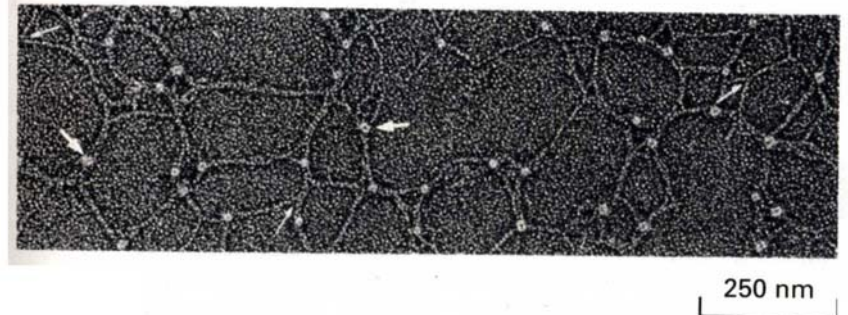
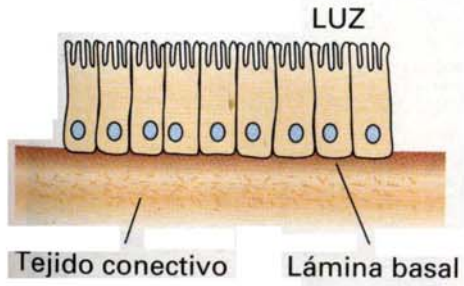


TABLE 19-5 Some Types of Collagen and Their Properties

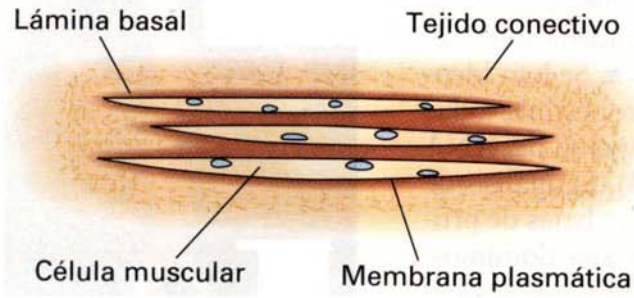
	TYPE	MOLECULAR FORMULA	POLYMERIZED FORM	TISSUE DISTRIBUTION
Fibril-forming (fibrillar)	I	$[\alpha 1(I)]_2\alpha 2(I)$	fibril	bone, skin, tendons, ligaments, cornea, internal organs (accounts for 90% of body collagen)
	II	$[\alpha 1(II)]_3$	fibril	cartilage, intervertebral disc, notochord, vitreous humor of the eye
	III	$[\alpha 1(III)]_3$	fibril	skin, blood vessels, internal organs
	V	$[\alpha 1(V)]_2\alpha 2(V)$ and $\alpha 1(V)\alpha 2(V)\alpha 3(V)$	fibril (with type I)	as for type I
	XI	$\alpha 1(XI)\alpha 2(IX)\alpha 3(XI)$	fibril (with type II)	as for type II
Fibril-associated	IX	$\alpha 1(IX)\alpha 2(IX)\alpha 3(IX)$	lateral association with type II fibrils	cartilage
	XII	$[\alpha 1(XII)]_3$	lateral association with some type I fibrils	tendons, ligaments, some other tissues
Network-forming	IV	$[\alpha 1(IV)]_2\alpha 2(IV)$	sheetlike network	basal lamina
	VII	$[\alpha 1(VII)]_3$	anchoring fibrils	beneath stratified squamous epithelia
Transmembrane	XVII	$[\alpha 1(XVII)]_3$	not known	hemidesmosomes
Others	XVIII	$[\alpha 1(XVIII)]_3$	not known	basal lamina around blood vessels

Note that types I, IV, V, IX, and XI are each composed of two or three types of α chains, whereas types II, III, VII, XII, XVII, and XVIII are composed of only one type of α chain each. Only 11 types of collagen are shown, but about 20 types of collagen and about 25 types of α chains have been identified so far.

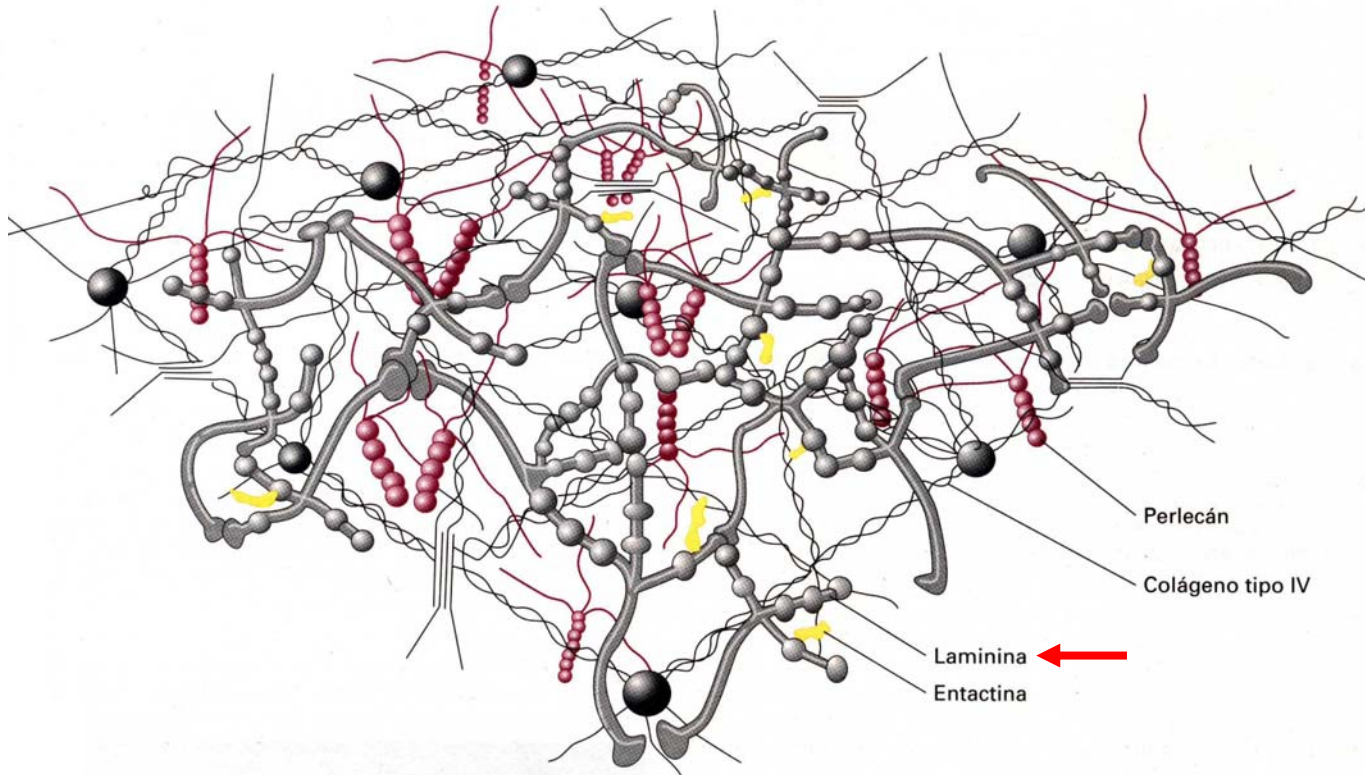
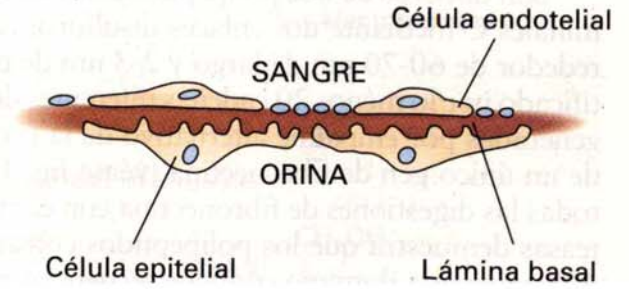
(a) Lámina epitelial



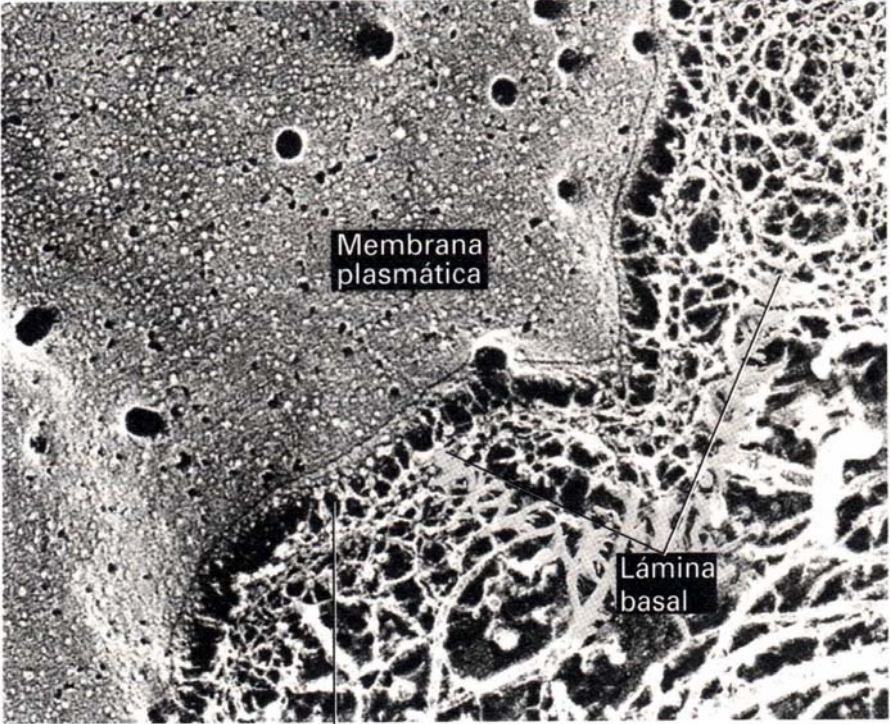
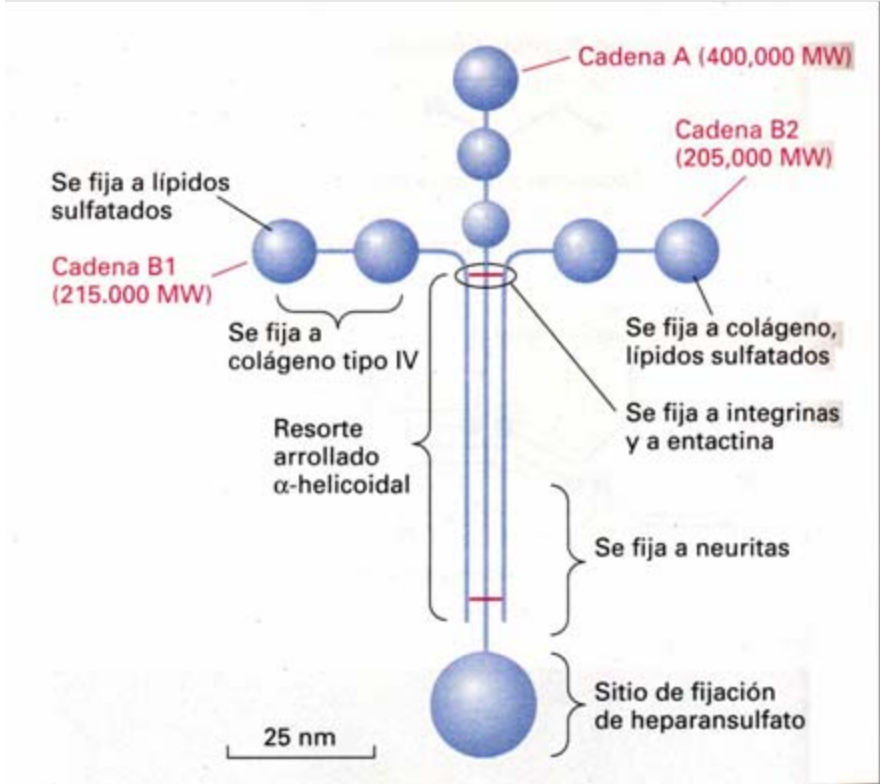
(b) Músculo



(c) Glomérulo renal

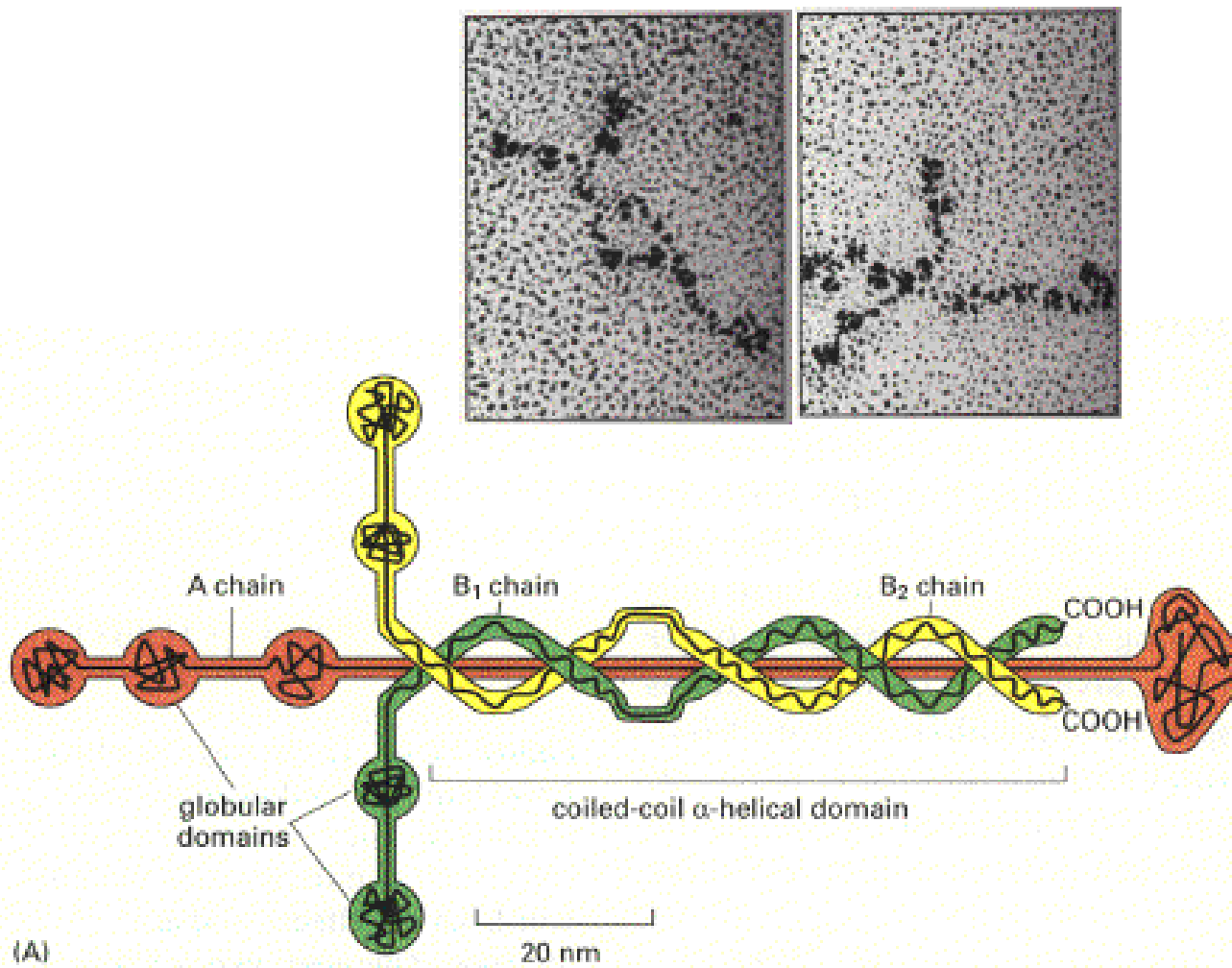


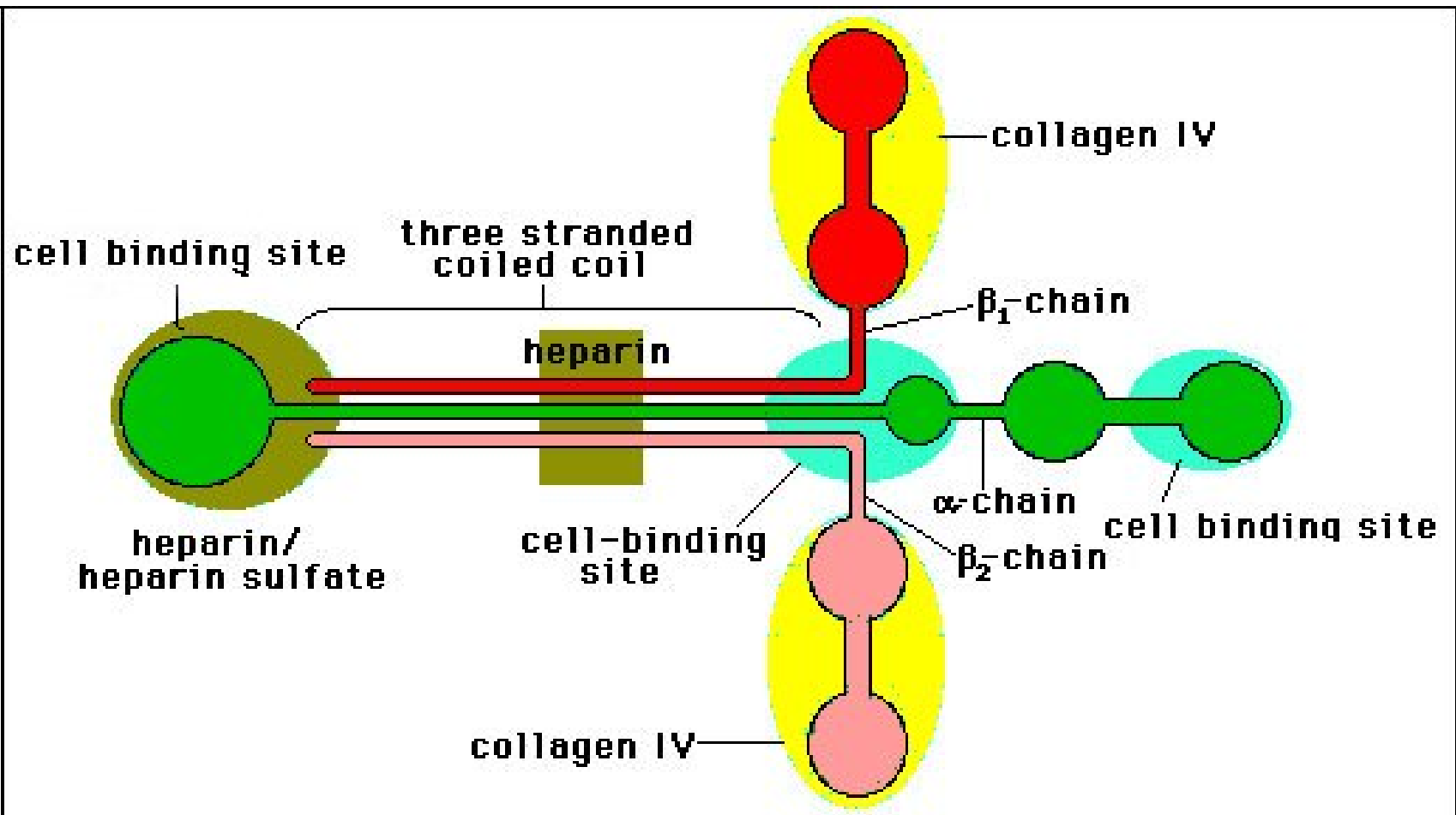
Proteína multiadherente: Laminina



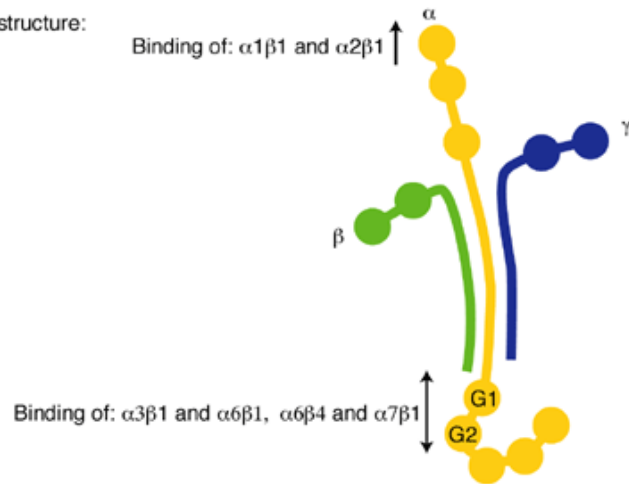
Proteínas receptoras de la superficie celular

Fibras de colágeno

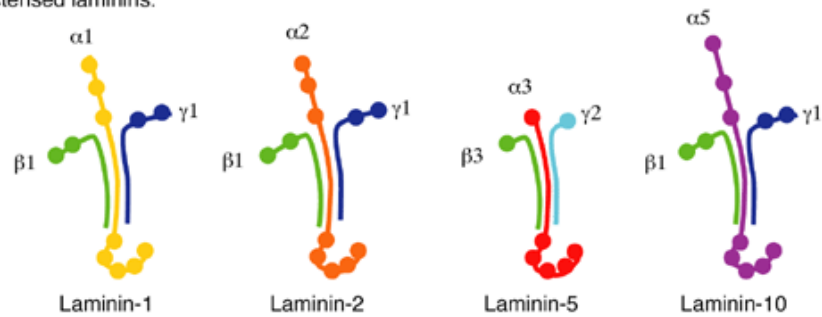




a Laminin structure:



b Four well-characterised laminins:

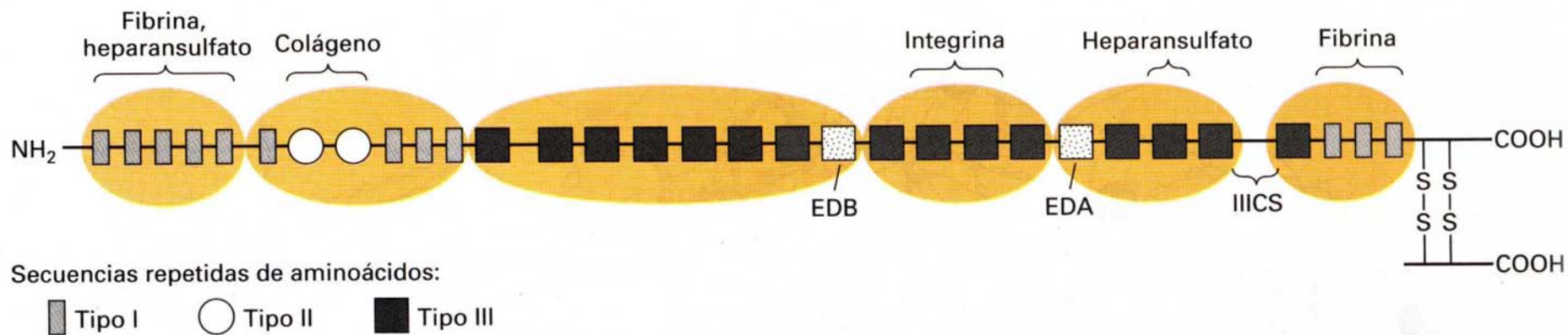
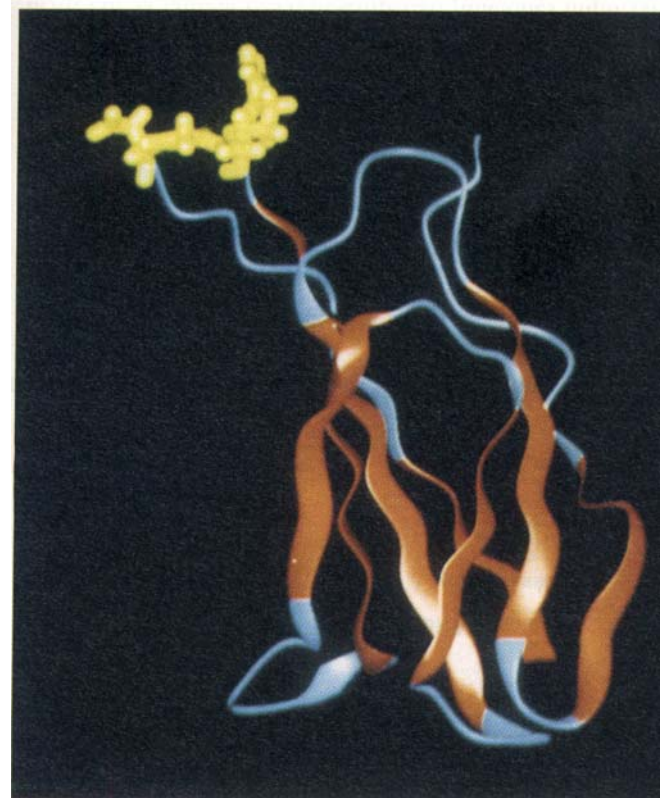


c Integrin binding:

	Laminin-1	Laminin-2	Laminin-5	Laminin-10
$\alpha 2 \beta 1$	Yes	Yes	No	Yes
$\alpha 3 \beta 1$	Weak	Weak	Yes	Weak
$\alpha 7 \beta 1$	Yes	Yes	No	Maybe
$\alpha 6 \beta 4$	Yes	Yes	Yes	Yes

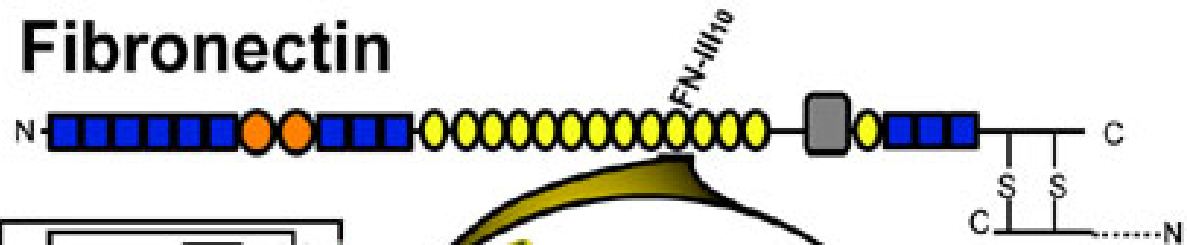
Laminin structure and laminin-binding integrins

Proteína multiadherente: Fibronectina

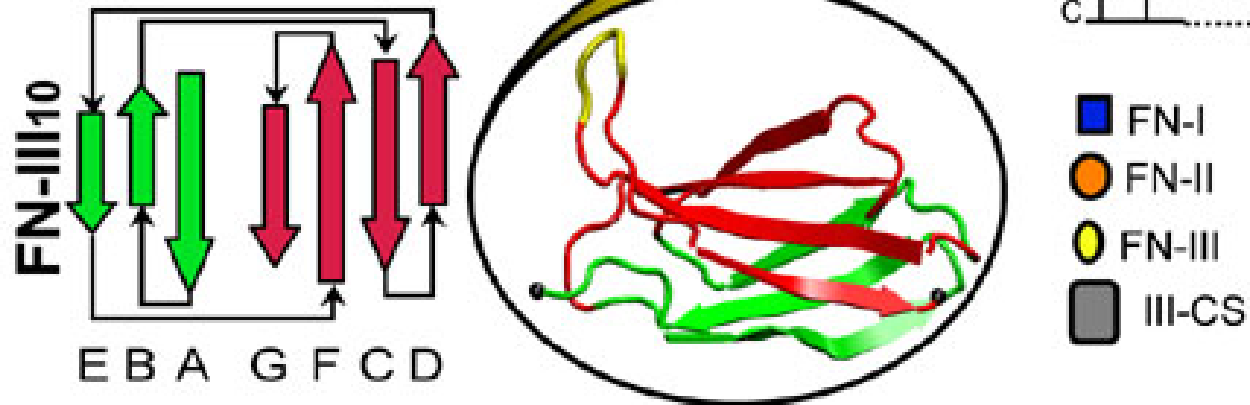


Fibronectin

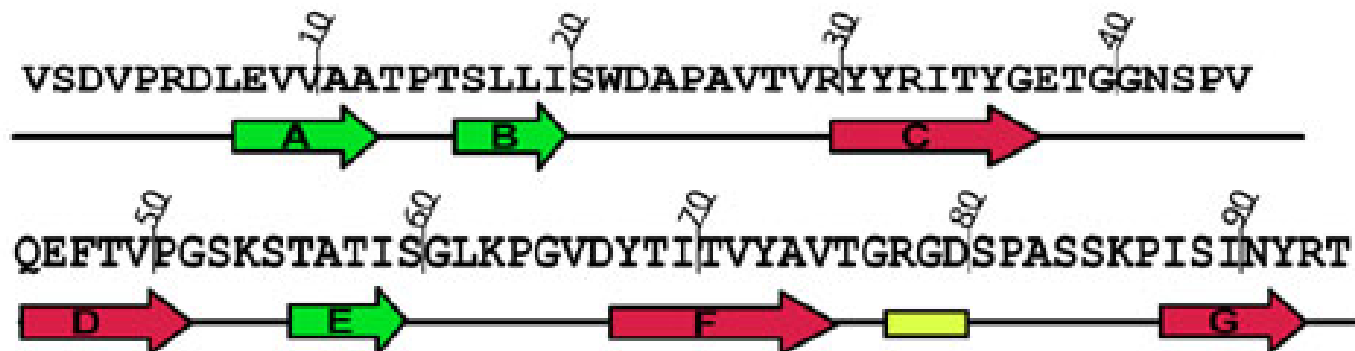
(a)



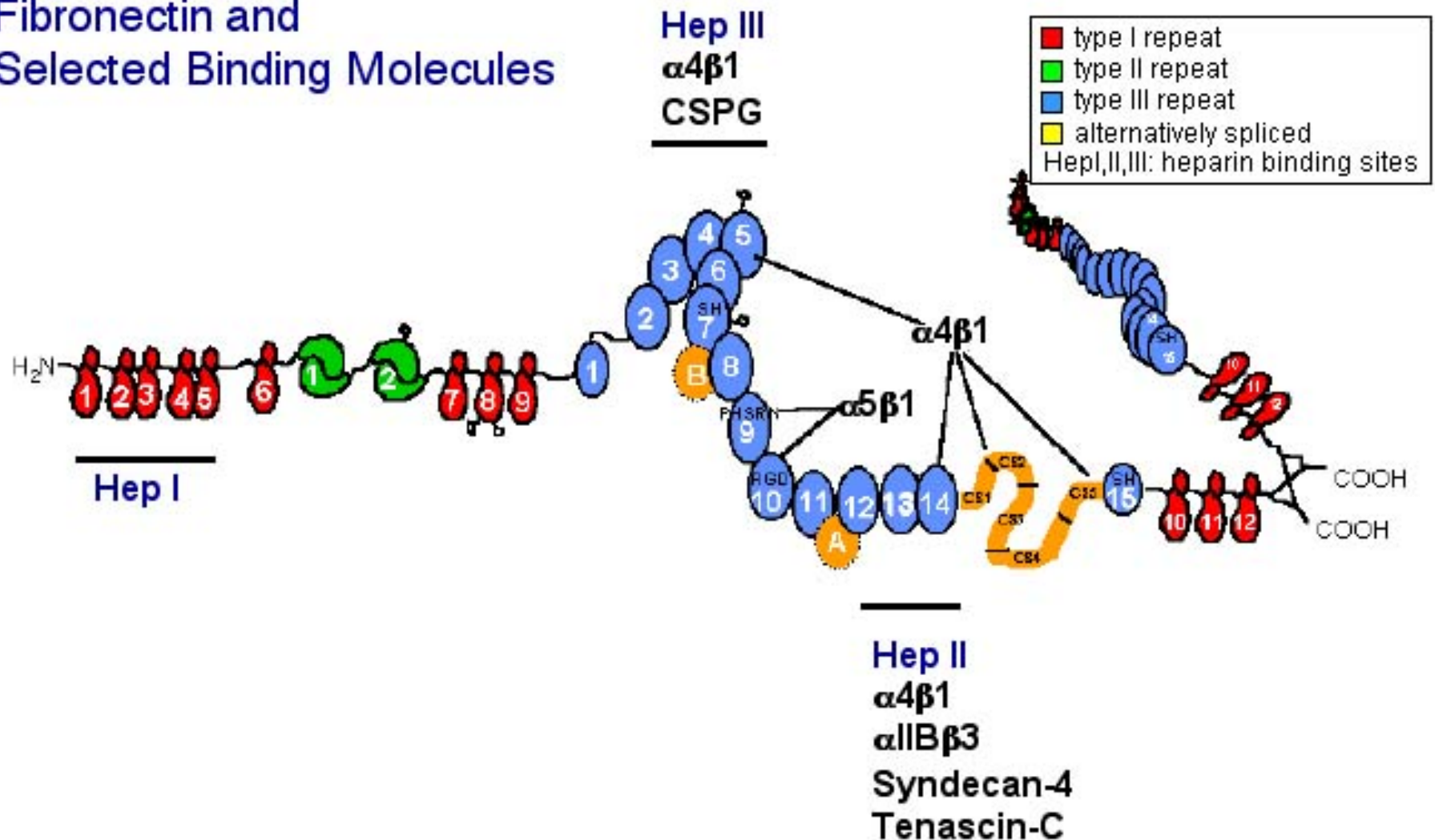
(b)



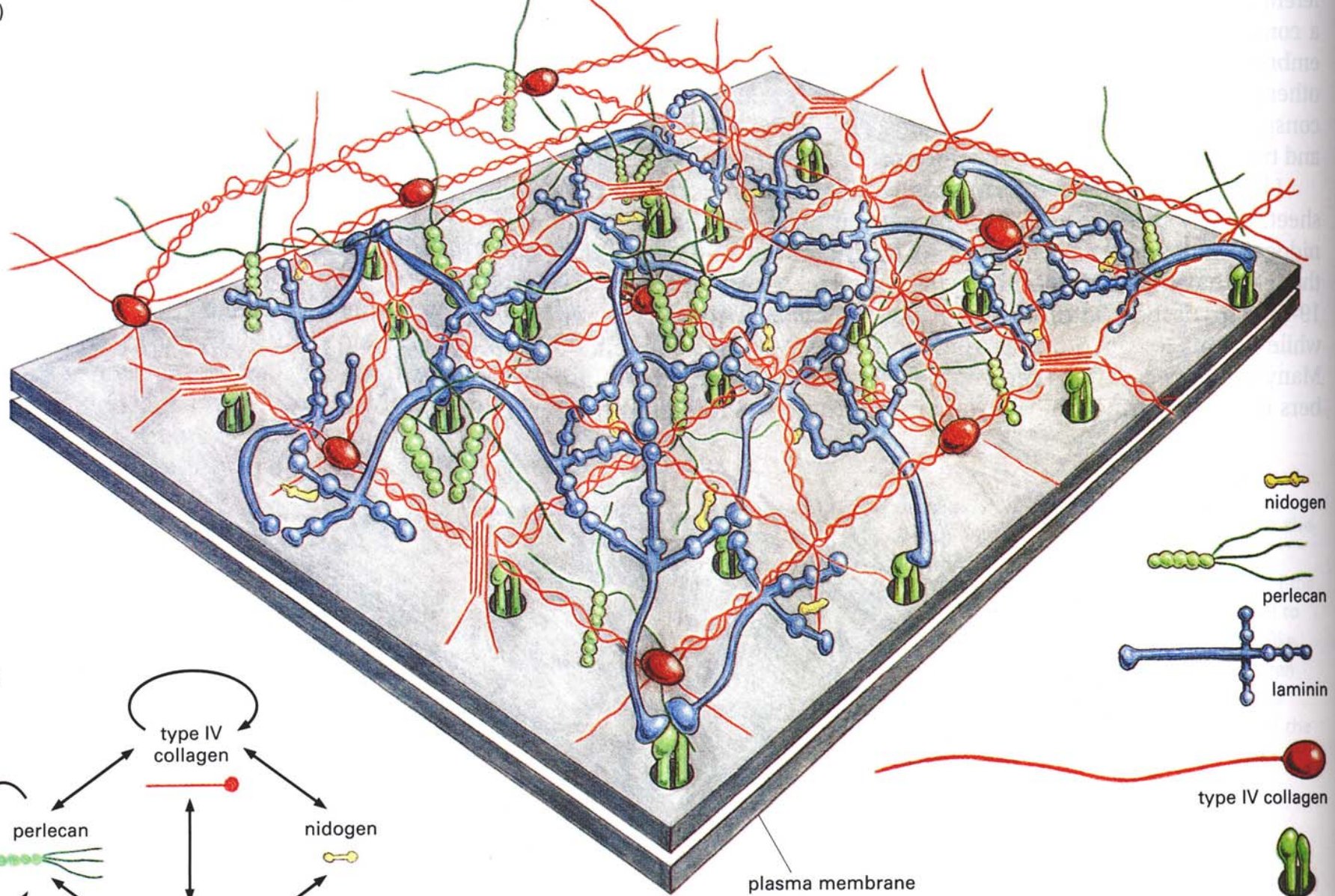
(c)



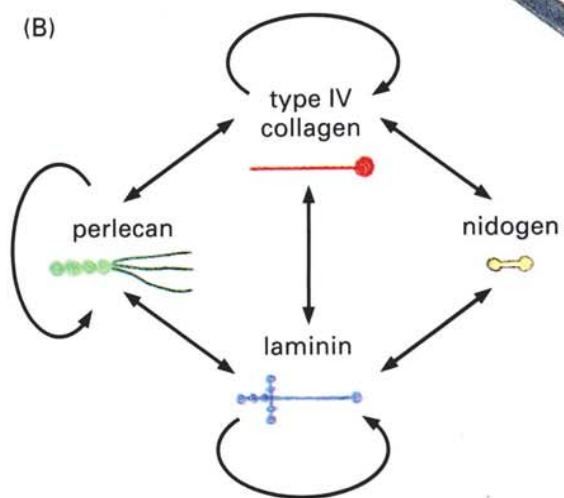
Fibronectin and Selected Binding Molecules

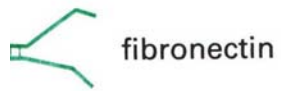


(A)



(B)





fibronectin



hyaluronan

fibrillar collagen



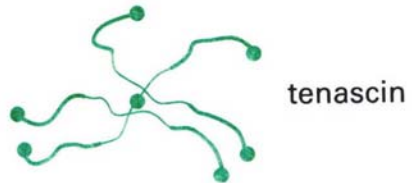
decorin



laminin



perlecan



tenascin

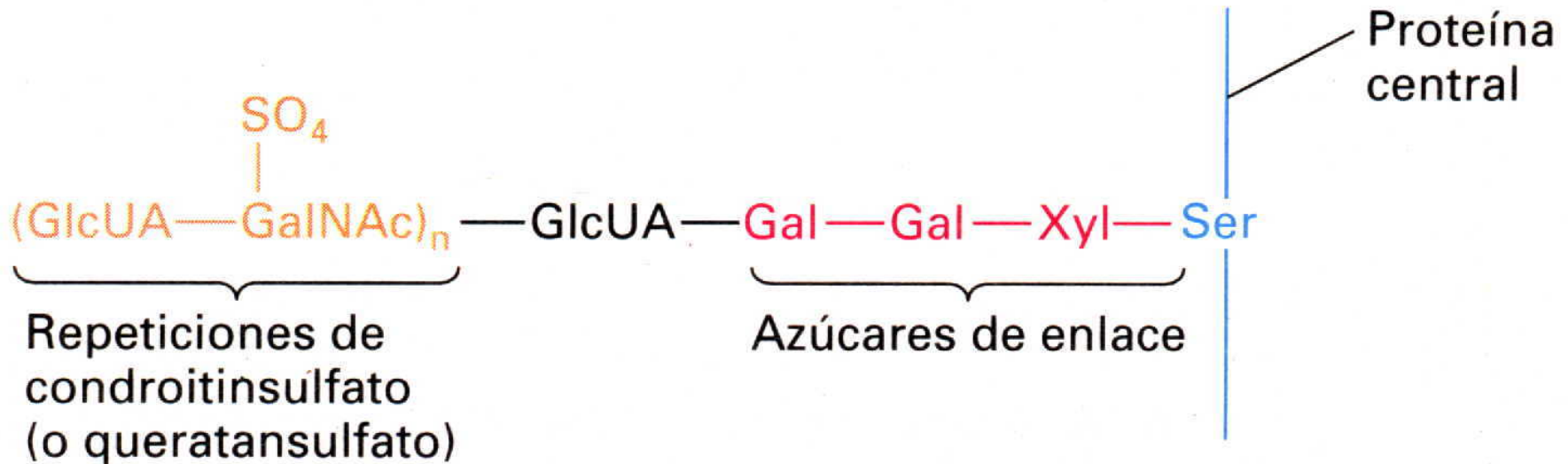


aggrecan

type IV collagen



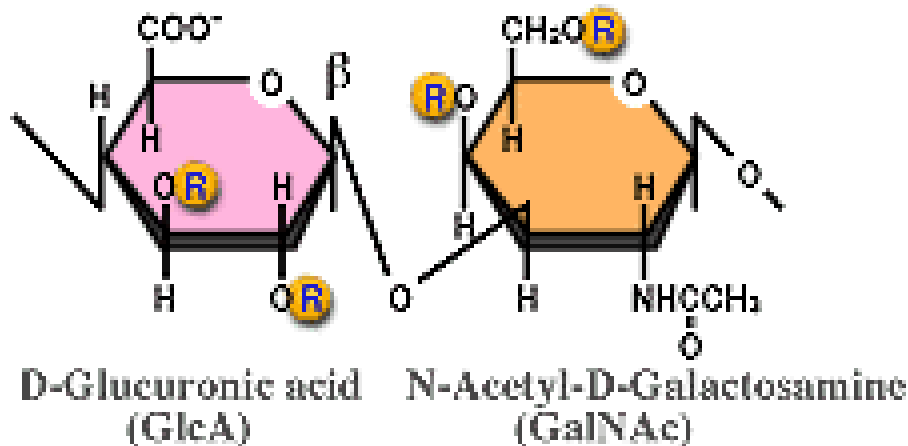
Proteoglycans structure



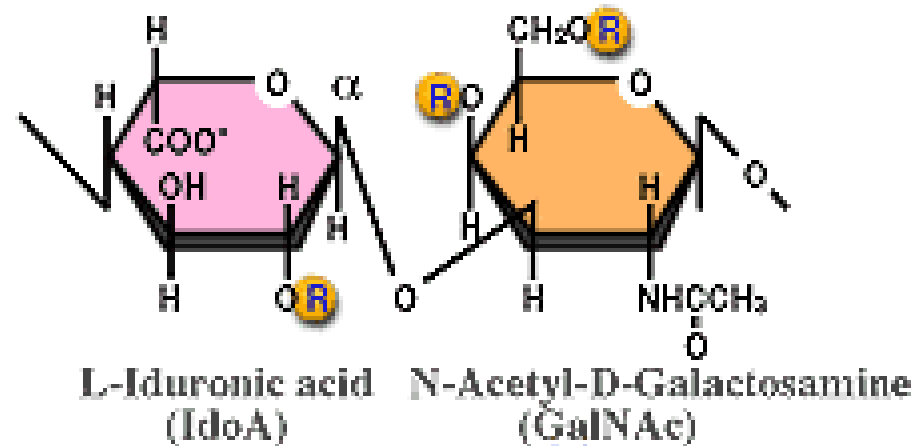
Gal = galactosa
GalNAc = N-acetilgalactosamina

GlcUA = ácido glucurónico
Xyl = xilosa

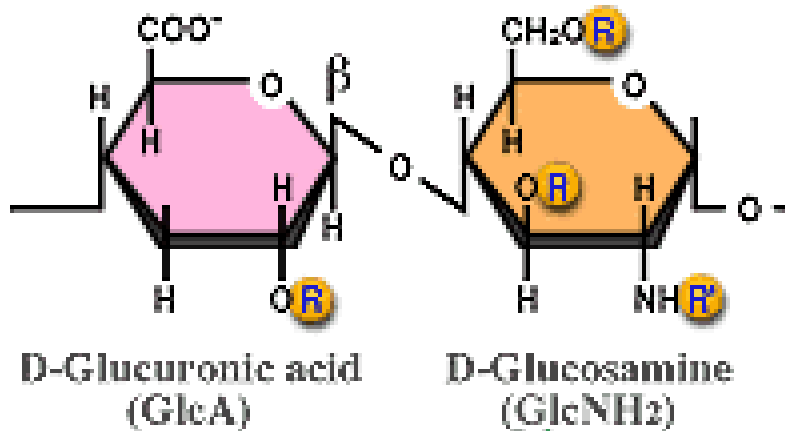
Repeating disaccharide units of various glycosaminoglycans



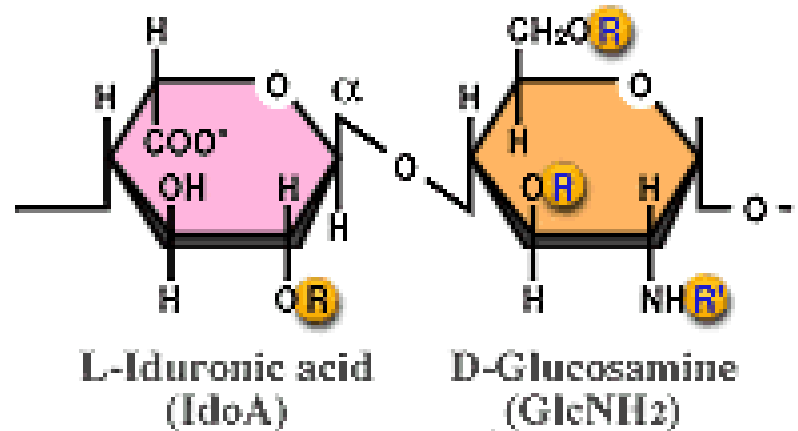
Chondroitin Sulfate



Dermatan Sulfate

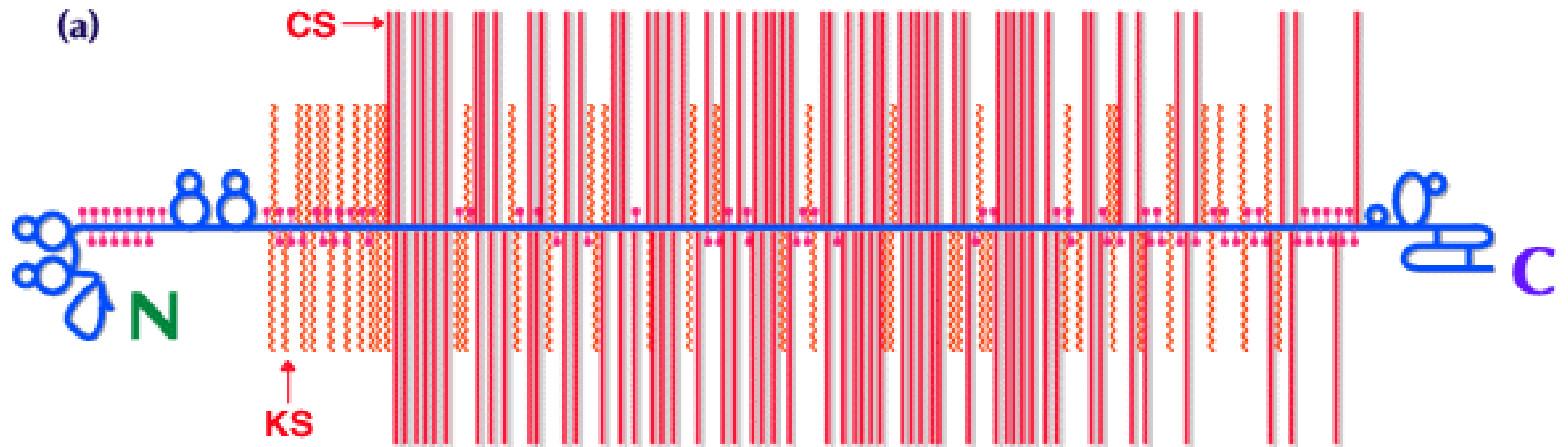


Heparan Sulfate

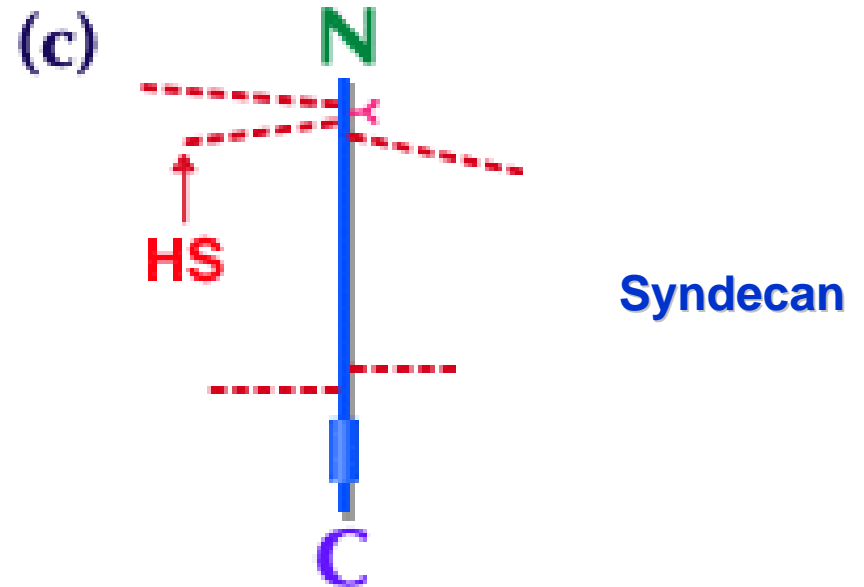
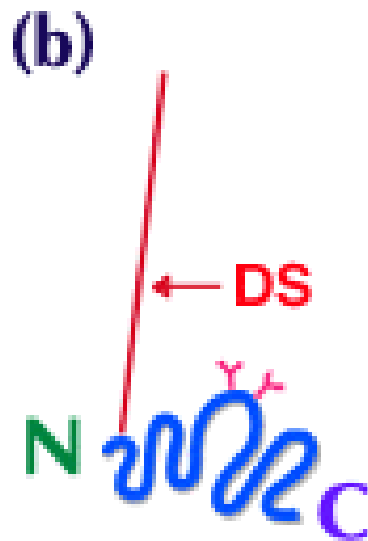


Heparin

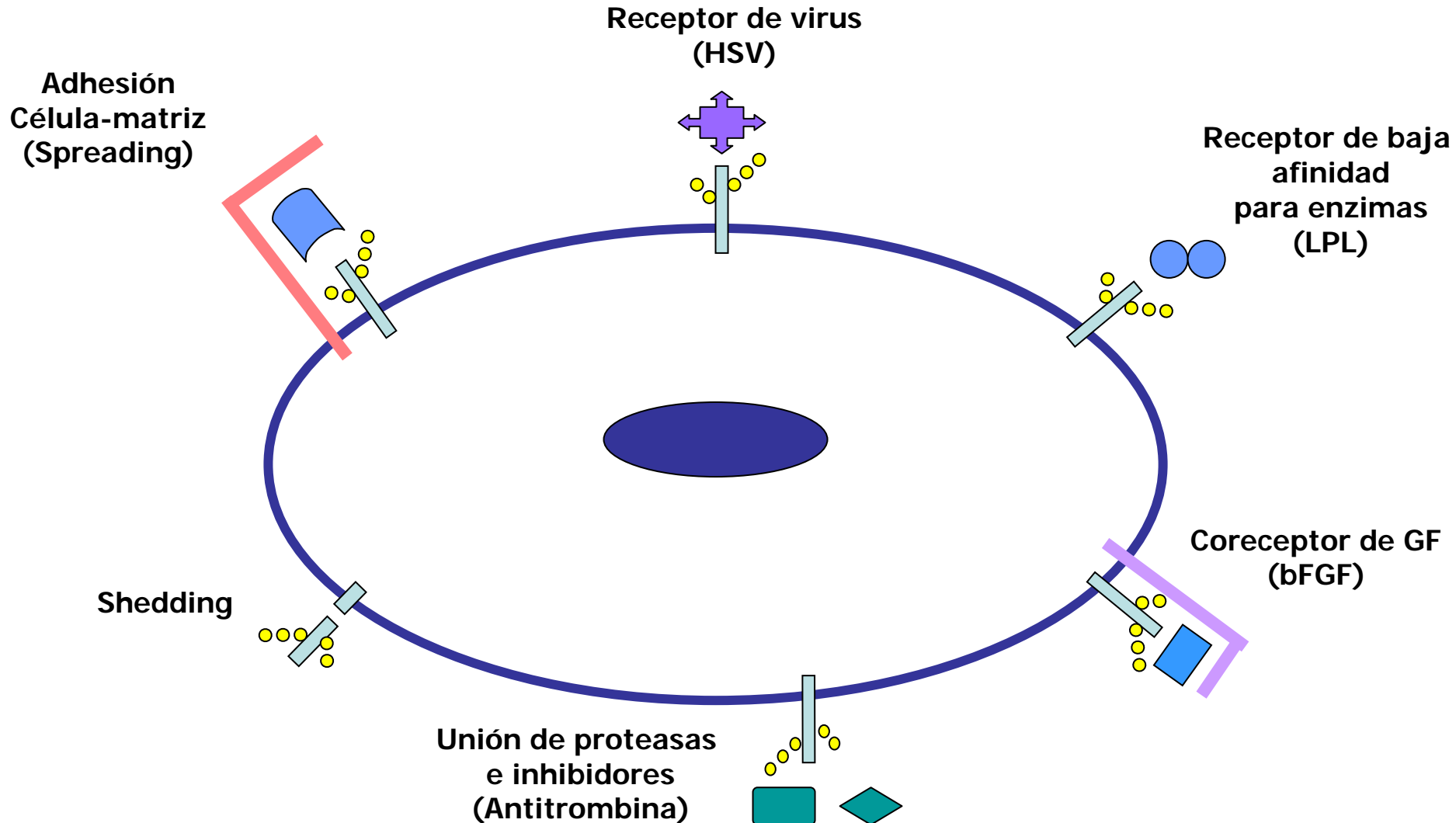
Aggrecan



Decorin

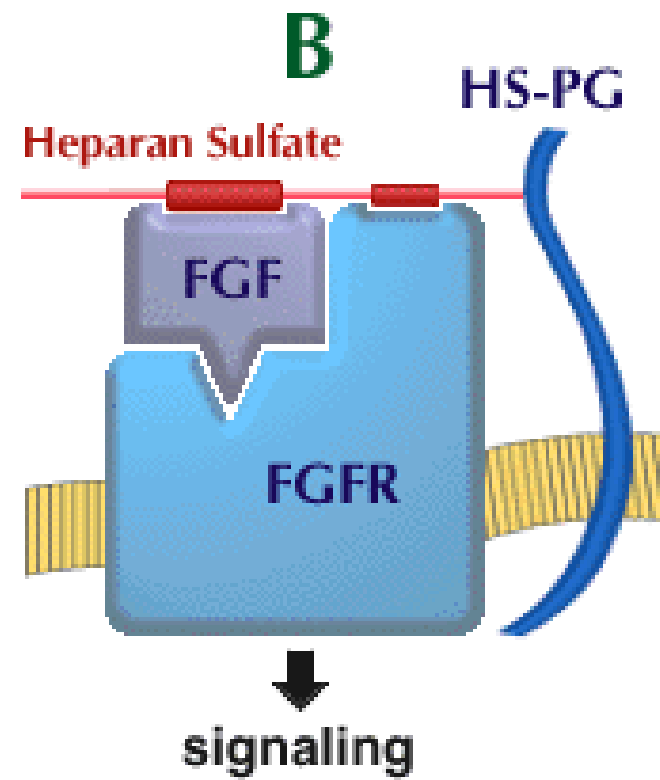
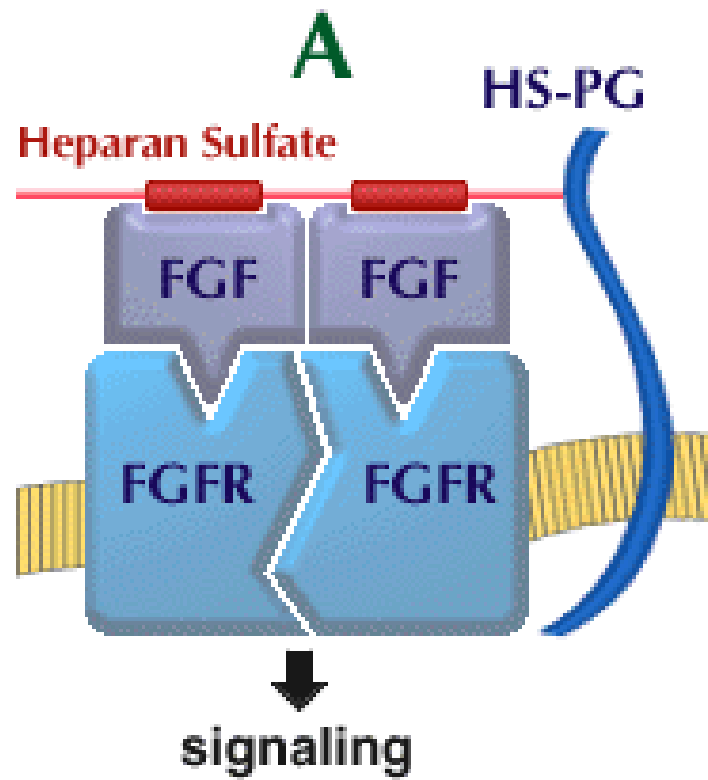


Principales funciones de los proteoglicanos

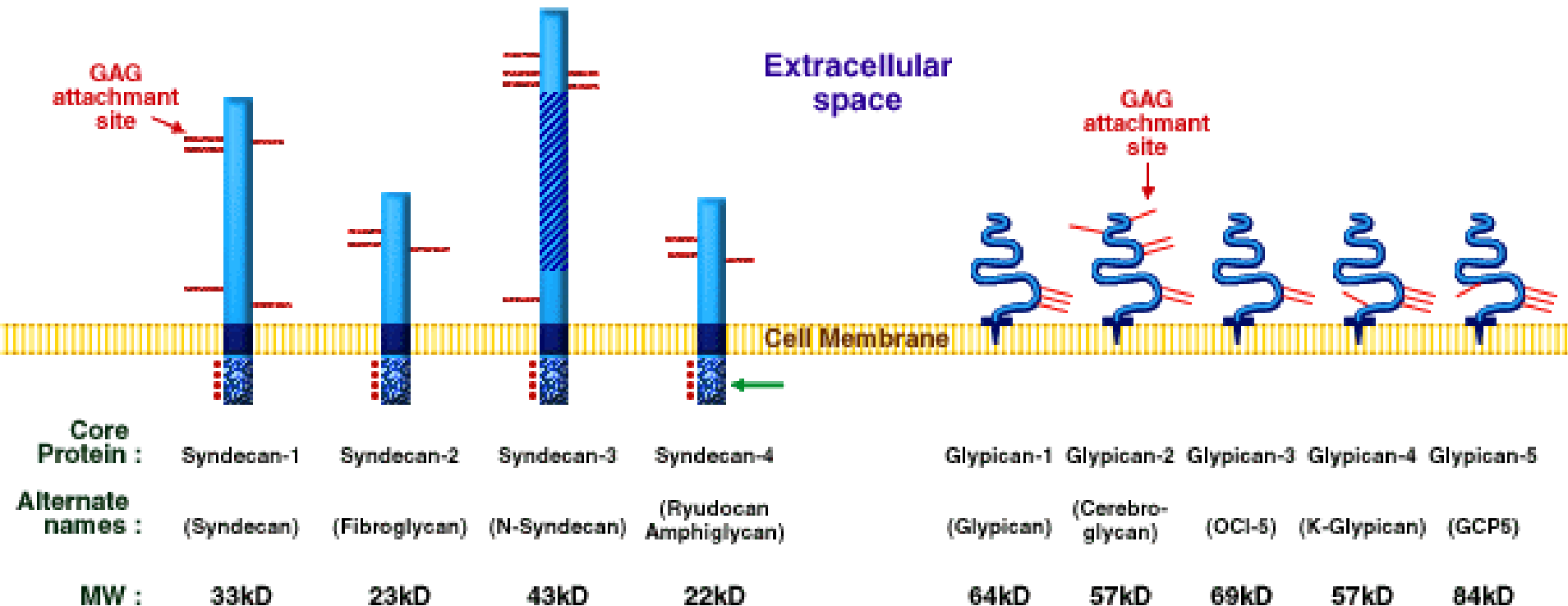


**Table 1. Heparan Sulfate and Heparin-Binding Proteins
(An incompleted list)**

Growth Factors	FGF-1(aFGF), FGF-2(bFGF), FGF-3, FGF-4, FGF-5, FGF-6, FGF-7, FGF-8, FGF-9, HGF(hepatocyte growth factor), HBEGF(heparin binding epidermal growth factor), VEGF(Vascular endothelial growth factor)
Adhesive Matrix Proteins	Fibronectin, Vitronectin, Laminin, Collagens, Thrombospondin etc.
Enzymes Involved in Lipid Metabolism	Lipoprotein Lipase, Hepatic Lipase, Phospholipase, Apolipoprotein B, Apolipoprotein E etc.
Serine Protease Inhibitors	Antithrombin III, Heparin Co-factor II, Protease Nexins etc.
Other Proteins	Superoxide Dimustase, Elastase, Platelet Factor 4, N-CAM, Transcription Factors, DNA Topoisomerase, RNA Polymerase, Tumor Necrosis Factor stc.

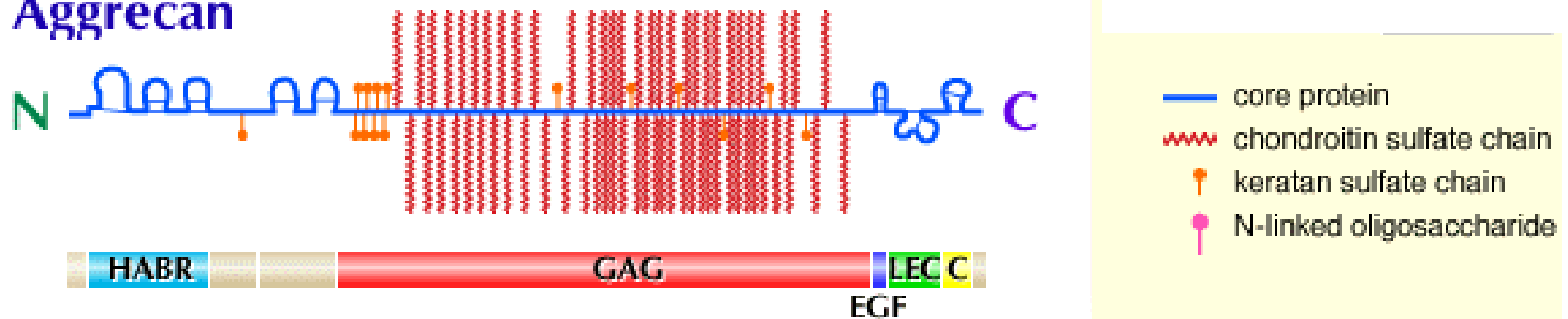


Syndecans and Glypicans: cell surface proteoglycans



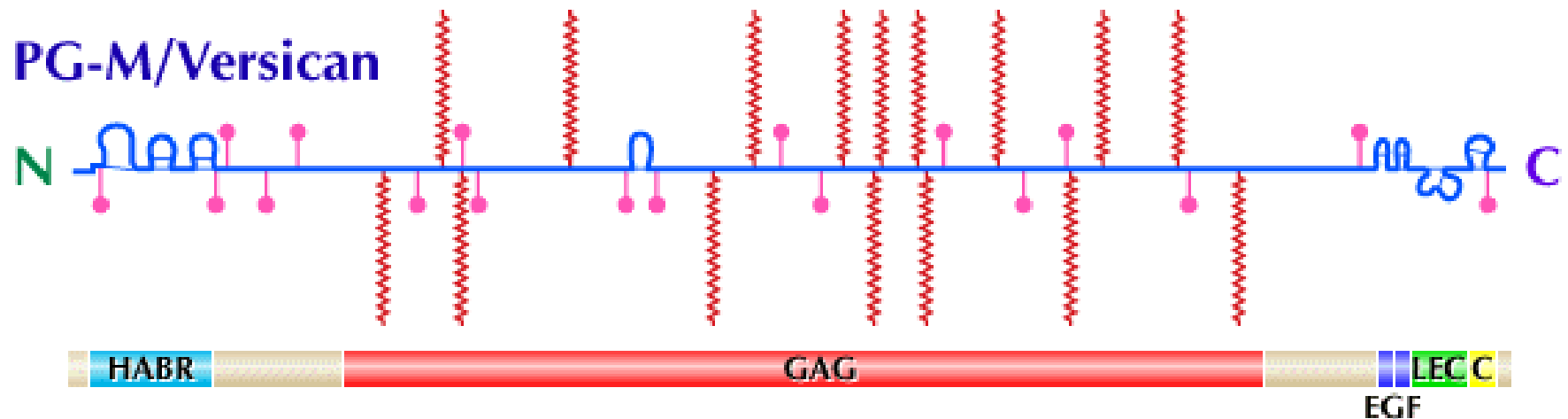
Keratan sulfate/chondroitin sulfate proteoglycan in cartilagenous tissue

Aggrecan



Keratan sulfato/ ej: SN, aorta y tendones, excepcionalmente en cartilagos

PG-M/Versican



Chondroitin sulfato/ ej: ampliamente distribuido y representado en los tejidos

Intracellular degradation of heparansulfate

