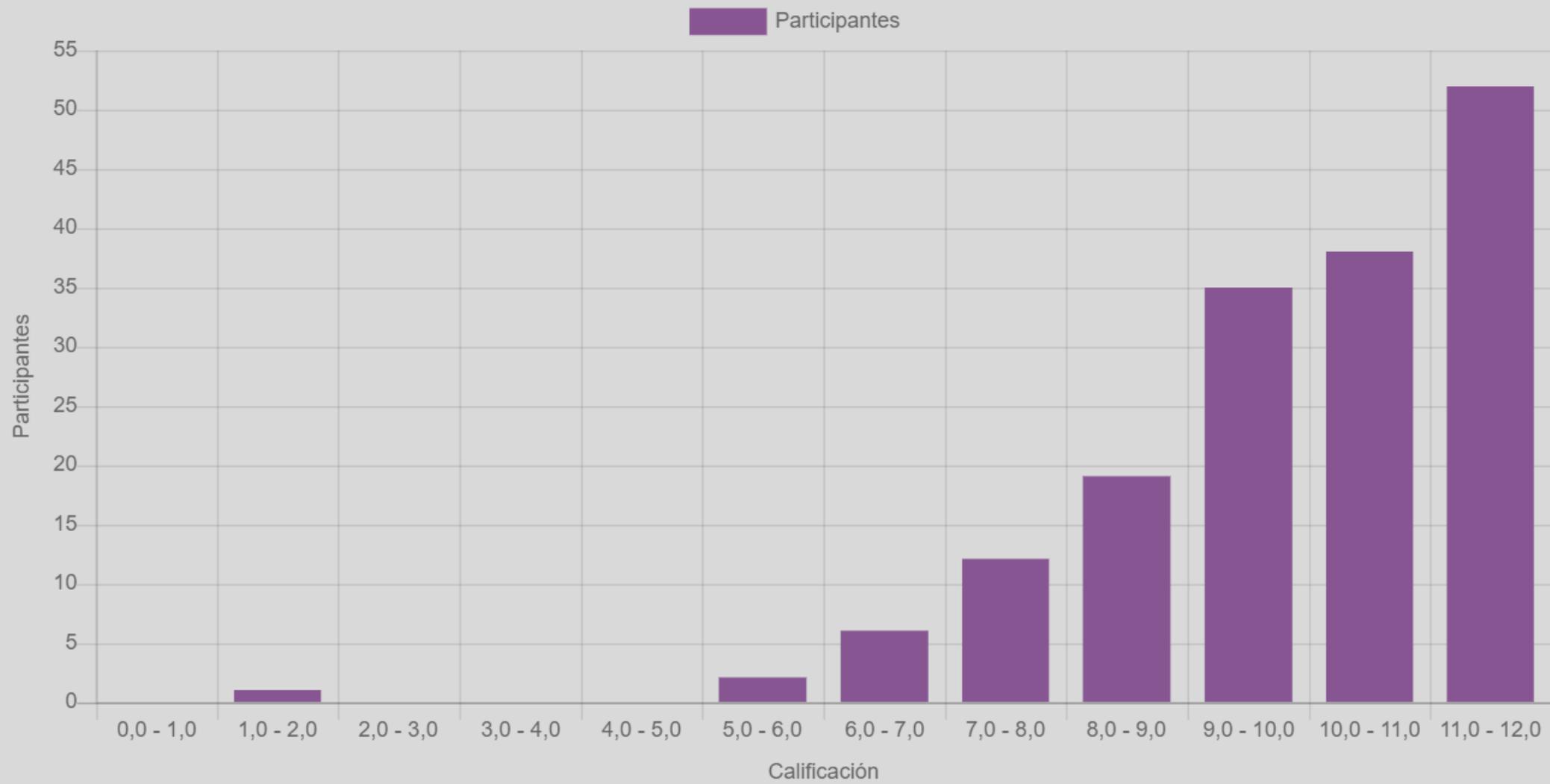


El citoesqueleto

Parte I

Flavio Zolessi

¿Autoevaluaciones?

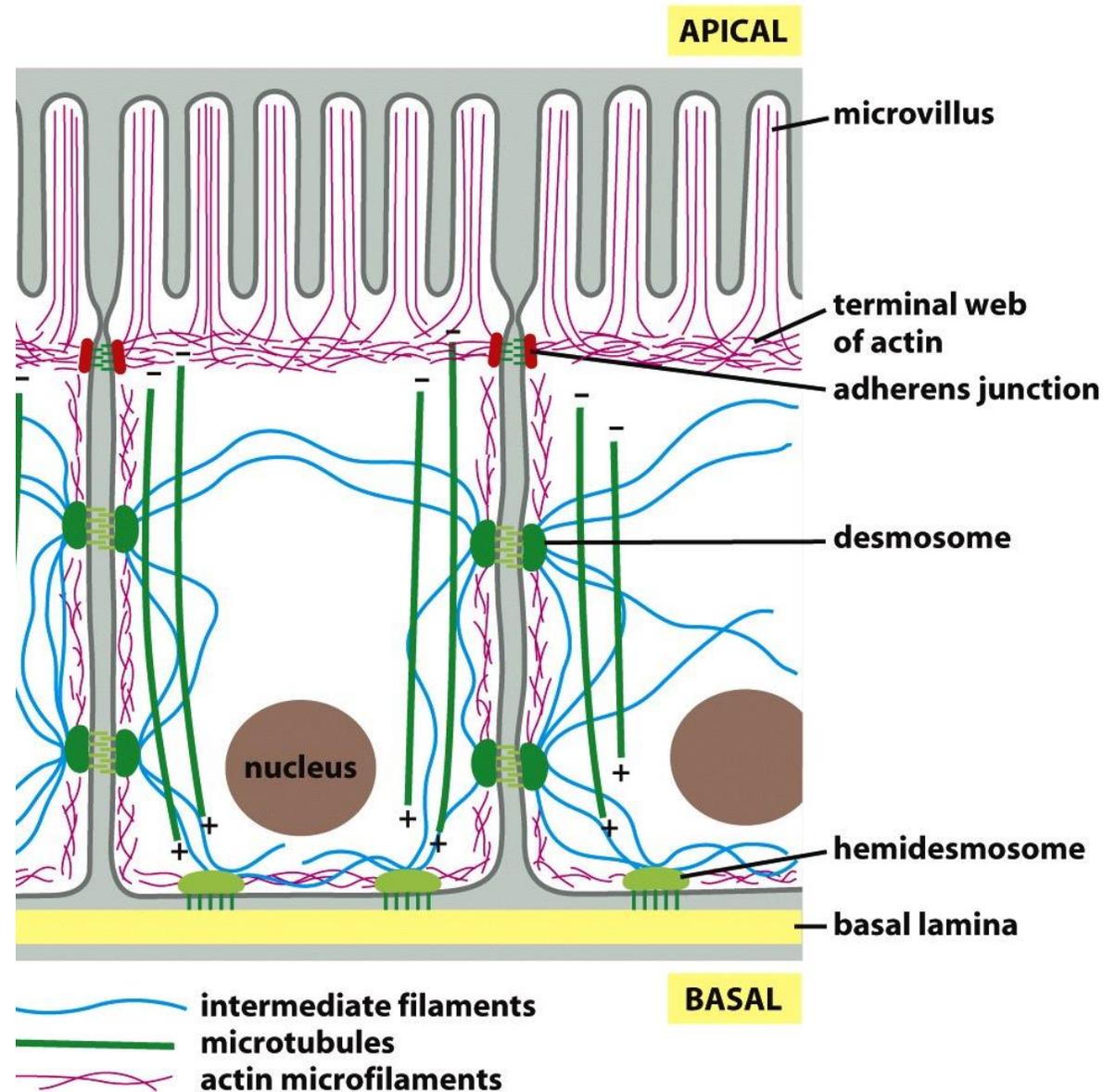
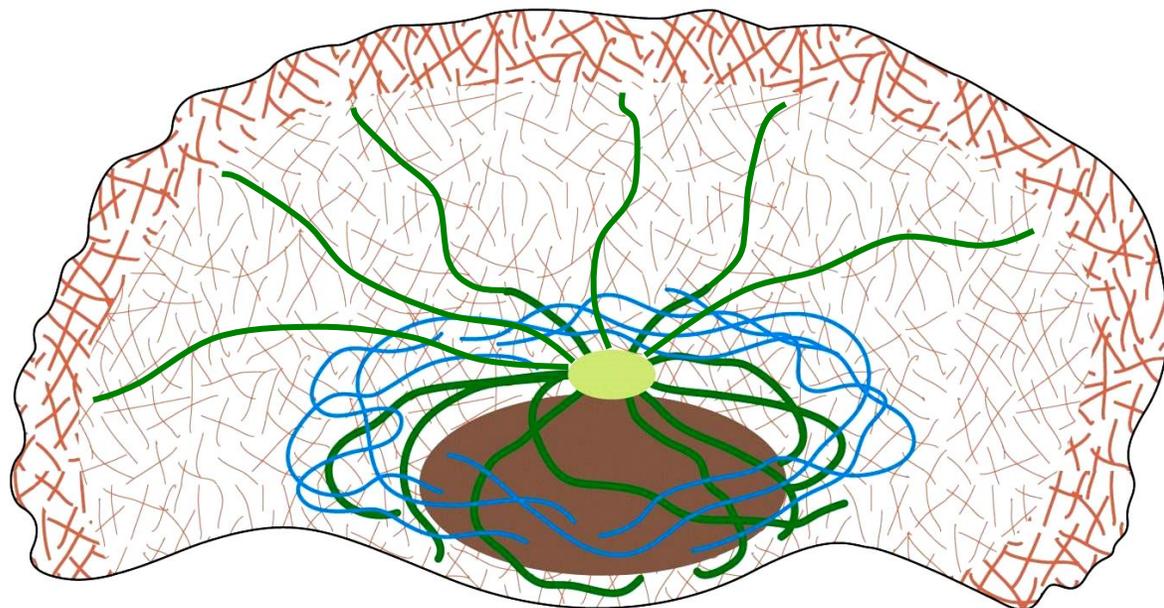


Elementos que componen el citoesqueleto

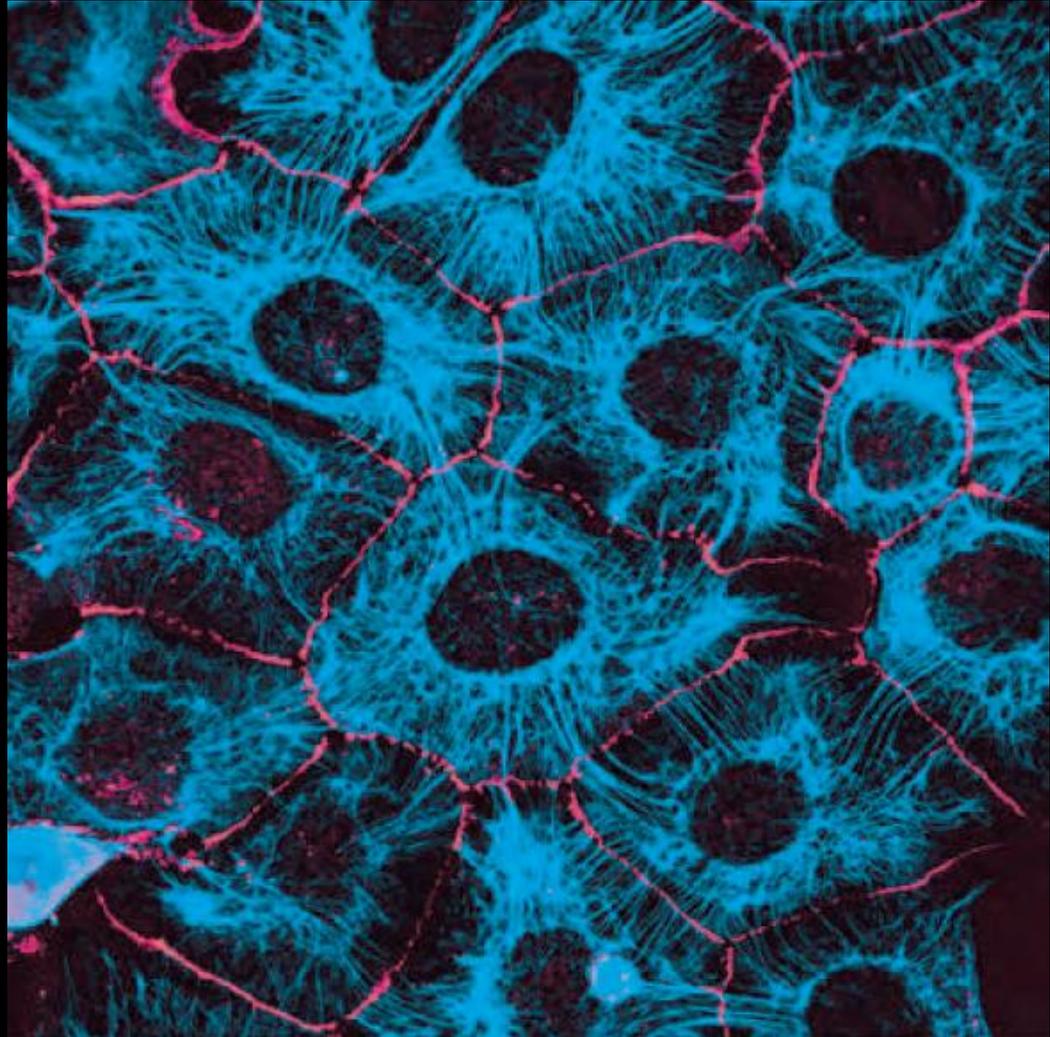
Filamentos de actina
(microfilamentos)

Microtúbulos

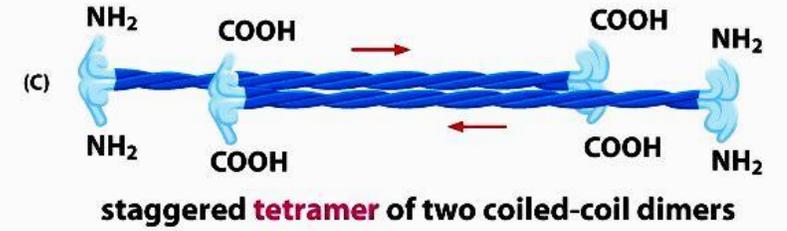
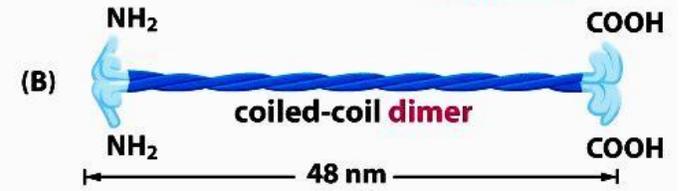
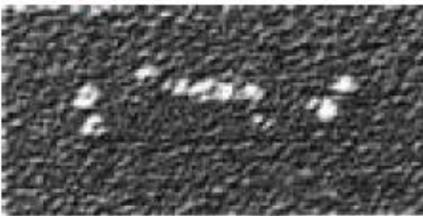
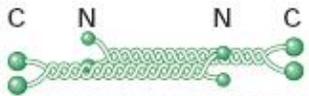
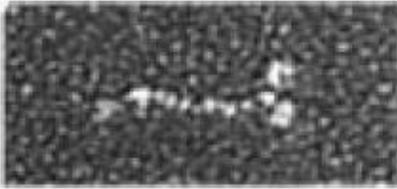
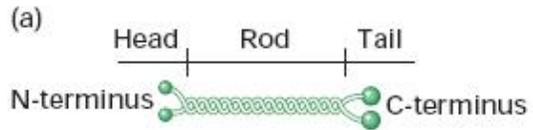
Filamentos intermedios



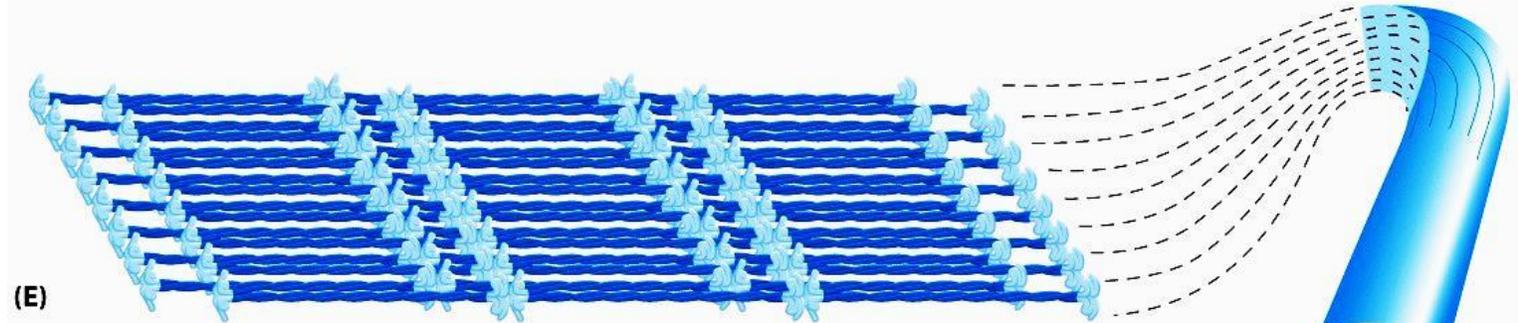
Filamentos intermedios:
Propiedades generales y funciones en las células



Filamentos Intermedios

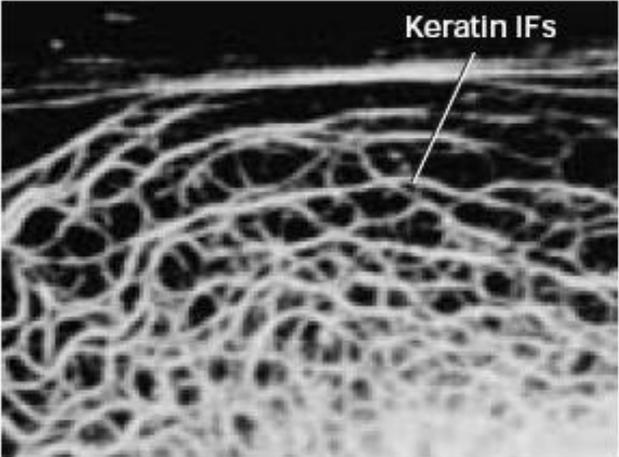
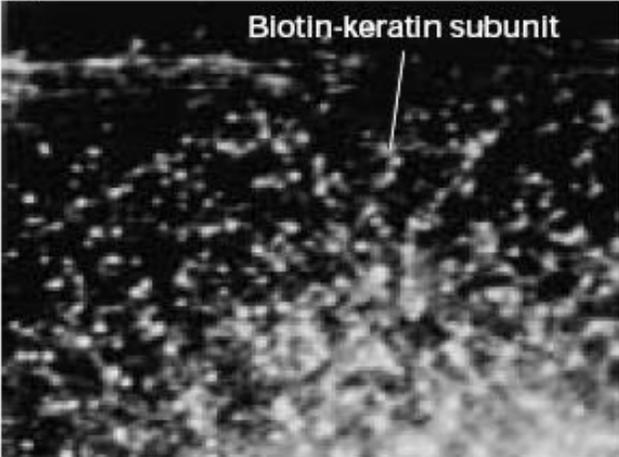


(D) two tetramers packed together

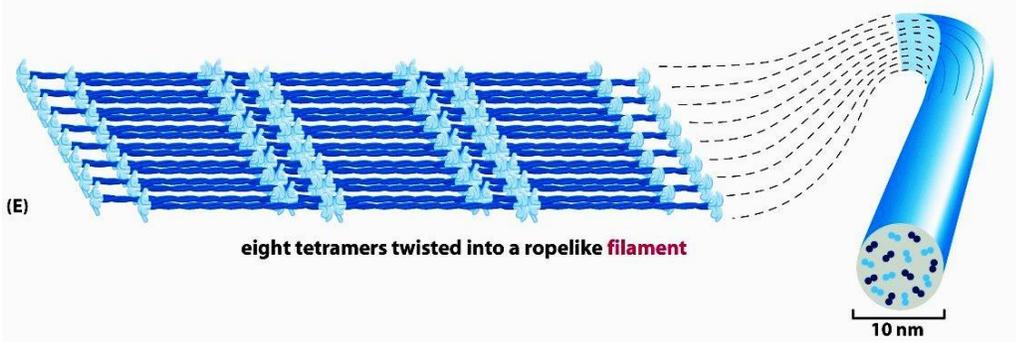
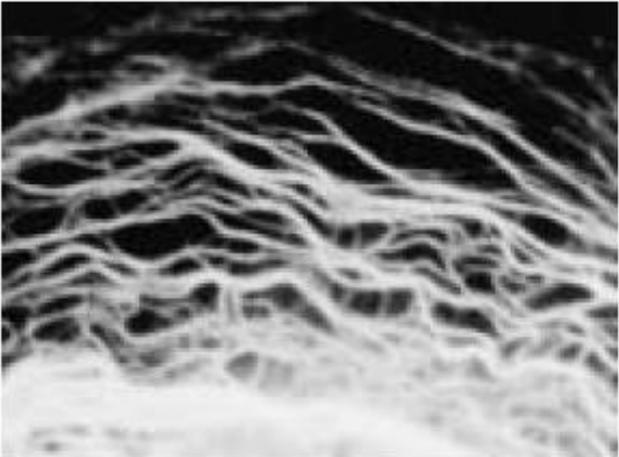
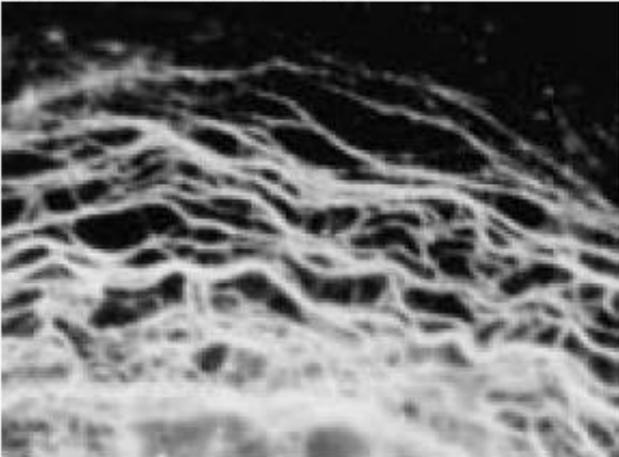


Filamentos intermedios: dinámica

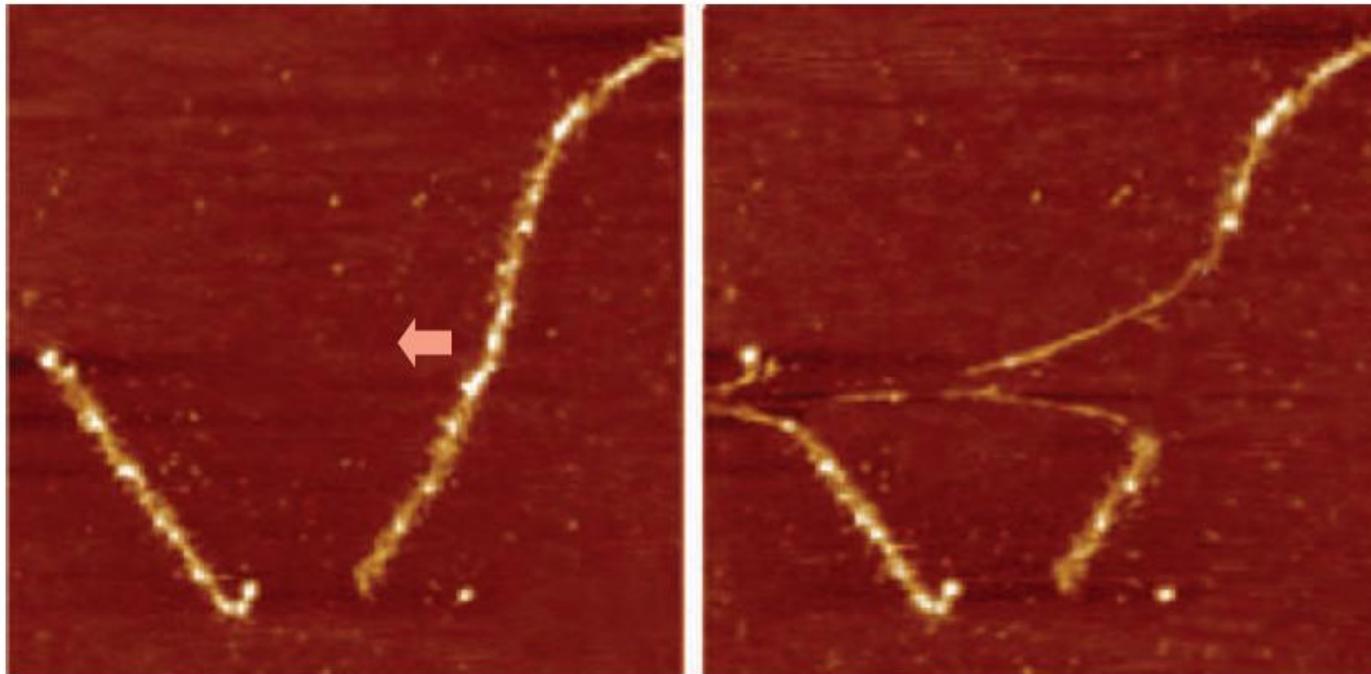
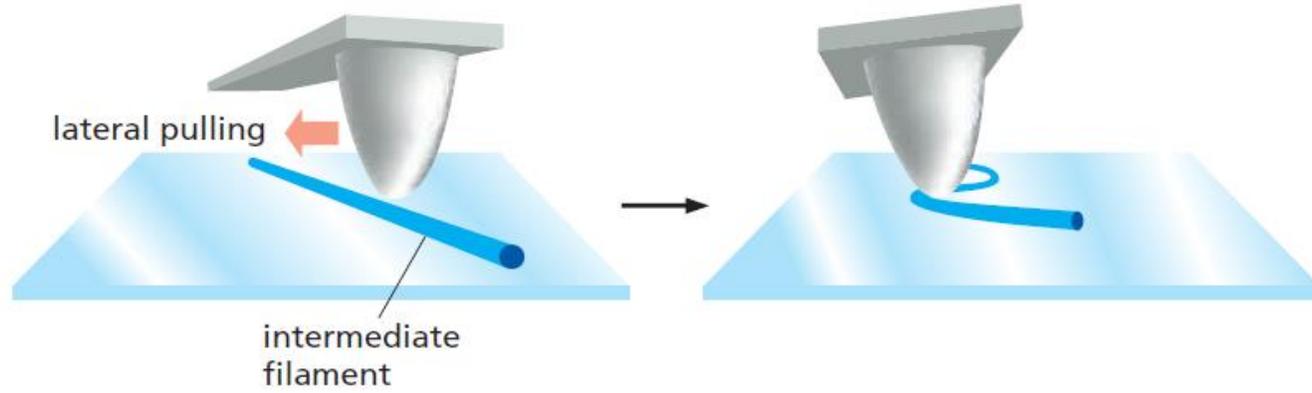
(a) 20 minutes after injection



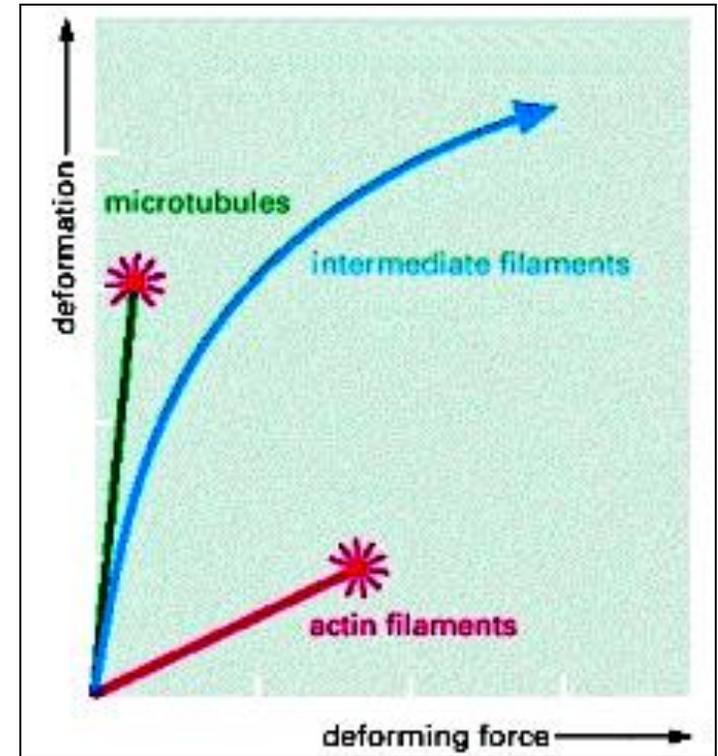
(b) 4 hours after injection



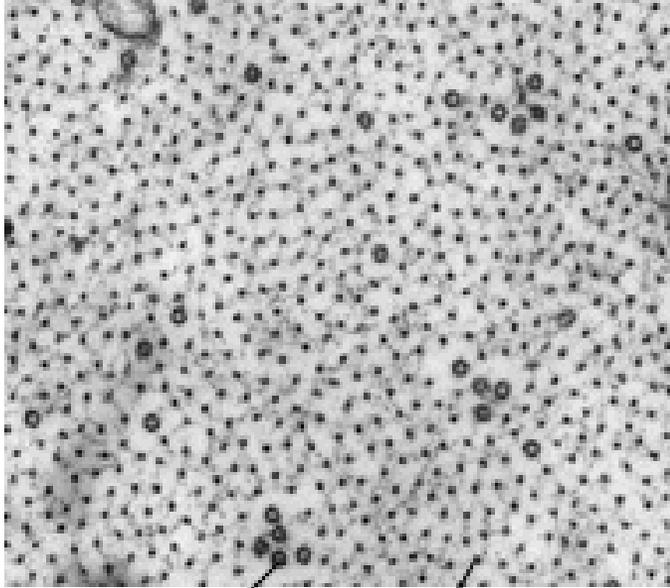
Filamentos intermedios: resistencia



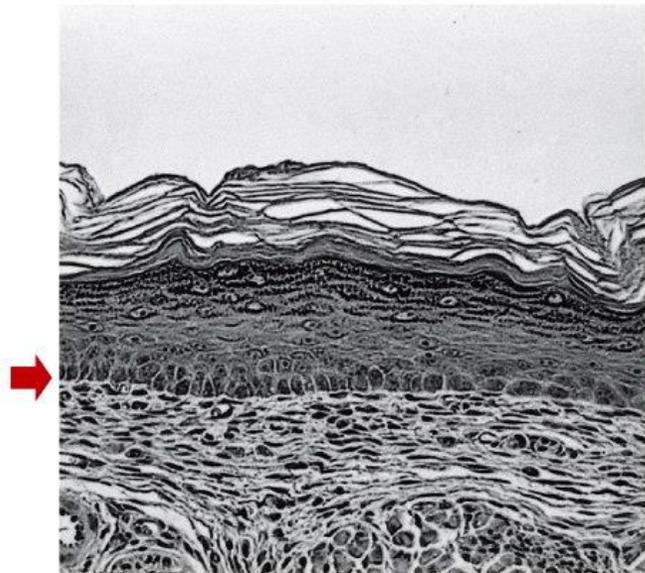
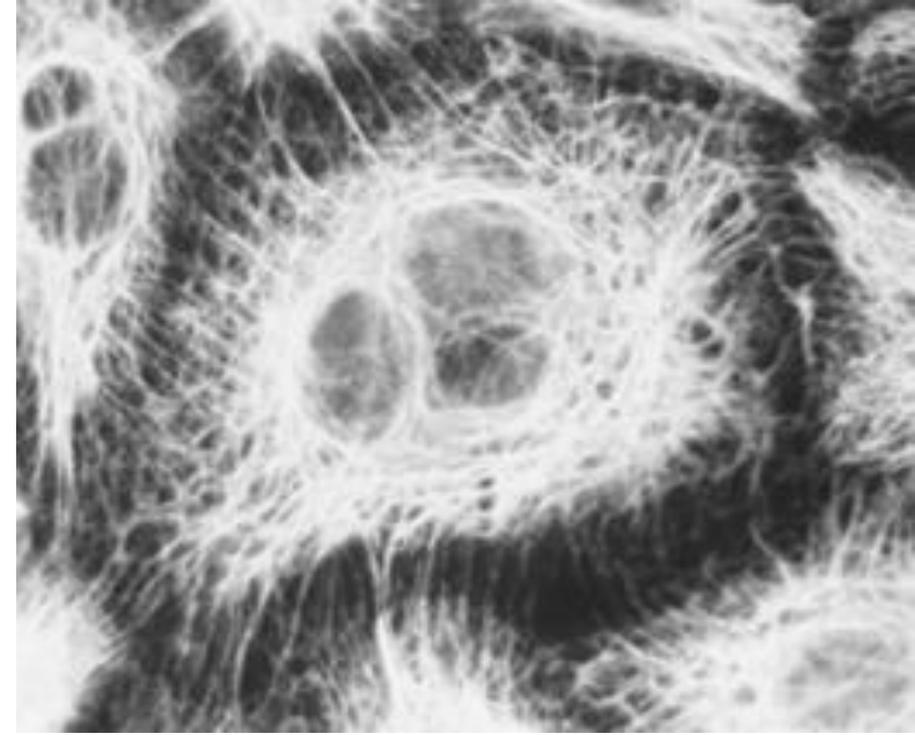
200 nm



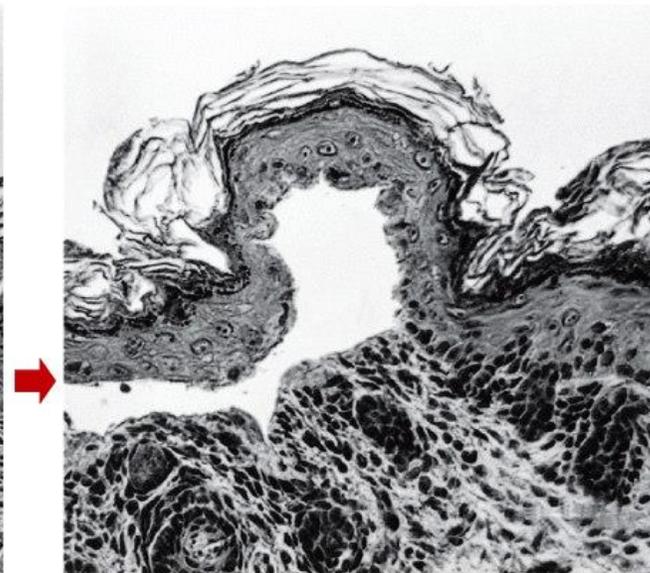
Filamentos Intermedios en las células



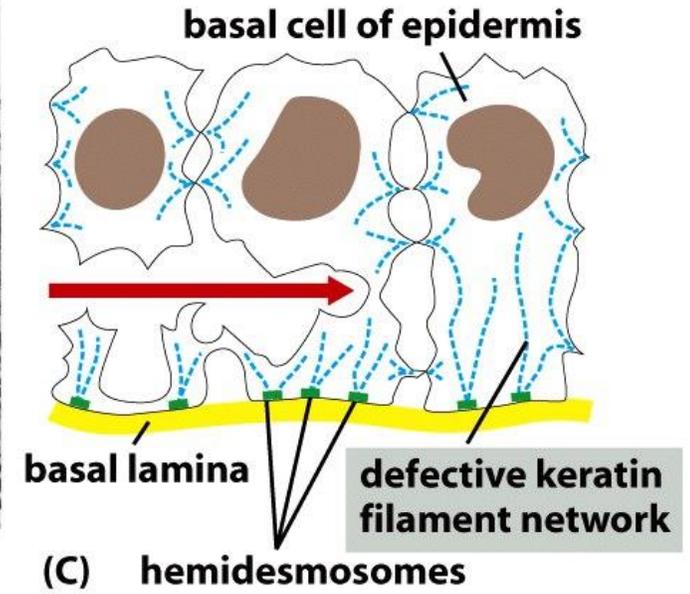
(C) microtubules
neurofilaments
250 nm



(A) 40 μm

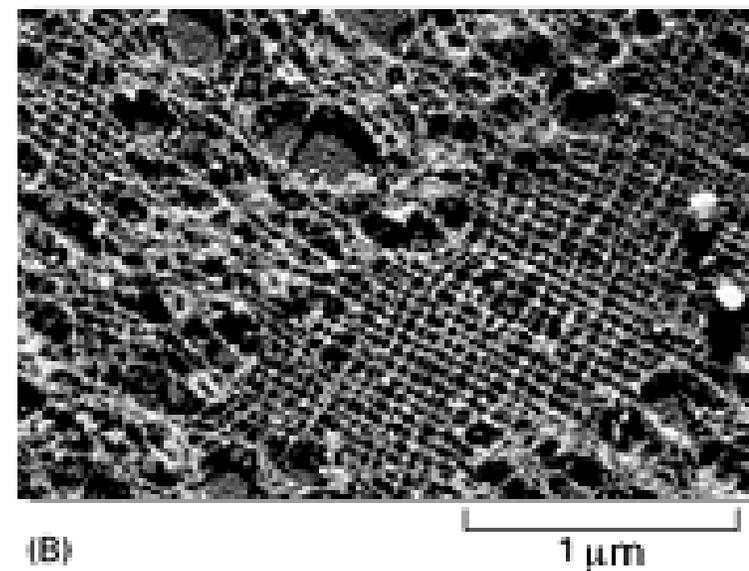
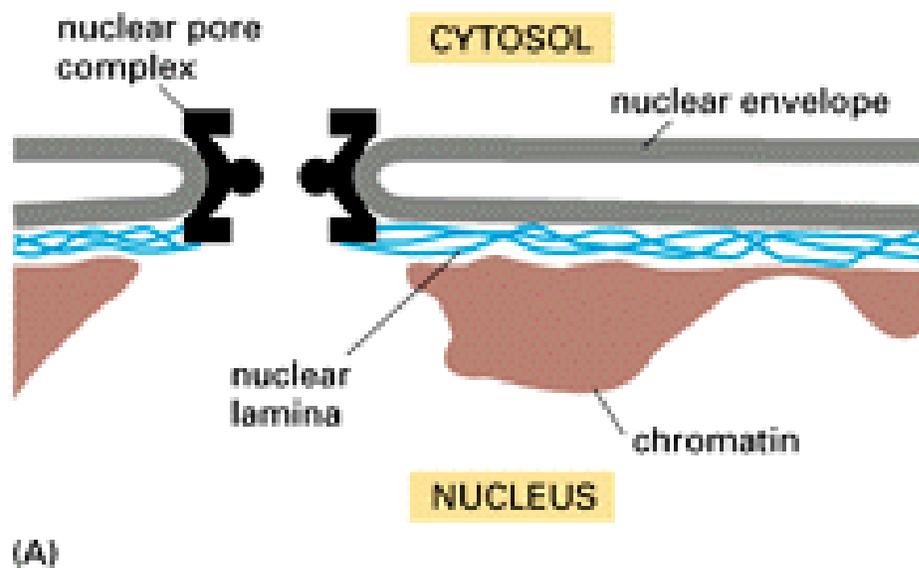
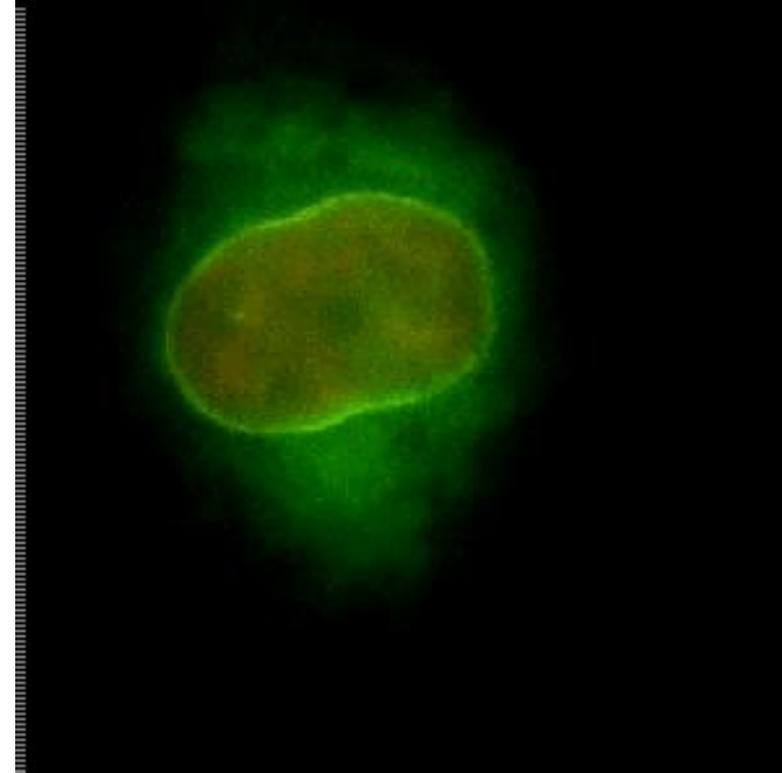
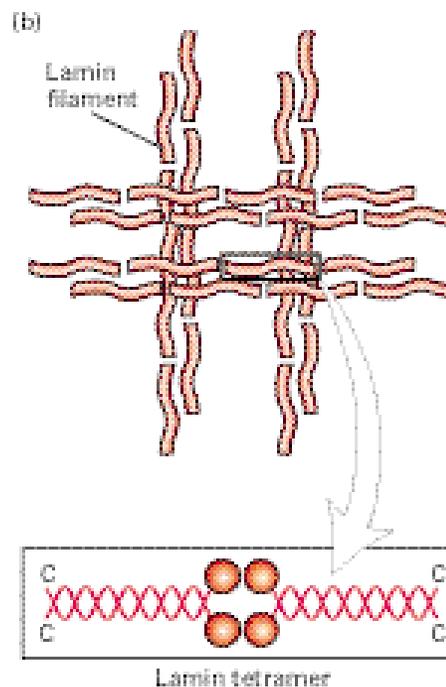
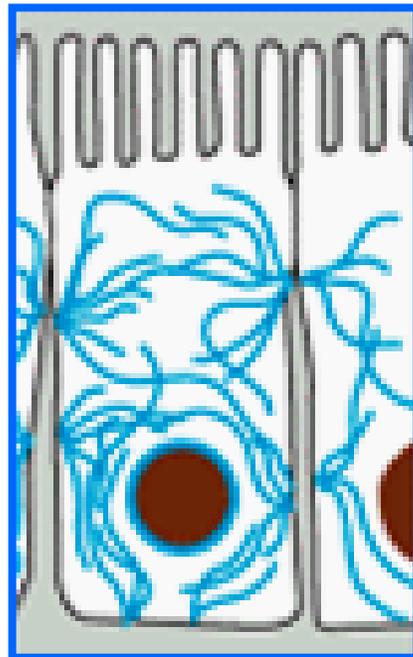


(B)



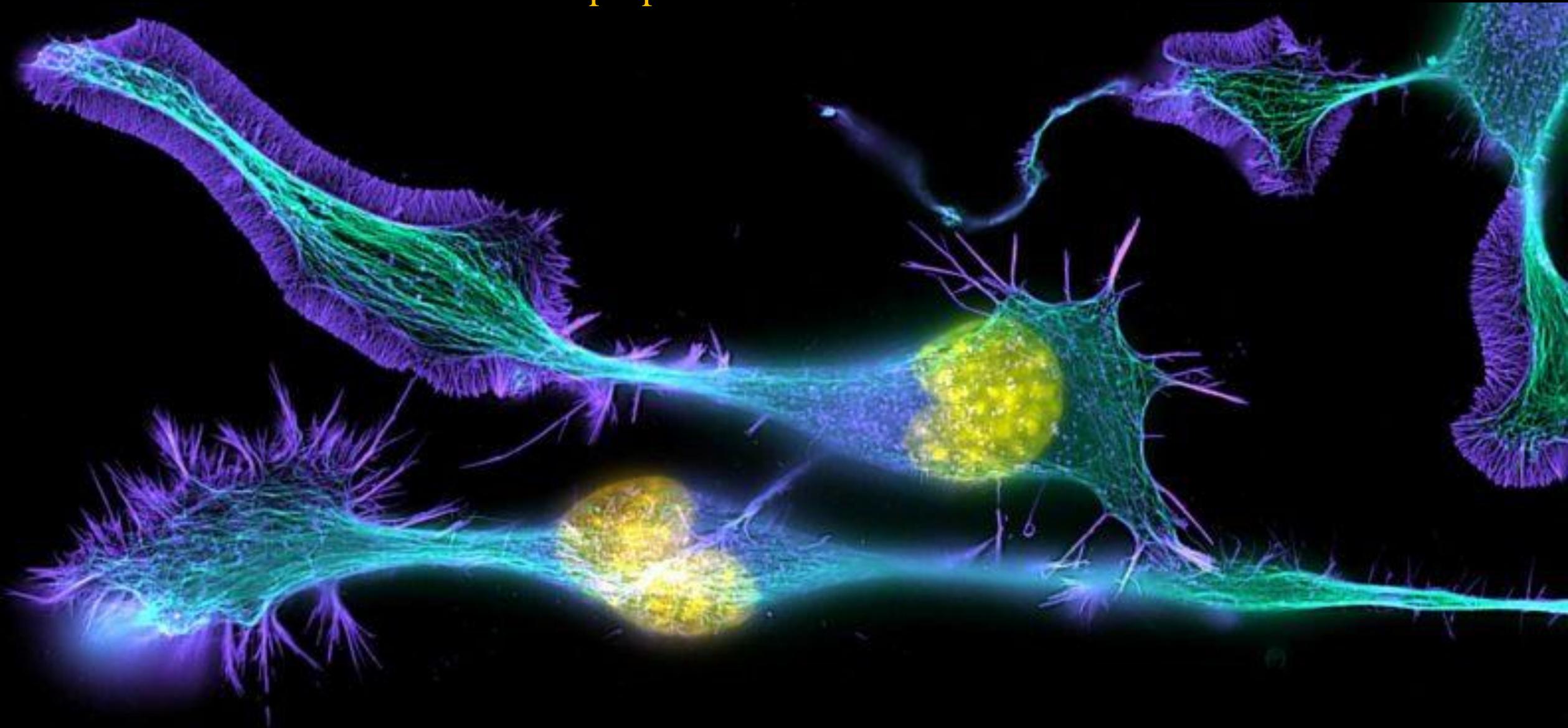
(C) hemidesmosomes

La lámina nuclear

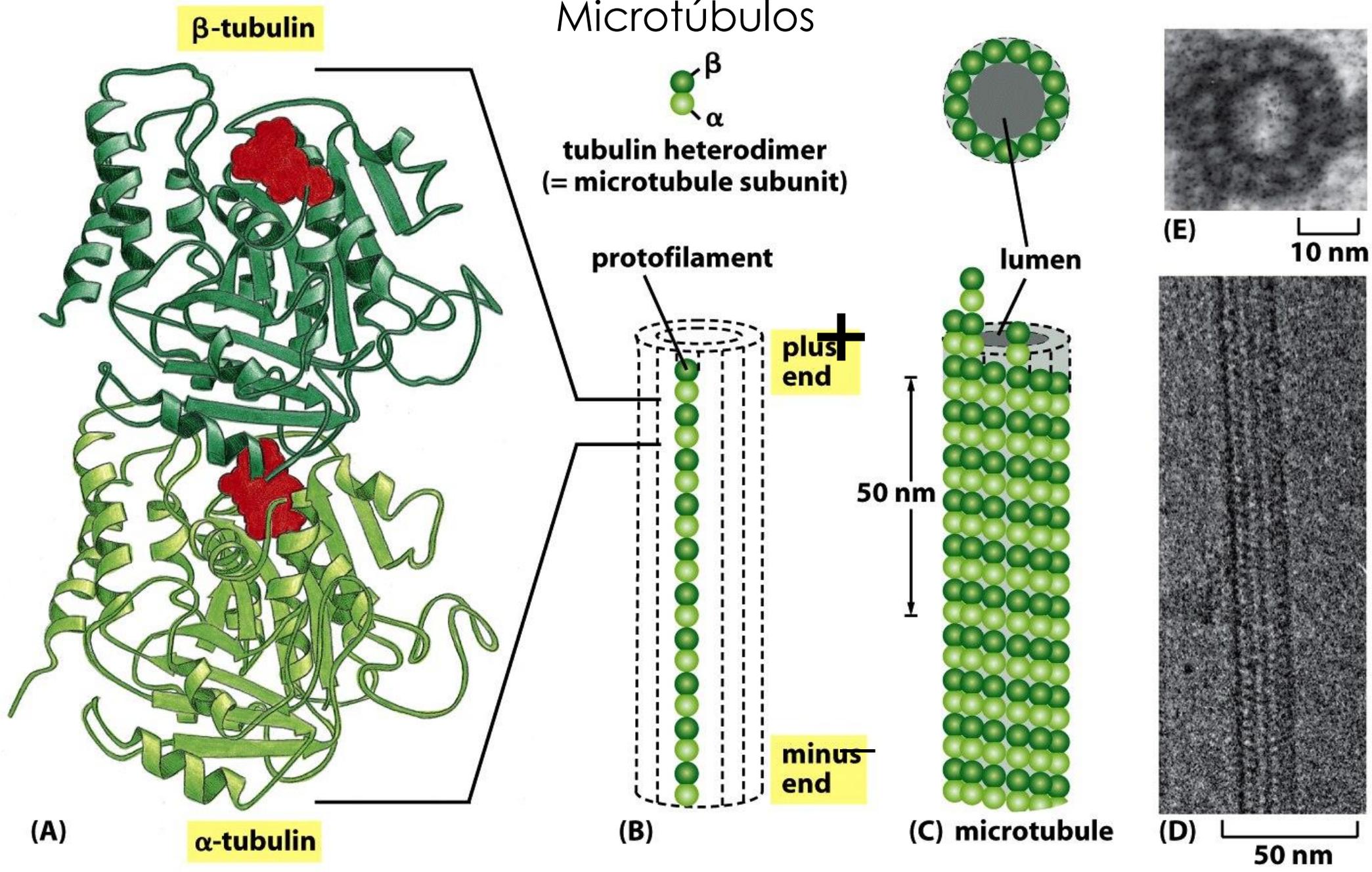


<https://youtu.be/ythc1pCYREY>

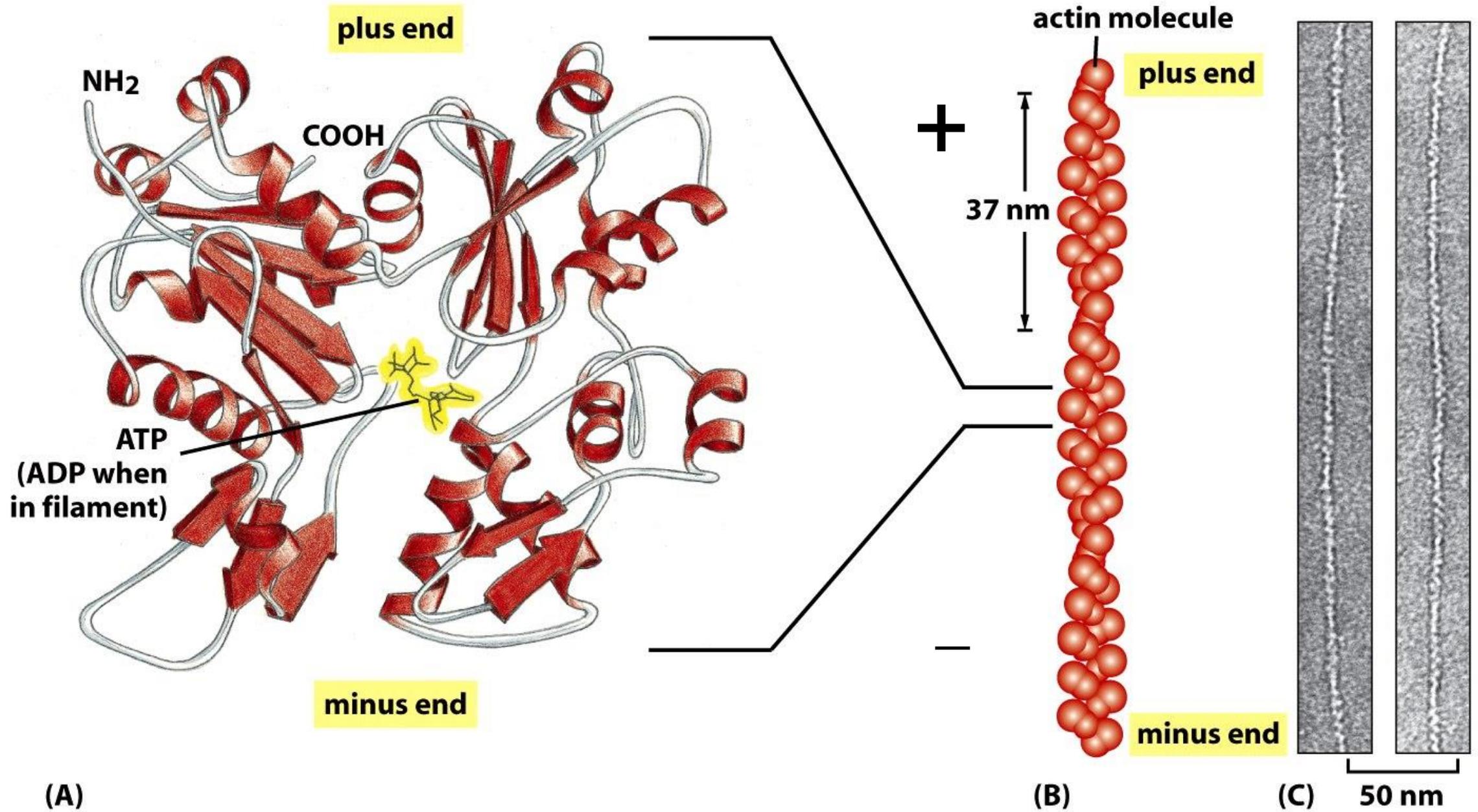
Microtúbulos y filamentos de actina:
propiedades intrínsecas



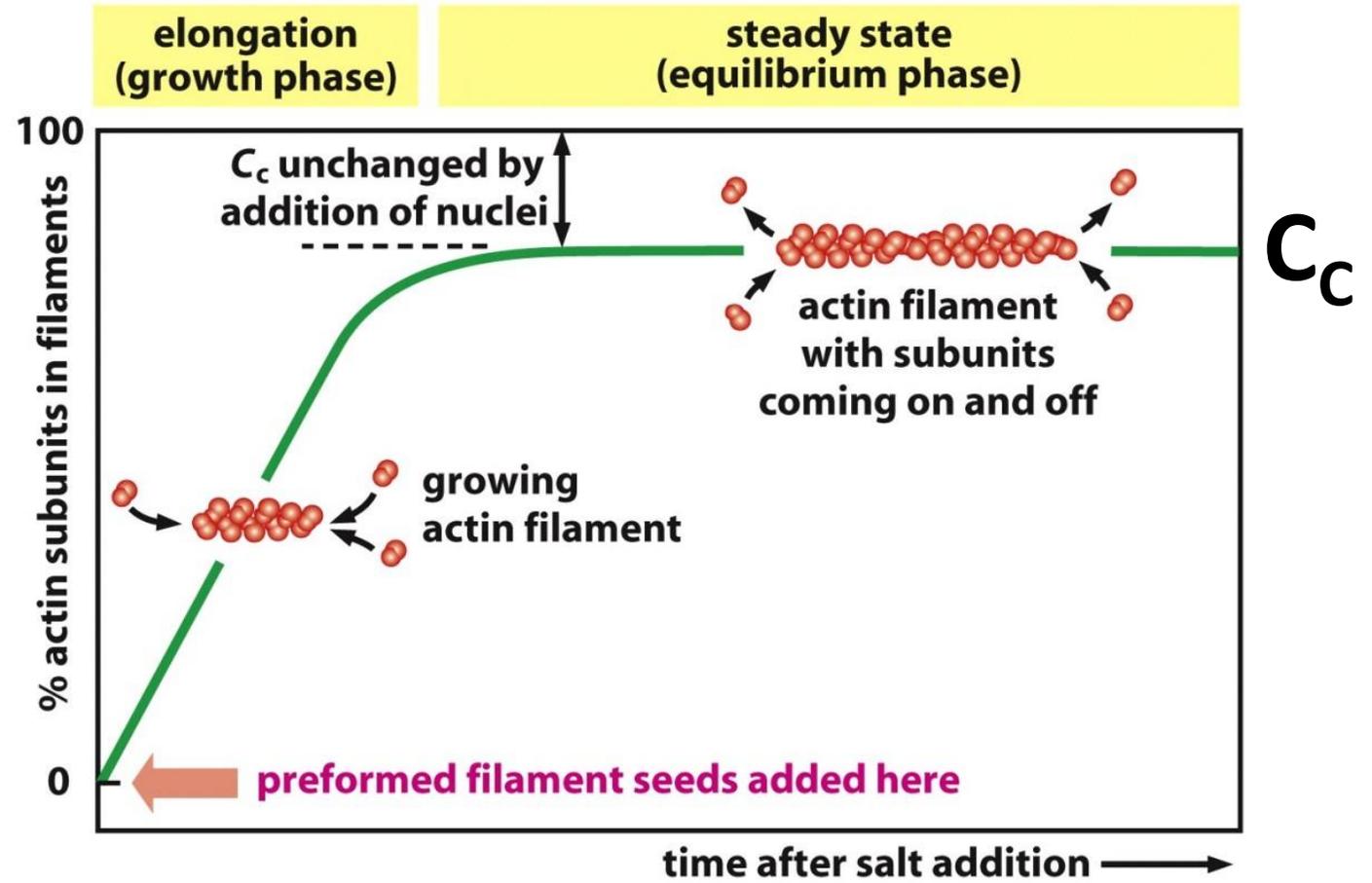
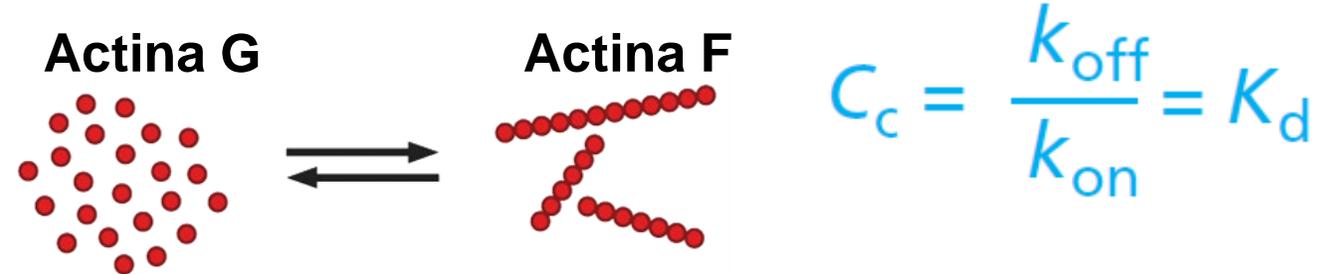
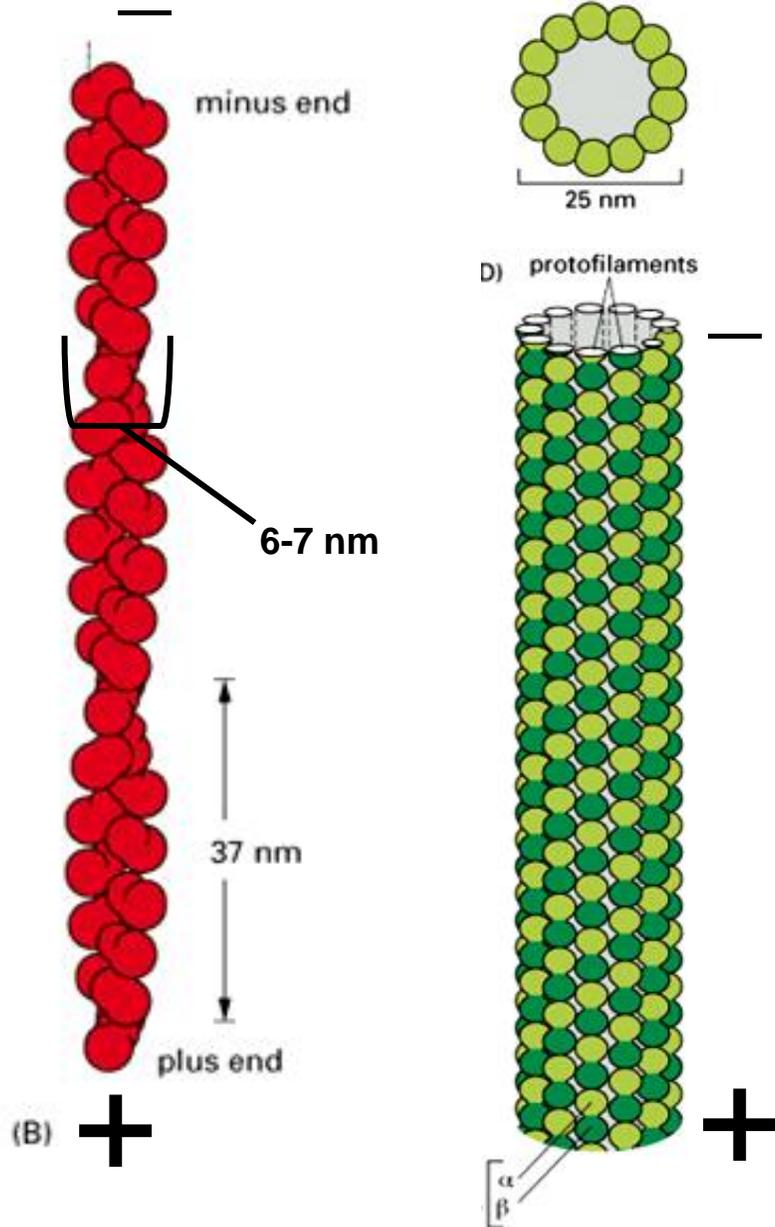
Microtúbulos



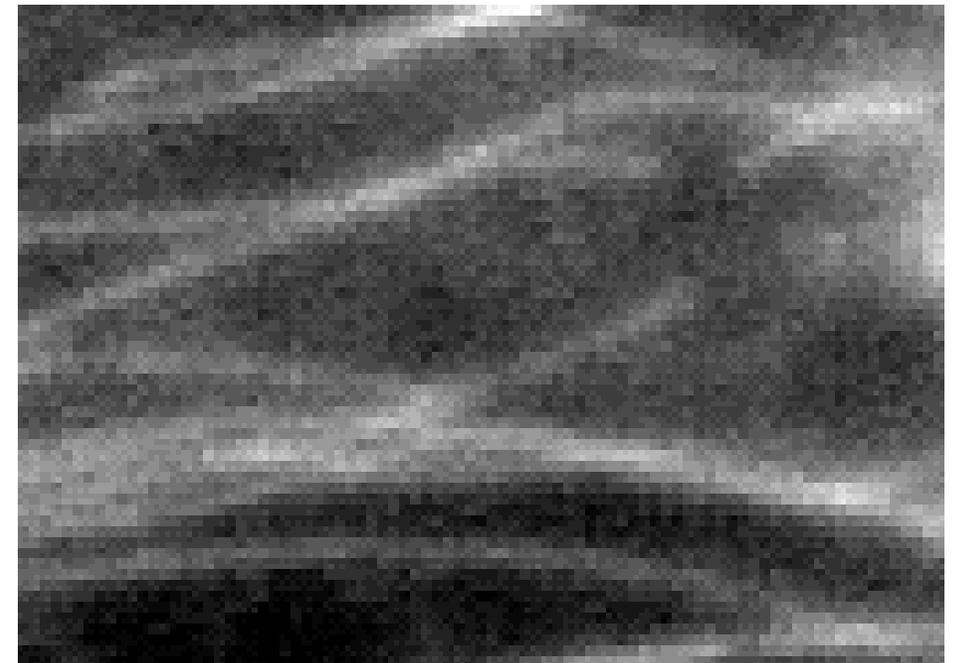
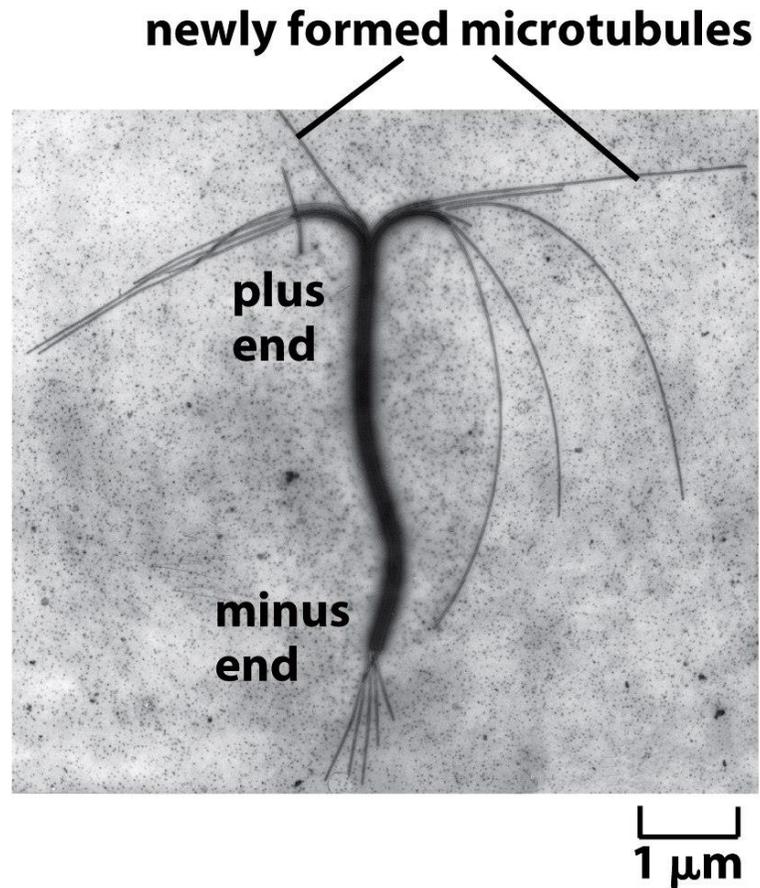
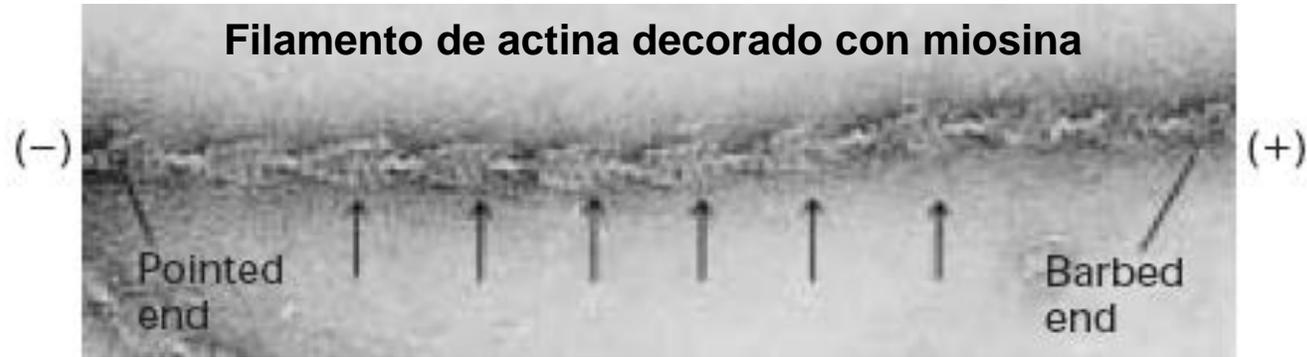
Filamentos de actina o microfilamentos



Los filamentos de actina y los microtúbulos como polímeros dinámicos



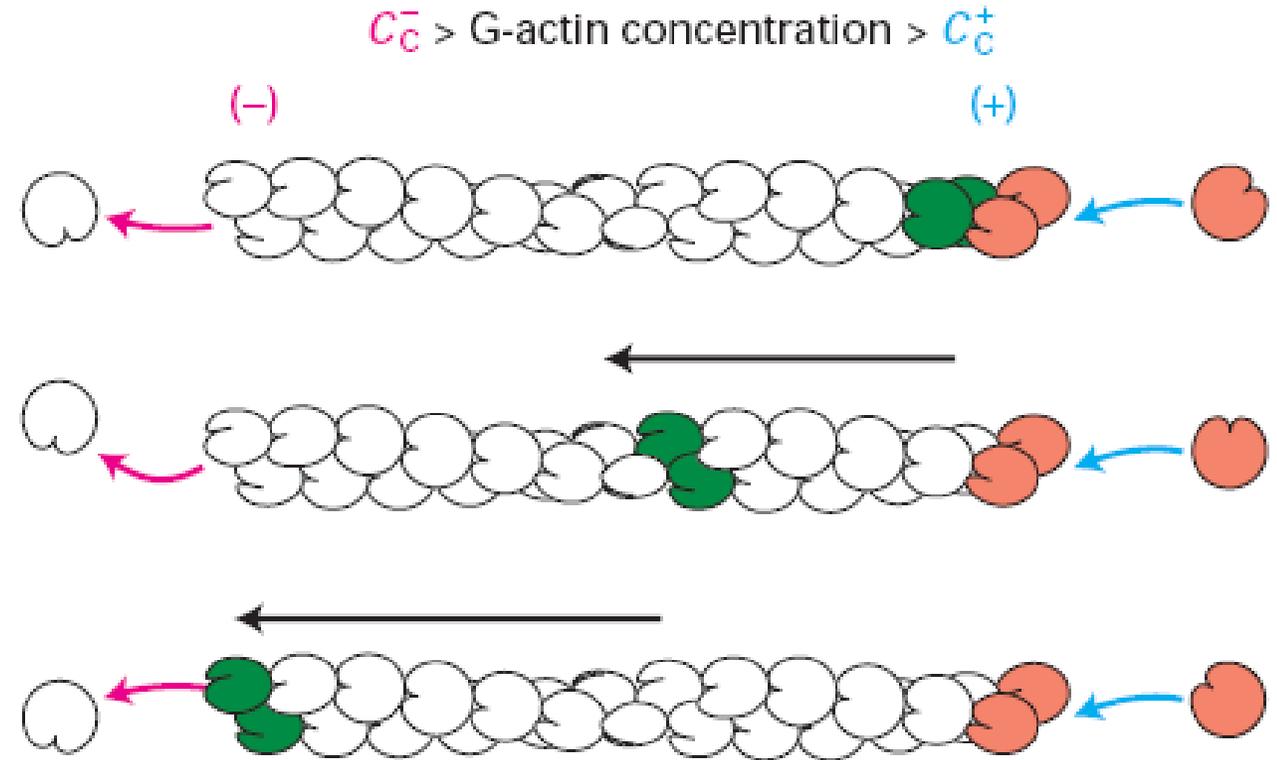
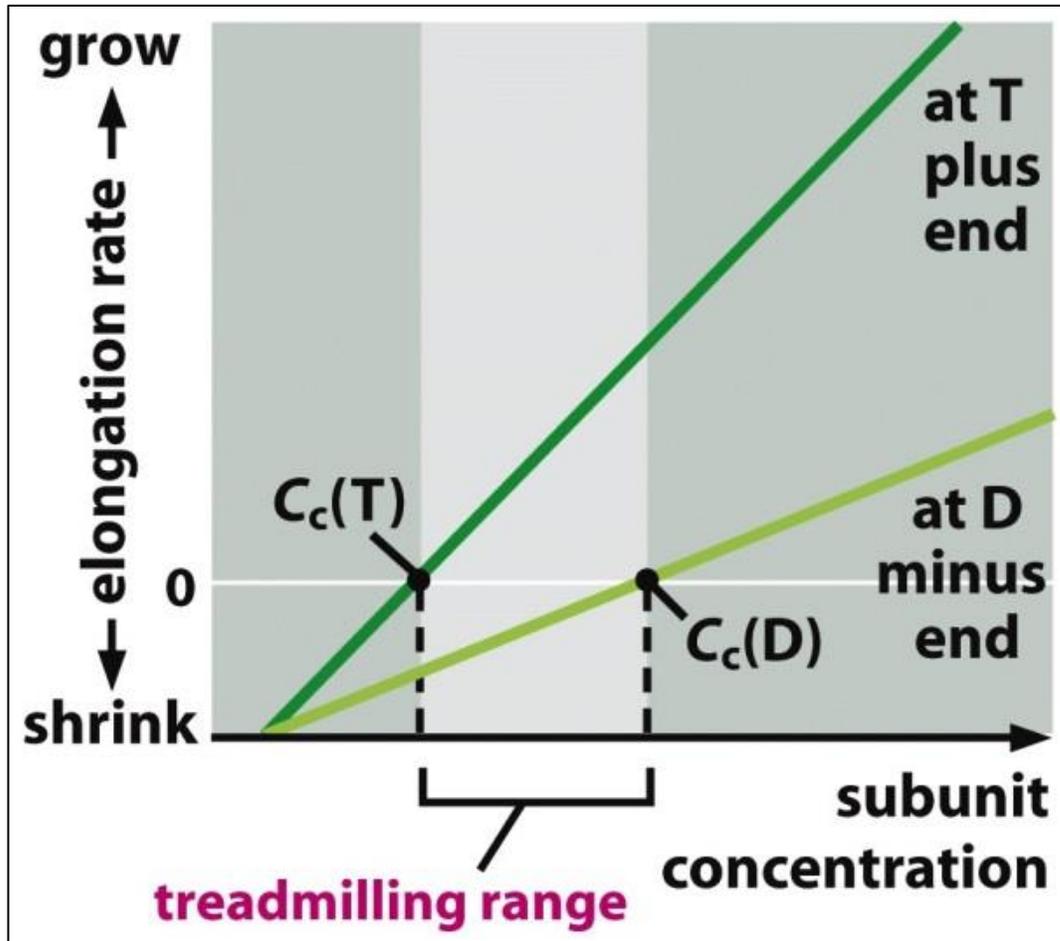
Polaridad de los filamentos y polimerización



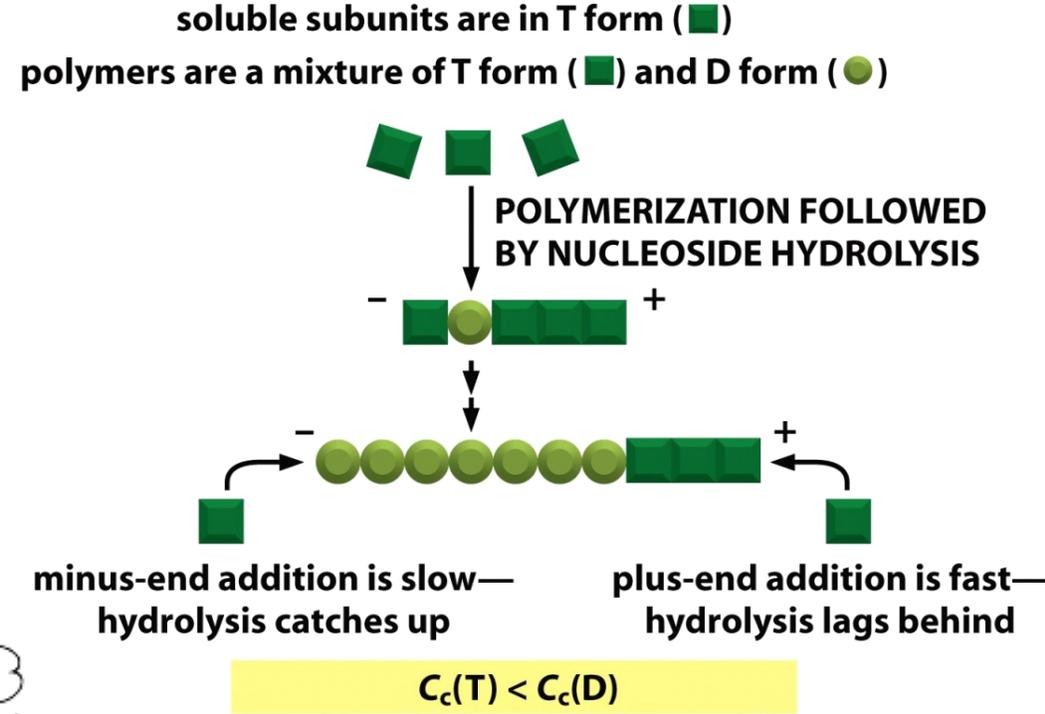
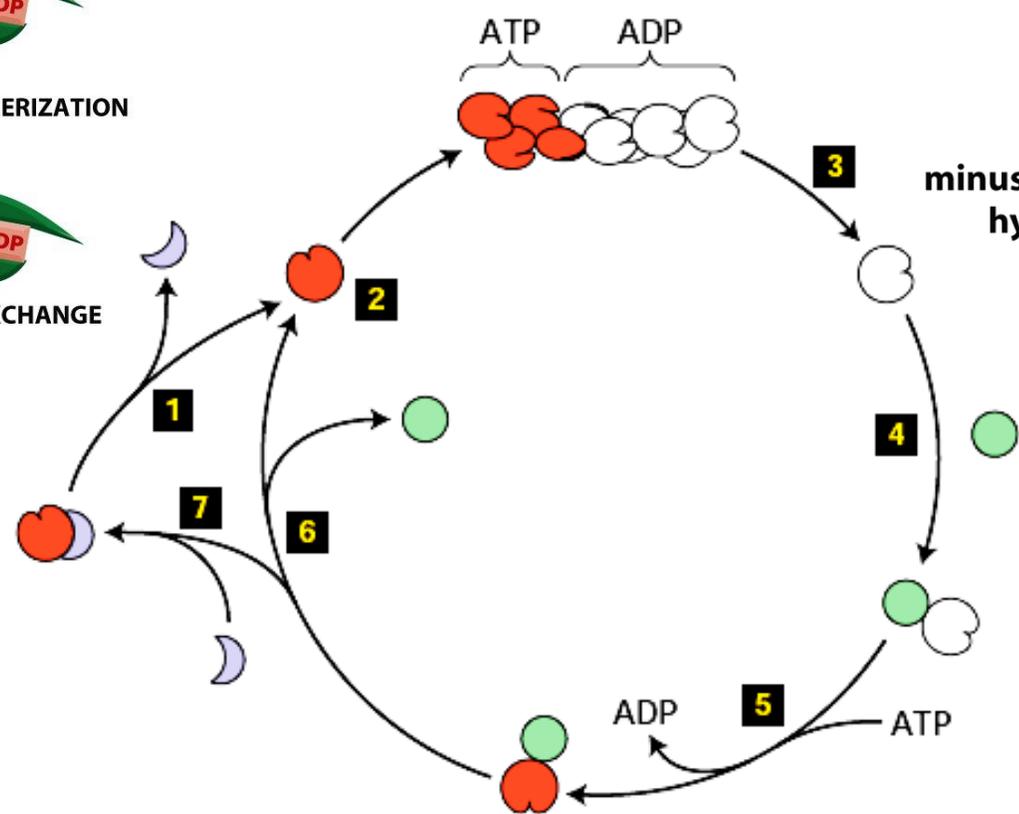
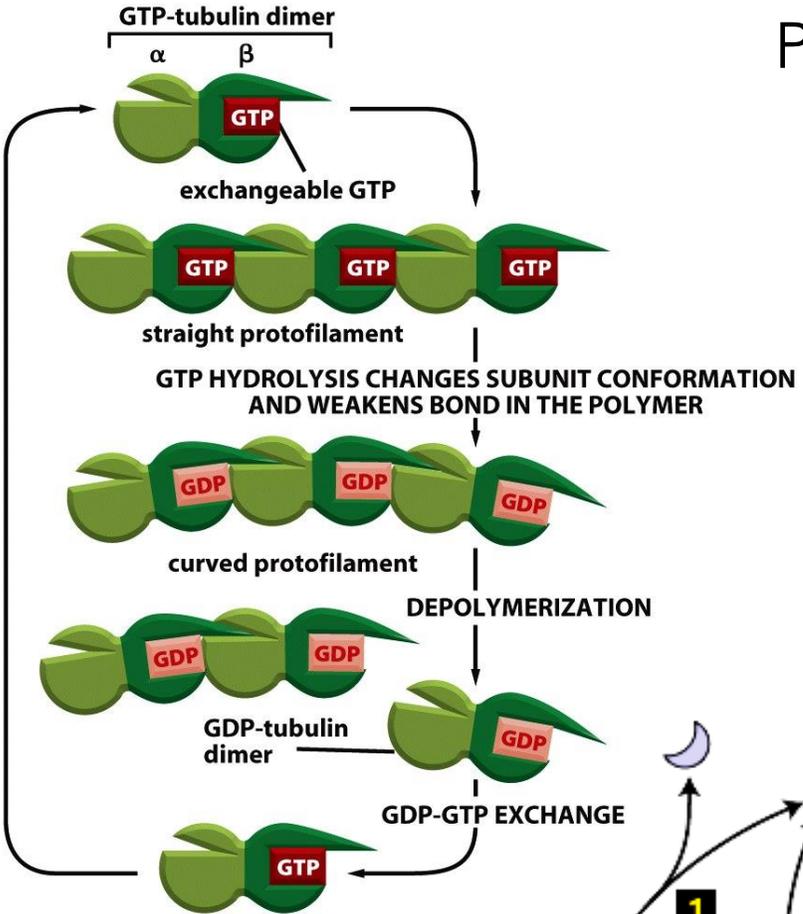
Gary
Borisy

https://youtu.be/UQ7_KYnA_L4

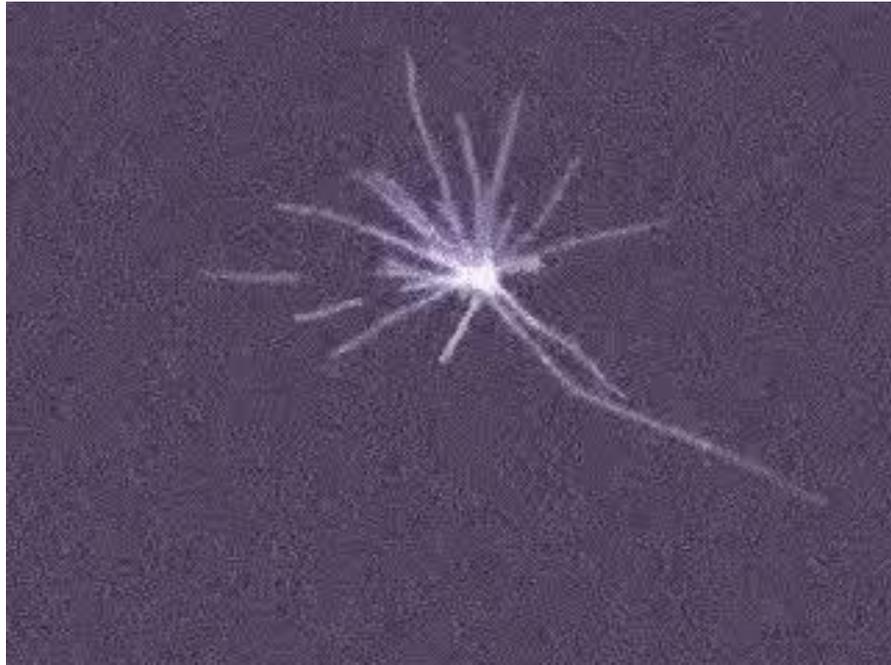
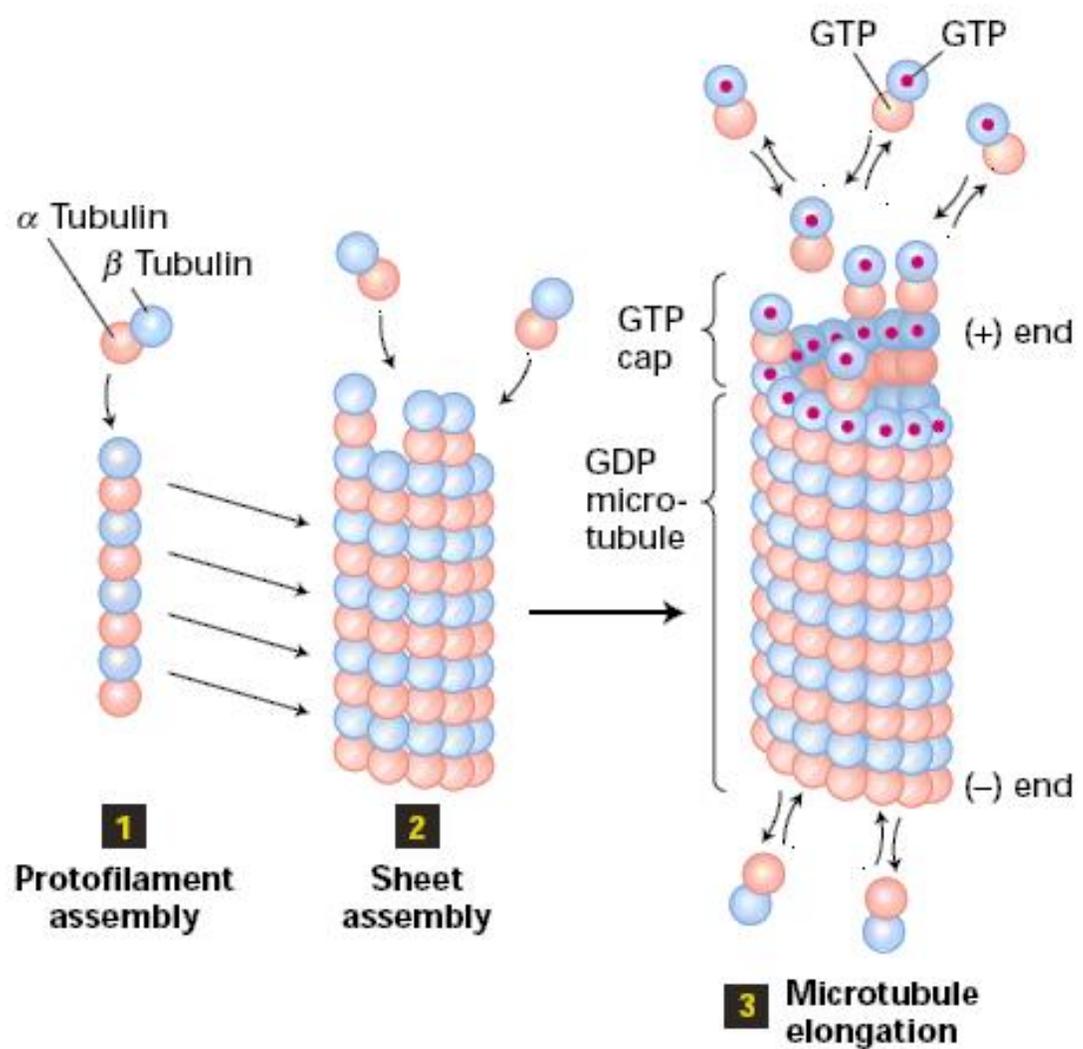
Treadmilling (cinta transportadora)



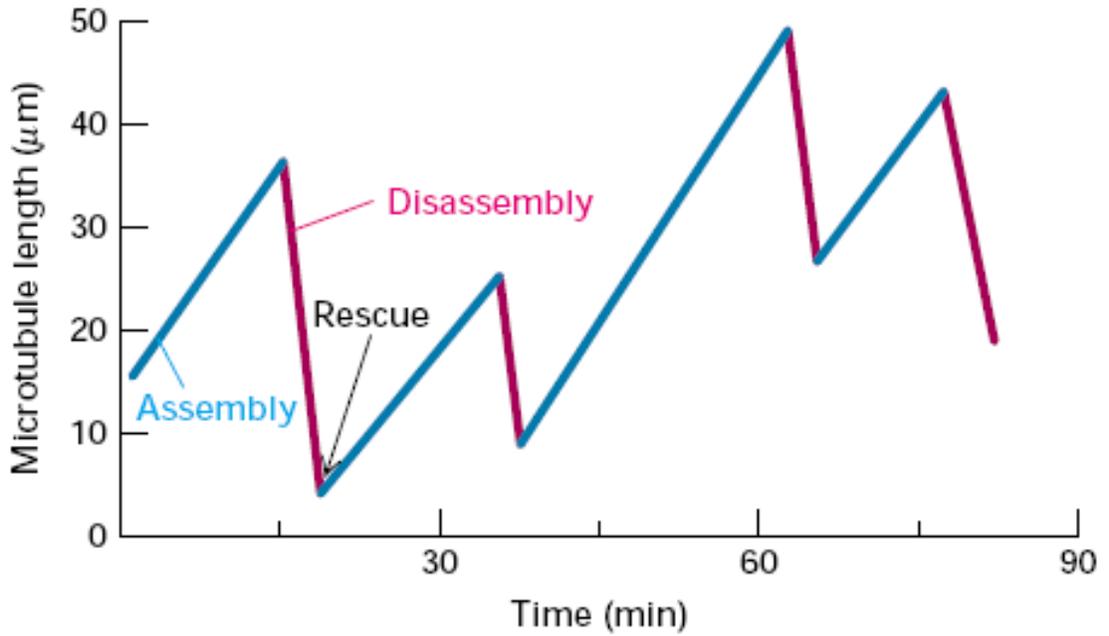
Polimerización y nucleótidos



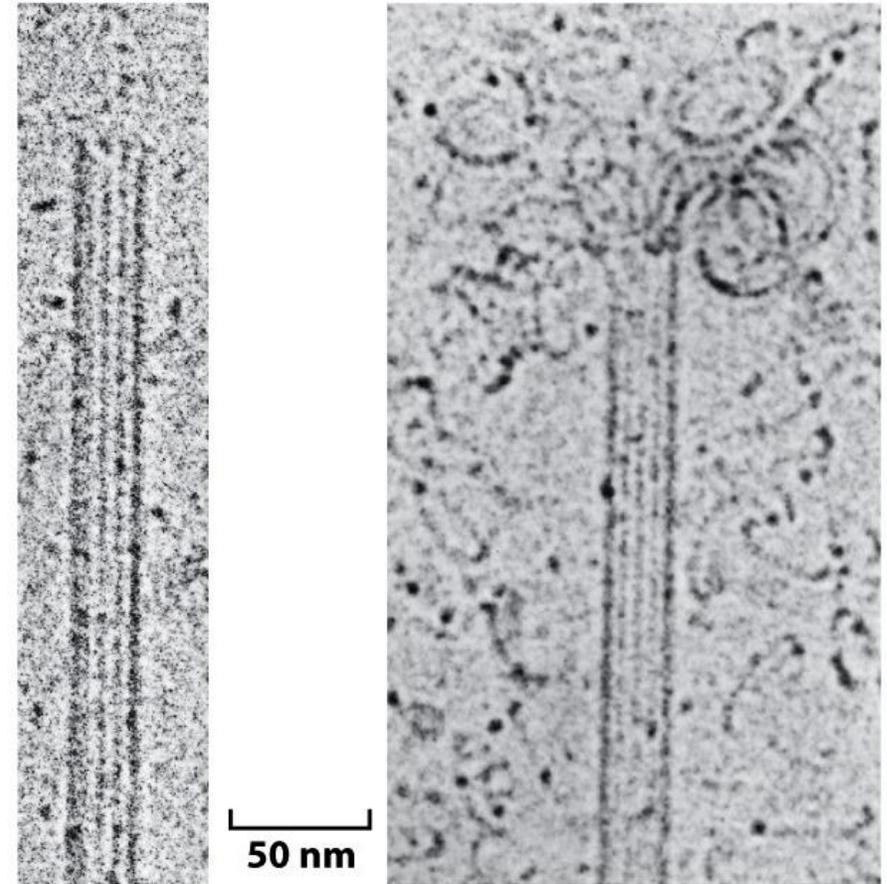
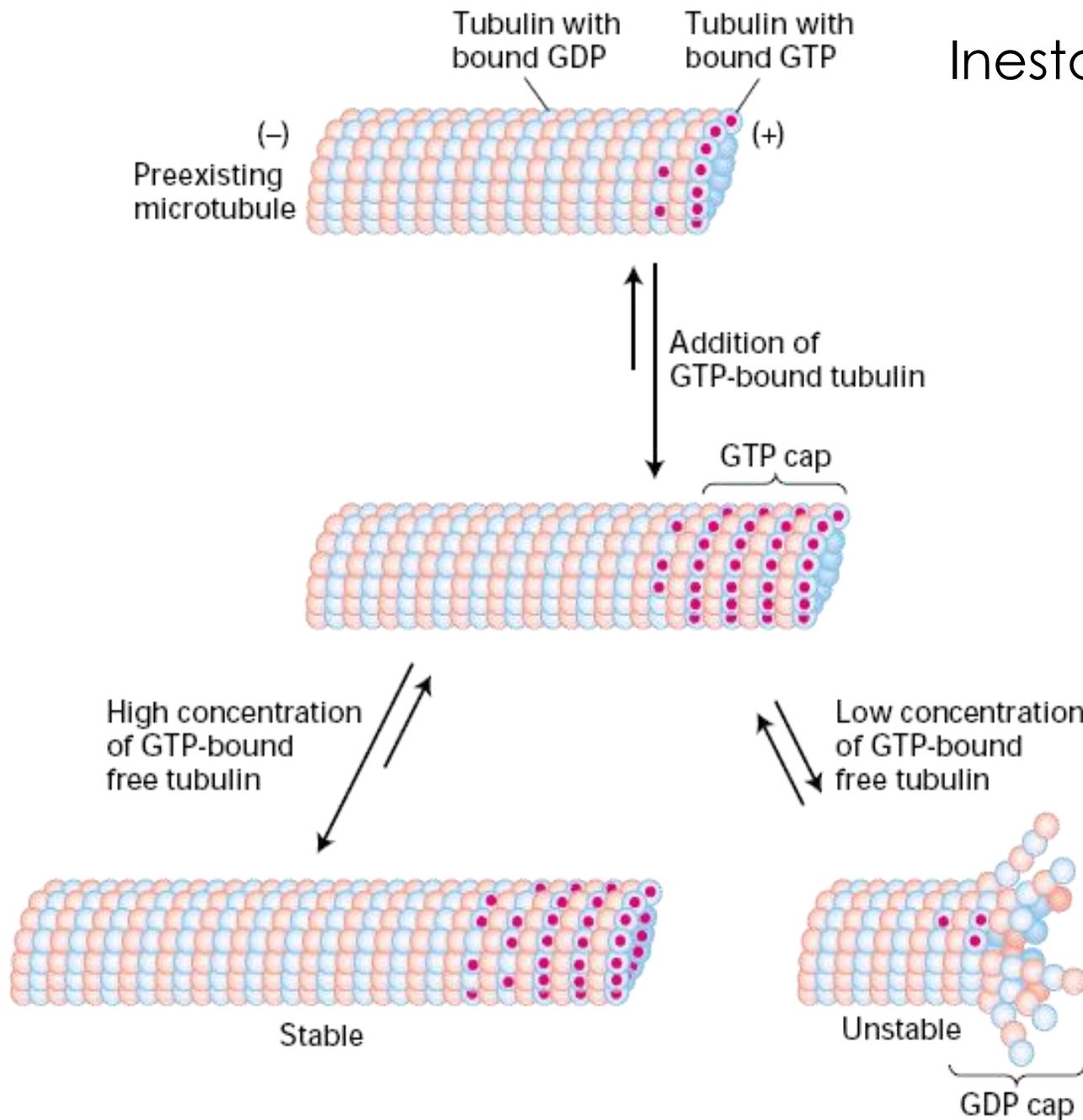
Crecimiento de los microtúbulos



<https://youtu.be/SorUcYfxsfg>



Inestabilidad dinámica de microtúbulos

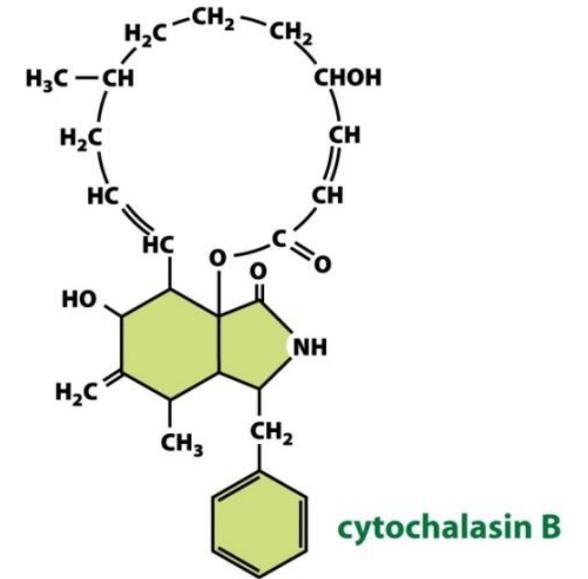


¡CATÁSTROFE!

Manipulación experimental de elementos del citoesqueleto

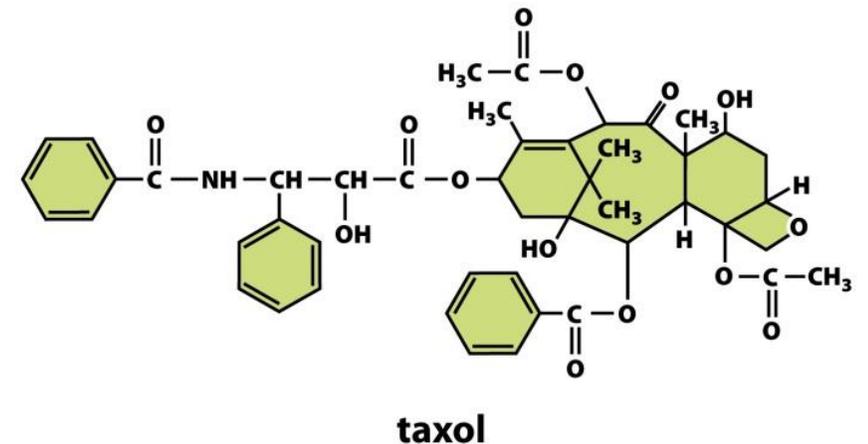
Drogas que afectan a la actina

Faloidina	Se une a filamentos y los estabiliza
Citocalasina	Cubre el extremo + y causa despolimerización
Swinholide	Corta filamentos
Latrunculina	Se une a subunidades e impide polimerización

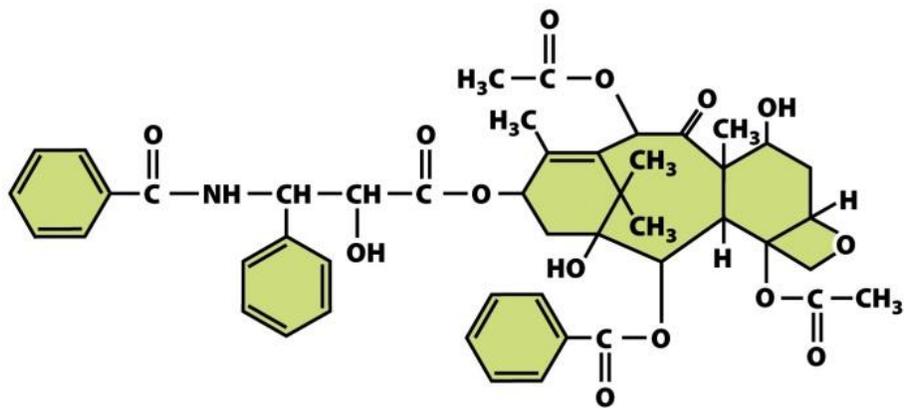


Drogas que afectan a los microtúbulos

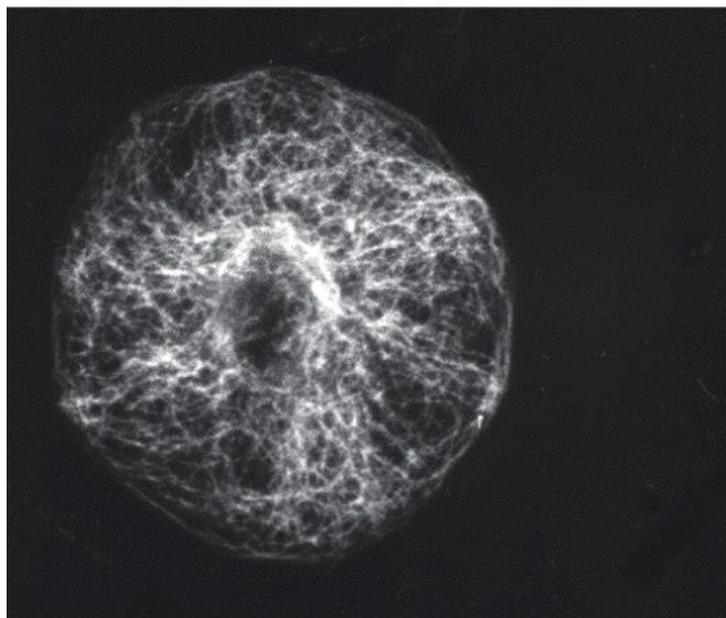
Taxol	Se une a filamentos y los estabiliza
Colchicina, colcemid	Se une a subunidades e impide polimerización
Vinblastina, vincristina	Se une a subunidades e impide polimerización
Nocodazole	Se une a subunidades e impide polimerización



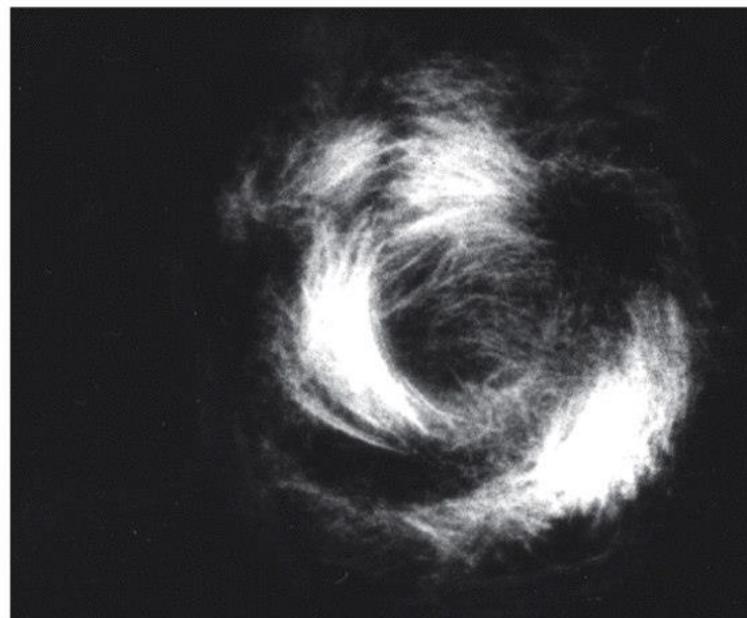
Manipulación experimental de elementos del citoesqueleto



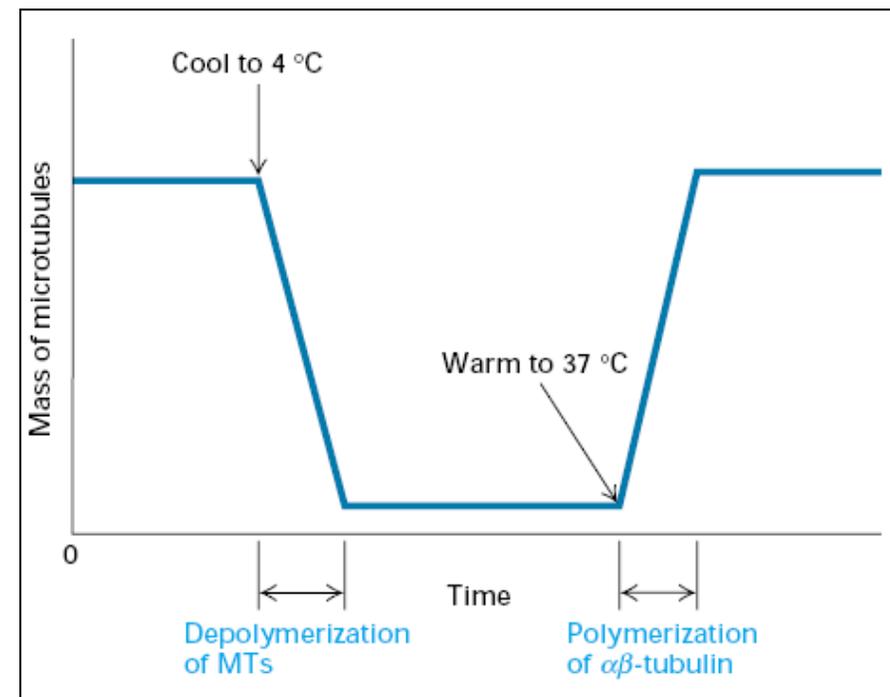
taxol



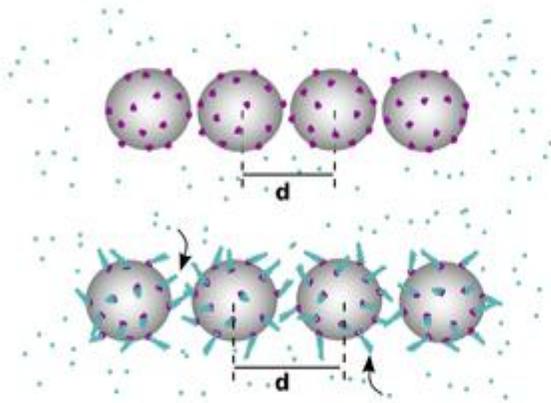
15 μm



(C)



a

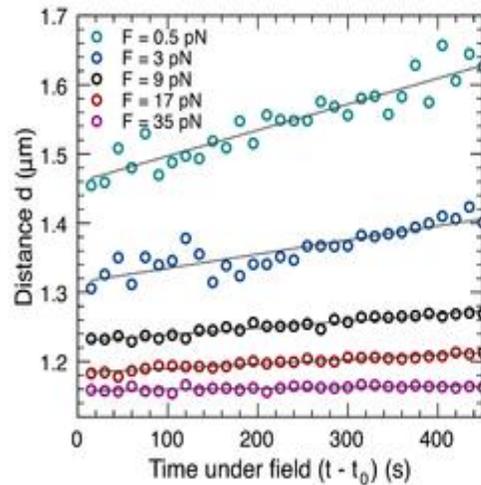


Force-Velocity Measurements of a Few Growing Actin Filaments

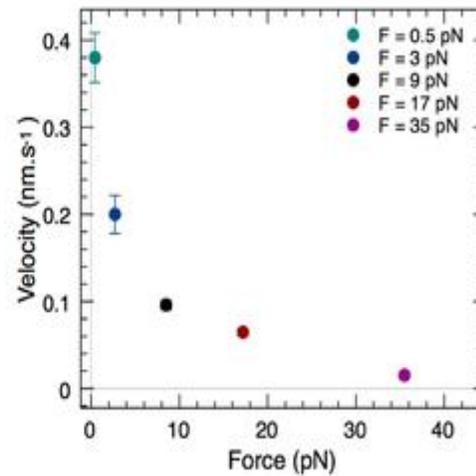
Coraline Brangbour¹, Olivia du Roure^{2*}, Emmanuèle Helfer³, Damien Démoulin¹, Alexis Mazurier¹, Marc Fermigier², Marie-France Carlier³, Jérôme Bibette¹, Jean Baudry¹

¹Laboratoire Colloïdes et Matériaux Divisés, UPMC, ESPCI ParisTech, CNRS PECSA UMR 7195, Paris, France, ²Physique et Mécanique des Milieux Hétérogènes, ESPCI ParisTech, CNRS UMR 7636, UPMC, Université Denis Diderot, Paris, France, ³Laboratoire d'Enzymologie et Biochimie Structurales, CNRS UPR 3082, Gif-sur-Yvette, France

c



d

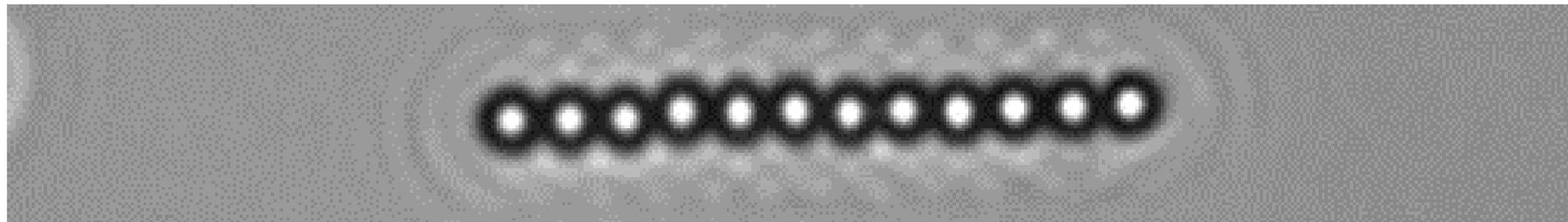


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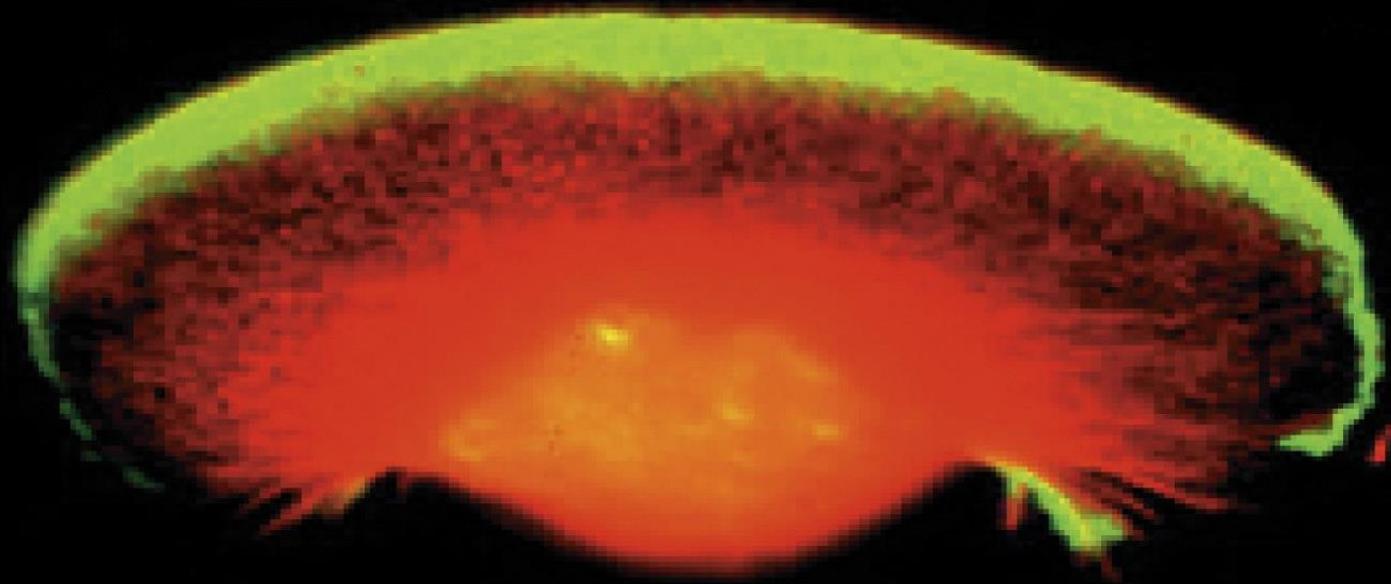
April 2011 | Volume 9 | Issue 4 | e1000613

Trabajo
extra 1

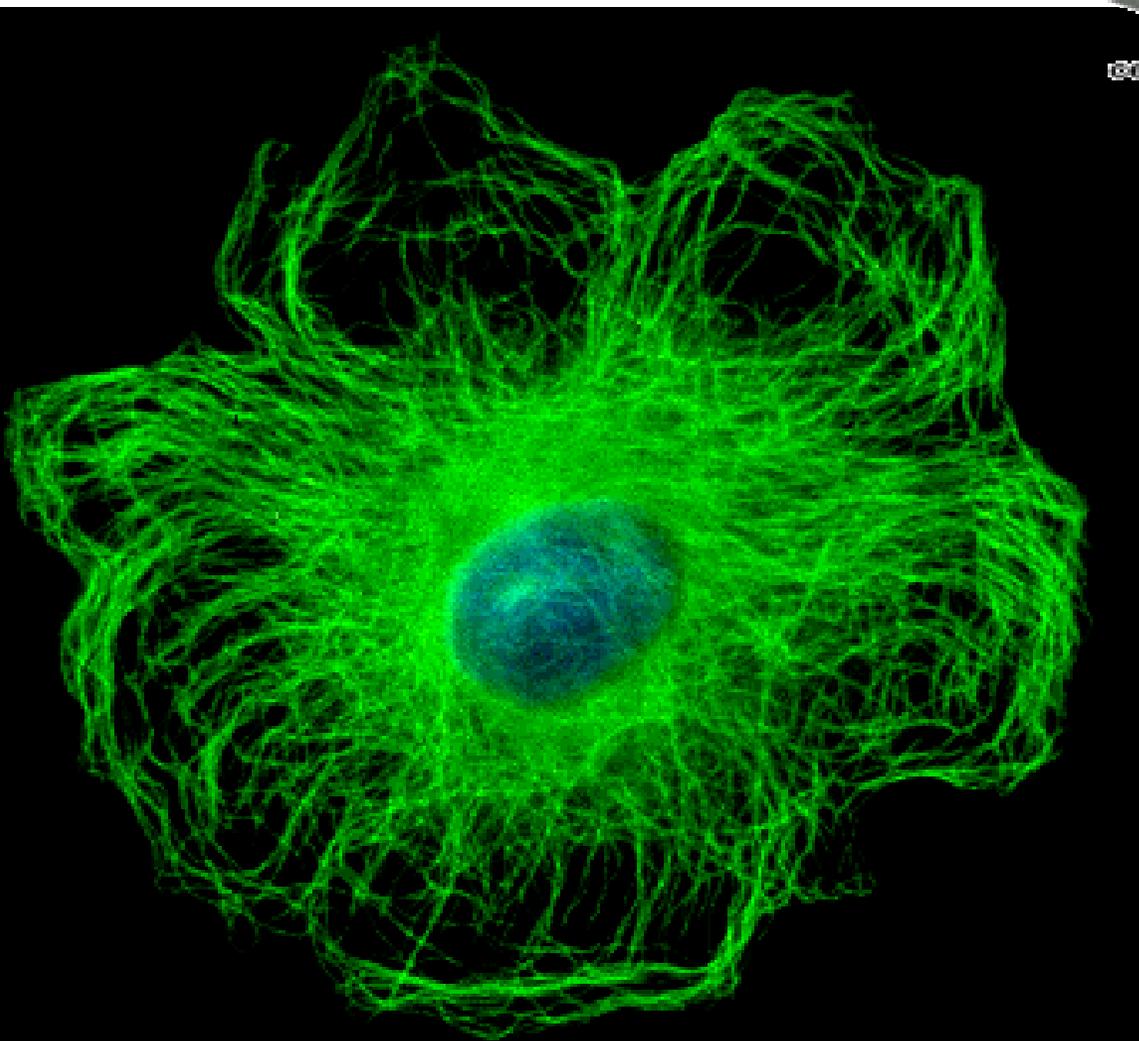
<http://dx.plos.org/10.1371/journal.pbio.1000613>



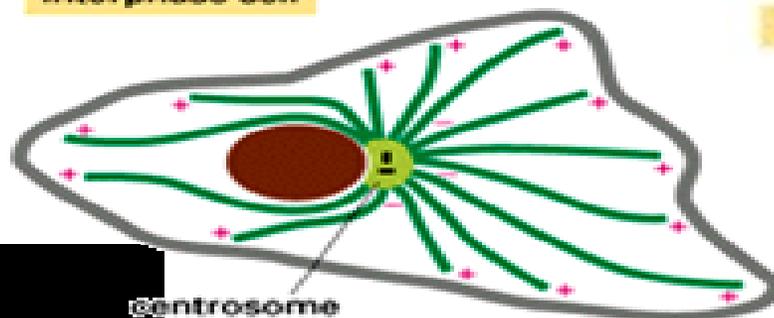
Microtúbulos y filamentos de actina:
Funciones y regulación en las células



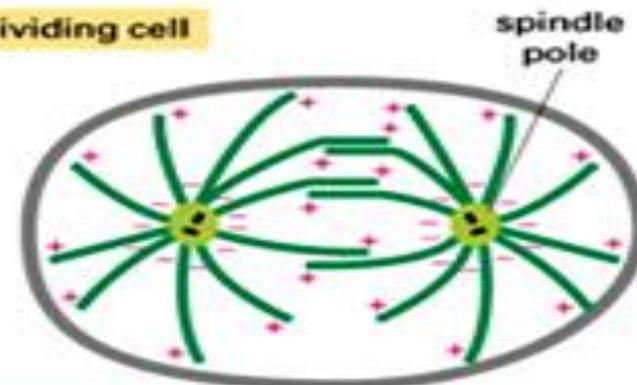
Distribución y funciones de los microtúbulos en las células



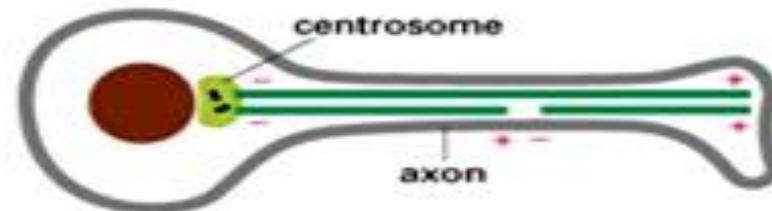
interphase cell



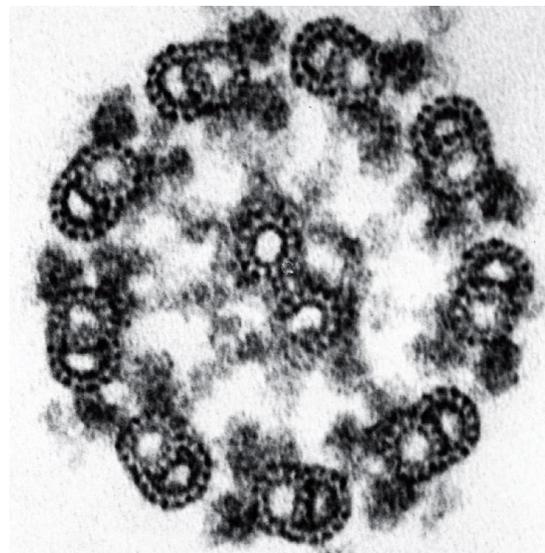
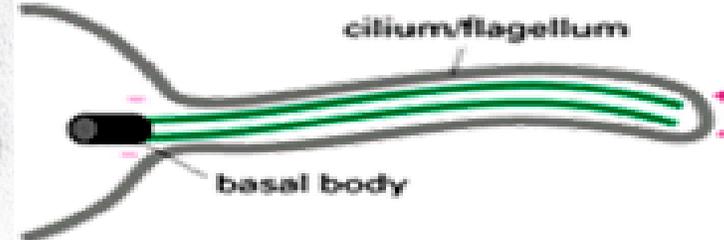
dividing cell



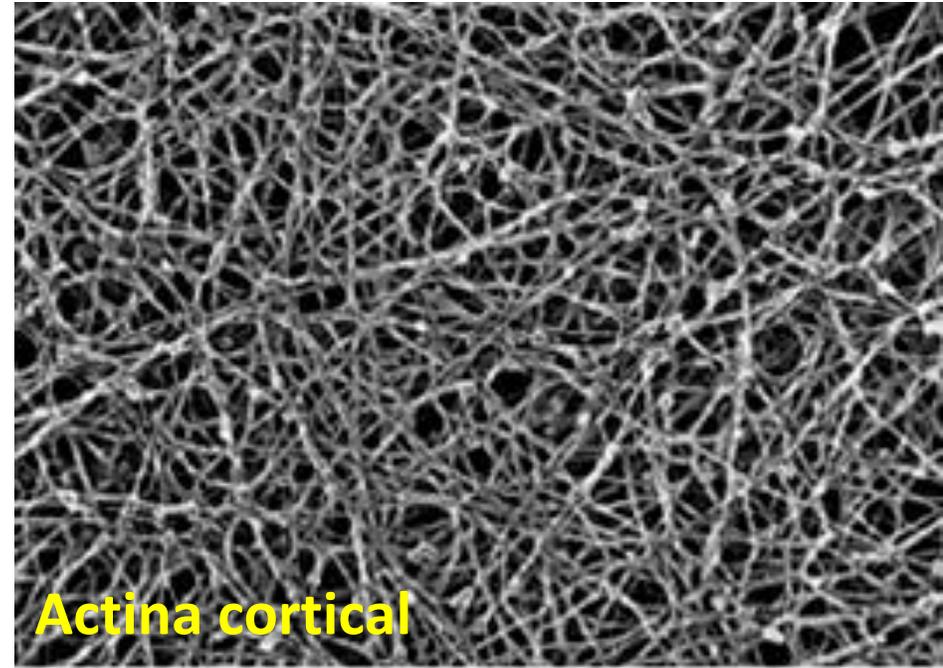
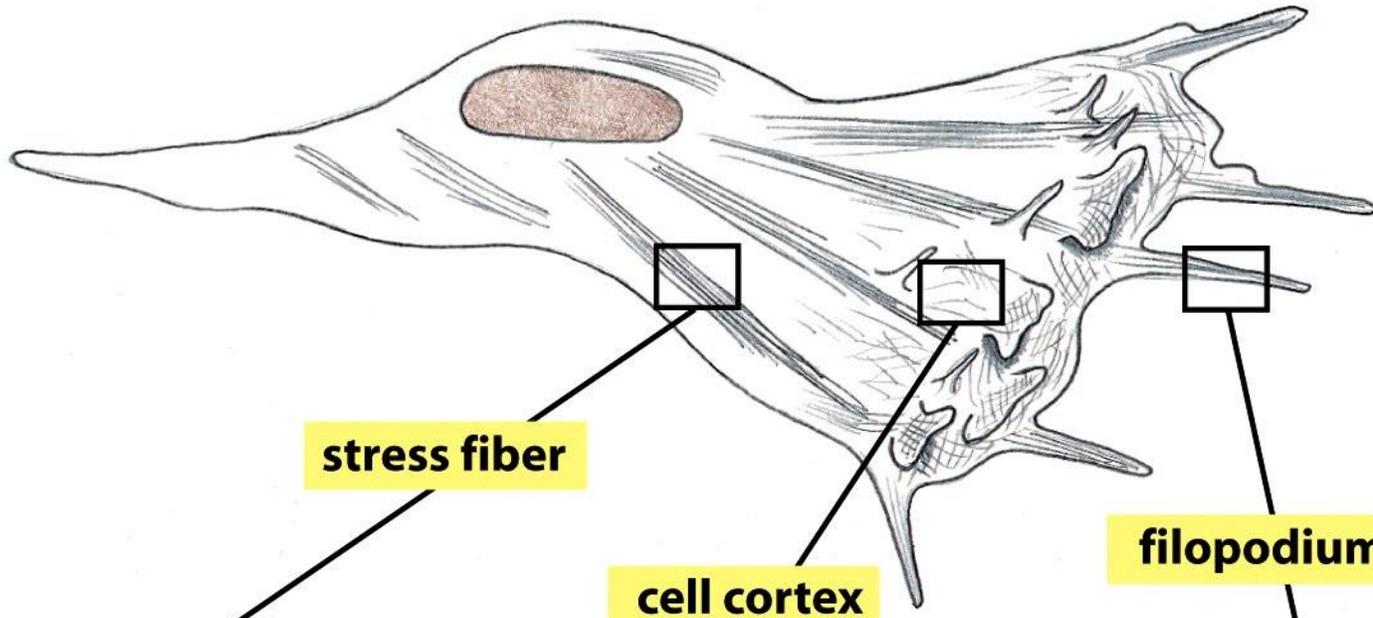
nerve cell



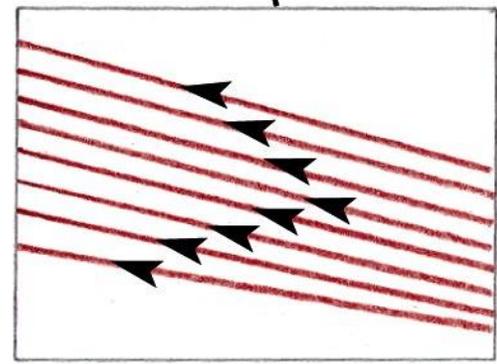
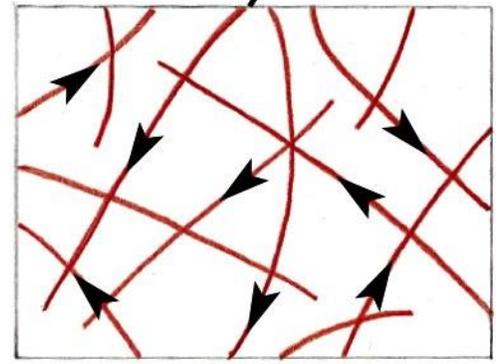
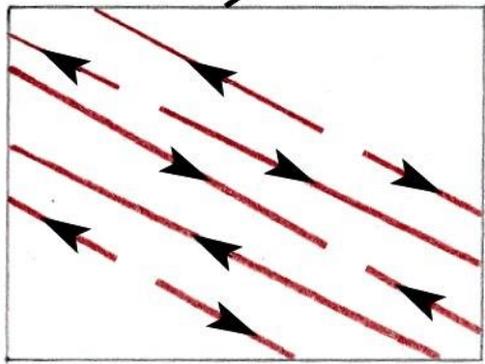
ciliated cell



Diferentes configuraciones de la actina

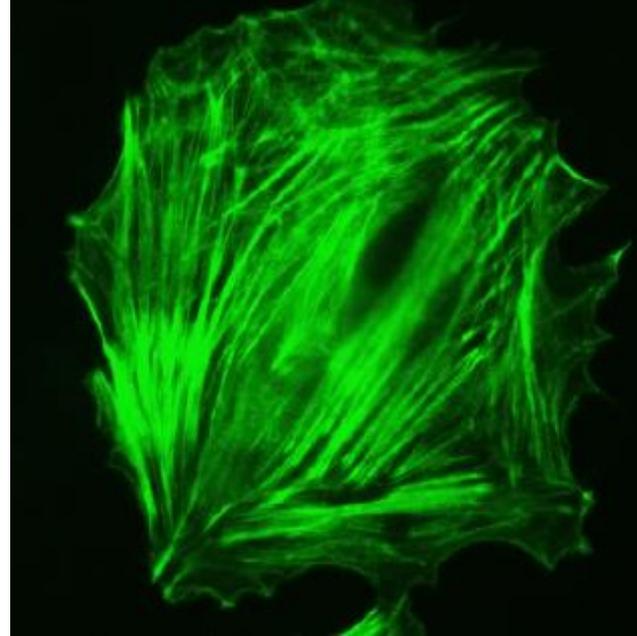


100 nm

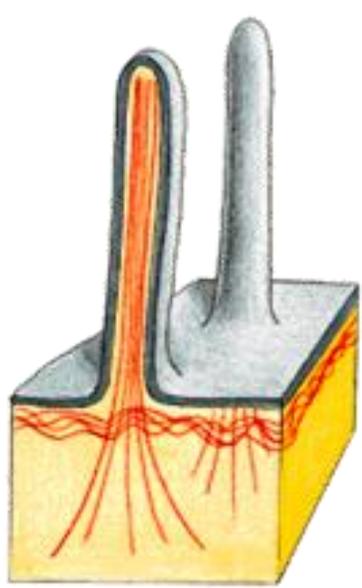


100 nm

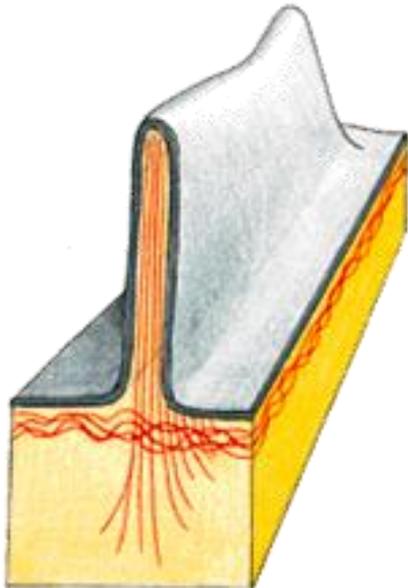
Fibras de estrés



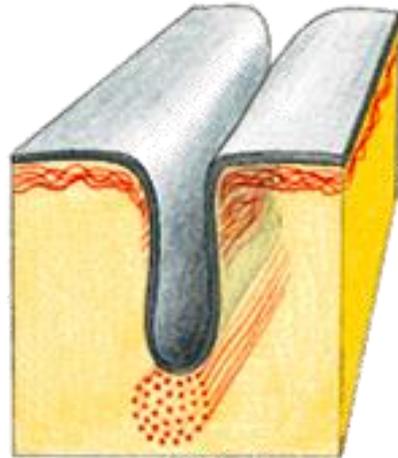
Distribución y funciones de los microfilamentos en las células



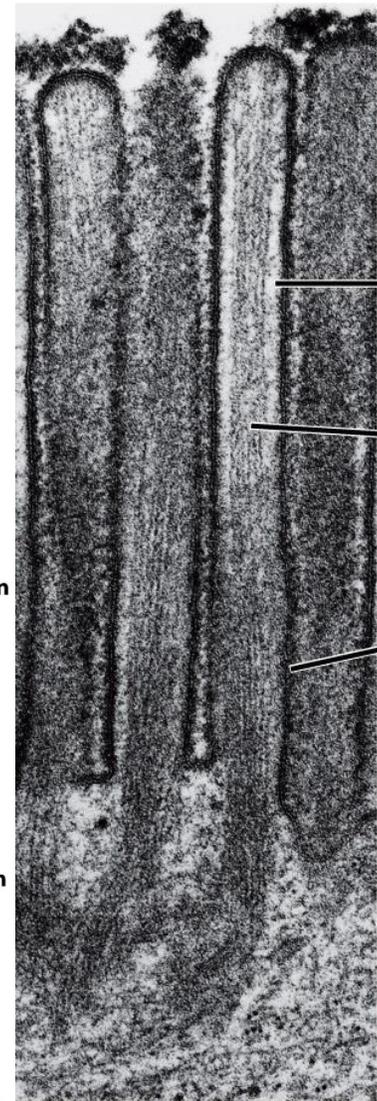
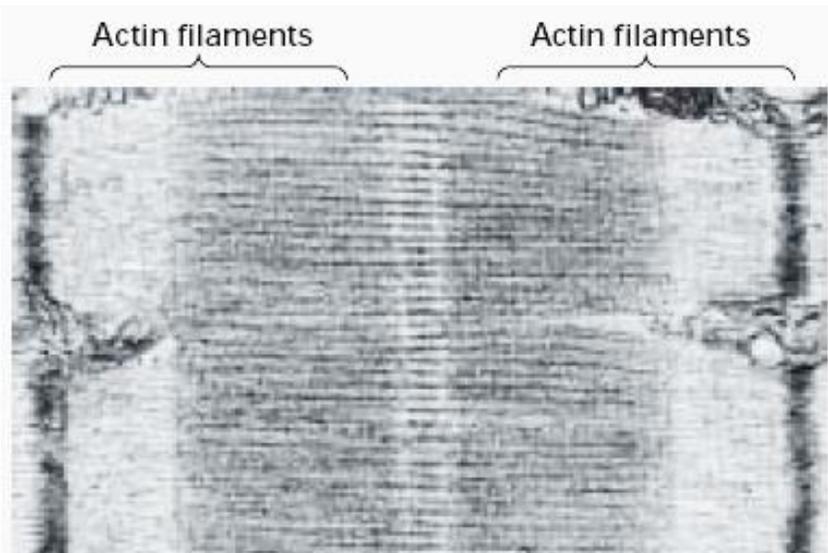
(A)



(B)



(C)



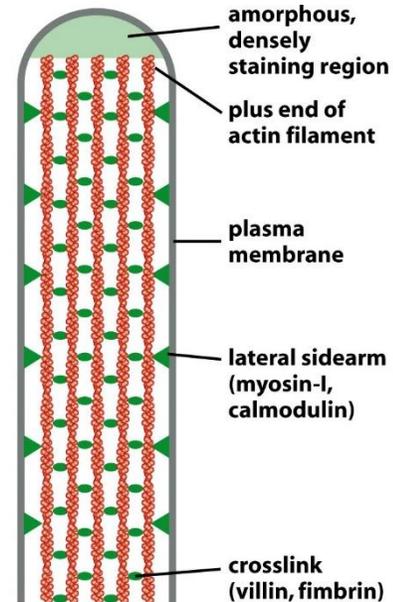
microvillus

actin
filament
bundle

plasma
membrane

terminal
web

1 μ m



amorphous,
densely
staining
region

plus end of
actin filament

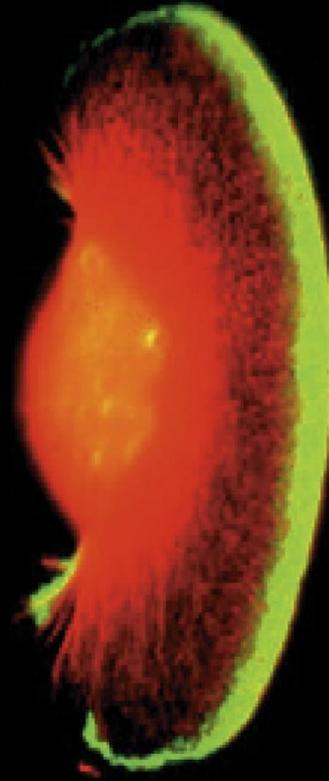
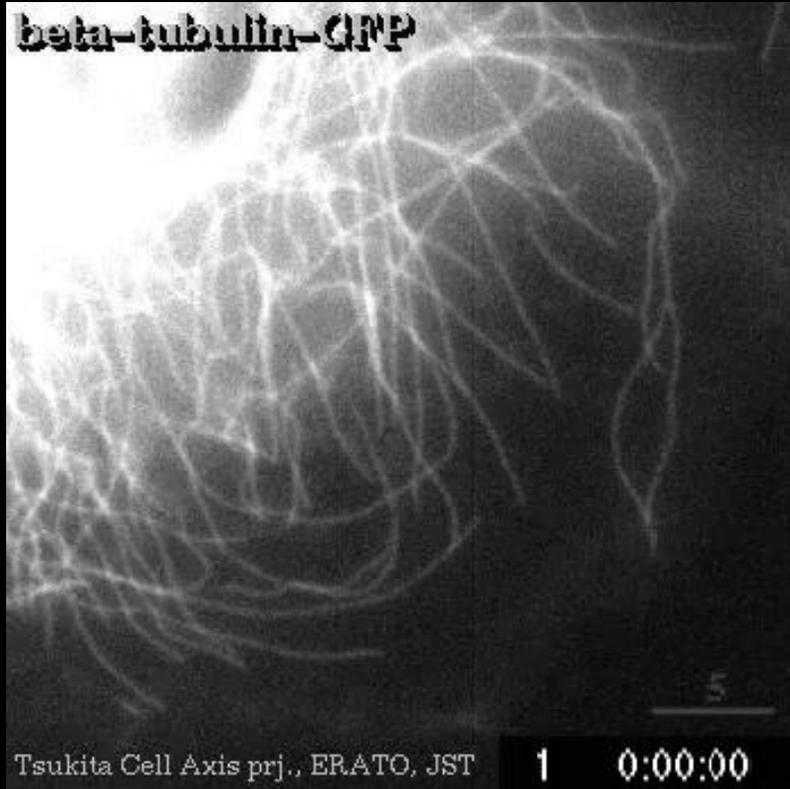
plasma
membrane

lateral sidearm
(myosin-I,
calmodulin)

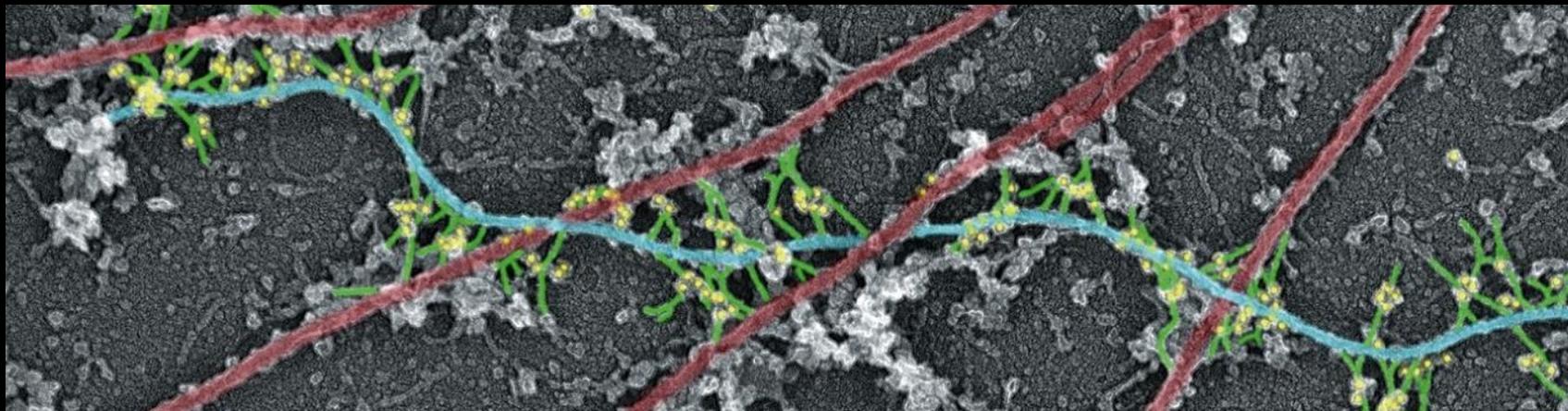
crosslink
(villin, fimbrin)

Interacción entre elementos del citoesqueleto en células

<https://youtu.be/XbnyHgtIOFQ>



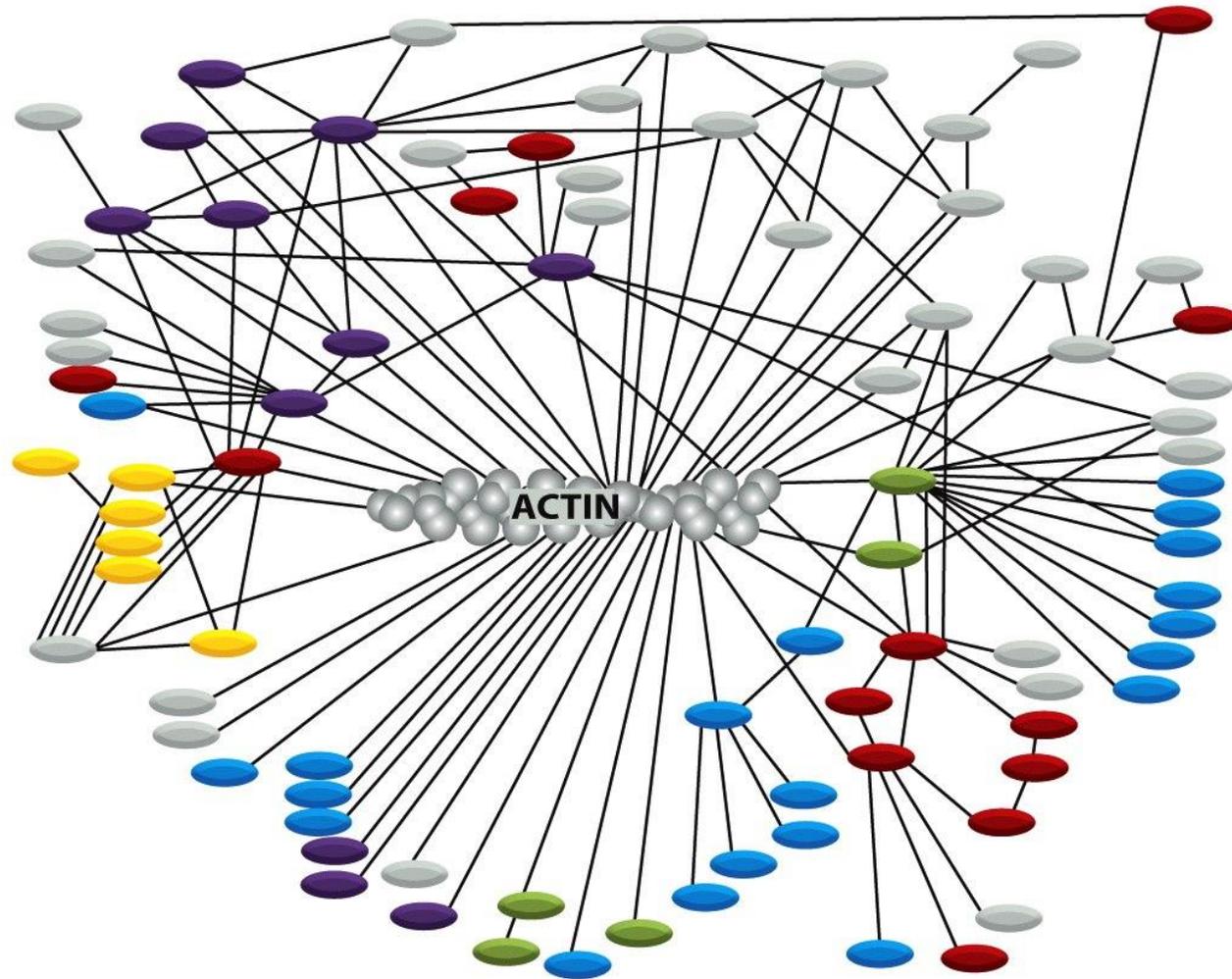
<https://youtu.be/Qm-Hp1IaIQ4>



Microtúbulos
Fil. Intermedios
Plectina

0.5 μm

Proteínas asociadas al citoesqueleto



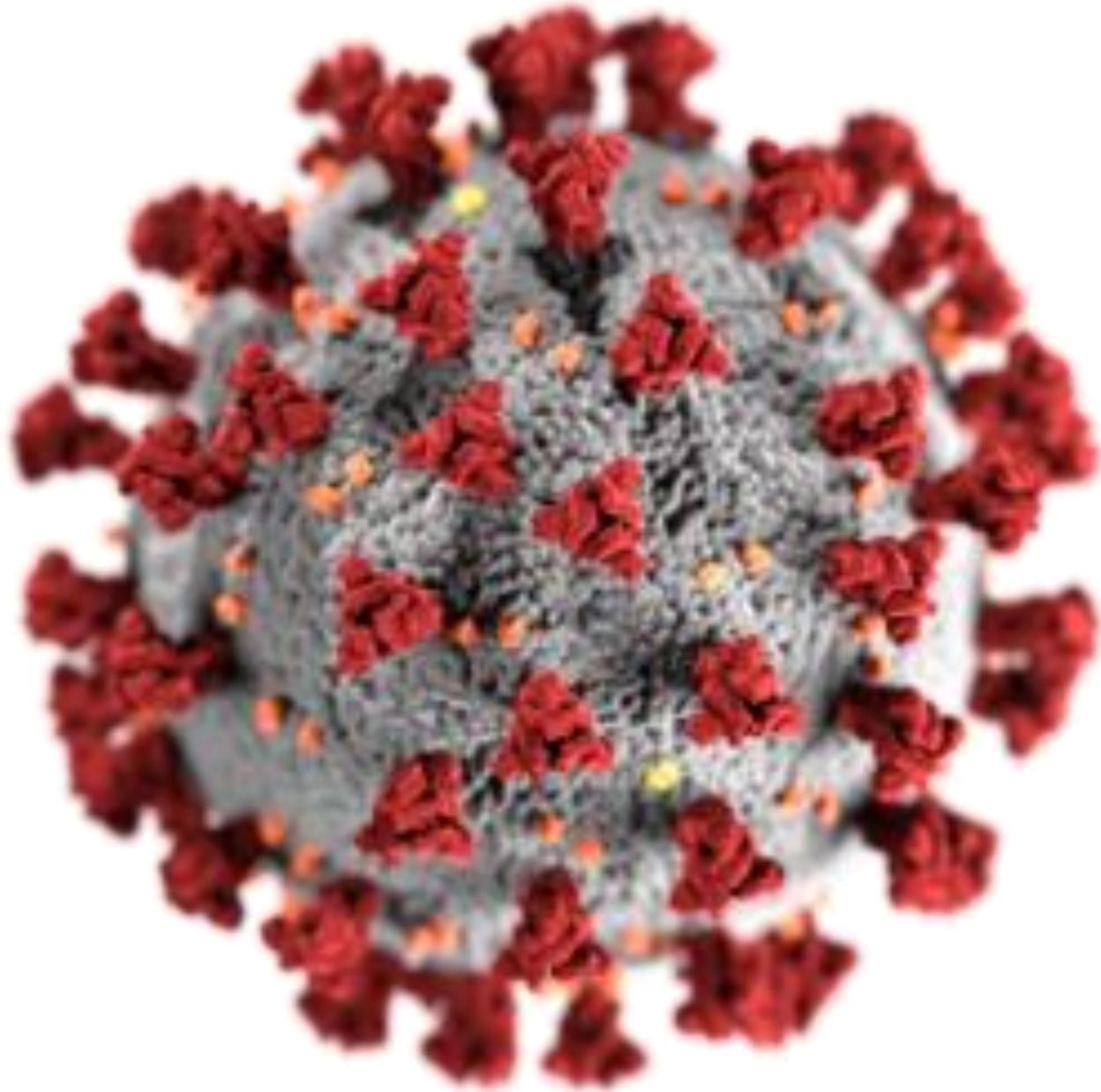
Trabajo
extra 2:

string-db.org

www.uniprot.org

KEY:

 Proteínas motoras (miosina)	 Síntesis de lípidos
 División y polaridad celular	 Dinámica del filamento
 Secreción, endocitosis	 Otras



Trabajo extra 3:

¿Relación entre
infección por
coronavirus y
citoesqueleto?

