BUB2 is a non-essential gene whose product is involved in the spindle checkpoint. The spindle checkpoint delays the onset of anaphase in cells with defects in mitotic spindle assembly or in the attachment of chromosomes to the spindle microtubules. The checkpoint works by inhibiting the activity of the anaphase promoting complex, thereby preventing the degradation of several cell cycle regulators. Like other spindle checkpoint mutants, bub2 loss-of-function mutants are sensitive to benomyl and cannot delay cell division in response to spindle depolymerization. Bub2p and Bfa1p localize to the spindle pole body, and appear to act in a branch of the spindle checkpoint pathway that may prevent cytokinesis prior to chromosome segregation. Cdh1p, an activator of the anaphase promoting complex, and the protein kinase Dbf2p are likely targets of Bub2p and Bfa1p. Genetic evidence suggests that the Bub2p-Bfa1p branch of the spindle checkpoint pathway is distinct from that involving Bub1p, Bub3p, Mad1p, Mad2p, Mad3p, and Mps1p, which may prevent premature chromosome disjunction.