

## Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Includes raw data to the manuscript

File Name: Supplementary Movie 1

Description: Fluorescence images from a time-lapse Z-stack series using a laserscanning confocal microscopy of a stable TUBGsh-U2OS cell co-expressing GFP- $\gamma$ tubulinresist ( $\gamma$ TubulinGFP) and cell cycle chromobody (CCCRFP, to visualize the nuclear location of endogenous PCNA in a living cell). The movie show the resulting average intensity projection of ten sequential images that were collected at 0.4- $\mu$ m intervals. Z-stack series were collected every 5 minutes.

File Name: Supplementary Movie 2

Description: Fluorescence images from a time-lapse confocal microscopy using a laser-scanning confocal microscopy of a stable TUBGsh-U2OS cell co-expressing GFP- $\gamma$ tubulinresist ( $\gamma$ TubulinGFP) and cell cycle chromobody (CCCRFP, to visualize the nuclear location of endogenous PCNA in a living cell). Images were collected every 5 minutes.

File Name: Supplementary Movie 3

Description: Fluorescence images show time-lapse series of a stable TUBGsgU2OS cell co-expressing a  $\gamma$ -tubulinresist and cell cycle chromobody (CCCRFP). The image series illustrates the accumulation of CCCRFP during S-phase execution. Images were collected every 5 minutes.

File Name: Supplementary Movie 4

Description: Fluorescence images show time-lapse series of a stable TUBGsgU2OS cell co-expressing a  $\gamma$ -tubulinA429-A432- A435 resist and cell cycle chromobody (CCCRFP). The image series illustrates the accumulation of CCCRFP and how mutations in the  $\gamma$ -tubulin PIP-motif affect the formation of CCCRFP foci during S-phase execution. Images were collected every 5 minutes.