**Supporting Information**

**Fig. S1.** EGFP silencing in EGFP-CHO cells. Anti-EGFP shRNA (200 nM) was mixed with TatU1A-Alexa546 or TatU1A-CL1-Alexa546 for complex formation, added to EGFP-CHO cells, and incubated at 37°C for 2 h. After 20 h of irradiation (540 ± 10 nm light passed through a 4× objective lens for 64 s), fluorescent images were evaluated. The irradiated area is to the right of the dotted line.
Fig. S2. Cellular FAM intensities after incubation of CHO cells with TatU1A-Alexa/shRNA-FAM or TatU1A-CL1-Alexa/shRNA-FAM. (A) The FAM intensities of the cells were evaluated by flow cytometry using FACSCalibur (BD Bioscience). (B) Mean FAM intensities with TatU1A and TatU1A-CL1 were analyzed using Cell Quest software (BD Bioscience).
**Fig. S3.** Evaluation of the knockdown of EGFP expression in EGFP stably-expressing human malignant mesothelioma cells. Cells were treated with TatU1A-Alexa546/shRNA or TatU1A-CL1-Alexa546/shRNA complexes and irradiated (540 ± 10 nm light passed through a 4× objective lens for 64 s). Cells were collected for flow cytometric analysis at 20 h after irradiation. The silencing effect was assessed by measuring EGFP MFI.
**Fig. S4.** Partial photoinduction of EGFP silencing. (A) Photomasking films were prepared to enable partial photostimulation of cells in the microwells of a 96-well plate, as described previously (Endoh *et al.* J. Controlled Release 137, 241-5, 2009). The photomasking film was attached to the bottom of the culture plate, and the cells were irradiated using a 4× objective lens. Cell lysates were obtained 20 h after photostimulation, and were applied to a 15 % SDS-polyacrylamide gel without boiling. Since EGFP maintains its fluorescence under this condition, EGFP was imaged by using a fluorescence image scanner (HITACHI FMBIO-SC01). (B) The EGFP intensity in the
partially irradiated wells. The EGFP intensity decreased depending on the size of the photostimulation area while the amount of total protein remained almost constant. As judged by the band intensity, the EGFP intensity decreased to 18% when the entire area was subjected to photostimulation. (C) Cytotoxicity after treatment with the TatU1A-CL1-Alexa546/shRNA complex and photostimulation. At 20 h after photostimulation, cytotoxicity was evaluated using the Cytotoxicity Detection Kit (LDH) (Roche, Switzerland), as described previously (Endoh et al. Bioconjug. Chem. 19, 1017-24, 2008).