About yeast ribosomes...Ribosomes are highly conserved large ribonucleoproteinparticles, consisting in yeast of a large 60S subunit and a small 40S subunit, that perform protein synthesis. Yeast ribosomes contain one copy each of four ribosomal RNAsand 79 different ribosomal proteins, which are encoded by 137 different genes scattered about the genome, 59 of which are duplicated. The 60S subunit contains 46 proteins and three RNA molecules: 25S RNA of 3392 nt, hydrogen bonded to the 5.8S RNA of 158 nt and associated with the 5S RNA of 121 nt. The 40S subunit has a single 18S RNA of 1798 nt and 33 proteins. All yeast ribosomal proteins have a mammalian homolog. In a rapidly growing yeast cell, 60% of total transcription is devoted to ribosomal RNA, and 50% of RNA polymerase II transcription and 90% of mRNA splicing are devoted to the production of mRNAs for r-proteins. Coordinate regulation of the rRNA genes and 137 r-protein genes is affected by nutritional cues and a number of signal transduction pathways that can abruptly induce or silence the ribosomal genes, whose transcripts have naturally short lifetimes, leading to major implications for the expression of other genes as well. The expression of some r-protein genes is influenced by Abf1p, and most are directly induced by binding of Rap1p to their promoters, which excludes nucleosomes and recruits Fhl1p and Ifh1p to drive transcription. Ribosome assembly is a complex process, with different steps occurring in different parts of the cell. Ribosomal protein genes are transcribed in the nucleus, and the mRNA is transported to the cytoplasm for translation. The newly synthesized r-proteins then enter the nucleus and associate in the nucleolus with the two rRNA transcripts, one of which is methylated and pseudouridylated, and then cleaved into three individual rRNAsas part of the assembly process. Separate ribosomal subunits are then transported from the nucleolus to the cytoplasm where they assemble into mature ribosomes before functioning in translation. Blockage of subunit assembly, such as due to inhibition of rRNA synthesis or processing, results in degradation of newly synthesized r-proteins.