BUD2 encodes a GTPase-activating proteinfor the small GTPase Rsr1p. Along with the GTP/GDP exchange factor Bud5p, Bud2p regulates the activity of Rsr1p and thereby helps control bud site selection in growing cells. Deletion or over-expression of BUD2 causes yeast cells to bud randomly in all cell types, instead of in the usual axial pattern in haploids and bipolar pattern in a/alpha diploids. When budding is conceptually divided into three steps, choice of a growth site, organization of the growth site, and actual growth and morphogenesis, Rsr1p and its negative regulator Bud2p and positive regulator Bud5p are the key players in the initial step of the process.