Yeast respond to mating pheromone by transducing the pheromone signal through a well-studied mitogen-activated protein kinasecascade. The culmination of this kinase cascade differentiates the cell for mating by activating transcription, altering cellular morphology, and arresting the cell in G1 phase. Phosphorylation by either of the two partially redundant kinases Fus3p and Kss1p at the end of the kinase cascade activates the Ste12 transcription factor, resulting in expression of genes involved in mating. Ste12p binds to pheromone response elementsin the upstream activating sequences of its target genes. Ste12p also regulates genes involved in pseudohyphal growth in diploids and invasive growth in haploids. In addition to sharing a transcription factor, the mating and filamentous growth pathways also share many of the same kinases involved in the mating response. Developmental specificity to distinguish these pathways is determined by the requirement of another transcription factor, Tec1p, in the filamentous but not mating pathway. Tec1p works in concert with Ste12p to cooperatively bind to filamentation response elementsin genes involved in filamentous growth.