Regulation of Microfilaments

3. Actin Assembly and its Regulation
4. Actin-Associated proteins

Actin microfilaments show many of the same properties as:
1. Nucleation, linear assembly, and steady state kinetics
2. Polar filaments
3. Treadmilling
4. Dynamic instability
5. Nucleotide splitting and exchange (ATP instead of GTP)
6. Regulation by associated proteins

1. Nucleation is aided by Actin Related Protein (ARP) complex

Regulation by associated proteins:
a. Regulation of assembly
b. Formation of filament arrays

or

microvillus

Diff. Arrays by different actin cross-linking proteins:

Two types of actin bundles:

α-actinin

Figure 16-38. Molecular Biology of the Cell, 4th Edition.

Figure 16-40. Molecular Biology of the Cell, 4th Edition.

Figure 16-42. Molecular Biology of the Cell, 4th Edition.
Microvilli increase the surface area of many epithelial cells.

Microvilli are used for trapping prey by choanoflagellates and sponges.

Microvilli are sensory receptor organelles in invertebrate vision and in vertebrate hearing. Organ of Corti in cochlea. Tilting of mvi causes bundles to tilt opening mech-gated ion channels. Fig. 22-12 613.

Actin binding to membranes can be regulated by phosphorylation of ERM (ezrin, radixin, or moesin) or other membrane binding proteins.

Effect of Rac, Rho, and Cdc42 activation on the actin organization of fibroblasts. Actin stained w fluorescent phalloidin. Fs w

(Rac, rho, & Cdc42 are all monomeric G-proteins that rec & convey signals from extra-

cellular to intracellular domains.)

(A) QUIESCENT CELLS  (B) Rho ACTIVATION

(C) Rac ACTIVATION  (D) Cdc42 ACTIVATION