PeBoW, a trimeric complex consisting of pescadillo (Pes1), block of proliferation (Bop1), and the WD repeat protein 12 (WDR12), is essential for processing and maturation of mammalian 5.8S and 28S ribosomal RNAs. Applying a mass spectrometric analysis, we identified the DEAD-box helicase DDX27 as stably associated factor of the PeBoW-complex. DDX27 interacts with the PeBoW-complex via an evolutionary conserved FxF motif in the N-terminal domain and is recruited to the nucleolus via its basic C-terminal domain. This recruitment is RNA-dependent and occurs independently of the PeBoW-complex. Interestingly, knockdown of DDX27, but not of Pes1, induces the accumulation of an extended form of the primary 47S rRNA. We conclude that DDX27 can interact specifically with the Pes1 and Bop1 but fulfils critical function(s) for proper 3’ end formation of 47S rRNA independently of the PeBoW-complex.

DEAD-box helicase DDX27 regulates 3' end formation of ribosomal 47S RNA and stably associates with the PeBoW-complex.

Figure 1
Model for DDX27 interactions and nucleolar function.
The C-terminal domain anchors DDX27 to the nucleolus in an RNase sensitive manner.
The FxF motif in the N-terminal domain interacts with the PeBoW complex thereby providing potentially a second anchoring mechanism. DDX27 is required for proper 47S rRNA 3' end formation, but may also be involved in additional rRNA processing steps. NoLS, nucleolar localization signal.