

## Description of Additional Supplementary Files

**Supplementary Data 1:** Full list of identified BS3 crosslinked peptides from the Rad4-23-33/TFIIH/AAF complex.

**Supplementary Movie 1:** 3.9Å-resolution cryo-EM map (Map 1) of TFIIH and corresponding model. Color scheme corresponds to Figure 3.

**Supplementary Movie 2:** Comparison between structures of TFIIH in transcription (PDB:5OQJ) and NER (PDB:7K01, this study). For transcription, template and non-template strands are blue and green. For NER, damaged and undamaged strand are blue and green.

**Supplementary Movie 3:** A comparison between structures of yeast TFIIH/Rad4-23-33/DNA (PDB:7K04) and human TFIIH/XPA/open DNA (PDB:6RO4). Color scheme corresponds to Figure 6.

**Supplementary Movie 4:** Multibody refinement of Map 1. A ~30 Å movement of Ssl2/Tfb5/Tfb2C brings the damaged strand into close proximity to the ssDNA binding cleft of Rad3.