DHH1 encodes a highly conserved DEAD-box RNA helicase that associates with components of mRNA decapping, deadenylation, and transcription complexes. Dhh1p stimulates mRNA decapping by decapping enzyme Dcp1p, and has been shown to localize to discrete cytoplasmic foci known as P-bodies, which appear to be involved in sequestering mRNAs in a nontranslating pool, from which they are subsequently degraded or possibly reactivated for translation. Orthologs of Dhh1p in other eukaryotes, such as Xenopus and Drosophila, play roles in repressing translation of specific mRNAs during early development. DHH1 in yeast is important in release from DNA-damage-induced cell cycle arrest at the G1/S checkpoint. dhh1 mutants are not defective for DNA repair and recover normally from the G2/M and replication checkpoints, suggesting a specific function for Dhh1p in recovery from G1/S checkpoint arrest. Dhh1p has been suggested to play a role in partitioning mRNAs between translatable and nontranslatable pools, which has been implicated in the recovery from G1/S cell cycle arrest following DNA damage. DHH1 is orthologous to the human putative proto-oncogene p54/RCK, and the high degree of conservation between these orthologs suggests that this mechanism is conserved among all eukaryotes and potentially important in human disease.