

## Supplementary data

S1-3. Movies. HeLa cells grown on glass coverslips were cotransfected with a mitochondrial matrix targeted photoactivatable GFP (mito-PAGFP) expression plasmid together with either mRFP (S1 movie), mRFP-Htt28Q (S2 movie) , or mRFP-Htt74Q (S3 movie) expression plasmids (see Figure 3 for details). After 24 hr of transfection and culturing in medium containing 1.25% serum, cells expressing the mRFP-tagged proteins were identified and the coexpressed mito-PAGFP protein was photoactivated and then GFP fluorescence images were capture at 15 second intervals for the next few minutes (see Materials and Methods). The movies illustrate the dynamic remodeling of mitochondria (shown at 75 times their normal speed), showing rapid movement as well as fusion and fission of mitochondria, in cells transfected with the mRFP or mRFP-Htt28Q constructs. By contrast, the movie of the cells transfected with mRFP-Htt74Q illustrates the slower movement and temporal increase in mitochondrial fragmentation in cells incubated for the same duration as those shown for the cells expressing the transfected mRFP-Htt28Q or mRFP proteins.