

**Supplementary Information**

**Ionic liquid [Bmim][PF<sub>6</sub>] stabilizes plasmid DNA against ultrasonic shear stress and enhances their *in vitro* delivery efficiency**

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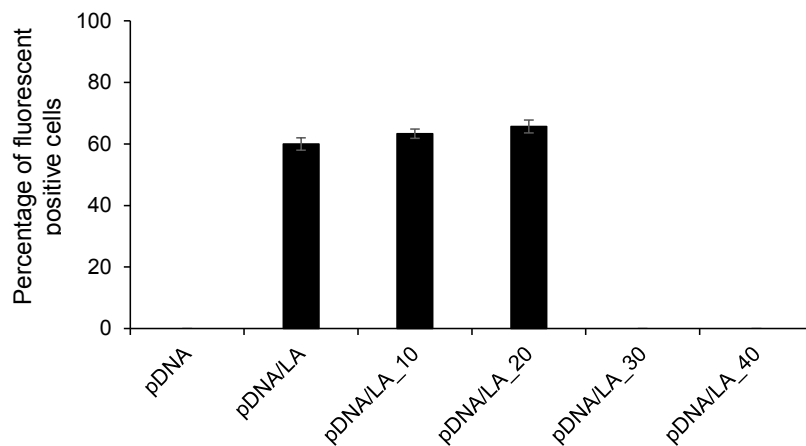
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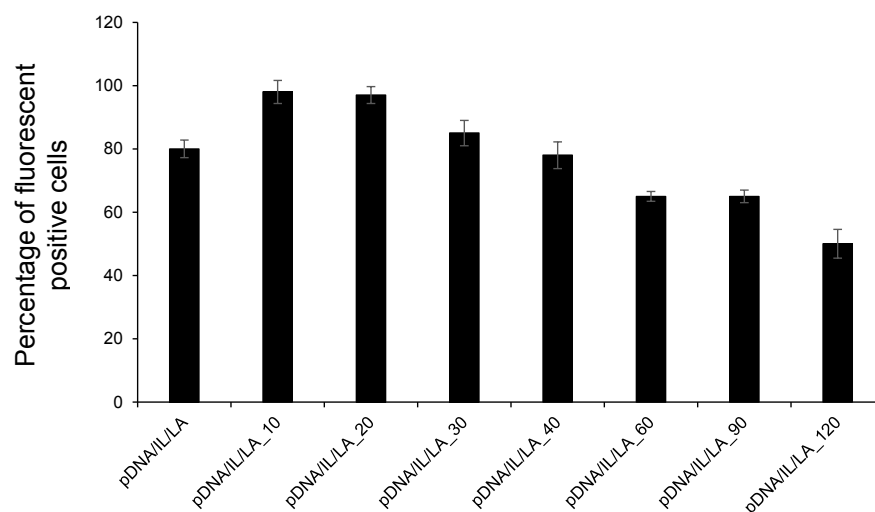
**Preparation of plasmid DNA/ionic liquid (IL) complexes:** Plasmid DNA (10  $\mu$ L, 16 mg/mL) was mixed with 990  $\mu$ L of [Bmim][PF<sub>6</sub>] in a 1.5 mL microcentrifuge tube and held for overnight vortex mixing. The reaction mixture was then centrifuged at 14 000 rpm for 30 min, and the supernatant was removed and pellet was washed twice with an ethanol (50%, semichilled) and acetonitrile (50%) mixture. The gellike plasmid DNA-[Bmim]<sup>+</sup> complex was observed by washing with acetonitrile (100%). We dissolved the gel in distilled water and made the final concentration 1 mg/mL; 5% of the DNA was lost during removal of excess [Bmim][PF<sub>6</sub>] ionic liquid. [Bmim][PF<sub>6</sub>] interacted with the DNA surface; i.e., [Bmim][PF<sub>6</sub>] was bound to the DNA entity.

**Table S1:** The zeta potential (mV) of only plasmid DNA and plasmid DNA/IL nanocomplexes

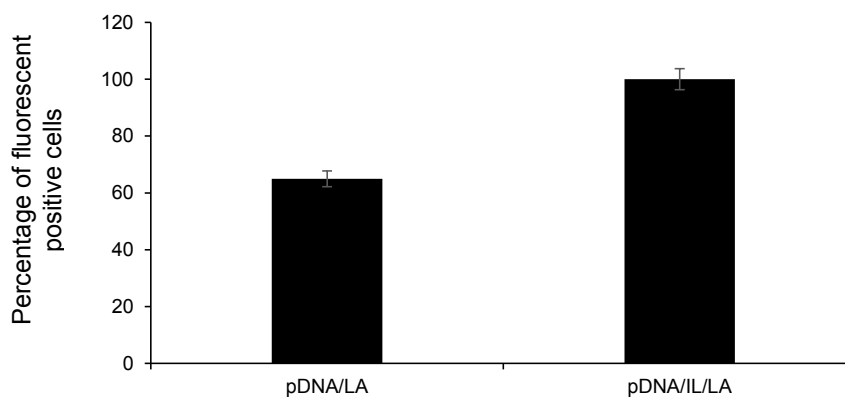
Sample Name	Zeta potential (mV)
Plasmid DNA	-0.259 $\pm$ .03
Plasmid DNA/IL	0.360 $\pm$ .04



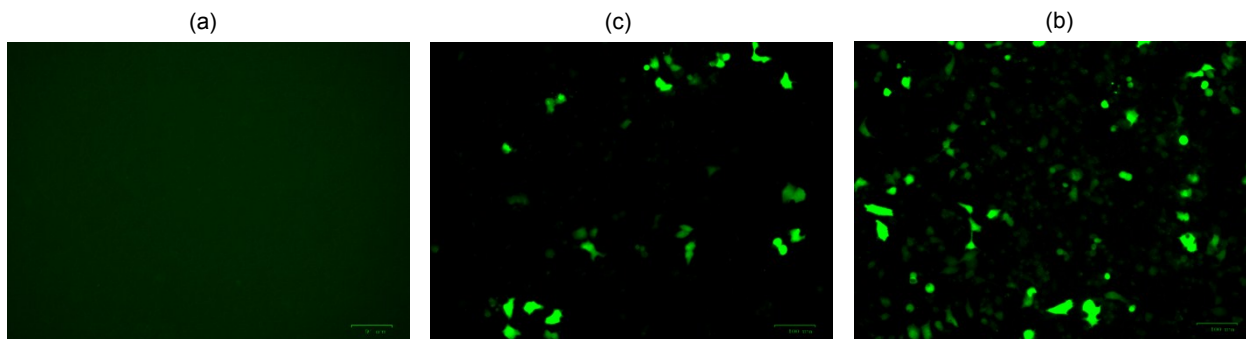
**Fig. S1.** Influence of lipofectamine (LA) on the delivery of plasmid DNA to COS7 cells. Plasmid DNA/lipofectamine (LA) complexes was subjected to ultrasonic shear stress for different time periods before delivering into COS7 cells in the presence of 10% fetal bovine serum (FBS). The data show the average number (%) of GFP positive HeLa cells counted in 10 different microscopic fields and the experiment was performed multiple times on three different days.



**Fig. S2.** Influence of ionic liquid [Bmim][PF<sub>6</sub>] on the delivery of plasmid DNA to COS7 cells. Plasmid DNA/IL (ionic liquid) nanocomplexes were subjected to ultrasonic shear stress for up to 120 minutes and complexed with LA before delivering into COS7 cells. The data show the average number (%) of GFP positive HeLa cells counted in 10 different microscopic fields and the experiment was performed multiple times on three different days.



**Fig. S3.** Influence of ionic liquid [Bmim][PF<sub>6</sub>] on the delivery of plasmid DNA to HEK293 cells. The data show the average number (%) of GFP positive HEK293 cells counted in 10 different microscopic fields and the experiment was performed multiple times on three different days.



**Fig. S4:** Delivery of plasmid DNA (pDNA), and pDNA/IL nanocomplexes to HeLa cells. (a) Only pDNA; (b) pDNA was complexed with 1  $\mu$ l lipofectamine (LA); (c) pDNA/IL nanocomplexes complexed with 1  $\mu$ l LA. Scale bar: 100  $\mu$ m.