

Supplementary Movie 1 WT *S. pombe* cells are round and decorated with ribosome arrays at day 7 of glucose depletion.

3D rendering of a segmented cryo-ET tomogram of a mitochondrion in a WT *S. pombe* cell at day 7 of glucose depletion. Segmentation of the mitochondrion shown in main Fig. 2, superimposed with the position and orientation of ribosomes aligned by STA. The OMM is depicted in red and the IMM and its cristae are shown in orange. Ribosomal proteins and RNAs of the LSU and SSU are colored cyan and yellow, respectively. In the second half of the Supplementary Movie, ribosome pentamers, open tetramers, closed tetramers and closed trimers light up in magenta, yellow, green and orange respectively.

Supplementary Movie 2 Δ *dnm1* *S. pombe* cells are elongated and decorated with ribosome arrays at day 7 of glucose depletion.

3D rendering of a segmented cryo-ET tomogram of a mitochondrion in a Δ *dnm1* *S. pombe* cell at day 7 of glucose depletion. Segmentation of the mitochondrion shown in Supplementary Fig. 5, superimposed with the position and orientation of ribosomes aligned by STA. The OMM is depicted in red and the IMM and its cristae are shown in orange. Ribosomal proteins and RNAs of the LSU and SSU are colored cyan and yellow, respectively.

Supplementary Movie 3 Δ *cpc2* *S. pombe* cells are round and not decorated with ribosome arrays at day 7 of glucose depletion.

3D rendering of a segmented cryo-ET tomogram of a mitochondrion in a $\Delta cpc2$ *S. pombe* cell at day 7 of glucose depletion. Segmentation of the mitochondrion shown in Supplementary Fig. 4, superimposed with the position and orientation of ribosomes aligned by STA. The OMM is depicted in red and the IMM and its cristae are shown in orange. Ribosomal proteins and RNAs of the LSU and SSU are colored cyan and yellow, respectively.

Supplementary Movie 4: PC1 depicting SSU dynamics for the consensus map using cryoDRGN.

Analysis of the conformational heterogeneity of the SSU in the consensus map of the *S. pombe* ribosome from *S. pombe* cell grown in glucose depleted EMM. PC1 and PC2 captured the rotation conformational changes of the SSU, respectively.

Supplementary Movie 5: PC1 depicting SSU dynamics for the consensus map using cryoDRGN.

Analysis of the conformational heterogeneity of the SSU in the consensus map of the *S. pombe* ribosome from *S. pombe* cell grown in glucose depleted EMM. PC1 and PC2 captured the rolling conformational changes of the SSU, respectively.

Supplementary Movie 6: PC1 depicting SSU dynamics for the focused map using cryoDRGN.

Analysis of the conformational heterogeneity of the SSU in the inactive map of the *S. pombe* ribosome depicted a conformational change in H69 in the PTC from *S. pombe* cell grown in glucose depleted EMM, depicting the rotation of the SSU.