Supporting Information

Tempo-spatial Activation of Sequential Quadruple Stimuli for High Gene Expression of Polymeric Gene Nanocomplexes

Hana Cho[†], Young-Woo Cho[‡], Sun-Woong Kang[‡], Mi-Kyoung Kwak[†], Kang Moo Huh[§], You Han Bae[¶, &], Han Chang Kang[†,*]

[†] Department of Pharmacy and Integrated Research Institute of Pharmaceutical Sciences, College of Pharmacy, The Catholic University of Korea, 43 Jibong-ro, Bucheon-si, Gyeonggi-do 14662, Republic of Korea

[‡] Next-generation Pharmaceutical Research Center, Korea Institute of Toxicology, 141 Gajeong-ro, Yuseong-gu, Daejeon, 34114, Republic of Korea

[§] Department of Polymer Science and Engineering, Chungnam National University, 99 Daehak-ro, Yuseong-gu, Daejeon 34134, Republic of Korea

[¶] Department of Pharmaceutics and Pharmaceutical Chemistry, The University of Utah, 30 S 2000 E, Rm 2972, Salt Lake City, UT 84112, USA

[&] Utah-Inha Drug Delivery Systems (DDS) and Advanced Therapeutics Research Center, 9 Songdomirae-ro, Yeonsu-gu, Incheon 21988, Republic of Korea

* Correspondence to:

Professor Han Chang Kang, Ph.D.

Tel: +82-2-2164-6533; Fax: +82-2-2164-4059

E-mail address: hckang@catholic.ac.kr

1. Supporting Figures

Figure S1. Dark-toxicity and photo-toxicity of RPC in MDA-MB-231 cells at 24 h post-treatment. The data are expressed as the means ± standard error (SE) (n=6).

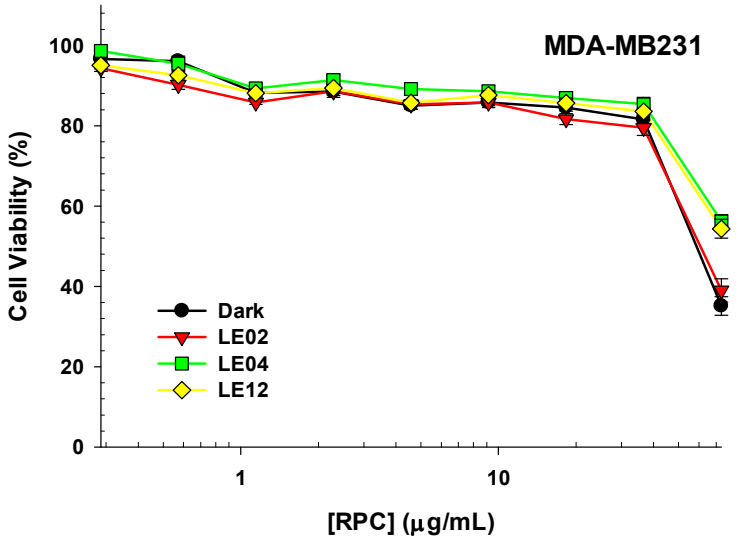

Figure S2. Representative TEM images of RPC/pDNA and PhA@RPC/pDNA complexes. Weight ratios of two polyplexes were 2.

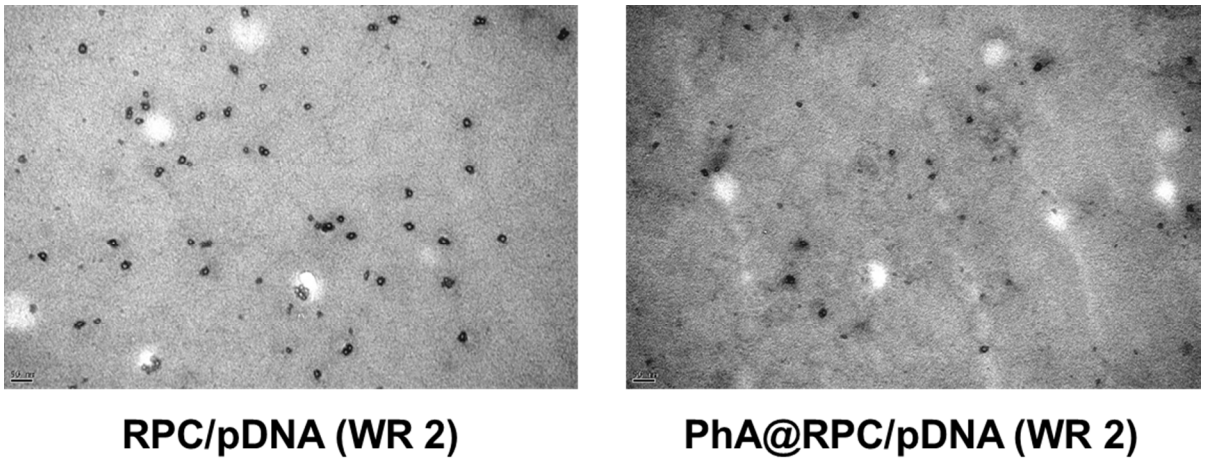

Figure S3. Time-point effects of light exposure on cell viability of the PhA@RPC/pDNA and RPC/pDNA complexes in MDA-MB-231 cells at 24 h post-treatment. For the experiments, dark (no light), LE02, LE04, LE06, LE10, and LE12 were applied after the cells were treated with the polyplexes (WR 2). The data are expressed as the means ± SE (n=3-23).

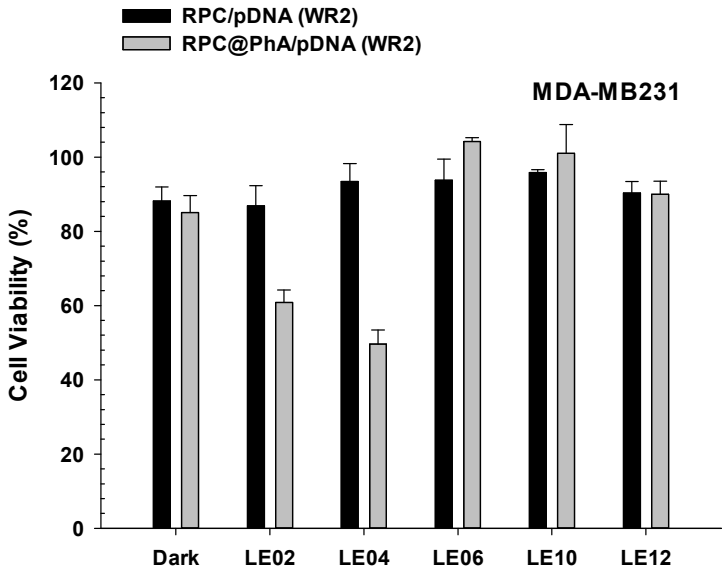

Figure S4. WR-dependent (a) transfection efficiency and (b) cell viability of PhA@RPC/pDNA and RPC/pDNA complexes in HeLa cells at 24 h post-treatment after treatment with either no light or LE12. The data are expressed as the means ± SE (n=4-20).

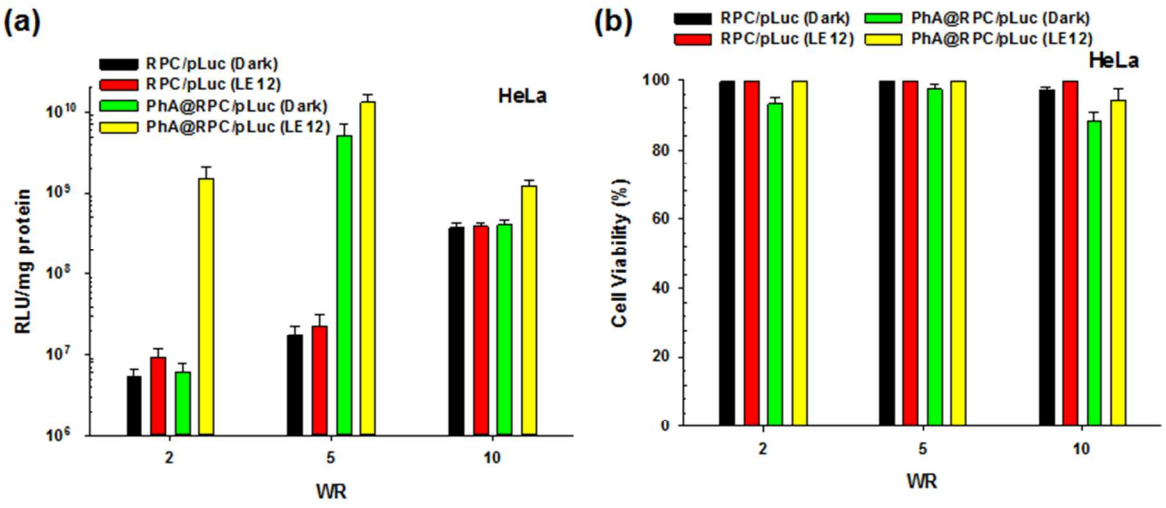

Figure S5. Light-triggered change in (a) intracellular ROS levels and (b) the activated NF-κB p-p105 levels in PhA@RPC/pDNA complex-transfected and RPC/pDNA complex-transfected MDA-MB-231 cells at 13 h post-transfection (i.e., an additional 1 h of incubation) after treatment with either no light or LE12. The data are expressed as the means ± SD (n=3). (*p < 0.05, **p<0.01 compared to the cell only without LE)