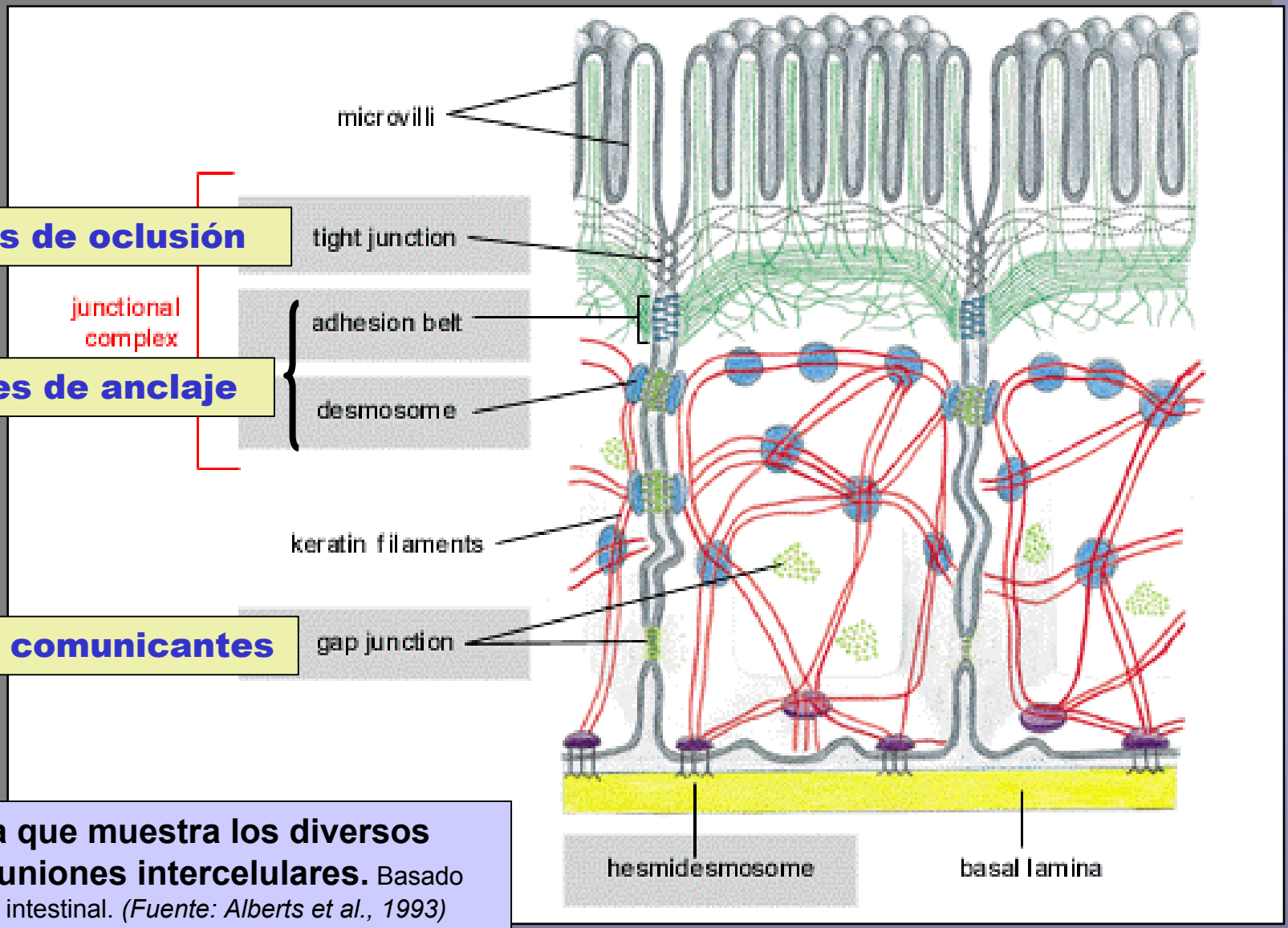
LAS UNIONES ENTRE CÉLULAS SON DE TRES TIPOS FUNDAMENTALES



Esquema que muestra los diversos tipos de uniones intercelulares. Basado en el epitelio intestinal. *(Fuente: Alberts et al., 1993)*

La caída de un dogma:
Las uniones adherentes no están ancladas al citoesqueleto de actina

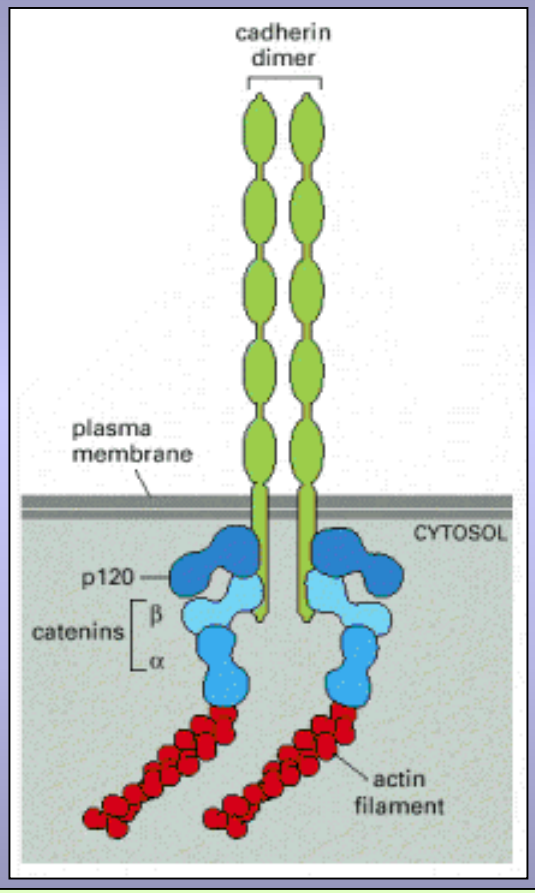


Figure 19-29. The linkage of classical cadherins to actin filaments. (Fuente: Alberts et al., 2002)

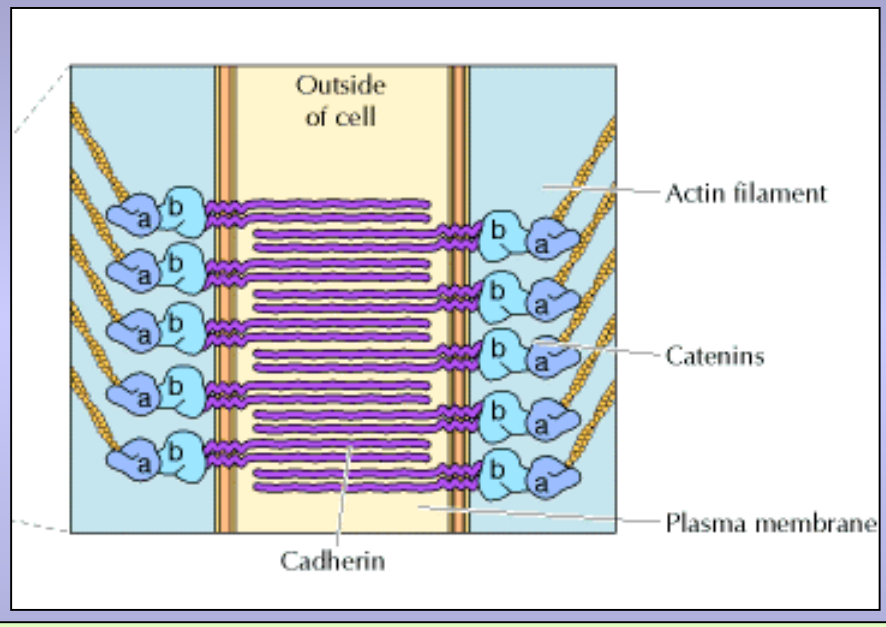
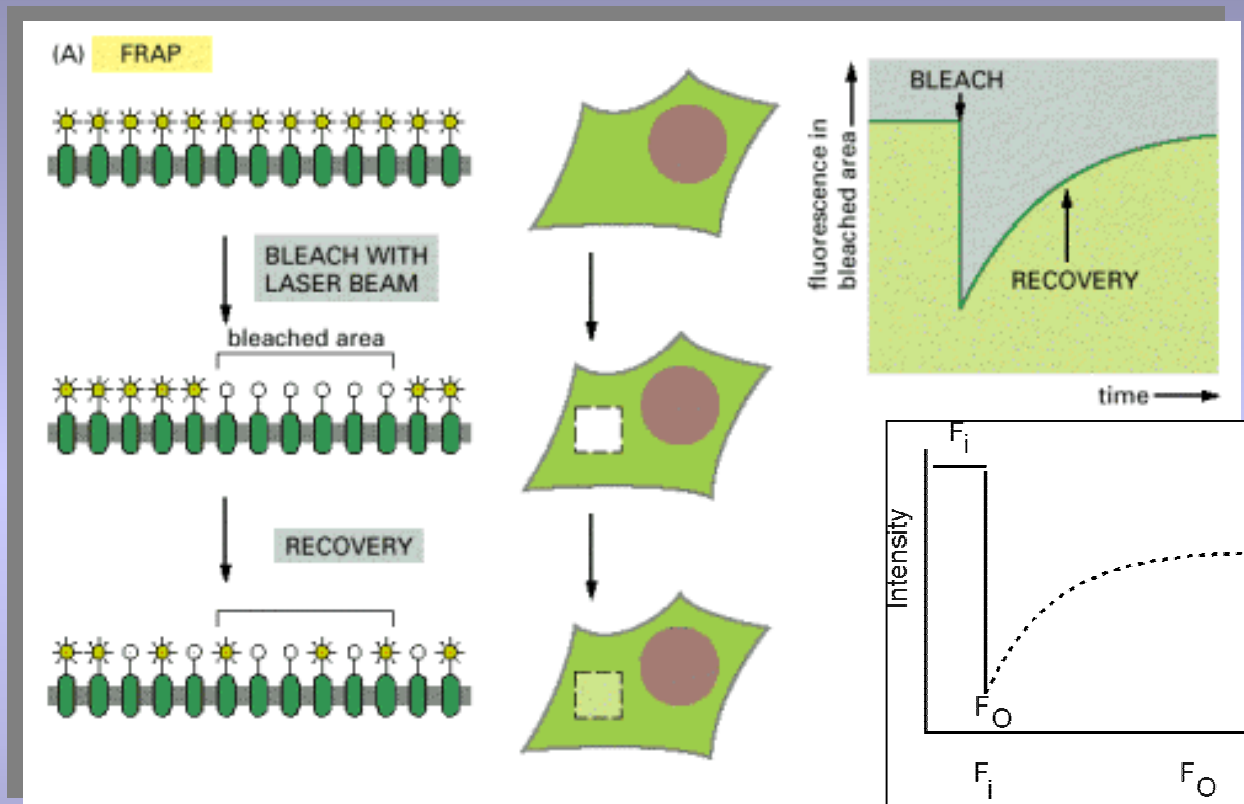
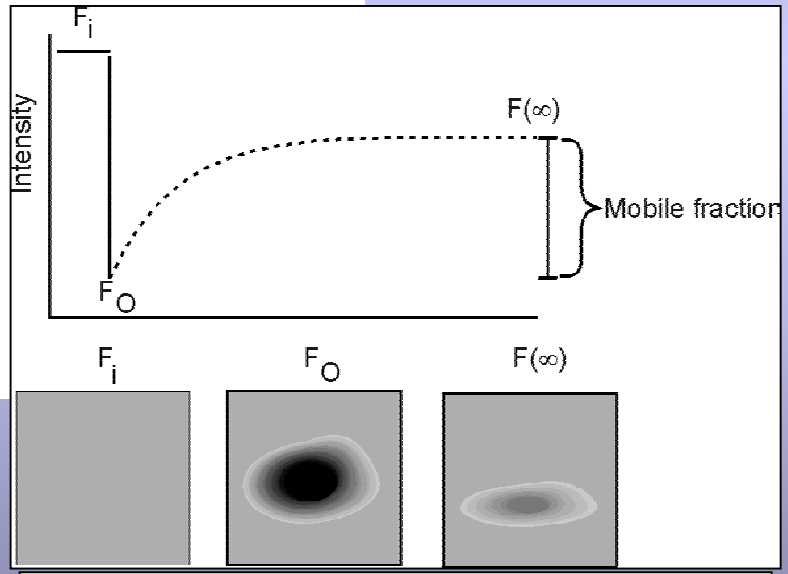


Figure 11.14. Attachment of actin filaments to adherens junctions. (Fuente: Cooper, 2000)

La técnica del FRAP:
Fluorescence Recovery After Photobleaching





In the FRAP technique, fluorescent molecules are bleached in a small area using a laser beam. The fluorescence intensity recovers as the bleached molecules diffuse away and unbleached molecules diffuse into the irradiated area (shown here in side and top views). The diffusion coefficient is calculated from a graph of the rate of recovery: the greater the diffusion coefficient of the membrane protein, the faster the recovery. *(Fuente: Alberts et al., 2002)*

Si la recuperación de la fluorescencia no es completa, existe una fracción inmóvil de la estructura que ha sido tratada con el láser.
Fuente: http://www-cellbio.med.unc.edu/facilities/frap.htm

Modelos alternativos que pueden explicar los resultados de Weis y Nelson

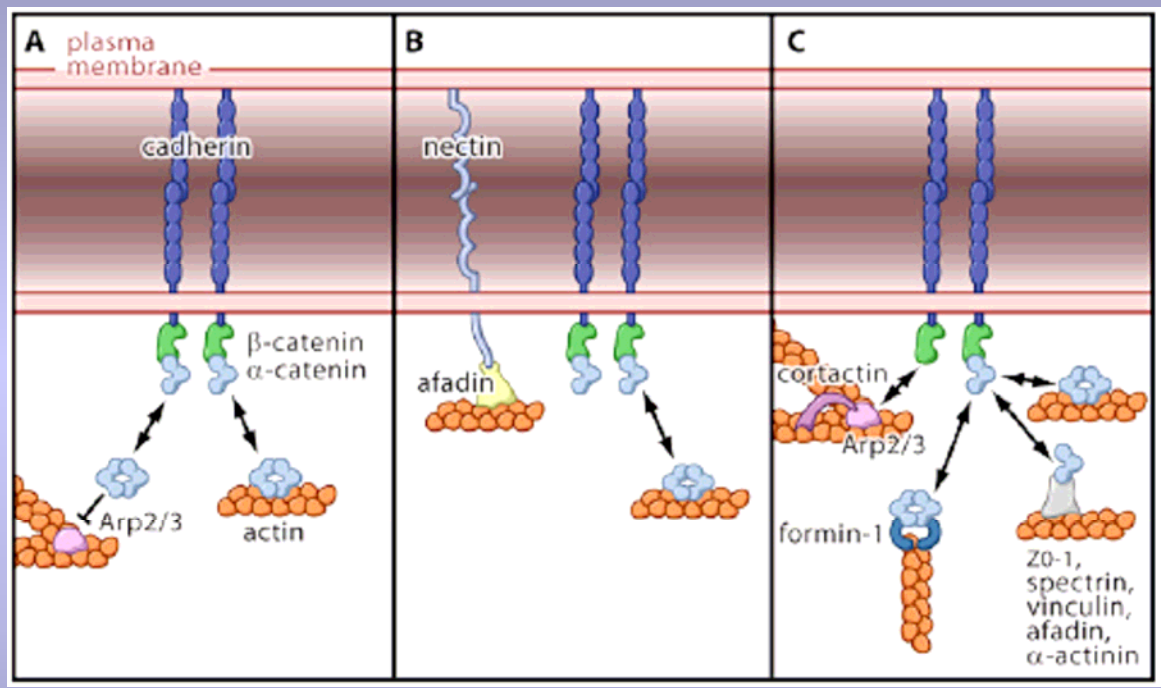


Figure 2. Revised Models for How the Adherens Junction Complex Connects with Actin

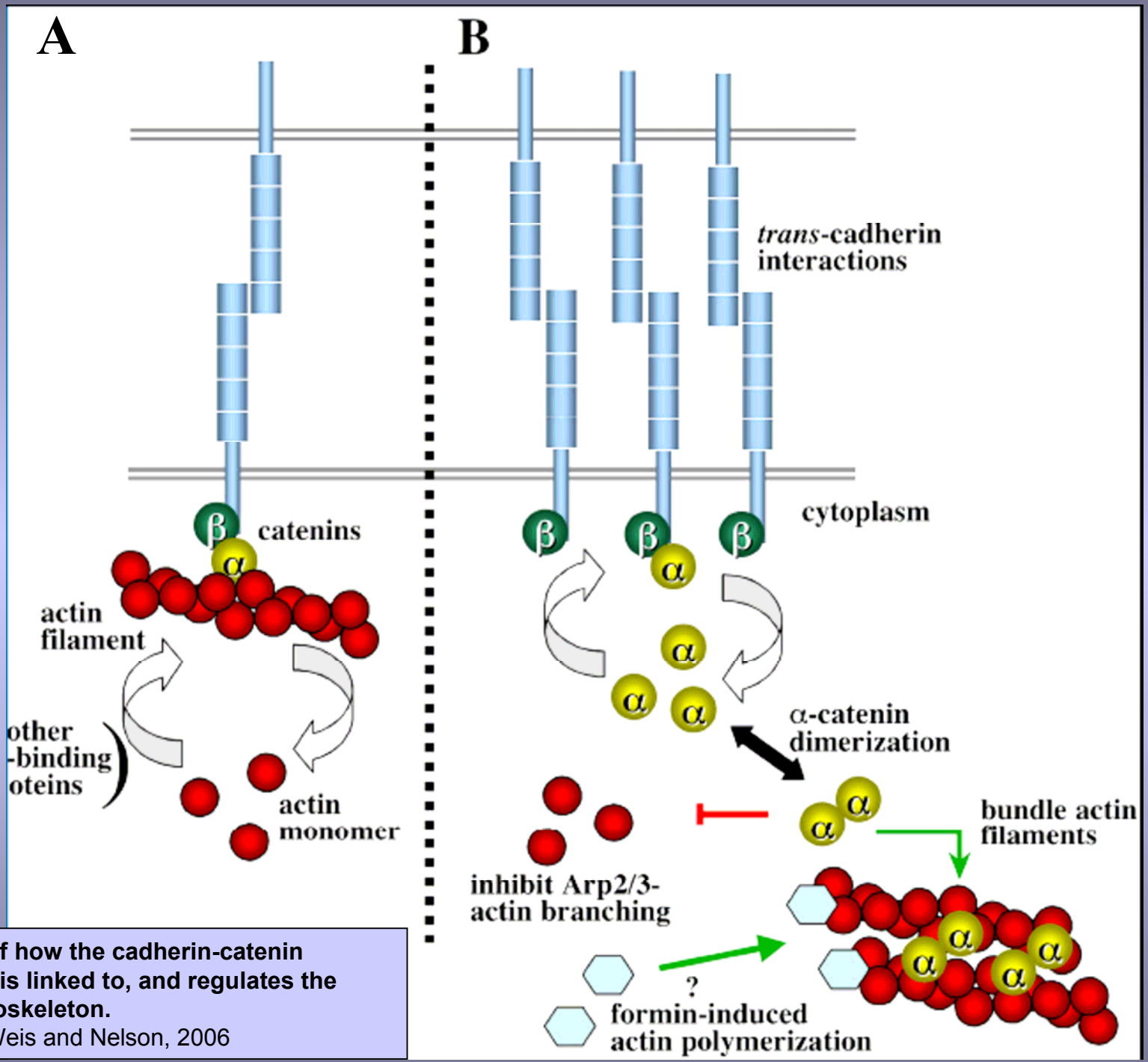
(A) The model proposed by Weis and Nelson: an α-catenin monomer binds to β-catenin; α-catenin homodimers, released from cadherin-catenin complexes, bind to actin and antagonize Arp2/3 function.

(B and C) Alternative models explain the association between actin and adherens junctions.

(B) A direct connection to actin is mediated by other junction proteins, such as nectin and afadin.

(C) The connection is mediated by the cumulative effect of several weak transient interactions between actin binding proteins (such as ZO-1, spectrin, vinculin, afadin, and α-actinin) and adherens junction components, facilitated by cadherin clustering.

Fuente: Gates and Peifer, 2005



Models of how the cadherin-catenin complex is linked to, and regulates the actin cytoskeleton.
Fuente: Weis and Nelson, 2006