IPK1 encodes an inositol 2-kinase that converts inositol 1,3,4,5,6-pentakisphosphateto inositol 1,2,3,4,5,6-hexakisphosphate. Inositol polyphosphates, such as IP5 and IP6, are an important class of signaling molecules that regulate various processes such as transcription, DNA repair, chromatin remodeling, and telomere elongation. In particular, IPand Ipk1p activity have been shown to be important for the process of mRNA export. Consistent with its role in mRNA export, Ipk1p localizes in the nucleus in a punctate pattern at the nuclear periphery. Null mutations in ipk1 result in temperature-sensitive growth, deficient in IPproduction, accumulation of mRNA in the nucleus, and are lethal when combined a gle1 null mutation. Ipk1p activity is conserved from yeast to man and expression of the plant or human ortholog is able to complement the defects of an ipk1 null strain. Knockouts of the mouse ortholog result in embryonic lethality and zebrafish knockdown experiments of 2-kinase activity result in developmental defects, implicating the importance of IPin the development of higher organisms.