|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cell line** | **Histology** | **AGE (years)** | **Race** | **Stage** | **# passages in culture** |
| OSPC ARK-1 | OSPC\* | 68 | C\*\*\* | IV | 5-10 |
| CC ARK-1 | CC\*\* | 42 | C | IIIC | 5-10 |

**Supplementary Table 1.** Patients characteristics from which primary cell lines were established. \* OSPC= Ovarina Serous Papillary Carcinoma; \*\* CC= Clear Cell; \*\*\* C= Caucasian

|  |  |
| --- | --- |
| **Histology** | **Stage** |
|  | **I** | **II** | **III** | **IV** |
| Serous | 2 | 5 | 42 | 8 |
| Endometrioid | 1 | 3 | 2 | - |
| Mucinous | 1 | - | - | - |
| Clear cell | 3 | - | 2 | 1 |

**Supplementary Table 2.** Characteristics of ovarian tumor samples from which RNA was extracted.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Formulation** | **Diameter**(nm±STDV) | **Loading**(μg/mg±STDV) | **Encapsulation efficiency**(%) | **Zeta potential**(mV±STDV) | **Coating density**(μg/mg NP±STDV) |
|  |  | PBS | Medium | PBS | Medium |  |  |
| CMV GFP scr-NP | 174±31 | 3.33±1.38 | 4.01±N/A | 33.3 | 40.1 | 33.3±0.5 | 3.13±0.26 |
| CMV GFP c-CPE-NP | 166±35 | 3.37±0.75 | 5.06±N/A | 33.7 | 50.6 | 34.9±0.6 | 3.5±0.21 |

**Supplementary Table 3.** Characterization of particle formulations.

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**Supplementary figure 1: DNA release in vitro in culture medium.** Release of plasmid DNA over a one week period from CMV GFP scr-NP (left panel) and CMV GFP c-CPE-NP (right panel). Both particle formulations showed an initial slow release of the DNA followed by a burst between 12 and 72 hours of incubation in culture medium at 37°C.

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**Supplementary Figure 2**: ovarian tumors’ uptake of c-CPE-NP in vivo. Representative time-course experiment showing the specific accumulation of c-CPE-NP into ovarian tumors starting at 12 hours after IP administration of the c-CPE-NP encapsulating the NIR790 Dye. Notably, fluorescence was retained in the tumor up to 96 hours after injection. The red circle identifies the localization of the sub-cutaneous tumor.



**Supplementary Figure 3: Treatment of OSPC-ARK-1-derived xenografts with c-CPE-NP encapsulating the p16 DT-A plasmid improves mice survival.** OSPC-ARK-1-derived xenograftstreated with vehicle, c-CPE-NP encapsulating the empty plasmid [c-CPE-NP (empty plasmid)] or the p16 DTA c-CPE-NPs for 30 days were monitored for Overall Survival (OS) for a total of 45 days after the first NP treatment. p16 DT-A c-CPE-NP treatment significantly improved OS of tumor bearing mice when compared to control vehicle injected mice (p = 0.007) and mice injected with c-CPE-NP encapsulating the empty plasmid (p = 0.02).