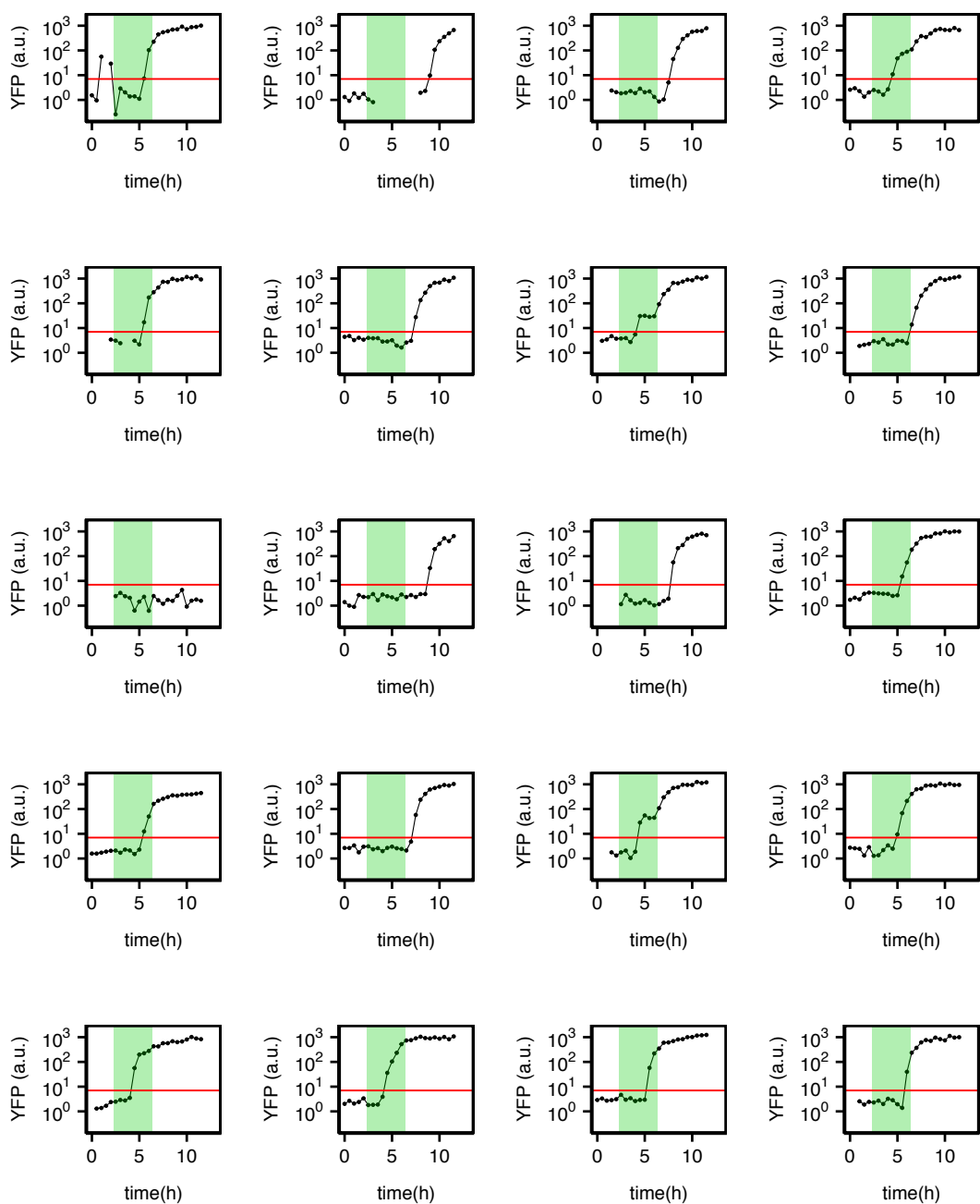
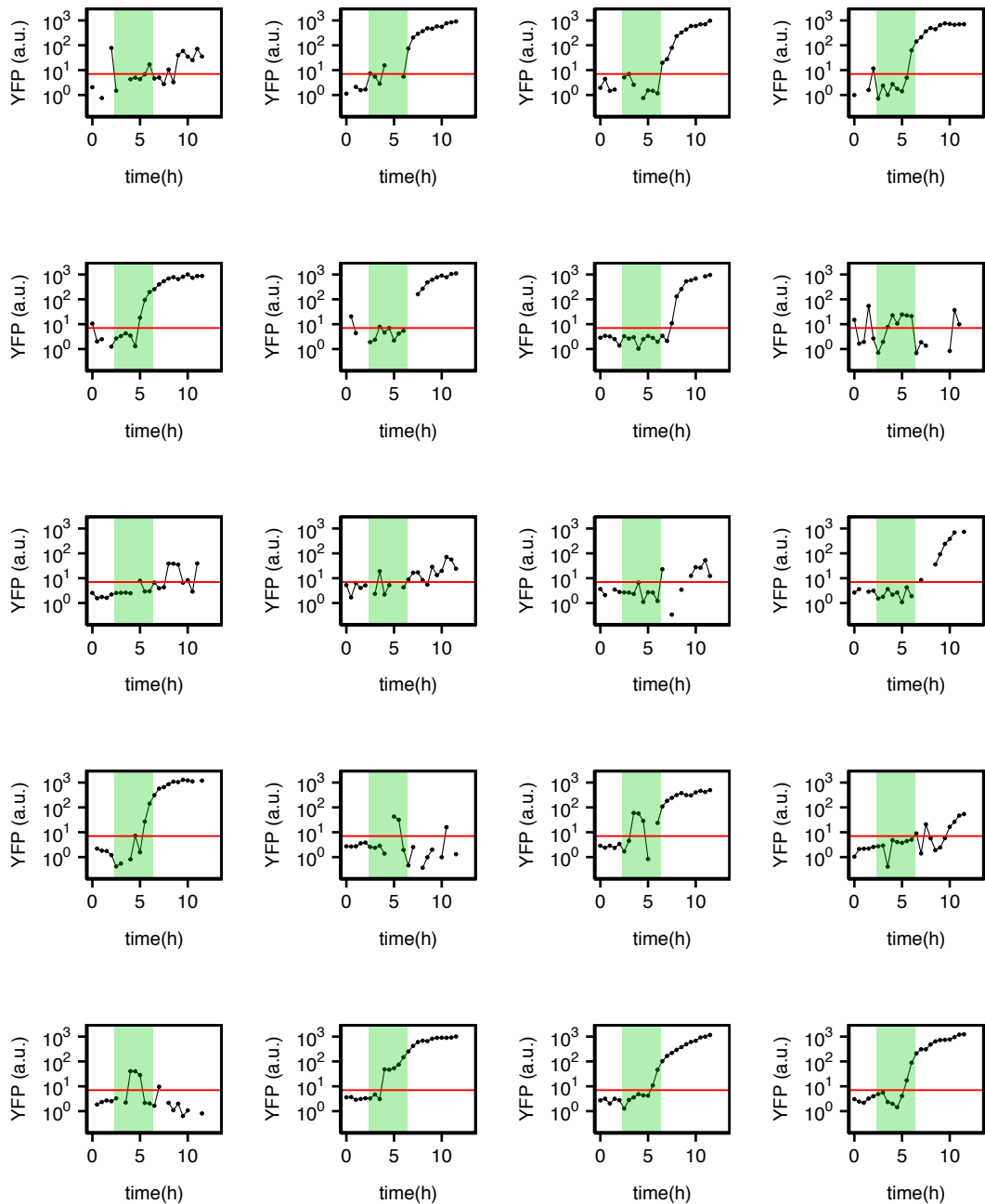


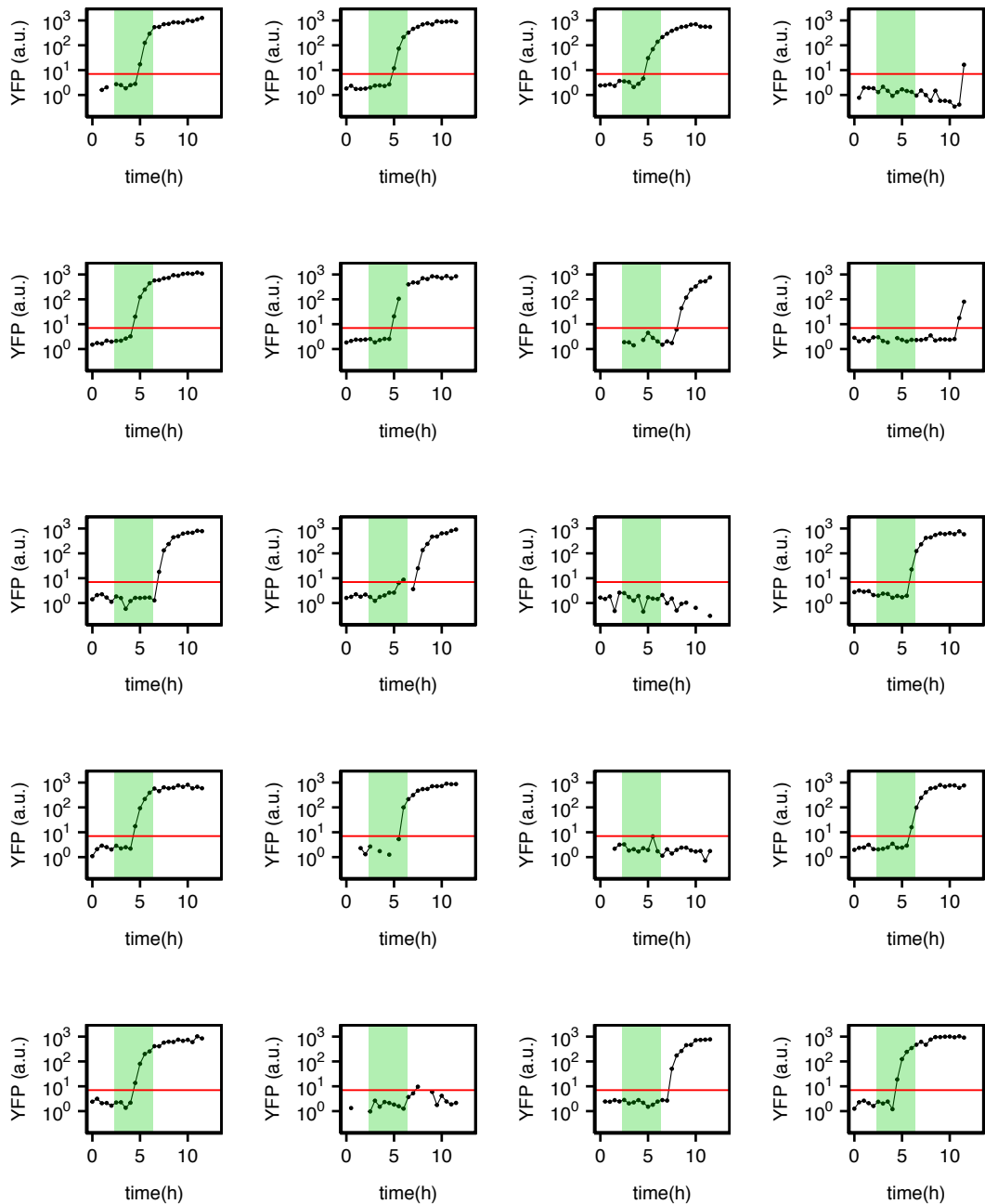
**Data S1. Single-cell YFP or RFP trajectories for cells of various strains, Related to Figures 2-5.**



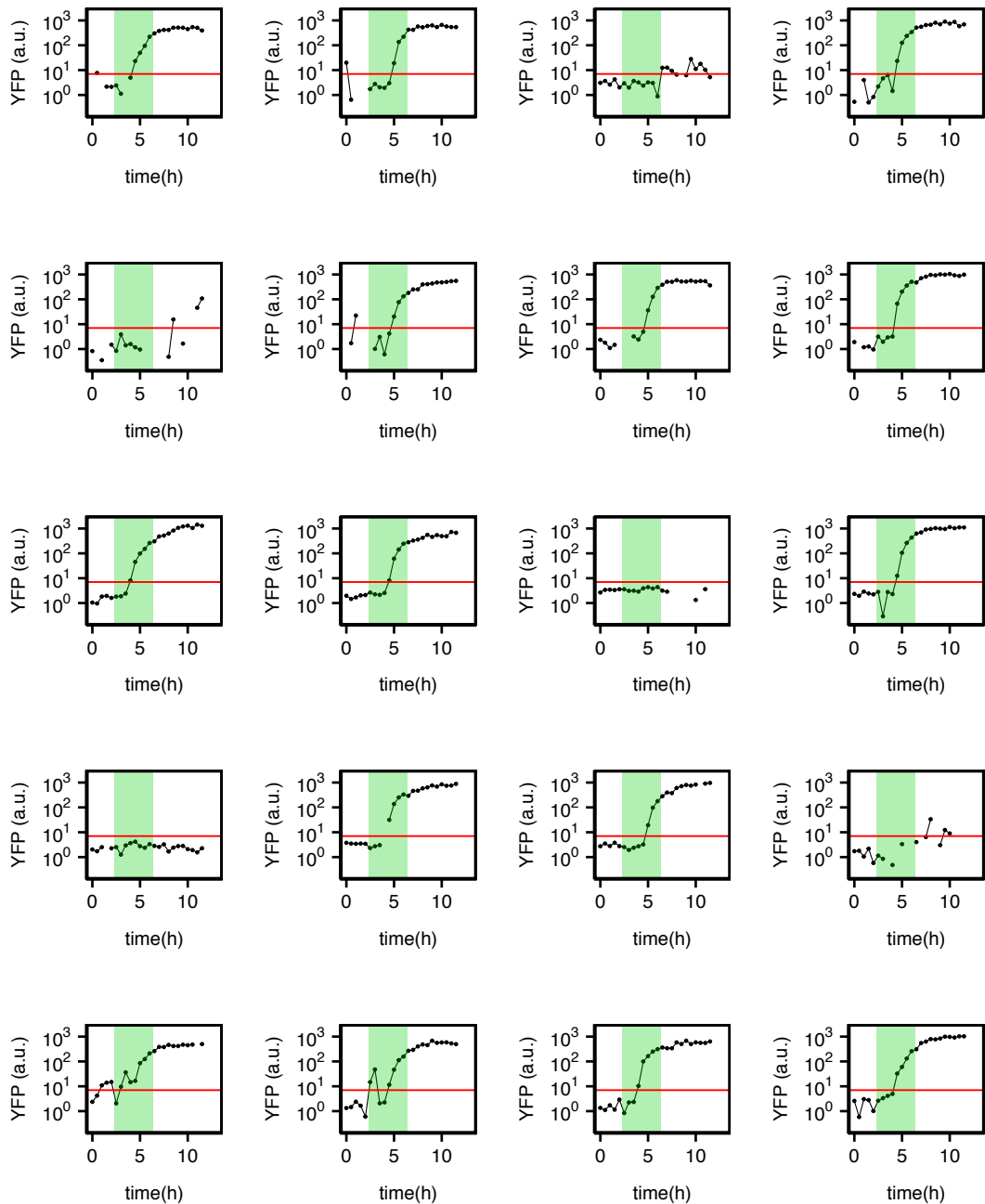
**Single-cell YFP trajectories for 20 young cells of the strain (yTY125a) containing the SSA repair reporter cassette (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



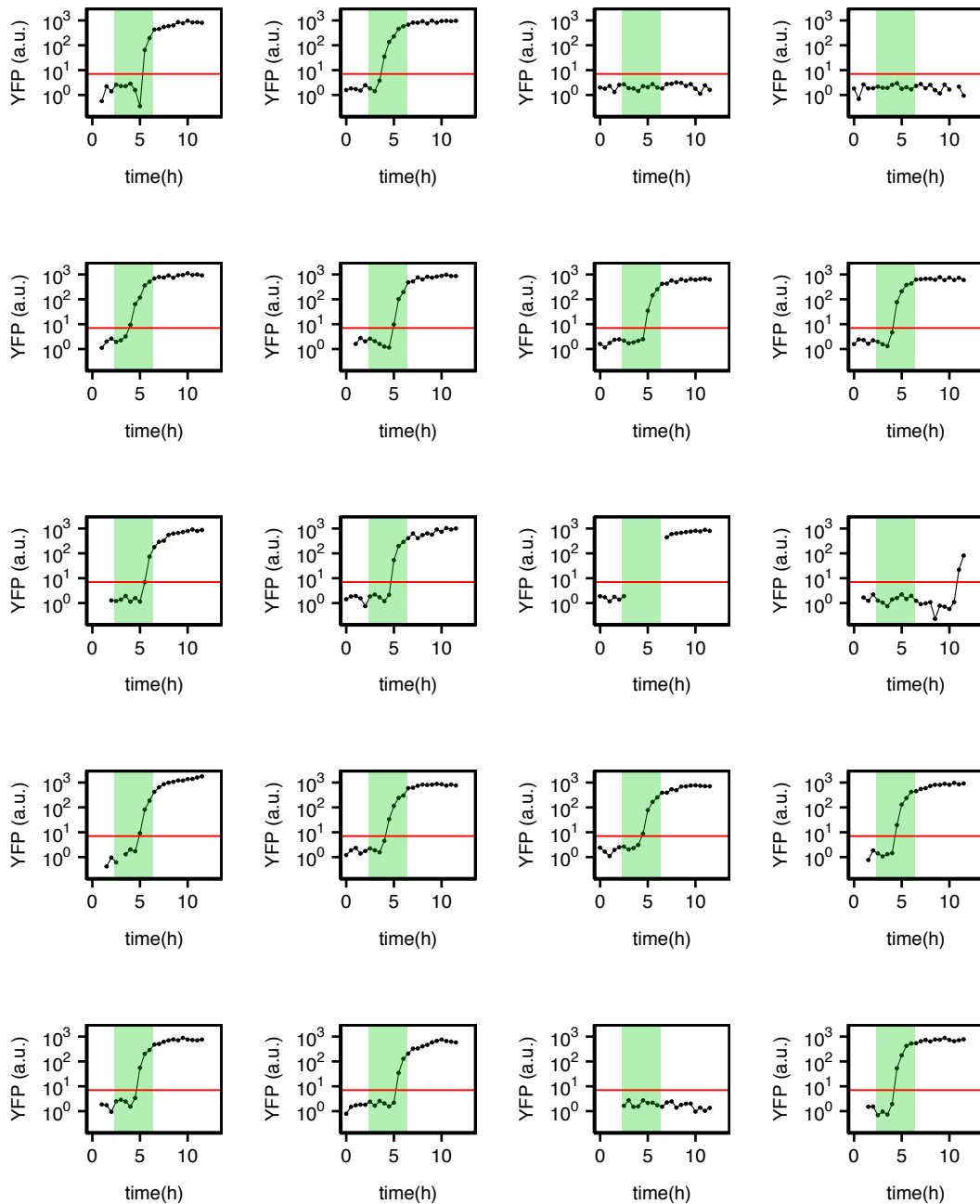
**Single-cell YFP trajectories for 20 old cells of the strain (yTY125a) containing the SSA repair reporter cassette (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



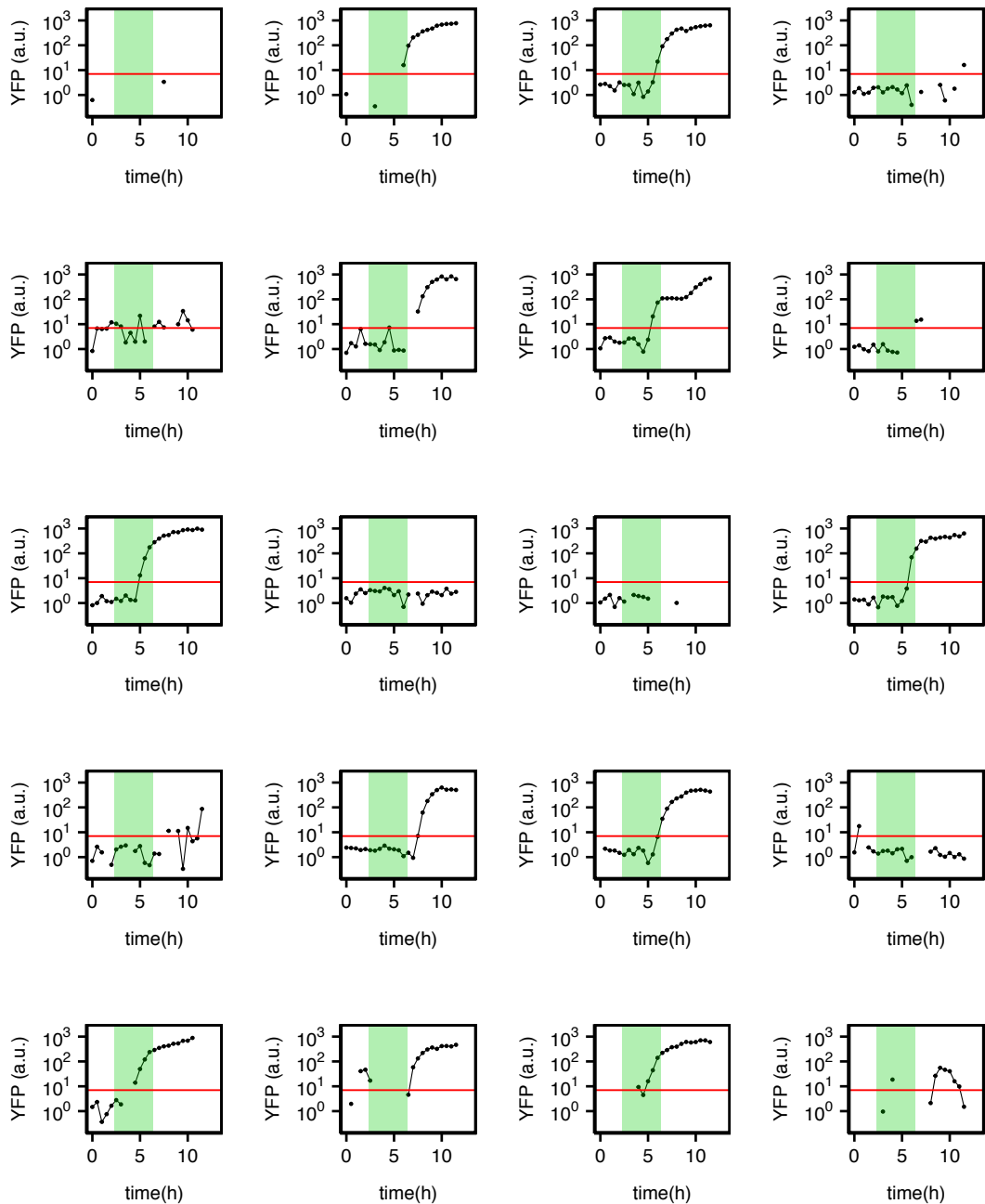
**Single-cell YFP trajectories for 20 young cells of the SSA strain (yTY147a) containing the SSA repair reporter cassette with the RFPdegradon (replicate # 2).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



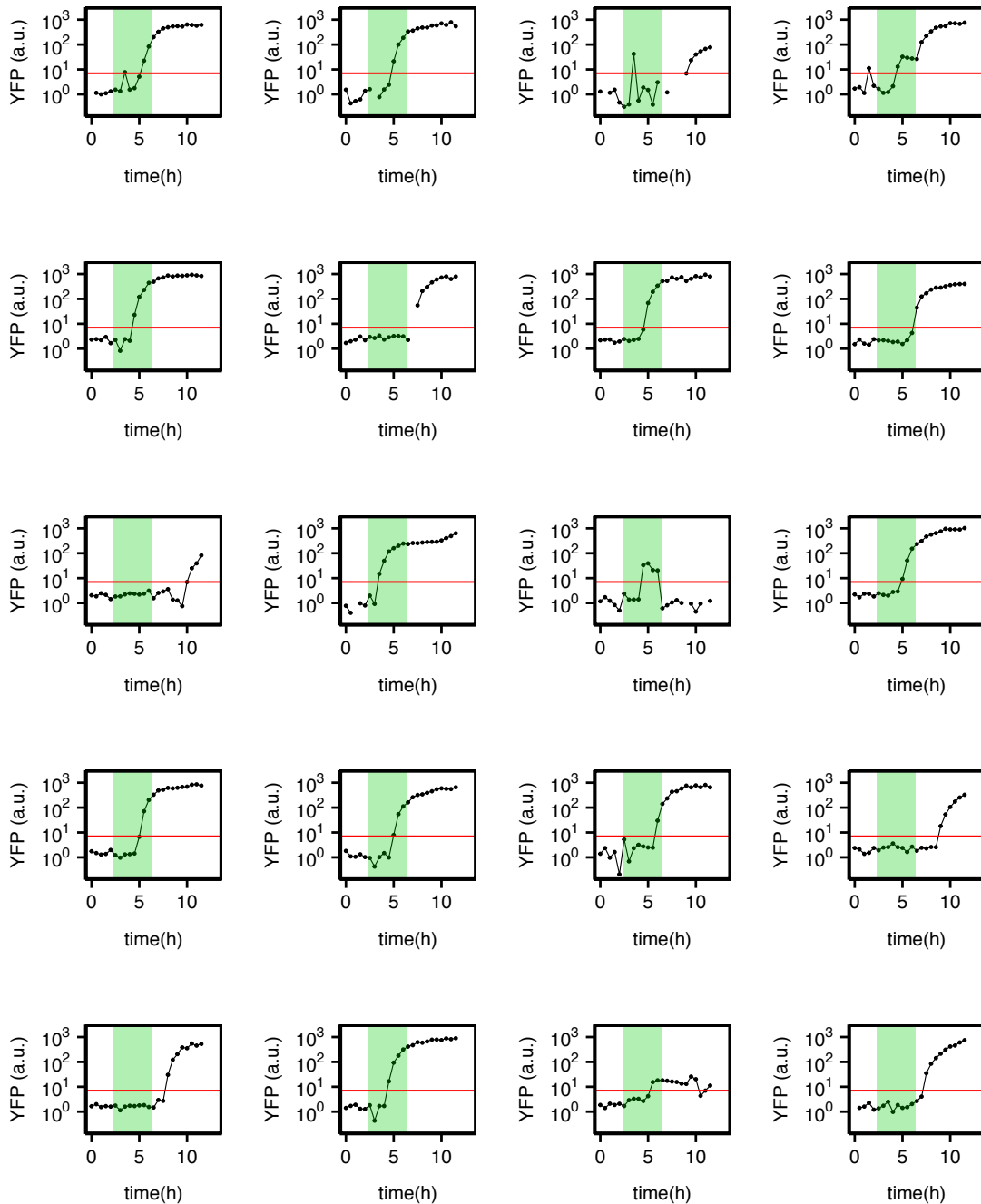
**Single-cell YFP trajectories for 20 old cells of the SSA strain (yTY147a) containing the SSA repair reporter cassette with the RFPdegron (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



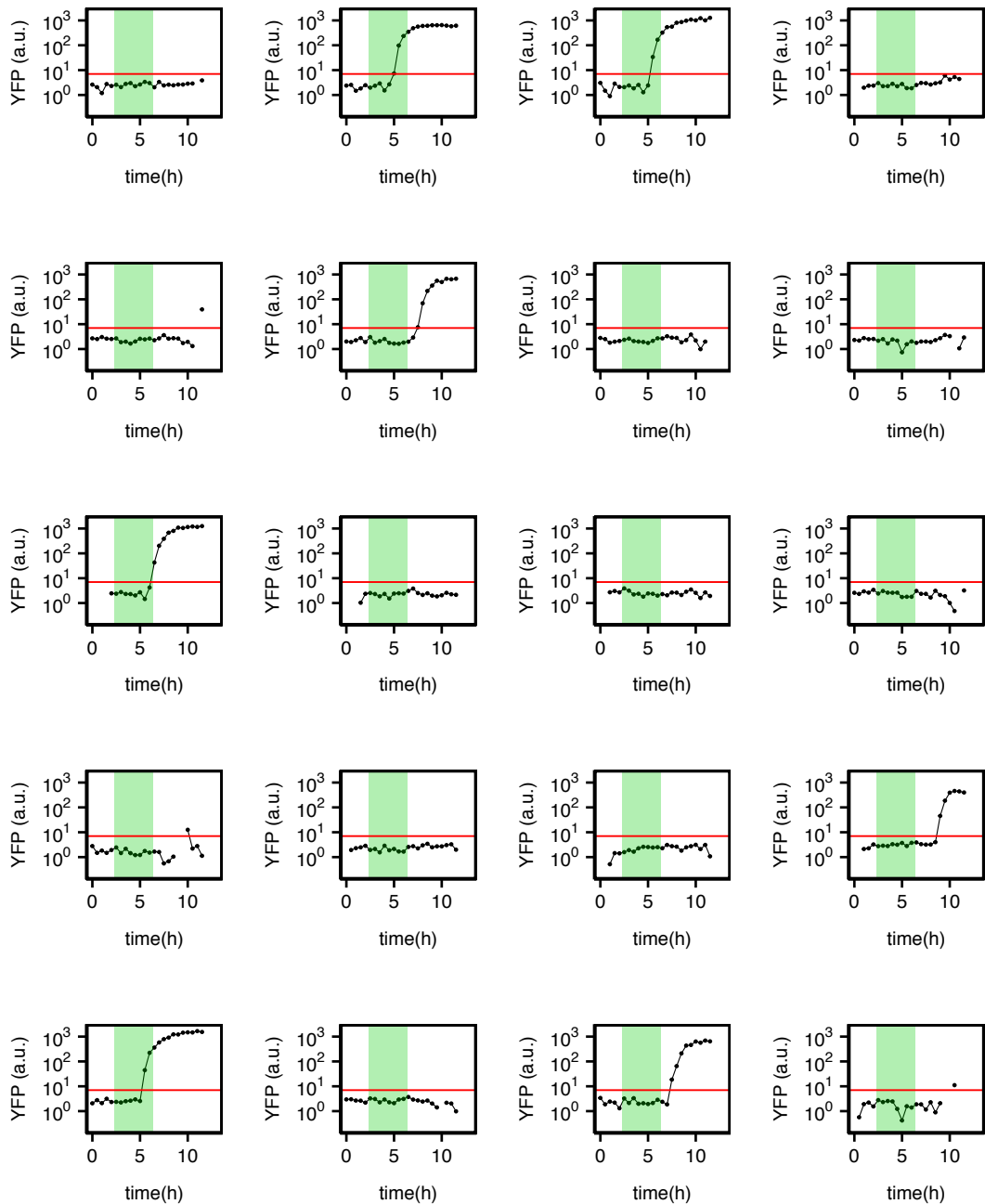
**Single-cell YFP trajectories for 20 young cells of the *DNL4*-deleted SSA strain (yTY149a) containing the SSA repair reporter cassette (replicate #2).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



**Single-cell YFP trajectories for 20 old cells of the *DNL4*-deleted SSA strain (yTY149a) containing the SSA repair reporter cassette (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).

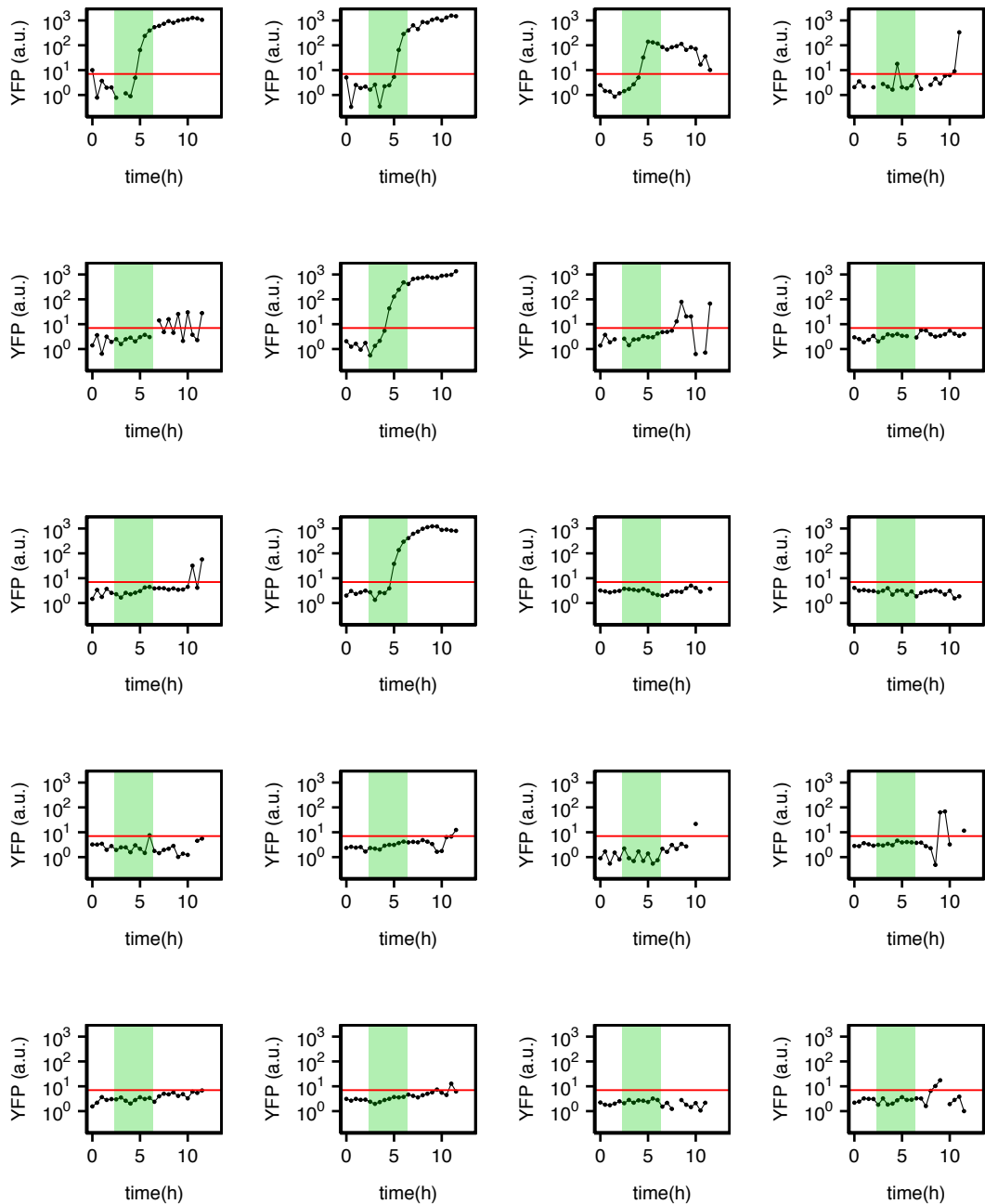


**Single-cell YFP trajectories for 20 old cells of the SSA strain (yTY161a) containing 3xCLN2 and the SSA repair reporter cassette (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).

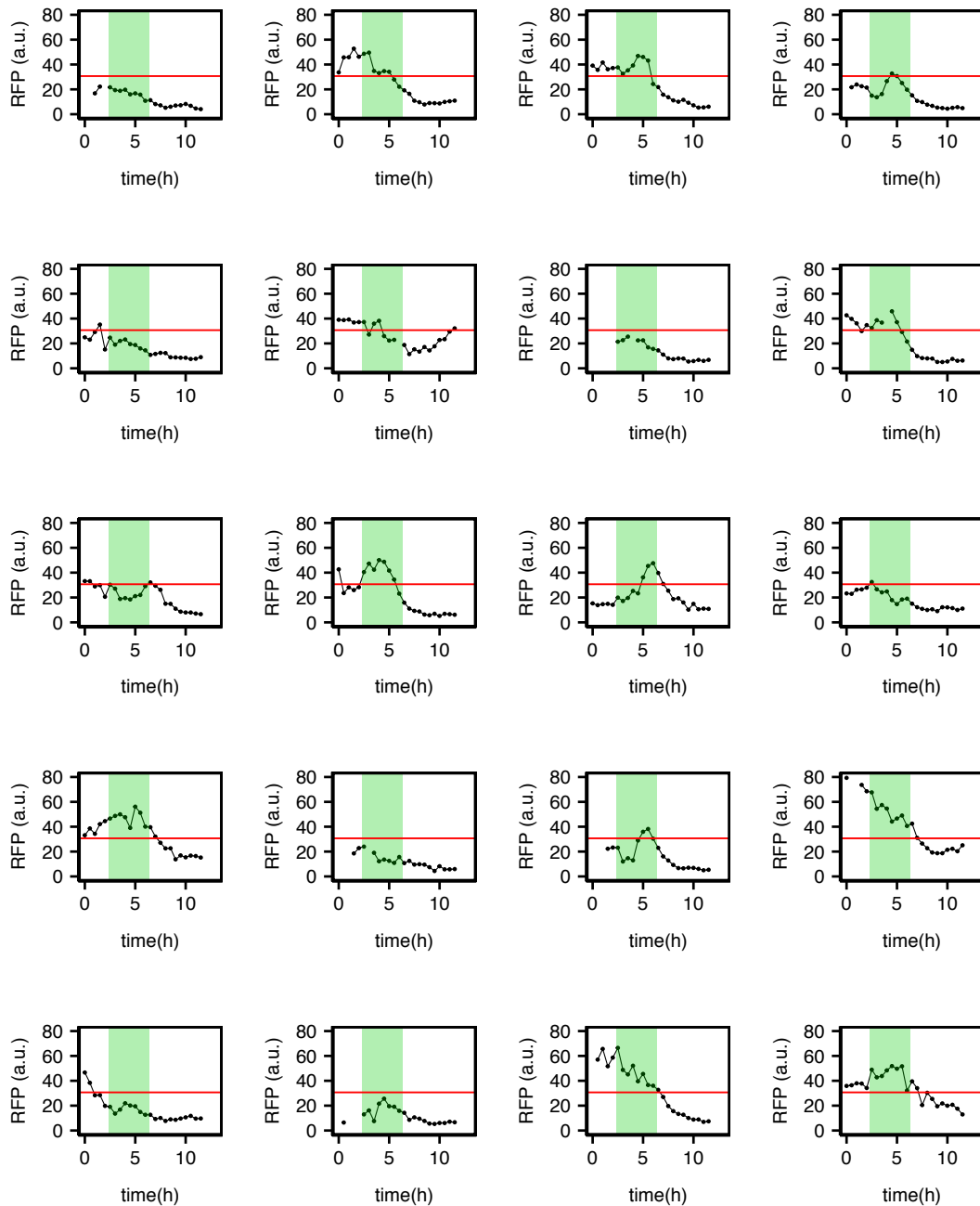


**Single-cell YFP trajectories for 20 young cells of SSAheterology strain (yTY133c) containing the SSA repair reporter cassette with 3% heterology (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).

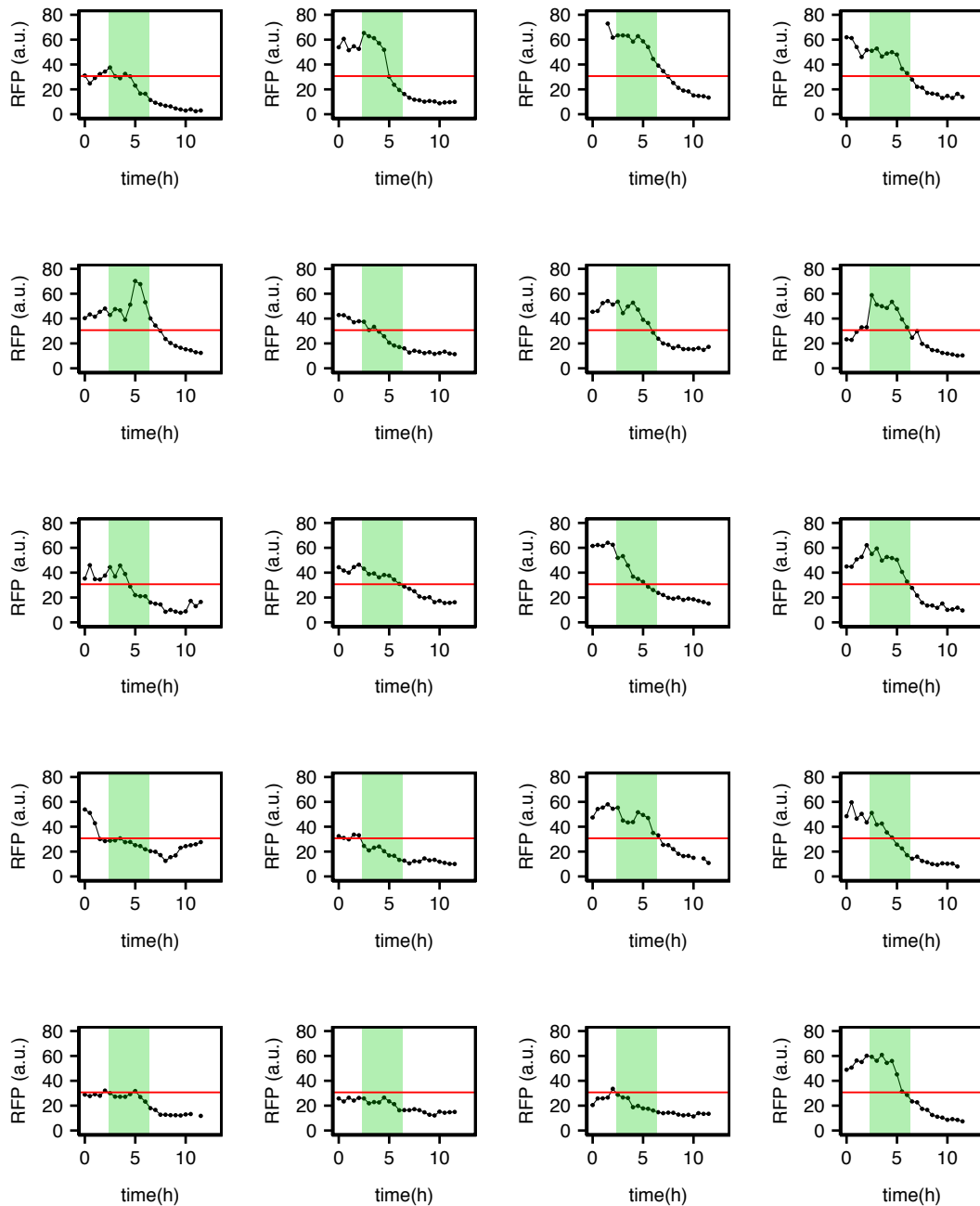




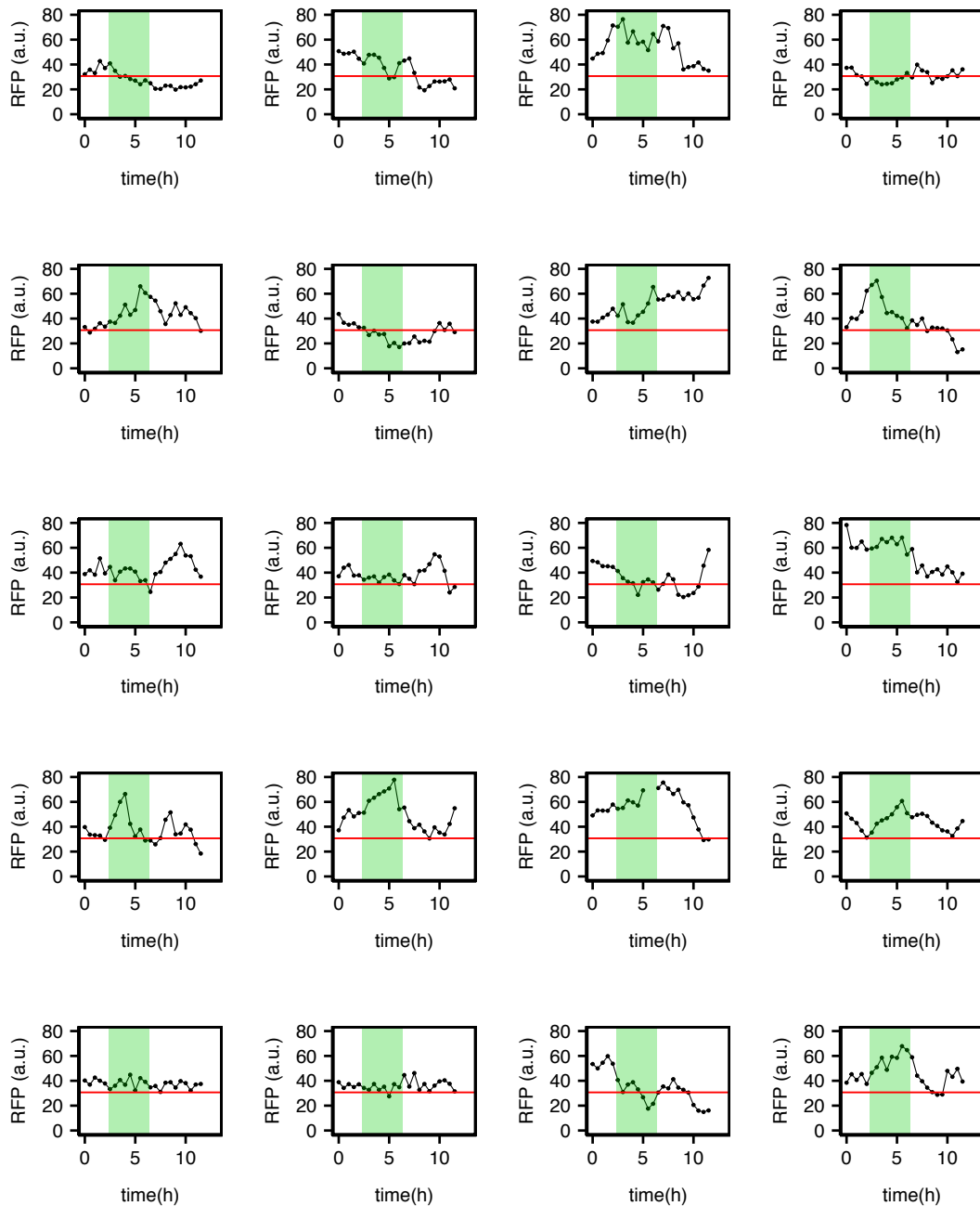
**Single-cell YFP trajectories for 20 old cells of the SSAheterology strain (yTY133c) containing the SSA repair reporter cassette with 3% heterology (replicate #2).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest, or negative YFP values which cannot be plotted on the log scale. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the YFP cutoff (7 a.u.).



**Single-cell RFP trajectories for 20 young cells of the SSA strain (yTY147a) containing the SSA repair reporter cassette with the RFPdegron (replicate # 2).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the RFP cutoff for calling RFP absence.



**Single-cell RFP trajectories for 20 old cells of the SSA strain (yTY147a) containing the SSA repair reporter cassette with the RFPdegron (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest. Shaded green area corresponds to 4-hour window of doxycycline treatment. Red horizontal line is the RFP cutoff for calling RFP absence.



**Single-cell RFP trajectories for 20 old cells of the SSAcontrol strain (yTY146a) containing the SSA repair reporter cassette with the RFPdegron (replicate #1).** Gaps are due to missing measurements due to inability to measure background fluorescence in the local region around the cell of interest. Shaded green area corresponds to the 4-hour window of doxycycline treatment. Red horizontal line is the RFP cutoff for calling RFP absence.