BUD5 encodes a GTP/GDP exchange factor for the small GTPase Rsr1p. Along with the GTPase-activating protein Bud2p, Bud5p regulates the activity of Rsr1p and thereby helps control bud site selection in growing cells. 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 positive regulator Bud5p and negative regulator Bud2p are the key players in the initial step of the process. Deletion of BUD5 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. Cells lacking Bud5p cannot develop pseudohyphae when embedded in agar. Bud5p shows similarity to Cdc25p, the GTP/GDP exchange factor that interacts with Ras.