The exosome complex possesses 3'-5' exonuclease and endoribonucleolytic activities that are essential for diverse ribonucleolytic processes in both the nucleus and the cytoplasm. The nuclear exosome is associated with the TRAMP complex and is involved in RNA catabolic processes including RNA surveillance, pre-mRNA turnoverand the production of mature 3' ends for snoRNAs, snRNAs and rRNAs. The cytoplasmic exosome is associated with Ski7p and the SKI complex and is involved in RNA catabolic processes that include both the routine turnover of normal mRNAas well as the degradation of aberrant mRNAs. The 10-subunit core exosome complexis the same in both locations, but the nuclear exosome contains an additional subunitand two additional accessory factors. Although the exosome was originally described as a \"complex of exonucleases,\" with multiple subunits proposed to have RNase activity, later work has shown that this mechanism is unlikely in yeast. With the exception of Ski6p, none of the yeast subunits that show homology to E. coli RNase PH retain the active site residues seen in the bacterial or archael enzymes. Further research has also demonstrated that most, if not all, detectable enzymatic activity resides in the Dis3p and Rrp6p subunits.Rrp6p is a 3'-5' exonuclease that is a subunit of the nuclear exosome. In addition to its involvement in processes mediated by the nuclear exosome, Rrp6p also performs the 467>final trimming step in the maturation of pre-5.8S rRNA and certain pre-snoRNAs that have already been processed by the core exosome. Rrp6p exonucleatic activity requires two divalent metal ions, similar to other exonucleases in the DEDD family, of which Rrp6p is a member. Other DEDD exonucleases include the Rrp6p homologs bacterial RNase D and human PM-Scl 100/EXOSC10. Null mutations in rrp6 result in slow growth at normal temperatures and inviability at 37 degrees C, while point mutations in the catalytic domain lead to cold-sensitivity. Other rrp6 mutant phenotypes include 5-fluorouracil sensitivity, accumulation of processing intermediates and polyadenylated forms of rRNAs, snRNAs, and snoRNAs, impaired mRNA surveillance/degradation/export, and defects in UV-induced DNA repair.