ACT1 encodes the single essential gene for actin. Actin is a ubiquitous, conserved cytoskeletal element critical for many cellular processes. The large collection of act1 mutants typically display defective intracellular actin distribution and show a wide diversity of phenotypes including: temperature sensitivity, osmotic sensitivity, ion concentration sensitivity, delocalized chitin deposition, a variety of gross morphological defects, abnormal nuclear segregation and/or cytokinesis, bud-site selection defects in diploids, alterations in organization and distribution of intracellular organelles, and a variety of secretion/endocytosis defects, reflecting the numerous functions of the actin cytoskeleton. Actin is an ATP-binding protein that exists both in monomericand filamentousforms. Actin filaments are assembled by the reversible polymerization of monomers and have an intrinsic polarity; the fast-growing end is called the barbed end and the slow-growing end is called the pointed end. Yeast cells contain three types of filamentous actin structures: actin cables, an actin-myosin contractile ring, and actin cortical patches, all of which undergo extensive reorganization throughout the cell cycle. Actin patches appear by fluorescence microscopy as cortical puncta, and are highly motile structures comprised of actin filaments that undergo rapid turnover. Actin patch assembly depends upon the actin-nucleating Arp2/3 complex. Actin patches are implicated in maintaining cell polarity, cell wall integrity, and endocytotic internalization. Actin cables are aligned with the mother-bud axis and are composed of bundles of actin filaments. Actin cables serve as tracks for polarized secretion, organelle and mRNA transport, and mitotic spindle alignment. The assembly of actin cables is dependent on the functionally redundant formins, Bni1p and Bnr1p. The actin-myosin contractile ring forms transiently at the mother-daughter neck and is important for cytokinesis. Genetic screens and biochemical purifications have been fruitful in identifying numerous factors that regulate actin cytoskeleton dynamics, organization, and function.